Updated 05/15/2020

FEDERAL PROJECT

Effective May 15, 2020
Supersedes April 22, 2020

BIDDING INSTRUCTIONS

FOR ALL PROJECTS:

1. Use pen and ink to complete all paper Bids.
2. As a minimum, the following must be received prior to the time of Bid opening:

For a Paper Bid:

a) a copy of the Notice to Contractors, b) the completed Acknowledgement of Bid Amendments form, c) the completed Schedule of Items, d) two copies of the completed and signed Contract Offer, Agreement & Award form, e) a Bid Guaranty, (if required), and f) any other certifications or Bid requirements listed in the Bid Documents as due by Bid opening.

For an Electronic Bid:

NOTE: Not all projects accept Electronic Bids. Please review the Notice to Contractors and see if it specifically states that Electronic Bids will be accepted.

a) a completed Bid using Expedite® software and submitted via the Bid Express™ web-based service, b) an electronic Bid Guaranty (if required) or a faxed copy of a Bid Bond (with original to be delivered within 72 hours), and c) any other Certifications or Bid requirements listed in the Bid Documents as due by Bid opening.

3. Include prices for all items in the Schedule of Items (excluding non-selected alternates).
4. Bid Guaranty acceptable forms are:
   a) a properly completed and signed Bid Bond on the Department's prescribed form (or on a form that does not contain any significant variations from the Department's form as determined by the Department) for 5% of the Bid Amount or
   b) an Official Bank Check, Cashier's Check, Certified Check, U.S. Postal Money Order or Negotiable Certificate of Deposit in the amount stated in the Notice to Contractors or
   c) an electronic bid bond submitted with an electronic bid.

5. If a paper Bid is to be sent, "FedEx First Overnight" delivery is suggested as the package is delivered directly to the DOT Headquarters Building located at 16 Child Street in Augusta. Other means, such as U.S. Postal Service's Express Mail has proven not to be reliable.

IN ADDITION, FOR FEDERAL AID PROJECTS:

6. Complete the DBE Proposed Utilization form, and submit with your bid. If you are submitting your bid electronically, you must FAX the form to (207) 624-3431. This is a curable defect.

If you need further information regarding Bid preparation, call the DOT Contracts Section at (207) 624-3410.

For complete bidding requirements, refer to Section 102 of the Maine Department of Transportation, Standard Specifications, March 2020 Edition.

April 28, 2017
Supersedes November 05, 2014

NOTICE

The Maine Department of Transportation is attempting to improve the way Bid Amendments/Addendums are handled and allow for an electronic downloading of bid packages from our website, while continuing to maintain an optional plan holders list.

Prospective bidders, subcontractors or suppliers who wish to download a copy of the bid package and receive a courtesy notification of project specific bid amendments must fill out the on-line plan holder registration form and provide an email address to the MDOT Contracts mailbox at: MDOT.contracts@maine.gov. Each bid package will require a separate request.

Additionally, interested parties will be responsible for reviewing and retrieving the Bid Amendments from our web site, and acknowledging receipt and incorporating those Bid Amendments in their bids using the Acknowledgement of Bid Amendment Form.

The downloading of bid packages from the MDOT website is not the same as providing an electronic bid to the Department. Electronic bids must be submitted via http://www.BIDX.com. For information on electronic bidding contact Rebecca Snowden at rebecca.snowden@maine.gov or Diane Barnes at diane.barnes@maine.gov.

NOTICE

For security and other reasons, all Bid Packages which are mailed, shall be provided in double (one envelope inside the other) envelopes. The *Inner Envelope* shall have the following information provided on it:

Bid Enclosed - Do Not Open
PIN:
Town:
Date of Bid Opening:
Name of Contractor with mailing address and telephone number:

In Addition to the usual address information, the *Outer Envelope* should have written or typed on it:

Double Envelope: Bid Enclosed
PIN:
Town:
Date of Bid Opening:
Name of Contractor:
This should not be much of a change for those of you who use Federal Express or similar services.

Hand-carried Bids may be in one envelope as before, and should be marked with the following information:

Bid Enclosed: Do Not Open
PIN:
Town:
Name of Contractor:

October 16, 2001

STATE OF MAINE DEPARTMENT OF TRANSPORTATION

Bid Guaranty-Bid Bond Form

KNOW ALL MEN BY THESE PRESENTS THAT_____

_____, of the City/Town of_____and State of_____

as Principal, and_____as Surety, a

Corporation duly organized under the laws of the State of_____and having a usual place of

Business in_____and hereby held and firmly bound unto the Treasurer of

the State of Maine in the sum of_____,for payment which Principal and Surety bind

themselves, their heirs, executers, administrators, successors and assigns, jointly and severally.

The condition of this obligation is that the Principal has submitted to the Maine Department of Transportation, hereafter Department, a certain bid, attached hereto and incorporated as a part herein, to enter into a written contract for the construction of _____

_____

_____and if the Department shall accept said bid and the Principal shall execute and deliver a contract in the form attached hereto (properly completed in accordance with said bid) and shall furnish bonds for this faithful performance of said contract, and for the payment of all persons performing labor or furnishing material in connection therewith, and shall in all other respects perform the agreement created by the acceptance of said bid, then this obligation shall be null and void; otherwise it shall remain in full force, and effect.

Signed and sealed this_____day of_____20_____

WITNESS:

_____

_____

_____

WITNESS

_____

_____

_____

PRINCIPAL:

By_____

By:_____

By:_____

SURETY:

By_____

By:_____

Name of Local Agency: _____

SAMPLE

NOTICE

Bidders:

Please use the attached "Request for Information" form when submitting questions concerning specific Contracts that have been advertised for Bid, include additional numbered pages as required. RFI's may be faxed to 207-624-3431, submitted electronically through the Departments web page of advertised projects by selecting the RFI tab on the project details page or via e-mail to RFI-Contracts.MDOT@maine.gov.

These are the only allowable mechanisms for answering Project specific questions. Maine DOT will not be bound to any answers to Project specific questions received during the Bidding phase through other processes.

When submitting RFIs by Email please follow the same guidelines as stated on the "Request for Information" form and include the word "RFI" along with the Project name and Identification number in the subject line.

State of Maine
Department of Transportation

RFI No: _____

REQUEST FOR INFORMATION

Date _____ Time _____

Information Requested for:

WIN(S): _____ Town(s):_____Bid Date: _____

Question(s):_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

Request by:

Company Name:_____**Phone:(_____)_____**

Email:_____**Fax: (_____)_____**

Complete this form and fax to 207-624-3431, Attn: Project Manager (name listed on the "Notice to Contractors"), or Email questions to RFI-Contracts.MDOT@maine.gov, Please include the word "RFI" along with the Project Name and Identification Number in the Subject line, or electronically by using the RFI Tab located on the Individual Projects Detail page.

NOTICE

Disadvantaged Business Enterprise Proposed Utilization

The Apparent Low Bidder shall submit the Disadvantaged Business Enterprise Proposed Utilization form with their bid. This is a curable bid defect.

The Contractor's Disadvantaged Business Enterprise Proposed Utilization Plan form contains additional information that is required by USDOT.

The Contractor's Disadvantaged Business Enterprise Proposed Utilization Plan form should be used.

A copy of the new Contractor's Disadvantaged Business Enterprise Proposed Utilization Plan and instructions for completing it are attached.

Note: Questions about DBE firms, or to obtain a printed copy of the DBE Directory, contact The Office of Civil Rights at (207) 624-3066.

MDOTs DBE Directory of Certified firms can also be obtained at https://www.maine.gov/mdot/civilrights/dbe/

INSTRUCTIONS FOR PREPARING THE MaineDOT CONTRACTOR'S DBE/SUBCONTRACTOR UTILIZATION FORM

The Contractor Shall Extend equal opportunity to MaineDOT certified DBE firms (as listed in MaineDOT's DBE Directory of Certified Businesses) in the selection and utilization of Subcontractors and Suppliers.

SPECIFIC INSTRUCTIONS FOR COMPLETING THE FORM:

Insert Contractor name, the name of the person(s) preparing the form, and that person(s) telephone, fax number and e-mail address.

Calculate and provide percentage of your bid that will be allocated to DBE firms, Federal Project Identification Number, and location of the Project work.

In the columns, name each subcontractor, DBE and non-DBE firm to be used, provide the Unit/Item cost of the work/product to be provided by the subcontractor, give a brief description and the dollar value of the work.

Revised 1/12

DBE GOAL NOTICE FFY 2019-2021
Maine Department of Transportation
Disadvantaged Business Enterprise Program

Notice is hereby given that in accordance with US DOT regulation 49 CFR Part 26, the Maine Department of Transportation (MaineDOT) has established a Disadvantaged Business Enterprise Program (DBE) for disadvantaged business participation in the federal-aid highway and bridge construction programs; MaineDOT contracts covered by the program include consulting, construction, supplies, manufacturing, and service contracts.

For FFY 2019-21 (October 1, 2018 through September 30, 2021) MaineDOT has established an annual DBE participation goal of **2.4%** to be achieved through race/gender neutral means. This goal has been approved by the Federal Highway Administration and remains in effect through September 30, 2021. Maine DOT must meet this goal each federal fiscal year. If the goal is not met, MaineDOT must provide a justification for not meeting the goal and provide a plan to ensure the goal is met, which may include placing contract goals on certain projects that contractors will be required to meet.

MaineDOT asks all contractors, consultants and subcontractors to seek certified DBE firms for projects and to work to meet the determined 2.4% goal without the need to impose contract goals. DBE firms are listed on the MaineDOT website at:

https://www.maine.gov/mdot/civilrights/docs/dbe/WeeklyDBEVendorList.pdf

Interested parties may view MaineDOT's DBE goal setting methodology, also posted on this website. If you have questions regarding this goal or the DBE program you may contact Sherry Tompkins at the Maine Department of Transportation, Civil Rights Office by telephone at (207) 624-3066 or by e-mail at: sherry.tompkins@maine.gov

.

MaineDOT CONTRACTOR'S DBE/SUBCONTRACTOR PROPOSED UTILIZATION FORM

All Bidders must furnish this form with their bid on Bid Opening day

Contractor: _____ **Telephone:** _____ **Ext** _____

Contact Person: _____ **Fax:** _____

E-mail: _____

BID DATE: _____

FEDERAL PROJECT PIN # _____ **PROJECT LOCATION:** _____

TOTAL ANTICIPATED DBE____% PARTICIPATION FOR THIS CONTRACT

WBE	DBE	Non DBE	Firm Name	Item Number & Description of Work	Quantity	Cost Per Unit/Item	Anticipated $ Value
						Subcontractor Total>	
						DBE Total >	

NOTE: THIS INFORMATION IS USED TO TRACK AND REPORT ANTICIPATED DBE PARTICIPATION IN ALL FEDERALLY FUNDED MAINE DOT CONTRACTS. THE ANTICIPATED DBE AMOUNT IS VOLUNTARY AND WILL NOT BECOME A PART OF THE CONTRACTUAL TERMS.

Equal Opportunity Use:

Form received:___/___/___Verified by: _____

FHWA ☐ FTA ☐ FAA ☐

For a complete list of certified firms and company designation (WBE/DBE) go to http://www.maine.gov/mdot/civilrights/

Rev. 01/15

Maine Department of Transportation Civil Rights Office

Directory of Certified Disadvantaged Business Enterprises

Listing can be found at:

https://www.maine.gov/mdot/civilrights/dbe/

For additional information and guidance contact:

Civil Rights Office at (207) 624-3066

It is the responsibility of the Contractor to access the DBE Directory at this site in order to have the most current listing.

Vendor Registration

Prospective Bidders must register as a vendor with the Department of Administrative & Financial Services if the vendor is awarded a contract. Vendors will not be able to receive payment without first being registered. Vendors/Contractors will find information and register through the following link –
http://www.maine.gov/purchases/venbid/index.shtml

STATE OF MAINE DEPARTMENT OF TRANSPORTATION
NOTICE TO CONTRACTORS

Sealed Bids addressed to the Maine Department of Transportation, Augusta, Maine 04333 and endorsed on the wrapper "Bids for International Bridge Replacement in the city of **EDMUNDSTON, PROVINCE OF NEW BRUNSWICK, CANADA** and in the town of **MADAWASKA, MAINE, USA**" will be received from contractors at the Reception Desk, MaineDOT Building, Capitol Street, Augusta, Maine, until 11:00 o'clock A.M. (prevailing time) on February 3, 2021 and at that time and place, publicly opened and read. **Only bidders prequalified for this specific project will be allowed to submit bids**. We now accept electronic bids for bid packages posted on the bidx.com website. Electronic bids do not have to be accompanied by paper bids. Please note: The Department will accept a facsimile of the bid bond; however, the original bid bond must then be received at the MDOT Contract Section within 72 hours of the bid opening. Until further notice, dual bids (one paper, one electronic) will be accepted, with the paper copy taking precedence.

Description: Maine Federal Aid Project No. 2173600 WIN 021736.00

Location: In New Brunswick Canada and Aroostook County USA on Bridge Avenue over the Maine Northern Railway, St. John River, and Canadian National Railway.

Scope of Work: International Bridge replacement plus other incidental work.

The basis of award will be Section 01 combined with the following Alternates;
Chosen Alternate Section 02, or Section 01 combined with chosen Alternate Section 03.
Chosen Alternate Section 04, or Section 01 combined with chosen Alternate Section 05.
Chosen Alternate Section 06, or Section 01 combined with chosen Alternate Section 07.
Chosen Alternate Section 08, or Section 01 combined with chosen Alternate Section 09.
Chosen Alternate Section 10, or Section 01 combined with chosen Alternate Section 11.

For general information regarding Bidding and Contracting procedures, contact George Macdougall at (207) 624-3410. Our webpage at http://www.maine.gov/mdot/contractors/ contains a copy of the Schedule of Items, Plan Holders List, written portions of bid amendments, drawings, bid results and an electronic form for RFI submittal. For Project-specific information fax all questions to **Project Manager Andrew Lathe** at (207) 624-3431, use electronic RFI form or email questions to RFI-Contracts.MDOT@maine.gov, project name and identification number should be in the subject line. Questions received after 12:00 noon of Monday (or if that Monday is a state holiday, Friday) prior to bid date will not be answered. Bidders shall not contact any other Departmental staff for clarification of Contract provisions, and the Department will not be responsible for any interpretations so obtained. TTY users call Maine Relay 711.

The Department expects to receive final approvals for pending Canadian permits and agreements before February 1, 2021. Pending permits include the Watercourse and Wetland Alteration Permit, Fisheries Act Authorization, International Bridges and Tunnels Authorization Act, and the Canadian Navigable Waters Approval. Related final documents will be issued as bid amendments as available. If any pending permits or agreements have not been received by the Department by February 1, 2021 the bid date will be extended accordingly.

Plans, specifications and bid forms may be seen at the MaineDOT Building in Augusta, Maine, and at the Department of Transportation's Regional Office in Presque Isle. They may be purchased from the Department between the hours of 8:00 a.m. to 4:30 p.m. by cash, credit card (Visa/Mastercard) or check payable to Treasurer, State of Maine sent to Maine Department of Transportation, Attn.: Mailroom, 16 State House Station, Augusta, Maine 04333-0016. They also may be purchased by telephone at (207) 624-3536 between the hours of 8:00 a.m. to 4:30 p.m. Full size plans $174.00 ($183.00 by mail). Half size plans $87.00 ($91.25 by mail), Bid Book $10 ($13 by mail), Single Sheets $2, payment in advance, all non-refundable.

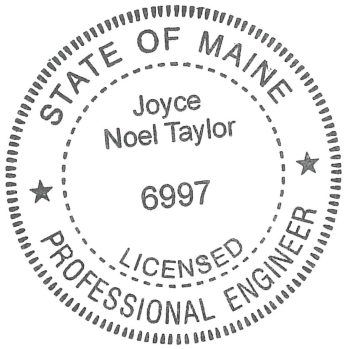
Each Bid must be made upon blank forms provided by the Department and must be accompanied by a bid bond at 5% of the bid amount or an official bank check, cashier's check, certified check, certificate of deposit, or United States postal money order in the amount of $2,050,000.00 payable to Treasurer, State of Maine as a Bid guarantee. A Contract Performance Surety Bond and a Contract Payment Surety Bond, each in the amount of 100 percent of the Contract price, will be required of the successful Bidder.

This Contract is subject to all applicable Federal Laws. This contract is subject to compliance with the Disadvantaged Business Enterprise program requirements as set forth by the Maine Department of Transportation.

All work shall be governed *by State of Maine, Department of Transportation, Standard Specifications, March 2020 Edition,* price $10 [$15 by mail], and *Standard Details, March 2020 Edition*, price $10 [$15 by mail]. They also may be purchased by telephone at (207) 624-3536 between the hours of 8:00 a.m. to 4:30 p.m. *Standard Detail* updates can be found at http://www.maine.gov/mdot/contractors/publications/ .

The right is hereby reserved to the MaineDOT to reject any or all bids.

Augusta, Maine
December 23, 2020



JOYCE NOEL TAYLOR, P. E.
CHIEF ENGINEER

SPECIAL PROVISION 102.7.3
ACKNOWLEDGMENT OF BID AMENDMENTS

With this form, the Bidder acknowledges its responsibility to check for all Amendments to the Bid Package. For each Project under Advertisement, Amendments are located at http://www.maine.gov/mdot/contractors/ . It is the responsibility of the Bidder to determine if there are Amendments to the Project, to download them, to incorporate them into their Bid Package, and to reference the Amendment number and the date on the form below. The Maine DOT will not post Bid Amendments any later than noon the day before Bid opening without individually notifying all the planholders.

Amendment Number	Date

The Contractor, for itself, its successors and assigns, hereby acknowledges that it has received all of the above referenced Amendments to the Bid Package.

CONTRACTOR

_____ _____
Date Signature of authorized representative

_____
(Name and Title Printed)

March 26, 2020

NOTICE

(COVID-19 Pandemic)

The Department considers the COVID-19 Pandemic an Uncontrollable Event as defined in Section 101.2 of the Department's Standard Specifications.

Accordingly, any documented delay to the project's Critical Path due to COVID-19 related issues, such as impacted workforce, subcontracts, or material supply, will be considered an Excusable Delay as defined in Section 109.5(A)(3) of the Department's Supplemental Specifications.

As an Excusable Delay, the Contractor is entitled to an extension of time provided that other associated notification, documentation, and procedural requirements set forth in the Contract are met.

Maine Department of Transportation

Proposal Schedule of Items

Proposal ID: 021736.00 Project(s): 021736.00

SECTION: 01 MAIN ITEMS

Alt Set ID: Alt Mbr ID:

Contractor: _____

Proposal Line Number	Item ID Description	Approximate Quantity and Units	Unit Price Dollars Cents	Bid Amount Dollars Cents
0010	202.19 REMOVING EXISTING BRIDGE	LUMP SUM	LUMP SUM	_____.____
0020	203.20 COMMON EXCAVATION	1,550.000 CY	_____.____	_____.____
0030	203.24 COMMON BORROW	17,300.000 CY	_____.____	_____.____
0040	203.25 GRANULAR BORROW	38,100.000 CY	_____.____	_____.____
0050	203.55 CULVERT BEDDING STONE	8,300.000 CY	_____.____	_____.____
0060	206.082 STRUCTURAL EARTH EXCAVATION - MAJOR STRUCTURES	5,800.000 CY	_____.____	_____.____
0070	206.092 STRUCTURAL ROCK EXCAVATION - MAJOR STRUCTURES	20.000 CY	_____.____	_____.____
0080	304.10 AGGREGATE SUBBASE COURSE - GRAVEL	150.000 CY	_____.____	_____.____
0090	403.2081 12.5 MM POLYMER MODIFIED HOT MIX ASPHALT	1,200.000 T	_____.____	_____.____
0100	409.15 BITUMINOUS TACK COAT - APPLIED	230.000 G	_____.____	_____.____
0110	501.220 MICRO PILES	58.000 EA	_____.____	_____.____
0120	501.2331 MICROPILE VERIFICATION LOAD TEST	1.000 EA	_____.____	_____.____

Proposal ID: 021736.00 Project(s): 021736.00

SECTION: 01 MAIN ITEMS

Alt Set ID: Alt Mbr ID:

Contractor: _____

Proposal Line Number	Item ID Description	Approximate Quantity and Units	Unit Price Dollars Cents	Bid Amount Dollars Cents
0130	501.2341 MICROPILE PROOF LOAD TEST	3.000 EA	_____.____	_____.____
0140	501.804 DRILLING EQUIPMENT MOBILIZATION	LUMP SUM	LUMP SUM	_____.____
0150	502.219 STRUCTURAL CONCRETE, ABUTMENTS AND RETAINING WALLS	LUMP SUM	LUMP SUM	_____.____
0160	502.239 STRUCTURAL CONCRETE PIERS	LUMP SUM	LUMP SUM	_____.____
0170	502.26 STRUCTURAL CONCRETE ROADWAY AND SIDEWALK SLABS ON STEEL BRIDGES	LUMP SUM	LUMP SUM	_____.____
0180	502.31 STRUCTURAL CONCRETE APPROACH SLABS	LUMP SUM	LUMP SUM	_____.____
0190	502.341 STRUCTURAL CONCRETE ROADWAY MEDIAN	14.000 CY	_____.____	_____.____
0200	502.49 STRUCTURAL CONCRETE CURBS AND SIDEWALKS	LUMP SUM	LUMP SUM	_____.____
0210	502.565 CONCRETE FILL	140.000 CY	_____.____	_____.____
0220	502.77 FIBER REINFORCED POLYMER BRIDGE DRAIN - TYPE: A	7.000 EA	_____.____	_____.____
0230	502.77 FIBER REINFORCED POLYMER BRIDGE DRAIN - TYPE: F	7.000 EA	_____.____	_____.____

Proposal ID: 021736.00 Project(s): 021736.00

SECTION: 01 MAIN ITEMS

Alt Set ID: Alt Mbr ID:

Contractor: _____

Proposal Line Number	Item ID Description	Approximate Quantity and Units	Unit Price Dollars Cents	Bid Amount Dollars Cents
0240	503.12 REINFORCING STEEL, FABRICATED AND DELIVERED	958,100.000 LB	_____.____	_____.____
0250	503.13 REINFORCING STEEL, PLACING	958,100.000 LB	_____.____	_____.____
0260	503.17 MECHANICAL WELDED SPLICE	301.000 EA	_____.____	_____.____
0270	503.26 STAINLESS STEEL REINFORCEMENT - FABRICATED & DELIVERED	985,000.000 LB	_____.____	_____.____
0280	503.27 STAINLESS STEEL REINFORCEMENT - PLACING	985,000.000 LB	_____.____	_____.____
0290	504.702 STRUCTURAL STEEL FABRICATED AND DELIVERED, WELDED	LUMP SUM	LUMP SUM	_____.____
0300	504.71 STRUCTURAL STEEL ERECTION	LUMP SUM	LUMP SUM	_____.____
0310	505.08 SHEAR CONNECTORS	LUMP SUM	LUMP SUM	_____.____
0320	507.0823 STEEL BRIDGE RAILING, 3 BAR S3-TL4	LUMP SUM	LUMP SUM	_____.____
0330	508.14 HIGH PERFORMANCE WATERPROOFING MEMBRANE	LUMP SUM	LUMP SUM	_____.____
0340	512.081 FRENCH DRAINS	LUMP SUM	LUMP SUM	_____.____

Proposal ID: 021736.00 Project(s): 021736.00

SECTION: 01 MAIN ITEMS

Alt Set ID: Alt Mbr ID:

Contractor: _____

Proposal Line Number	Item ID Description	Approximate Quantity and Units	Unit Price Dollars Cents	Bid Amount Dollars Cents
0350	513.22 CRUSHED STONE SLOPE PROTECTION	250.000 SY	_____.____	_____.____
0360	515.21 PROTECTIVE COATING FOR CONCRETE SURFACES	LUMP SUM	LUMP SUM	_____.____
0370	521.23 EXPANSION DEVICE FINGER JOINT ABUT NO.1	1.000 EA	_____.____	_____.____
0380	521.23 EXPANSION DEVICE FINGER JOINT ABUT NO.2	1.000 EA	_____.____	_____.____
0390	523.52 BEARING INSTALLATION	31.000 EA	_____.____	_____.____
0400	523.5551 POT OR DISC BEARINGS, FIXED	12.000 EA	_____.____	_____.____
0410	523.5552 POT OR DISC BEARINGS, EXPANSION	19.000 EA	_____.____	_____.____
0420	524.301 TEMPORARY STRUCTURAL SUPPORT EARTH	LUMP SUM	LUMP SUM	_____.____
0430	524.301 TEMPORARY STRUCTURAL SUPPORT GIRDER NO.4	LUMP SUM	LUMP SUM	_____.____
0440	524.40 PROTECTIVE SHIELD	LUMP SUM	LUMP SUM	_____.____
0450	526.301 PORTABLE CONCRETE BARRIER TYPE I	LUMP SUM	LUMP SUM	_____.____

Proposal ID: 021736.00 Project(s): 021736.00

SECTION: 01 MAIN ITEMS

Alt Set ID: Alt Mbr ID:

Contractor: _____

Proposal Line Number	Item ID Description	Approximate Quantity and Units	Unit Price Dollars	 Cents	Bid Amount Dollars	 Cents
0460	526.34 PERMANENT CONCRETE TRANSITION BARRIER	4.000 EA				
0470	606.65 GUARDRAIL THRIE BEAM - SINGLE RAIL	38.000 LF				
0480	606.66 TERMINAL END THRIE BEAM	2.000 EA				
0490	607.1706 TEMPORARY CHAIN LINK FENCE - 8'	LUMP SUM	LUMP SUM			
0500	607.183 CHAIN LINK SNOW FENCE 33 INCH	LUMP SUM	LUMP SUM			
0510	610.08 PLAIN RIPRAP	170.000 CY				
0520	610.16 HEAVY RIPRAP	28,900.000 CY				
0530	615.07 LOAM	700.000 CY				
0540	618.14 SEEDING METHOD NUMBER 2	113.000 UN				
0550	619.12 MULCH	113.000 UN				
0560	619.14 EROSION CONTROL MIX	700.000 CY				
0570	620.58 EROSION CONTROL GEOTEXTILE	24,000.000 SY				
0580	620.60 SEPARATION GEOTEXTILE	1,850.000 SY				

Proposal ID: 021736.00 Project(s): 021736.00

SECTION: 01 MAIN ITEMS

Alt Set ID: Alt Mbr ID:

Contractor: _____

Proposal Line Number	Item ID Description	Approximate Quantity and Units	Unit Price Dollars	 Cents	Bid Amount Dollars	 Cents
0590	626.11 PRECAST CONCRETE JUNCTION BOX	3.000 EA				
0600	626.22 NON-METALLIC CONDUIT	5,900.000 LF				
0610	626.221 NON-METALLIC CONDUIT CONCRETE ENCASED	860.000 LF				
0620	627.733 4" WHITE OR YELLOW PAINTED PAVEMENT MARKING LINE	6,200.000 LF				
0630	627.76 TEMPORARY PAVEMENT MARKING LINE, WHITE OR YELLOW	LUMP SUM	LUMP SUM			
0640	629.05 HAND LABOR, STRAIGHT TIME	120.000 HR				
0650	631.10 AIR COMPRESSOR (INCLUDING OPERATOR)	40.000 HR				
0660	631.11 AIR TOOL (INCLUDING OPERATOR)	80.000 HR				
0670	631.12 ALL PURPOSE EXCAVATOR (INCLUDING OPERATOR)	80.000 HR				
0680	631.172 TRUCK - LARGE (INCLUDING OPERATOR)	120.000 HR				
0690	631.22 FRONT END LOADER (INCLUDING OPERATOR)	40.000 HR				

Proposal ID: 021736.00 Project(s): 021736.00

SECTION: 01 MAIN ITEMS

Alt Set ID: Alt Mbr ID:

Contractor: _____

Proposal Line Number	Item ID Description	Approximate Quantity and Units	Unit Price Dollars Cents	Bid Amount Dollars Cents
0700	634.160 HIGHWAY LIGHTING	LUMP SUM	LUMP SUM	_____.____
0710	634.2042 LED LUMINARIES	13.000 EA	_____.____	_____.____
0720	634.210 CONVENTIONAL LIGHT STANDARD	13.000 EA	_____.____	_____.____
0730	634.803 AESTHETIC LIGHTING	LUMP SUM	LUMP SUM	_____.____
0740	639.18 FIELD OFFICE TYPE A MODIFIED	1.000 EA	_____.____	_____.____
0750	639.19 FIELD OFFICE TYPE B	1.000 EA	_____.____	_____.____
0760	641.35 ALUMINUM FLAG POLE	3.000 EA	_____.____	_____.____
0770	645.103 DEMOUNT GUIDE SIGN	11.000 EA	_____.____	_____.____
0780	645.12 OVERHEAD GUIDE SIGN: STA 103+30	LUMP SUM	LUMP SUM	_____.____
0790	645.12 OVERHEAD GUIDE SIGN: STA 112+85	LUMP SUM	LUMP SUM	_____.____
0800	645.291 ROADSIDE GUIDE SIGNS TYPE II	60.000 SF	_____.____	_____.____
0810	645.292 REGULATORY, WARNING, CONFIRMATION AND ROUTE MARKER ASSEMBLY SIGNS TYPE II	160.000 SF	_____.____	_____.____
0820	652.312 TYPE III BARRICADE	5.000 EA	_____.____	_____.____

Proposal ID: 021736.00 Project(s): 021736.00

SECTION: 01 MAIN ITEMS

Alt Set ID: Alt Mbr ID:

Contractor: _____

Proposal Line Number	Item ID Description	Approximate Quantity and Units	Unit Price Dollars	Cents	Bid Amount Dollars	Cents
0830	652.33 DRUM	50.000 EA				
0840	652.34 CONE	50.000 EA				
0850	652.35 CONSTRUCTION SIGNS	300.000 SF				
0860	652.361 MAINTENANCE OF TRAFFIC CONTROL DEVICES	LUMP SUM	LUMP SUM			
0870	652.38 FLAGGER	400.000 HR				
0880	652.41 PORTABLE CHANGEABLE MESSAGE SIGN	10.000 EA				
0890	653.24 4 INCH POLYSTYRENE PLASTIC INSULATION	320.000 SY				
0900	656.75 TEMPORARY SOIL EROSION AND WATER POLLUTION CONTROL	LUMP SUM	LUMP SUM			
0910	659.10 MOBILIZATION	LUMP SUM	LUMP SUM			
0920	660.21 ON-THE-JOB TRAINING (BID)	7,000.000 HR				
0930	801.011 BYPASS PUMPING SYSTEM	LUMP SUM	LUMP SUM			
0940	801.183 12 INCH PVC SANITARY SEWER (DR-18)	380.000 LF				

Proposal ID: 021736.00 Project(s): 021736.00

SECTION: 01 MAIN ITEMS

Alt Set ID: Alt Mbr ID:

Contractor: _____

Proposal Line Number	Item ID Description	Approximate Quantity and Units	Unit Price Dollars Cents	Bid Amount Dollars Cents
0950	803.173 SEWER MANHOLE - 4 FOOT DIAMETER	3.000 EA	_____.____	_____.____
0960	805.293 ADDITIONAL SELECT BACKFILL MATERIAL	20.000 CY	_____.____	_____.____
0970	827.302 UNSUITABLE SOIL EXCAVATION - BELOW GRADE	20.000 CY	_____.____	_____.____
0980	827.304 TRENCH ROCK EXCAVATION	20.000 CY	_____.____	_____.____
0990	827.33 TRENCH INSULATION 2 INCH	40.000 LF	_____.____	_____.____
1000	910.301 SPECIAL WORK RELCT OF MUN SVCS CAT B	LUMP SUM	LUMP SUM	_____.____
1010	910.301 SPECIAL WORK UTILITY CONDUIT APPR ONLY	LUMP SUM	LUMP SUM	_____.____
1020	910.301 SPECIAL WORK UTILITY CONDUIT BR ONLY	LUMP SUM	LUMP SUM	_____.____

Section: 01 Total: _____.____

Proposal ID: 021736.00 Project(s): 021736.00

SECTION: 02 PIER NO.1 DRIVEN PILE FDN

Alt Set ID: AA Alt Mbr ID: 1

Contractor: _____

Proposal ID: 021736.00 Project(s): 021736.00

SECTION: 02 PIER NO.1 DRIVEN PILE FDN

Alt Set ID: AA Alt Mbr ID: 1

Contractor: _____

Proposal Line Number	Item ID Description	Approximate Quantity and Units	Unit Price Dollars Cents	Bid Amount Dollars Cents
1030	206.082 STRUCTURAL EARTH EXCAVATION - MAJOR STRUCTURES	1,100.000 CY	_____.____	_____.____
1040	501.239 DYNAMIC LOADING TESTS - PROVIDING FOR	2.000 EA	_____.____	_____.____
1050	501.54 STEEL H-BEAM PILES 117 LBS/FT, DELIVERED	1,900.000 LF	_____.____	_____.____
1060	501.541 STEEL H-BEAM PILES 117 LBS/FT, IN PLACE	1,900.000 LF	_____.____	_____.____
1070	501.90 PILE TIPS	36.000 EA	_____.____	_____.____
1080	501.91 PILE SPLICES	36.000 EA	_____.____	_____.____
1090	501.92 PILE DRIVING EQUIPMENT MOBILIZATION	LUMP SUM	LUMP SUM	_____.____
1100	502.239 STRUCTURAL CONCRETE PIERS	LUMP SUM	LUMP SUM	_____.____
1110	502.249 STRUCTURAL CONCRETE PIERS (PLACED UNDER WATER)	LUMP SUM	LUMP SUM	_____.____
1120	503.12 REINFORCING STEEL, FABRICATED AND DELIVERED	54,900.000 LB	_____.____	_____.____
1130	503.13 REINFORCING STEEL, PLACING	54,900.000 LB	_____.____	_____.____

Proposal ID: 021736.00 Project(s): 021736.00

SECTION: 02 PIER NO.1 DRIVEN PILE FDN

Alt Set ID: AA Alt Mbr ID: 1

Contractor: _____

Proposal Line Number	Item ID / Description	Approximate Quantity and Units	Unit Price		Bid Amount	
			Dollars	Cents	Dollars	Cents
1140	511.07 COFFERDAM: PIER NO.1	LUMP SUM	LUMP SUM		_____	.____
		Section: 02	Total:		_____	.____

Proposal ID: 021736.00 Project(s): 021736.00

SECTION: 03 PIER NO.1 DRILLED SHAFT FDN

Alt Set ID: AA Alt Mbr ID: 2

Contractor: _____

Proposal ID: 021736.00 Project(s): 021736.00

SECTION: 03 PIER NO.1 DRILLED SHAFT FDN

Alt Set ID: AA Alt Mbr ID: 2

Contractor: _____

Proposal Line Number	Item ID Description	Approximate Quantity and Units	Unit Price Dollars	 Cents	Bid Amount Dollars	 Cents
1150	206.082 STRUCTURAL EARTH EXCAVATION - MAJOR STRUCTURES	1,100.000 CY				
1160	501.8016 6 FOOT DIAMETER DRILLED SHAFT	180.000 LF				
1170	501.804 DRILLING EQUIPMENT MOBILIZATION	LUMP SUM	LUMP SUM			
1180	501.807 REMOVAL OF OBSTRUCTIONS	4.000 HOUR				
1190	501.82 CROSS HOLE SONIC LOGGING TESTING	1.000 EA				
1200	501.83 DRILLED SHAFT CONFIRMATORY BORINGS	115.000 LF				
1210	501.831 DRILLED SHAFT - ROCK SOCKET 5.5 FT DIA	65.000 LF				
1220	501.832 DRILLED SHAFT - SLOPING ROCK	2.000 HR				
1230	501.85 CORING OF DRILLED SHAFTS WITHOUT DEFECTS	10.000 LF				
1240	501.86 DRILLED SHAFT INSPECTION DEVICE TEST	4.000 EA				
1250	501.861 CONCRETE TEST CYLINDERS OF SHAFTS WITHOUT DEFECTS	4.000 EA				

Proposal ID: 021736.00 Project(s): 021736.00

SECTION: 03 PIER NO.1 DRILLED SHAFT FDN

Alt Set ID: AA Alt Mbr ID: 2

Contractor: _____

Proposal Line Number	Item ID Description	Approximate Quantity and Units	Unit Price Dollars	 Cents	Bid Amount Dollars	 Cents
1260	501.87 THERMAL INTEGRITY PROFILER TEST, PROVIDING FOR	4.000 EA				
1270	502.239 STRUCTURAL CONCRETE PIERS	LUMP SUM	LUMP SUM			
1280	502.249 STRUCTURAL CONCRETE PIERS (PLACED UNDER WATER)	LUMP SUM	LUMP SUM			
1290	503.12 REINFORCING STEEL, FABRICATED AND DELIVERED	54,100.000 LB				
1300	503.13 REINFORCING STEEL, PLACING	54,100.000 LB				
1310	511.07 COFFERDAM: PIER NO.1	LUMP SUM	LUMP SUM			
	Section: 03		Total:			

Proposal ID: 021736.00 Project(s): 021736.00

SECTION: 04 PIER NO.2 SPREAD FOOTING FDN

Alt Set ID: AB Alt Mbr ID: 1

Contractor: _____

Proposal Line Number	Item ID Description	Approximate Quantity and Units	Unit Price Dollars Cents	Bid Amount Dollars Cents
1320	203.2318 DISPOSAL OF SPECIAL WASTE	2,200.000 T	_____.____	_____.____
1330	206.082 STRUCTURAL EARTH EXCAVATION - MAJOR STRUCTURES	1,400.000 CY	_____.____	_____.____
1340	206.092 STRUCTURAL ROCK EXCAVATION - MAJOR STRUCTURES	25.000 CY	_____.____	_____.____
1350	502.239 STRUCTURAL CONCRETE PIERS	 LUMP SUM	LUMP SUM	_____.____
1360	502.24 STRUCTURAL CONCRETE PIERS (PLACED UNDER WATER)	1,060.000 CY	_____.____	_____.____
1370	503.12 REINFORCING STEEL, FABRICATED AND DELIVERED	55,600.000 LB	_____.____	_____.____
1380	503.13 REINFORCING STEEL, PLACING	55,600.000 LB	_____.____	_____.____
1390	511.07 COFFERDAM: PIER NO. 2	 LUMP SUM	LUMP SUM	_____.____
		Section: 04	Total:	_____.____

Proposal ID: 021736.00 Project(s): 021736.00

SECTION: 05 PIER NO.2 DRILLED SHAFT FDN

Alt Set ID: AB Alt Mbr ID: 2

Contractor: _____

Proposal ID: 021736.00 Project(s): 021736.00

SECTION: 05 PIER NO.2 DRILLED SHAFT FDN

Alt Set ID: AB Alt Mbr ID: 2

Contractor: _____

Proposal Line Number	Item ID Description	Approximate Quantity and Units	Unit Price Dollars	 Cents	Bid Amount Dollars	 Cents
1400	203.2318 DISPOSAL OF SPECIAL WASTE	950.000 T				
1410	206.082 STRUCTURAL EARTH EXCAVATION - MAJOR STRUCTURES	600.000 CY				
1420	501.8016 6 FOOT DIAMETER DRILLED SHAFT	90.000 LF				
1430	501.804 DRILLING EQUIPMENT MOBILIZATION	 LUMP SUM	 LUMP SUM			
1440	501.807 REMOVAL OF OBSTRUCTIONS	4.000 HOUR				
1450	501.82 CROSS HOLE SONIC LOGGING TESTING	1.000 EA				
1460	501.83 DRILLED SHAFT CONFIRMATORY BORINGS	35.000 LF				
1470	501.831 DRILLED SHAFT - ROCK SOCKET 5.5 FT DIA	65.000 LF				
1480	501.832 DRILLED SHAFT - SLOPING ROCK	2.000 HR				
1490	501.85 CORING OF DRILLED SHAFTS WITHOUT DEFECTS	10.000 LF				
1500	501.86 DRILLED SHAFT INSPECTION DEVICE TEST	4.000 EA				

Proposal ID: 021736.00 Project(s): 021736.00

SECTION: 05 PIER NO.2 DRILLED SHAFT FDN

Alt Set ID: AB Alt Mbr ID: 2

Contractor: _____

Proposal Line Number	Item ID Description	Approximate Quantity and Units	Unit Price Dollars	Unit Price Cents	Bid Amount Dollars	Bid Amount Cents
1510	501.861 CONCRETE TEST CYLINDERS OF SHAFTS WITHOUT DEFECTS	4.000 EA				
1520	501.87 THERMAL INTEGRITY PROFILER TEST, PROVIDING FOR	4.000 EA				
1530	502.239 STRUCTURAL CONCRETE PIERS	LUMP SUM	LUMP SUM			
1540	502.249 STRUCTURAL CONCRETE PIERS (PLACED UNDER WATER)	LUMP SUM	LUMP SUM			
1550	503.12 REINFORCING STEEL, FABRICATED AND DELIVERED	54,100.000 LB				
1560	503.13 REINFORCING STEEL, PLACING	54,100.000 LB				
1570	511.07 COFFERDAM: PIER NO.2	LUMP SUM	LUMP SUM			
	Section: 05		Total:			

Proposal ID: 021736.00 Project(s): 021736.00

SECTION: 06 PIER NO.3 SPREAD FOOTING FDN

Alt Set ID: AC Alt Mbr ID: 1

Contractor: _____

Proposal Line Number	Item ID / Description	Approximate Quantity and Units	Unit Price Dollars	Unit Price Cents	Bid Amount Dollars	Bid Amount Cents
1580	203.2318 DISPOSAL OF SPECIAL WASTE	2,350.000 T				
1590	206.082 STRUCTURAL EARTH EXCAVATION - MAJOR STRUCTURES	1,500.000 CY				
1600	206.092 STRUCTURAL ROCK EXCAVATION - MAJOR STRUCTURES	25.000 CY				
1610	502.239 STRUCTURAL CONCRETE PIERS	LUMP SUM	LUMP SUM			
1620	502.24 STRUCTURAL CONCRETE PIERS (PLACED UNDER WATER)	1,155.000 CY				
1630	503.12 REINFORCING STEEL, FABRICATED AND DELIVERED	55,600.000 LB				
1640	503.13 REINFORCING STEEL, PLACING	55,600.000 LB				
1650	511.07 COFFERDAM: PIER NO.3	LUMP SUM	LUMP SUM			

Section: 06 Total: _____

Proposal ID: 021736.00 Project(s): 021736.00

SECTION: 07 PIER NO.3 DRILLED SHAFT FDN

Alt Set ID: AC Alt Mbr ID: 2

Contractor: _____

Proposal ID: 021736.00 Project(s): 021736.00

SECTION: 07 PIER NO.3 DRILLED SHAFT FDN

Alt Set ID: AC Alt Mbr ID: 2

Contractor: _____

Proposal Line Number	Item ID Description	Approximate Quantity and Units	Unit Price Dollars Cents	Bid Amount Dollars Cents
1660	203.2318 DISPOSAL OF SPECIAL WASTE	950.000 T	_____.____	_____.____
1670	206.082 STRUCTURAL EARTH EXCAVATION - MAJOR STRUCTURES	600.000 CY	_____.____	_____.____
1680	501.8016 6 FOOT DIAMETER DRILLED SHAFT	100.000 LF	_____.____	_____.____
1690	501.804 DRILLING EQUIPMENT MOBILIZATION	 LUMP SUM	LUMP SUM	_____.____
1700	501.807 REMOVAL OF OBSTRUCTIONS	4.000 HOUR	_____.____	_____.____
1710	501.82 CROSS HOLE SONIC LOGGING TESTING	1.000 EA	_____.____	_____.____
1720	501.83 DRILLED SHAFT CONFIRMATORY BORINGS	35.000 LF	_____.____	_____.____
1730	501.831 DRILLED SHAFT - ROCK SOCKET 5.5 FT DIA	65.000 LF	_____.____	_____.____
1740	501.832 DRILLED SHAFT - SLOPING ROCK	2.000 HR	_____.____	_____.____
1750	501.85 CORING OF DRILLED SHAFTS WITHOUT DEFECTS	10.000 LF	_____.____	_____.____
1760	501.86 DRILLED SHAFT INSPECTION DEVICE TEST	4.000 EA	_____.____	_____.____

Proposal ID: 021736.00 Project(s): 021736.00

SECTION: 07 PIER NO.3 DRILLED SHAFT FDN

Alt Set ID: AC Alt Mbr ID: 2

Contractor: _____

Proposal Line Number	Item ID Description	Approximate Quantity and Units	Unit Price Dollars	Unit Price Cents	Bid Amount Dollars	Bid Amount Cents
1770	501.861 CONCRETE TEST CYLINDERS OF SHAFTS WITHOUT DEFECTS	4.000 EA				
1780	501.87 THERMAL INTEGRITY PROFILER TEST, PROVIDING FOR	4.000 EA				
1790	502.239 STRUCTURAL CONCRETE PIERS	LUMP SUM	LUMP SUM			
1800	502.249 STRUCTURAL CONCRETE PIERS (PLACED UNDER WATER)	LUMP SUM	LUMP SUM			
1810	503.12 REINFORCING STEEL, FABRICATED AND DELIVERED	54,100.000 LB				
1820	503.13 REINFORCING STEEL, PLACING	54,100.000 LB				
1830	511.07 COFFERDAM: PIER NO.3	LUMP SUM	LUMP SUM			

Section: 07 Total: _____

Proposal ID: 021736.00 Project(s): 021736.00

SECTION: 08 PIER NO.4 SPREAD FOOTING FDN

Alt Set ID: AD Alt Mbr ID: 1

Contractor: _____

Proposal Line Number	Item ID Description	Approximate Quantity and Units	Unit Price Dollars	Unit Price Cents	Bid Amount Dollars	Bid Amount Cents
1840	203.2318 DISPOSAL OF SPECIAL WASTE	2,350.000 T				
1850	206.082 STRUCTURAL EARTH EXCAVATION - MAJOR STRUCTURES	1,500.000 CY				
1860	206.092 STRUCTURAL ROCK EXCAVATION - MAJOR STRUCTURES	25.000 CY				
1870	502.239 STRUCTURAL CONCRETE PIERS	LUMP SUM	LUMP SUM			
1880	502.24 STRUCTURAL CONCRETE PIERS (PLACED UNDER WATER)	1,060.000 CY				
1890	503.12 REINFORCING STEEL, FABRICATED AND DELIVERED	55,600.000 LB				
1900	503.13 REINFORCING STEEL, PLACING	55,600.000 LB				
1910	511.07 COFFERDAM: PIER NO. 4	LUMP SUM	LUMP SUM			

Section: 08 Total: _____

Proposal ID: 021736.00 Project(s): 021736.00

SECTION: 09 PIER NO.4 DRILLED SHAFT FDN

Alt Set ID: AD Alt Mbr ID: 2

Contractor: _____

Proposal ID: 021736.00 Project(s): 021736.00

SECTION: 09 PIER NO.4 DRILLED SHAFT FDN

Alt Set ID: AD Alt Mbr ID: 2

Contractor: _____

Proposal Line Number	Item ID Description	Approximate Quantity and Units	Unit Price Dollars	 Cents	Bid Amount Dollars	 Cents
1920	203.2318 DISPOSAL OF SPECIAL WASTE	950.000 T				
1930	206.082 STRUCTURAL EARTH EXCAVATION - MAJOR STRUCTURES	600.000 CY				
1940	501.8016 6 FOOT DIAMETER DRILLED SHAFT	90.000 LF				
1950	501.804 DRILLING EQUIPMENT MOBILIZATION	 LUMP SUM	 LUMP SUM			
1960	501.807 REMOVAL OF OBSTRUCTIONS	4.000 HOUR				
1970	501.82 CROSS HOLE SONIC LOGGING TESTING	1.000 EA				
1980	501.83 DRILLED SHAFT CONFIRMATORY BORINGS	85.000 LF				
1990	501.831 DRILLED SHAFT - ROCK SOCKET 5.5 FT DIA	65.000 LF				
2000	501.832 DRILLED SHAFT - SLOPING ROCK	2.000 HR				
2010	501.85 CORING OF DRILLED SHAFTS WITHOUT DEFECTS	10.000 LF				
2020	501.86 DRILLED SHAFT INSPECTION DEVICE TEST	4.000 EA				

Proposal ID: 021736.00 Project(s): 021736.00

SECTION: 09 PIER NO.4 DRILLED SHAFT FDN

Alt Set ID: AD Alt Mbr ID: 2

Contractor: _____

Proposal Line Number	Item ID Description	Approximate Quantity and Units	Unit Price Dollars	 Cents	Bid Amount Dollars	 Cents
2030	501.861 CONCRETE TEST CYLINDERS OF SHAFTS WITHOUT DEFECTS	4.000 EA				
2040	501.87 THERMAL INTEGRITY PROFILER TEST, PROVIDING FOR	4.000 EA				
2050	502.239 STRUCTURAL CONCRETE PIERS	LUMP SUM	LUMP SUM			
2060	502.249 STRUCTURAL CONCRETE PIERS (PLACED UNDER WATER)	LUMP SUM	LUMP SUM			
2070	503.12 REINFORCING STEEL, FABRICATED AND DELIVERED	54,100.000 LB				
2080	503.13 REINFORCING STEEL, PLACING	54,100.000 LB				
2090	511.07 COFFERDAM: PIER NO.4	LUMP SUM	LUMP SUM			
	Section: 09		Total:			

Proposal ID: 021736.00 Project(s): 021736.00

SECTION: 10 PIER NO.5 SPREAD FOOTING FDN

Alt Set ID: AE Alt Mbr ID: 1

Contractor: _____

Proposal Line Number	Item ID / Description	Approximate Quantity and Units	Unit Price Dollars	Unit Price Cents	Bid Amount Dollars	Bid Amount Cents
2100	203.2318 DISPOSAL OF SPECIAL WASTE	2,600.000 T				
2110	206.082 STRUCTURAL EARTH EXCAVATION - MAJOR STRUCTURES	1,650.000 CY				
2120	206.092 STRUCTURAL ROCK EXCAVATION - MAJOR STRUCTURES	25.000 CY				
2130	502.239 STRUCTURAL CONCRETE PIERS	LUMP SUM	LUMP SUM			
2140	502.24 STRUCTURAL CONCRETE PIERS (PLACED UNDER WATER)	1,300.000 CY				
2150	503.12 REINFORCING STEEL, FABRICATED AND DELIVERED	55,600.000 LB				
2160	503.13 REINFORCING STEEL, PLACING	55,600.000 LB				
2170	511.07 COFFERDAM: PIER NO. 5	LUMP SUM	LUMP SUM			

Section: 10 Total: _____

Proposal ID: 021736.00 Project(s): 021736.00

SECTION: 11 PIER NO.5 DRILLED SHAFT FDN

Alt Set ID: AE Alt Mbr ID: 2

Contractor: _____

Proposal ID: 021736.00 Project(s): 021736.00

SECTION: 11 PIER NO.5 DRILLED SHAFT FDN

Alt Set ID: AE Alt Mbr ID: 2

Contractor: _____

Proposal Line Number	Item ID Description	Approximate Quantity and Units	Unit Price Dollars Cents	Bid Amount Dollars Cents
2180	203.2318 DISPOSAL OF SPECIAL WASTE	950.000 T	_____.____	_____.____
2190	206.082 STRUCTURAL EARTH EXCAVATION - MAJOR STRUCTURES	600.000 CY	_____.____	_____.____
2200	501.8016 6 FOOT DIAMETER DRILLED SHAFT	110.000 LF	_____.____	_____.____
2210	501.804 DRILLING EQUIPMENT MOBILIZATION	 LUMP SUM	LUMP SUM	_____.____
2220	501.807 REMOVAL OF OBSTRUCTIONS	4.000 HOUR	_____.____	_____.____
2230	501.82 CROSS HOLE SONIC LOGGING TESTING	1.000 EA	_____.____	_____.____
2240	501.83 DRILLED SHAFT CONFIRMATORY BORINGS	120.000 LF	_____.____	_____.____
2250	501.831 DRILLED SHAFT - ROCK SOCKET 5.5 FT DIA	65.000 LF	_____.____	_____.____
2260	501.832 DRILLED SHAFT - SLOPING ROCK	8.000 HR	_____.____	_____.____
2270	501.85 CORING OF DRILLED SHAFTS WITHOUT DEFECTS	10.000 LF	_____.____	_____.____
2280	501.86 DRILLED SHAFT INSPECTION DEVICE TEST	4.000 EA	_____.____	_____.____

Proposal ID: 021736.00 Project(s): 021736.00

SECTION: 11 PIER NO.5 DRILLED SHAFT FDN

Alt Set ID: AE Alt Mbr ID: 2

Contractor: _____

Proposal Line Number	Item ID Description	Approximate Quantity and Units	Unit Price Dollars	Unit Price Cents	Bid Amount Dollars	Bid Amount Cents
2290	501.861 CONCRETE TEST CYLINDERS OF SHAFTS WITHOUT DEFECTS	4.000 EA				
2300	501.87 THERMAL INTEGRITY PROFILER TEST, PROVIDING FOR	4.000 EA				
2310	502.239 STRUCTURAL CONCRETE PIERS	LUMP SUM	LUMP SUM			
2320	502.249 STRUCTURAL CONCRETE PIERS (PLACED UNDER WATER)	LUMP SUM	LUMP SUM			
2330	503.12 REINFORCING STEEL, FABRICATED AND DELIVERED	54,100.000 LB				
2340	503.13 REINFORCING STEEL, PLACING	54,100.000 LB				
2350	511.07 COFFERDAM: PIER NO.5	LUMP SUM	LUMP SUM			
	Section: 11		Total:			

Proposal ID: 021736.00 Project(s): 021736.00

SECTION: 12 EDMUNDSTON SEWER RELOCATION (OPTIONAL)

Alt Set ID: Alt Mbr ID:

Contractor: _____

Proposal Line Number	Item ID / Description	Approximate Quantity and Units	Unit Price Dollars	Unit Price Cents	Bid Amount Dollars	Bid Amount Cents
2360	910.301 SPECIAL WORK RELCT OF MUN SVCS CAT A	LUMP SUM	LUMP SUM		_____	_____
		Section: 12	Total:		_____	_____
			Total Bid:		_____	_____

CONTRACT AGREEMENT, OFFER & AWARD

AGREEMENT made on the date last signed below, by and between the State of Maine, acting through and by its Department of Transportation (Department), an agency of state government with its principal administrative offices located at Child Street Augusta, Maine, with a mailing address at 16 State House Station, Augusta, Maine 04333-0016, and _____

_____

a corporation or other legal entity organized under the laws of the State of _____, with its principal place of business located at _____

_____

The Department and the Contractor, in consideration of the mutual promises set forth in this Agreement (the "Contract"), hereby agree as follows:

A. The Work.

The Contractor agrees to complete all Work as specified or indicated in the Contract including Extra Work in conformity with the Contract, WIN **021736.00**, for **International Bridge Replacement** in **Edmundston New Brunswick, Canada, Madawaska Maine USA**, Counties of **Aroostook Maine USA and Madawaska New Brunswick Canada.** The Work includes construction, maintenance during construction, warranty as provided in the Contract, and other incidental work.

The Contractor shall be responsible for furnishing all supervision, labor, equipment, tools supplies, permanent materials and temporary materials required to perform the Work including construction quality control including inspection, testing and documentation, all required documentation at the conclusion of the project, warranting its work and performing all other work indicated in the Contract.

The Department shall have the right to alter the nature and extent of the Work as provided in the Contract; payment to be made as provided in the same.

B. Time.

The Contractor agrees to complete all Work, except warranty work, on or before **November 22, 2024.** Further, the Department may deduct from moneys otherwise due the Contractor, not as a penalty, but as Liquidated Damages in accordance with Sections 107.7 and 107.8 of the *State of Maine Department of Transportation Standard Specifications, March 2020 Edition* and related Special Provisions.

C. Price.

The quantities given in the Schedule of Items of the Bid Package will be used as the basis for determining the original Contract amount and for determining the amounts of the required Performance Surety Bond and Payment Surety Bond, and that the amount of this offer is

Section 01 $_____

Section 02 $_____

Section 03 $_____

Section 04 $_____

Section 05 $_____

Section 06 $_____

Section 07 $_____

Section 08 $_____

Section 09 $_____

Section 10 $_____

Section 11 $_____

Section 12 $_____

Performance Bond and Payment Bond each being 100% of the amount of this Contract.

D. Contract.

This Contract, which may be amended, modified, or supplemented in writing only, consists of the Contract documents as defined in the Plans, *Standard Specifications, March 2020 Edition*, *Standard Details March 2020 Edition* as updated through advertisement, Supplemental Specifications, Special Provisions, Contract Agreement; and Contract Bonds. It is agreed and understood that this Contract will be governed by the documents listed above.

E. Certifications.

By signing below, the Contractor hereby certifies that to the best of the Contractor's knowledge and belief:

1. All of the statements, representations, covenants, and/or certifications required or set forth in the Bid and the Bid Documents, including those in Appendix A to Division 100 of the *Standard Specifications March 2020 Edition* (Federal Contract Provisions Supplement), and the Contract are still complete and accurate as of the date of this Agreement.

2. The Contractor knows of no legal, contractual, or financial impediment to entering into this Contract.

3. The person signing below is legally authorized by the Contractor to sign this Contract on behalf of the Contractor and to legally bind the Contractor to the terms of the Contract.

F. Offer.

The undersigned, having carefully examined the site of work, the Plans, *Standard Specifications March 2020 Edition, Standard Details March 2020 Edition* as updated through advertisement, Supplemental Specifications, Special Provisions, Contract Agreement; and Contract Bonds contained herein for construction of: **WIN 021736.00, International Bridge replacement plus other incidental work, State of Maine and New Brunswick Canada,** on which bids will be received until the time specified in the "Notice to Contractors" do(es) hereby bid and offer to enter into this contract to supply all the materials, tools, equipment and labor to construct the whole of the Work in strict accordance with the terms and conditions of this Contract at the unit prices in the attached "Schedule of Items."

The Offeror agrees to perform the work required at the price specified above and in accordance with the bids provided in the attached "Schedule of Items" in strict accordance with the terms of this solicitation, and to provide the appropriate insurance and bonds if this offer is accepted by the Government in writing.

As Offeror also agrees:

First: To do any extra work, not covered by the attached "Schedule of Items," which may be ordered by the Resident, and to accept as full compensation the amount determined upon a "Force Account" basis as provided in the *Standard Specifications, March 2020 Edition*, and as addressed in the contract documents.

Second: That the bid bond at 5% of the bid amount or the official bank check, cashier's check, certificate of deposit or U. S. Postal Money Order in the amount given in the "Notice to Contractors", payable to the Treasurer of the State of Maine and accompanying this bid, shall be forfeited, as liquidated damages, if in case this bid is accepted, and the undersigned shall fail to abide by the terms and conditions of the offer and fail to furnish satisfactory insurance and Contract bonds under the conditions stipulated in the Specifications within 15 days of notice of intent to award the contract.

Third: To begin the Work as stated in Section 107.2 of the *Standard Specifications March 2020 Edition* and complete the Work within the time limits given in the Special Provisions of this Contract.

Fourth: The Contractor will be bound to the Disadvantaged Business Enterprise (DBE) Requirements contained in the attached Notice (Additional Instructions to Bidders) and submit a completed Contractor's Disadvantaged Business Enterprise Utilization Plan with their bid.

Fifth: That this offer shall remain open for 30 calendar days after the date of opening of bids.

Sixth: The Bidder hereby certifies, to the best of its knowledge and belief that: the Bidder has not, either directly or indirectly, entered into any agreement, participated in any collusion, or otherwise taken any action in restraint of competitive bidding in connection with its bid, and its subsequent contract with the Department.

IN WITNESS WHEREOF, the Contractor, for itself, its successors and assigns, hereby execute two duplicate originals of this Agreement and thereby binds itself to all covenants, terms, and obligations contained in the Contract Documents.

CONTRACTOR

_____	_____
Date	(Signature of Legally Authorized Representative of the Contractor)
_____	_____
Witness	(Name and Title Printed)

G. Award.

Your offer is hereby accepted for (see checked boxes):

Section 01 ❑	**Section 02 ❑**	**Section 03 ❑**	**Section 04 ❑**
Section 05 ❑	**Section 06 ❑**	**Section 07 ❑**	**Section 08 ❑**
Section 09 ❑	**Section 10 ❑**	**Section 11 ❑**	**Section 12 ❑**

Contract Amount: _____

This award consummates the Contract, and the documents referenced herein.

MAINE DEPARTMENT OF TRANSPORTATION

_____	_____
Date	By: Bruce A. Van Note, Commissioner
_____	
Witness	

CONTRACT AGREEMENT, OFFER & AWARD

AGREEMENT made on the date last signed below, by and between the State of Maine, acting through and by its Department of Transportation (Department), an agency of state government with its principal administrative offices located at Child Street Augusta, Maine, with a mailing address at 16 State House Station, Augusta, Maine 04333-0016, and _____

_____

a corporation or other legal entity organized under the laws of the State of _____, with its principal place of business located at _____

_____

The Department and the Contractor, in consideration of the mutual promises set forth in this Agreement (the "Contract"), hereby agree as follows:

A. The Work.

The Contractor agrees to complete all Work as specified or indicated in the Contract including Extra Work in conformity with the Contract, WIN **021736.00**, for **International Bridge Replacement** in **Edmundston New Brunswick, Canada, Madawaska Maine USA**, Counties of **Aroostook Maine USA and Madawaska New Brunswick Canada.** The Work includes construction, maintenance during construction, warranty as provided in the Contract, and other incidental work.

The Contractor shall be responsible for furnishing all supervision, labor, equipment, tools supplies, permanent materials and temporary materials required to perform the Work including construction quality control including inspection, testing and documentation, all required documentation at the conclusion of the project, warranting its work and performing all other work indicated in the Contract.

The Department shall have the right to alter the nature and extent of the Work as provided in the Contract; payment to be made as provided in the same.

B. Time.

The Contractor agrees to complete all Work, except warranty work, on or before **November 22, 2024.** Further, the Department may deduct from moneys otherwise due the Contractor, not as a penalty, but as Liquidated Damages in accordance with Sections 107.7 and 107.8 of the *State of Maine Department of Transportation Standard Specifications, March 2020 Edition* and related Special Provisions.

C. Price.

The quantities given in the Schedule of Items of the Bid Package will be used as the basis for determining the original Contract amount and for determining the amounts of the required Performance Surety Bond and Payment Surety Bond, and that the amount of this offer is

Section 01 $_____

Section 02 $_____

Section 03 $_____

Section 04 $_____

Section 05 $_____

Section 06 $_____

Section 07 $_____

Section 08 $_____

Section 09 $_____

Section 10 $_____

Section 11 $_____

Section 12 $_____

Performance Bond and Payment Bond each being 100% of the amount of this Contract.

D. Contract.

This Contract, which may be amended, modified, or supplemented in writing only, consists of the Contract documents as defined in the Plans, *Standard Specifications, March 2020 Edition, Standard Details March 2020 Edition* as updated through advertisement, Supplemental Specifications, Special Provisions, Contract Agreement; and Contract Bonds. It is agreed and understood that this Contract will be governed by the documents listed above.

E. Certifications.

By signing below, the Contractor hereby certifies that to the best of the Contractor's knowledge and belief:

1. All of the statements, representations, covenants, and/or certifications required or set forth in the Bid and the Bid Documents, including those in Appendix A to Division 100 of the *Standard Specifications March 2020 Edition* (Federal Contract Provisions Supplement), and the Contract are still complete and accurate as of the date of this Agreement.

2. The Contractor knows of no legal, contractual, or financial impediment to entering into this Contract.

3. The person signing below is legally authorized by the Contractor to sign this Contract on behalf of the Contractor and to legally bind the Contractor to the terms of the Contract.

F. Offer.

The undersigned, having carefully examined the site of work, the Plans, *Standard Specifications March 2020 Edition, Standard Details March 2020 Edition* as updated through advertisement, Supplemental Specifications, Special Provisions, Contract Agreement; and Contract Bonds contained herein for construction of: **WIN 021736.00, International Bridge replacement plus other incidental work, State of Maine and New Brunswick Canada,** on which bids will be received until the time specified in the "Notice to Contractors" do(es) hereby bid and offer to enter into this contract to supply all the materials, tools, equipment and labor to construct the whole of the Work in strict accordance with the terms and conditions of this Contract at the unit prices in the attached "Schedule of Items."

The Offeror agrees to perform the work required at the price specified above and in accordance with the bids provided in the attached "Schedule of Items" in strict accordance with the terms of this solicitation, and to provide the appropriate insurance and bonds if this offer is accepted by the Government in writing.

As Offeror also agrees:

First: To do any extra work, not covered by the attached "Schedule of Items," which may be ordered by the Resident, and to accept as full compensation the amount determined upon a "Force Account" basis as provided in the *Standard Specifications, March 2020 Edition*, and as addressed in the contract documents.

Second: That the bid bond at 5% of the bid amount or the official bank check, cashier's check, certificate of deposit or U. S. Postal Money Order in the amount given in the "Notice to Contractors", payable to the Treasurer of the State of Maine and accompanying this bid, shall be forfeited, as liquidated damages, if in case this bid is accepted, and the undersigned shall fail to abide by the terms and conditions of the offer and fail to furnish satisfactory insurance and Contract bonds under the conditions stipulated in the Specifications within 15 days of notice of intent to award the contract.

Third: To begin the Work as stated in Section 107.2 of the *Standard Specifications March 2020 Edition* and complete the Work within the time limits given in the Special Provisions of this Contract.

Fourth: The Contractor will be bound to the Disadvantaged Business Enterprise (DBE) Requirements contained in the attached Notice (Additional Instructions to Bidders) and submit a completed Contractor's Disadvantaged Business Enterprise Utilization Plan with their bid.

Fifth: That this offer shall remain open for 30 calendar days after the date of opening of bids.

Sixth: The Bidder hereby certifies, to the best of its knowledge and belief that: the Bidder has not, either directly or indirectly, entered into any agreement, participated in any collusion, or otherwise taken any action in restraint of competitive bidding in connection with its bid, and its subsequent contract with the Department.

IN WITNESS WHEREOF, the Contractor, for itself, its successors and assigns, hereby execute two duplicate originals of this Agreement and thereby binds itself to all covenants, terms, and obligations contained in the Contract Documents.

CONTRACTOR

_____	_____
Date	(Signature of Legally Authorized Representative of the Contractor)
_____	_____
Witness	(Name and Title Printed)

G. Award.

Your offer is hereby accepted for (see checked boxes):

Section 01 ❑	**Section 02 ❑**	**Section 03 ❑**	**Section 04 ❑**
Section 05 ❑	**Section 06 ❑**	**Section 07 ❑**	**Section 08 ❑**
Section 09 ❑	**Section 10 ❑**	**Section 11 ❑**	**Section 12 ❑**

Contract Amount: _____

This award consummates the Contract, and the documents referenced herein.

MAINE DEPARTMENT OF TRANSPORTATION

_____	_____
Date	By: Bruce A. Van Note, Commissioner
_____	
Witness	

CONTRACT AGREEMENT, OFFER & AWARD

AGREEMENT made on the date last signed below, by and between the State of Maine, acting through and by its Department of Transportation (Department), an agency of state government with its principal administrative offices located at Child Street Augusta, Maine, with a mailing address at 16 State House Station, Augusta, Maine 04333-0016, and **(Name of the firm bidding the job)** a corporation or other legal entity organized under the laws of the State of Maine, with its principal place of business located at **(address of the firm bidding the job)**

The Department and the Contractor, in consideration of the mutual promises set forth in this Agreement (the "Contract"), hereby agree as follows:

SAMPLE

A. The Work.

The Contractor agrees to complete all Work as specified or indicated in the Contract including Extra Work in conformity with the Contract, PIN No.01**12345.00**, for the **Hot Mix Asphalt Overlay** in the town/city of **South Nowhere,** County of **Washington**, Maine. The Work includes construction, maintenance during construction, warranty as provided in the Contract, and other incidental work.

The Contractor shall be responsible for furnishing all supervision, labor, equipment, tools supplies, permanent materials and temporary materials required to perform the Work including construction quality control including inspection, testing and documentation, all required documentation at the conclusion of the project, warranting its work and performing all other work indicated in the Contract.

The Department shall have the right to alter the nature and extent of the Work as provided in the Contract; payment to be made as provided in the same.

B. Time.

The Contractor agrees to complete all Work, except warranty work, on or before **November 15, 2006.** Further, the Department may deduct from moneys otherwise due the Contractor, not as a penalty, but as Liquidated Damages in accordance with Sections 107.7 and 107.8 of the *State of Maine Department of Transportation Standard Specifications, March 2020 Edition* and related Special Provisions.

C. Price.

The quantities given in the Schedule of Items of the Bid Package will be used as the basis for determining the original Contract amount and for determining the amounts of the required Performance Surety Bond and Payment Surety Bond, and that the amount of this offer is **(Place bid here in alphabetical form such as One Hundred and Two dollars and 10 cents)** **$ (repeat bid here in numerical terms, such as $102.10)** Performance Bond and Payment Bond each being 100% of the amount of this Contract.

D. Contract.

This Contract, which may be amended, modified, or supplemented in writing only, consists of the Contract documents as defined in the Plans, *Standard Specifications, March 2020 Edition, Standard Details March 2020 Edition*, Supplemental Specifications, Special Provisions, Contract Agreement; and Contract Bonds. It is agreed and understood that this Contract will be governed by the documents listed above.

SAMPLE

E. Certifications.

By signing below, the Contractor hereby certifies that to the best of the Contractor's knowledge and belief:

1. All of the statements, representations, covenants, and/or certifications required or set forth in the Bid and the Bid Documents, including those in Appendix A to Division 100 of the *Standard Specifications March 2020 Edition* (Federal Contract Provisions Supplement), and the Contract are still complete and accurate as of the date of this Agreement.

2. The Contractor knows of no legal, contractual, or financial impediment to entering into this Contract.

3. The person signing below is legally authorized by the Contractor to sign this Contract on behalf of the Contractor and to legally bind the Contractor to the terms of the Contract.

F. Offer.

The undersigned, having carefully examined the site of work, the Plans, *Standard Specifications, March 2020 Edition, Standard Details March 2020 Edition*, Supplemental Specifications, Special Provisions, Contract Agreement; and Contract Bonds contained herein for construction of:

PIN 012345.00 South Nowhere, Hot Mix Asphalt Overlay ,

State of Maine, on which bids will be received until the time specified in the "Notice to Contractors" do(es) hereby bid and offer to enter into this contract to supply all the materials, tools, equipment and labor to construct the whole of the Work in strict accordance with the terms and conditions of this Contract at the unit prices in the attached "Schedule of Items."

The Offeror agrees to perform the work required at the price specified above and in accordance with the bids provided in the attached "Schedule of Items" in strict accordance with the terms of this solicitation, and to provide the appropriate insurance and bonds if this offer is accepted by the Government in writing.

SAMPLE

As Offeror also agrees:

First: To do any extra work, not covered by the attached "Schedule of Items," which may be ordered by the Resident, and to accept as full compensation the amount determined upon a "Force Account" basis as provided in the *Standard Specifications, March 2020 Edition*, and as addressed in the contract documents.

Second: That the bid bond at 5% of the bid amount or the official bank check, cashier's check, certificate of deposit or U. S. Postal Money Order in the amount given in the "Notice to Contractors", payable to the Treasurer of the State of Maine and accompanying this bid, shall be forfeited, as liquidated damages, if in case this bid is accepted, and the undersigned shall fail to abide by the terms and conditions of the offer and fail to furnish satisfactory insurance and Contract bonds under the conditions stipulated in the Specifications within 15 days of notice of intent to award the contract.

Third: To begin the Work as stated in Section 107.2 of the *Standard Specifications March 2020 Edition* and complete the Work within the time limits given in the Special Provisions of this Contract.

Fourth: The Contractor will be bound to the Disadvantaged Business Enterprise (DBE) Requirements contained in the attached Notice (Additional Instructions to Bidders) and submit a completed Contractor's Disadvantaged Business Enterprise Utilization Plan with their bid.

Fifth: That this offer shall remain open for 30 calendar days after the date of opening of bids.

Sixth: The Bidder hereby certifies, to the best of its knowledge and belief that: the Bidder has not, either directly or indirectly, entered into any agreement, participated in any collusion, or otherwise taken any action in restraint of competitive bidding in connection with its bid, and its subsequent contract with the Department.

IN WITNESS WHEREOF, the Contractor, for itself, its successors and assigns, hereby execute two duplicate originals of this Agreement and thereby binds itself to all covenants, terms, and obligations contained in the Contract Documents.

CONTRACTOR

_____	**(Sign Here)**
Date	(Signature of Legally Authorized Representative of the Contractor)
(Witness Sign Here)	**(Print Name Here)**
Witness	(Name and Title Printed)

SAMPLE

G. Award.

Your offer is hereby accepted. This award consummates the Contract, and the documents referenced herein.

MAINE DEPARTMENT OF TRANSPORTATION

_____	_____
Date	By: Bruce A. Van Note, Commissioner
_____	
(Witness)	

BOND # _____

CONTRACT PERFORMANCE BOND
(Surety Company Form)

KNOW ALL MEN BY THESE PRESENTS: That _____ **_____ in the State of _____**, as principal, and…….....,
a corporation duly organized under the laws of the State of ..... and having a usual place of business ....,
as Surety, are held and firmly bound unto the Treasurer of the State of Maine in the sum of **_____ and 00/100 Dollars ($)**, to be paid said Treasurer of the State of Maine or his successors in office, for which payment well and truly to be made, Principal and Surety bind themselves, their heirs, executors and administrators, successors and assigns, jointly and severally by these presents.

The condition of this obligation is such that if the Principal designated as Contractor in the Contract to construct Project Number _____ in the Municipality of _____ promptly and faithfully performs the Contract, then this obligation shall be null and void; otherwise it shall remain in full force and effect.

The Surety hereby waives notice of any alteration or extension of time made by the State of Maine.

Signed and sealed this ..... day of ....., 20….. .

WITNESSES:	SIGNATURES:
	CONTRACTOR:
Signature.....	.....….....
Print Name Legibly	Print Name Legibly ...……....
	SURETY:
Signature	....……....
Print Name Legibly	Print Name Legibly .....
SURETY ADDRESS:	NAME OF LOCAL AGENCY:
.....	ADDRESS .....
.....	...……....
.....	.....……....
TELEPHONE.....	.....……....

SAMPLE

BOND # _____

CONTRACT PAYMENT BOND
(Surety Company Form)

KNOW ALL MEN BY THESE PRESENTS: That _____ _____ **in the State of** _____, as principal, and.....…..... a corporation duly organized under the laws of the State of ..... and having a usual place of business in .....……., as Surety, are held and firmly bound unto the Treasurer of the State of Maine for the use and benefit of claimants as herein below defined, in the sum of _____ **and 00/100 Dollars ($)** for the payment whereof Principal and Surety bind themselves, their heirs, executors and administrators, successors and assigns, jointly and severally by these presents.

The condition of this obligation is such that if the Principal designated as Contractor in the Contract to construct Project Number _____ in the Municipality of _____ promptly satisfies all claims and demands incurred for all labor and material, used or required by him in connection with the work contemplated by said Contract, and fully reimburses the obligee for all outlay and expense which the obligee may incur in making good any default of said Principal, then this obligation shall be null and void; otherwise it shall remain in full force and effect.

A claimant is defined as one having a direct contract with the Principal or with a Subcontractor of the Principal for labor, material or both, used or reasonably required for use in the performance of the contract.

Signed and sealed this ..... day of ...…….....…., 20 ... .

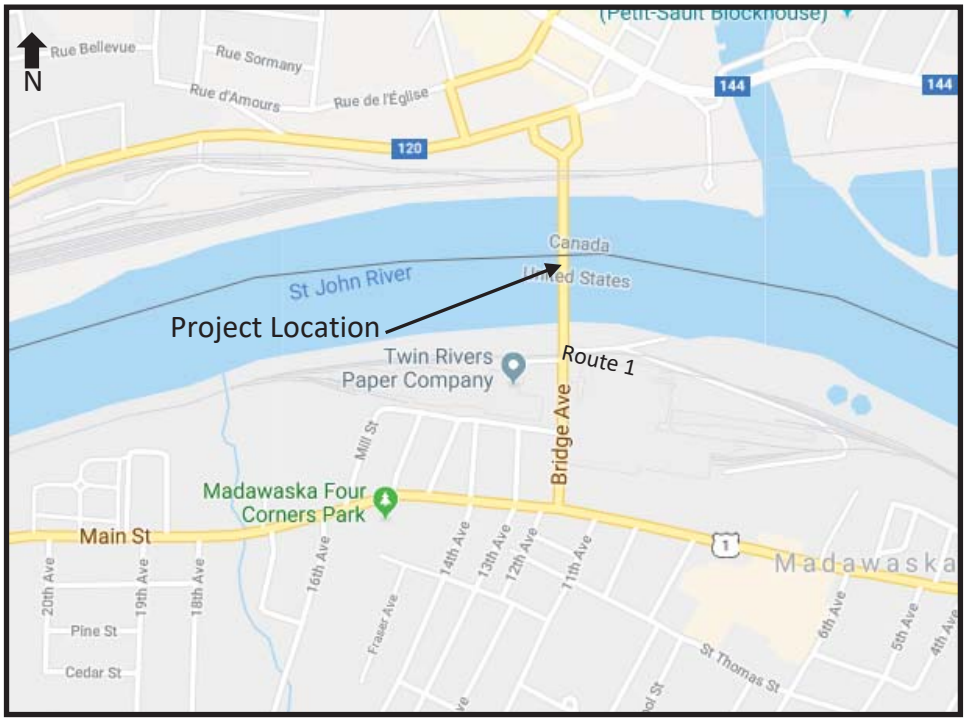
WITNESS:	SIGNATURES:
	CONTRACTOR:
Signature…….....	.....….....
Print Name Legibly .....……..	Print Name Legibly ….....….....
	SURETY:
Signature.....	...….....….....
Print Name Legibly	Print Name Legibly ….....….....
SURETY ADDRESS:	NAME OF LOCAL AGENCY:
...….....….....	ADDRESS ….....….....
.....	…….....….....
TELEPHONE	…….....….....

SAMPLE

LOCATION MAP

Madawaska, ME – Edmundston, NB, International Bridge #2399, WIN 021736.00
Bridge Avenue over St. John River





Latitude: 47° 21' 34" N, Longitude: 68° 19' 43" W

"General Decision Number: ME20200034 05/08/2020

Superseded General Decision Number: ME20190034

State: Maine

Construction Type: Highway

County: Aroostook County in Maine.

HIGHWAY CONSTRUCTION PROJECTS

Note: Under Executive Order (EO) 13658, an hourly minimum wage of $10.80 for calendar year 2020 applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2015. If this contract is covered by the EO, the contractor must pay all workers in any classification listed on this wage determination at least $10.80 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract in calendar year 2020. If this contract is covered by the EO and a classification considered necessary for performance of work on the contract does not appear on this wage determination, the contractor must pay workers in that classification at least the wage rate determined through the conformance process set forth in 29 CFR 5.5(a)(1)(ii) (or the EO minimum wage rate,if it is higher than the conformed wage rate). The EO minimum wage rate will be adjusted annually. Please note that this EO applies to the above-mentioned types of contracts entered into by the federal government that are subject to the Davis-Bacon Act itself, but it does not apply to contracts subject only to the Davis-Bacon Related Acts, including those set forth at 29 CFR 5.1(a)(2)-(60). Additional information on contractor requirements and worker protections under the EO is available at www.dol.gov/whd/govcontracts.

```
Modification Number     Publication Date
          0              01/03/2020
          1              04/17/2020
          2              05/08/2020

* ENGI0004-005 04/01/2018

                                    Rates          Fringes

POWER EQUIPMENT OPERATOR:
     Grader/Blade, Milling
     Machine, Paver (Asphalt,
     Aggregate, and Concrete),
     Roller Asphalt.............$ 22.61            12.50
-----------------------------------------------------------------
  SUME2014-029 06/23/2017

                                    Rates          Fringes

CARPENTER, Includes Form Work....$ 18.34             2.84

HIGHWAY/PARKING LOT STRIPING:
 Laborer.........................$ 14.29             1.89

IRONWORKER, REINFORCING.........$ 16.27             0.00

LABORER:  Asphalt, Includes
Raker, Shoveler, Spreader and
Distributor.....................$ 14.32             3.17

LABORER:  Common or General.....$ 13.23             1.22

LABORER:  Wheelman..............$ 15.40             3.01
```

```
OPERATOR:
Backhoe/Excavator/Trackhoe.......$ 17.63              2.28

OPERATOR:  Bobcat/Skid
Steer/Skid Loader................$ 20.36              5.06

OPERATOR:  Broom/Sweeper.........$ 16.52              6.38

OPERATOR:  Bulldozer.............$ 16.58              2.89

OPERATOR:  Loader................$ 16.21              3.23

OPERATOR:  Mechanic..............$ 22.30              8.71

OPERATOR:  Screed................$ 18.82              4.75

OPERATOR: Roller (Earth).........$ 15.55              5.83

TRAFFIC CONTROL:   Flagger.......$  9.00              0.00

TRAFFIC CONTROL:
Laborer-Cones/
Barricades/Barrels -
Setter/Mover/Sweeper.............$ 17.48              5.37

TRUCK DRIVER:  Dump Truck........$ 14.40              7.04

TRUCK DRIVER:  TackTruck.........$ 18.82              8.29
------------------------------------------------------------

WELDERS - Receive rate prescribed for craft performing
operation to which welding is incidental.

============================================================

Note: Executive Order (EO) 13706, Establishing Paid Sick Leave
```

for Federal Contractors applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2017. If this contract is covered by the EO, the contractor must provide employees with 1 hour of paid sick leave for every 30 hours they work, up to 56 hours of paid sick leave each year. Employees must be permitted to use paid sick leave for their own illness, injury or other health-related needs, including preventive care; to assist a family member (or person who is like family to the employee) who is ill, injured, or has other health-related needs, including preventive care; or for reasons resulting from, or to assist a family member (or person who is like family to the employee) who is a victim of, domestic violence, sexual assault, or stalking. Additional information on contractor requirements and worker protections under the EO is available at www.dol.gov/whd/govcontracts.

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (ii)).

The body of each wage determination lists the classification and wage rates that have been found to be prevailing for the cited type(s) of construction in the area covered by the wage determination. The classifications are listed in alphabetical order of ""identifiers"" that indicate whether the particular rate is a union rate (current union negotiated rate for local), a survey rate (weighted average rate) or a union average rate (weighted union average rate).

Union Rate Identifiers

A four letter classification abbreviation identifier enclosed in dotted lines beginning with characters other than ""SU"" or ""UAVG"" denotes that the union classification and rate were prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2014. PLUM is an abbreviation identifier of the union which prevailed in the survey for this classification, which in this example would be Plumbers. 0198 indicates the local union number or district council number where applicable, i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. 07/01/2014 is the effective date of the most current negotiated rate, which in this example is July 1, 2014.

Union prevailing wage rates are updated to reflect all rate changes in the collective bargaining agreement (CBA) governing this classification and rate.

Survey Rate Identifiers

Classifications listed under the ""SU"" identifier indicate that no one rate prevailed for this classification in the survey and the published rate is derived by computing a weighted average rate based on all the rates reported in the survey for that classification. As this weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SULA2012-007 5/13/2014. SU indicates the rates are survey rates based on a weighted average calculation of rates and are not majority rates. LA indicates the State of Louisiana. 2012 is the year of survey on which these classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. 5/13/2014 indicates the survey completion date for the classifications and rates under that identifier.

Survey wage rates are not updated and remain in effect until a new survey is conducted.

Union Average Rate Identifiers

Classification(s) listed under the UAVG identifier indicate that no single majority rate prevailed for those classifications; however, 100% of the data reported for the classifications was union data. EXAMPLE: UAVG-OH-0010 08/29/2014. UAVG indicates that the rate is a weighted union average rate. OH indicates the state. The next number, 0010 in the example, is an internal number used in producing the wage determination. 08/29/2014 indicates the survey completion date for the classifications and rates under that identifier.

A UAVG rate will be updated once a year, usually in January of each year, to reflect a weighted average of the current negotiated/CBA rate of the union locals from which the rate is based.

WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

* an existing published wage determination
* a survey underlying a wage determination
* a Wage and Hour Division letter setting forth a position on a wage determination matter
* a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests

for summaries of surveys, should be with the Wage and Hour Regional Office for the area in which the survey was conducted because those Regional Offices have responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

4.) All decisions by the Administrative Review Board are final.

==========

END OF GENERAL DECISION"

THIS DOCUMENT MUST BE CLEARLY POSTED AT ALL CONSTRUCTION SITES FUNDED IN PART WITH STATE FUNDS

State of Maine
Department of Labor
Bureau of Labor Standards
Augusta, Maine 04333-0045
Telephone (207) 623-7906

Wage Determination - In accordance with 26 MRS §1301 et. seq., this is a determination by the Bureau of Labor Standards, of the fair minimum wage rate to be paid to laborers and workers employed on the below titled project.

2020 Fair Minimum Wage Rates
Heavy & Bridge Aroostook County

Occupation Title	Minimum Wage	Minimum Benefit	Total	Occupation Title	Minimum Wage	Minimum Benefit	Total
Asphalt Raker	$16.00	$0.00	$16.00	Laborers (Helpers & Tenders)	$18.00	$3.33	$21.33
Backhoe Loader Operator	$26.00	$8.61	$34.61	Laborer - Skilled	$20.00	$4.10	$24.10
Boom Truck (Truck Crane) Operator	$28.13	$6.39	$34.52	Line Erector Power/Cable Splicer	$35.00	$0.75	$35.75
Bricklayer	$24.50	$4.47	$28.97	Loader Operator - Front-End	$21.25	$0.54	$21.79
Bulldozer Operator	$22.00	$4.70	$26.70	Mechanic- Maintenance	$19.25	$3.63	$22.88
Carpenter	$26.00	$5.68	$31.68	Mechanic- Refrigeration	$27.00	$4.21	$31.21
Carpenter - Rough	$21.07	$3.53	$24.60	Millwright	$31.40	$6.89	$38.29
Cement Mason/Finisher	$16.88	$0.52	$17.40	Painter	$26.50	$5.53	$32.03
Communication Equip Installer	$25.00	$0.87	$25.87	Pipe/Steam/Sprinkler Fitter	$29.09	$17.36	$46.45
Comm Trans Microwave & Cell	$22.00	$1.47	$23.47	Pipelayer	$28.00	$6.76	$34.76
Crane Operator =>15 Tons)	$32.50	$7.54	$40.04	Plumber (Licensed)	$26.00	$4.50	$30.50
Diver	$24.00	$3.12	$27.12	Plumber Helper/Trainee	$19.00	$2.98	$21.98
Earth Auger Operator	$26.65	$6.12	$32.77	Propane/Natural Gas Serv/Install	$32.00	$9.23	$41.23
Electrician - Licensed	$32.61	$8.06	$40.67	Rigger	$23.00	$7.10	$30.10
Electrician Helper/Cable Puller	$19.00	$5.10	$24.10	Roller Operator - Earth	$16.43	$2.69	$19.12
Excavator Operator	$24.50	$3.18	$27.68	Roller Operator - Pavement	$20.25	$3.56	$23.81
Fence Setter	$18.00	$1.30	$19.30	Screed/Wheelman	$18.50	$2.45	$20.95
Flagger	$13.00	$0.00	$13.00	Sheet Metal Worker	$26.56	$6.03	$32.59
Grader/Scraper Operator	$22.00	$2.16	$24.16	Truck Driver - Light	$16.00	$0.44	$16.44
Industrial Truck (Forklift) Operator	$29.07	$6.63	$35.70	Truck Driver - Medium	$19.00	$1.97	$20.97
Ironworker - Ornamental	$22.30	$22.37	$44.67	Truck Driver - Heavy	$18.86	$1.16	$20.02
Ironworker - Reinforcing	$29.45	$6.47	$35.92	Truck Driver - Tractor Trailer	$26.78	$6.42	$33.20
Ironworker - Structural	$20.00	$4.55	$24.55				

The Laborer classifications include a wide range of work duties. Therefore, if any specific occupation to be employed on this project is not listed in this determination, call the Bureau of Labor Standards at the above number for further clarification.

Welders are classified in the trade to which the welding is incidental.

Apprentices – The minimum wage rate for registered apprentices are those set forth in the standards and policies of the Maine State Apprenticeship and Training Council for approved apprenticeship programs.

Title 26 §1310 requires that a clearly legible statement of all fair minimum wage and benefits rates to be paid the several classes of laborers, workers and mechanics employed on the construction on the public work must be kept posted in a prominent and easily accessible place at the site by each contractor and subcontractor subject to sections 1304 to 1313.

Appeal – Any person affected by the determination of these rates may appeal to the Commissioner of Labor by filing a written notice with the Commissioner stating the specific grounds of the objection within ten (10) days from the filing of these rates.

A true copy

Attest: Scott R. Cotnoir
Scott R. Cotnoir
Wage & Hour Director
Bureau of Labor Standards

Expiration Date: 12-31-2020

MaineDOT DBE Project Attainment Target (PAT)
for this Project is **.007 %**

The MaineDOT seeks to meet the specified annual Disadvantaged Business Enterprise (DBE) usage goal set out by 49 CFR 26.45 through the efforts of contractors seeking to employ qualified DBE subcontractors. We seek to meet this goal by race neutral means and do not, at this time, use contract specific requirements for each project. We do however, understand the capacity of Maine's DBE community and the unique characteristics a project may have that would differ from the broad annual goal.

Taking this into consideration, the MaineDOT will review each project and develop an anticipated attainment or Project Attainment Target (PAT) based on several factors that are project specific. Those factors include:

- □ Scope of Work
- □ DBE availability according to Specification Item
- □ Geographic location
- □ DBE capacity

This PAT is developed to assist contractors to better understand the DBE participation that the MaineDOT can reasonably expect for a specific project. The PAT is NOT a mandate but an assessment of the DBE opportunities that this project could meet or exceed. MaineDOT anticipates that each contractor will make the best effort to reach or exceed the PAT for this project.

Madawaska, ME
Madawaska International Bridge (#2399)
Bridge Construction / Replacement
WIN 21736.00
12/16/2020

GENERAL NOTE

A review of environmental databases in the project area (Maine Department of Environmental Protection (MDEP) File Room Databases, Canadian Federal Contaminated Sites Inventory, New Brunswick Property-based Environmental Information Database) indicates a number of documented petroleum product and hazardous substances releases associated with Twin Rivers Paper Company (formerly Fraser Paper Company), Maine Northern Railway Company (formerly Bangor and Aroostook Railroad and Montreal, Maine and Atlantic Railway), and Canadian National (CN) Railway Company.

The ongoing and historic industrial and commercial use of properties adjacent to the bridge construction initiative suggests soil and/or groundwater contamination may be encountered within the proposed areas of construction earthwork. Although no one definitive petroleum product / hazardous material release incident can be identified to have impacted a specific area(s) of earthwork associated with the Madawaska International Bridge initiative, it is warranted to consider existing historical environmental data and the ongoing use and storage of these materials within the railroads rights-of-way and at Twin Rivers Paper Company. Consequently, the Contractor shall remain alert for evidence of petroleum product and/or hazardous material contamination.

In the event the Contractor encounters evidence of soil and/or groundwater contamination, the Contractor shall immediately stop work in the impacted area, secure the excavation, and notify the Resident. In addition, the Contractor shall employ appropriate health and safety measures to protect its workers against hazards associated with working near petroleum / hazardous materials impacted soil and/or groundwater. If evidence of contamination is found in the Maine, the Resident shall contact the Senior Geologist in MaineDOT's Environmental Office at 207-624-3000, and the MDEP at 800-482-0777. If evidence of contamination is found in New Brunswick, the Resident shall contact the Environmental Branch of NBDTI should be contacted (Monique Pelletier (Telephone: (506) 453-5783, Email: Monique.Pelletier@gnb.ca).
The Work may only continue with authorization from the Resident.

SPECIAL PROVISION
SECTION 104
GENERAL RIGHTS AND RESPONSIBILITIES
(Reserved Limits)

It is hereby brought to the Contractor's attention that use of the following area will not become available to the Contractor until November 20th, 2023.

Property registered to United States of America depicted on the right of way map as parcel 4, located west of the existing bridge.

SPECIAL PROVISION
SECTION 104
GENERAL RIGHTS AND RESPONSIBILITIES
(Furnishing of Right-of-Way)

104.2.1 Furnishing of Right-of-Way The following paragraphs are added to this Subsection:

The Maine Department of Transportation has secured Temporary Construction rights on property owned by the United States of America, south of Abutment No. 1 as shown on the Right of Way Maps. Construction of the proposed bridge as well as a new Land Port of Entry (separate project, by Others) must occur simultaneously within these limits.

The Temporary Construction Limits on this parcel are divided into four distinct Areas, as shown in Figure 1. Within each of these Areas, the Department has negotiated with the landowner to identify a precedence of work activities among the Bridge Contractor and the Land Port of Entry (LPOE) contractor, as identified in Table 1. Although precedence for work activities among the contractors has been set, the contractors shall reasonably accommodate work activities and access needs of the other contractor, in accordance with Standard Specification Subsection 104.4.7.

Table 1: Precedence of Work Activities

Area	Bridge Contractor	LPOE contractor
Area 1	Jan. 1, 2021 – Dec. 31, 2021	Jan. 1, 2022 – Bridge Opening
Area 2	Jan. 1, 2021 – May 31, 2023	June 1, 2023 – Bridge Opening
Area 3	Jan. 1, 2021 – Dec. 31, 2022	Jan. 1, 2023 – Bridge Opening
Area 4	Jan. 1, 2021 – Dec. 31, 2022	Jan. 1, 2023 – Bridge Opening

In addition to the identified precedence of work within each Area, the LPOE contractor will provide the Bridge Contractor uninterrupted access from Mill Street to the proposed bridge location behind abutment 1 until the bridge work is complete. The access will be a minimum width of 30-ft, maximum grade of 8%, accommodate safe passage of construction equipment, oversized delivery trucks, vehicles, and workers, and be located along the boundary between Mill Street and the Temporary Construction Limits.

The Contractor is prohibited from progressing work activities or otherwise utilizing LPOE property after the bridge is opened to traffic.

The New Brunswick Department of Transportation and Infrastructure (NBDTI) has secured an area within the Canadian Port of Entry (POE) for workspace and laydown area as identified on the ROW map and on the Maintenance of Traffic Plans. Should the Contractor require additional space beyond that supplied by NBDTI on the Canadian side of the border, it will be the responsibility of the Contractor to obtain such space at no cost to the Department.

The storing of equipment and material along Rue St Francois or on the Canada Border Services Agency (CBSA) property is prohibited.

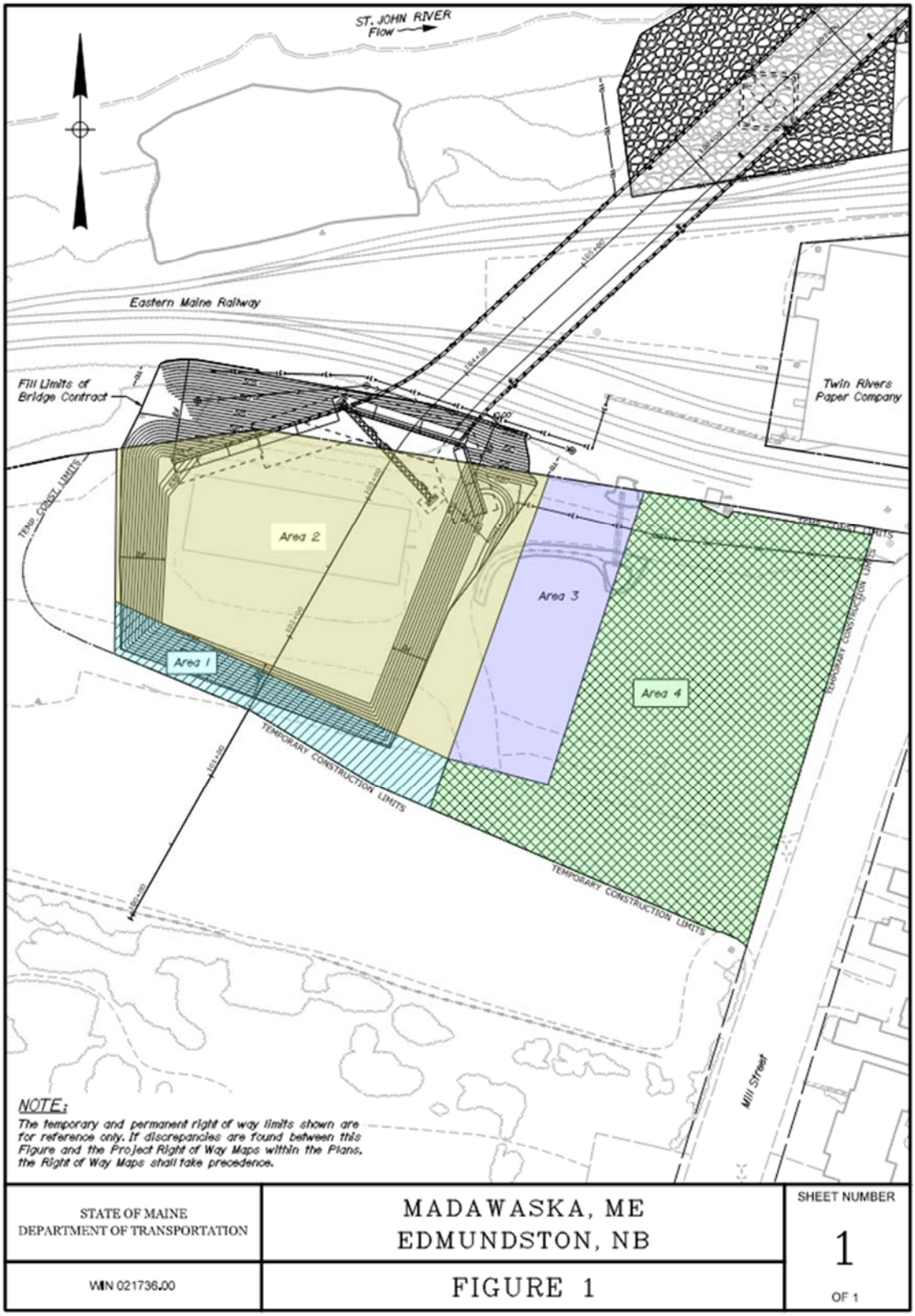


Figure 1: Work Area Definition

SPECIAL PROVISION
SECTION 104
GENERAL RIGHTS AND RESPONSIBILITIES
(Bridge Closure Notification)

Section 104, General Rights and Responsibilities, of the Standard Specifications is amended as follows:

104.4.10 Coordination of Road Closure/Bridge Closure/Bridge Width Restriction Notification:

Paragraph 2 is removed and replaced with the following paragraphs:

Bridge closure(s), as allowed by Special Provision 107 Bridge Closure Period, shall be announced through public notice and published in a local newspaper of each community ten Days prior to each respective closure. The Resident may direct notices to be in English and/or French. Such notices shall be announced by the Contractor following approval by the Resident.

The bridge closure(s) shall also be announced on two portable changeable message signs (PCMS) along each of Rue St. Francois in Edmundston and U.S. Route 1 in Madawaska, at locations as approved by the Resident (four total PCMS). The Contractor shall also make available, to the Department, an additional six PCMS and shall deploy these units to locations directed by the Resident. Such locations may be up to 50-miles from the project site to warn drivers of the impending bridge closure.

Town: **Madawaska**
Project: **21736.00**
Date: **October 13, 2020**

SPECIAL PROVISIONS
SECTION 104
Utilities

UTILITY COORDINATION

The Contractor has primary responsibility for coordinating their work with utilities and/or railroad after contract award. The Contractor shall communicate directly with the utilities and/or railroad regarding any utility work necessary to maintain the Contractor's schedule and prevent project construction delays. The Contractor shall notify the Resident of any issues.

THE CONTRACTOR SHALL PLAN AND CONDUCT WORK ACCORDINGLY.

MEETING

A Preconstruction Utility Conference, as defined in Subsection 104.4.6 of the Standard Specifications **IS REQUIRED**.

GENERAL INFORMATION

These Special Provisions outline the arrangements that have been made by the Department for utility and/or railroad work to be undertaken in conjunction with this project. The following list identifies all known utilities or railroads having facilities presently located within the limits of this project or intending to install facilities during project construction.

Utilities and/or railroads have been notified and will be furnished a project specification.

Overview & Utility/Railroad Contact Information:

Utility/Railroad	Aerial	Underground	Railroad	Contact Name	Contact Number
Town of Madawaska		**X**		**Gary Picard**	**207-728-6351**
New Brunswick-Maine Railway	**X**	**X**	**X**	**Josh Snyder**	**506-651-7912**
Maine Department of Transportation	**X**	**X**		**Ron Cote**	**207-446-2305**
Twin Rivers Paper Company		**X**	**X**	**Doug Cyr**	**207-728-8038**
Versant Power Company	**X**			**Tom Rogerson**	**207-944-8225**

Temporary utility/railroad adjustments **ARE** anticipated. If any unexpected utility relocations become necessary, they shall be scheduled in accordance with Section 104 of the Standard Specifications and shall be performed by the appropriate utility company in conjunction with the work by the Contractor. Should the Contractor choose to have any poles temporarily relocated, all work shall be done at the Contractor's request and expense, with no additional cost or schedule impacts to the Department.

All adjustments are to be made by the respective utility/railroad unless otherwise specified herein.

Fire hydrants shall not be disturbed until all necessary work has been accomplished to provide proper fire protection.

Unless otherwise specified, any underground utility/railroad facilities shown on the project plans represent approximate locations gathered from available information. The Department cannot certify the level of accuracy of this data. Underground facilities indicated on the topographic sheets (plan views) have been collected from historical records and/or on-site designations provided by the respective utility/railroad companies. Underground facilities indicated on the cross-sections have been carried over from the plan view data and may also include further approximations of the elevations (depths) based upon straight-line interpolation from the nearest manholes, gate valves, or test pits.

It is the responsibility of the Contractor with the Utility Pole owner, to layout all of the proposed pole locations in the field prior to the start of utility relocations. Should any adjustments be needed, the Utility will document adjustments and inform the Department prior to utility relocations.

The Contractor shall provide the utilities access to the new pole locations. Construction of any spot cuts or fills in excess of 2 feet must be completed prior to utility relocations. All cut/fill depths listed on the pole list are approximate and will need to be verified by the Contractor prior to poles being set. The Contractor shall prepare a plan for how access and the spot cuts and fills will be accomplished and what the schedule will be for performing the work. This plan will be discussed at the pre-construction utility meeting.

***** Specific information regarding the line voltage can be requested from* Versant Power Company****

Utility/railroad working days are Monday through Friday. Times are estimated on the basis of a single crew for each utility/railroad. Any times and dates mentioned are **estimates only** and are dependent upon favorable weather, working conditions, and freedom from emergencies. The Contractor shall have no claim against the Department if they are exceeded.

Aerial

Summary:

Utility	Summary of Work	Estimated Working Days
Maine Department of Transportation	Inspection of electrical service.	N/A
	Total:	N/A

UNDERGROUND

Summary:

Utility	Summary of Work	Estimated Working Days
Town of Madawaska	Inspection of sewer work	N/A
Maine Department of Transportation	Inspection of electrical service.	N/A
	Total:	N/A

Utility Specific Issues:

Town of Madawaska

The Town of Madawaska has an existing/active sewer system within the project work limits. The Town of Madawaska will provide the Maine Department of Transportation plans and specifications needed for the replacement of the sewer main in a new location. The Maine Department of Transportation's Contractor will be installing the new sewer per specifications submitted by the Town of Madawaska including, sewerage pumping until the new system is operational. The town has entered in an agreement with MDOT for the sewer work. Pay items for the Town of Madawaska sewer replacement work are shown on page two of the contract plan set and noted under *Items Specific to Town of Madawaska.* The Town of Madawaska will be responsible for inspection and acceptance of the new system.

Note* Temporary sewerage pumping will be required during the installation of the new sewer line. The Contractor will need to place a temporary bypass line within a ridged conduit that will pass under the railroad track rails to a manhole located in the railroad yard. The Contractor must coordinate this work and receive Railroad approval for the temporary sewerage plan. The temporary sewer line must be installed to provide passage of vehicles and equipment in the rail yard. Payment for sewer bypass pumping will be paid under pay item #801.011 *Bypass Pumping System. The Contractor shall submit to MDOT and the Town of Madawaska a general written plan as to the timeline and how the sewer line will be constructed during construction prior to utility pre-construction meeting.*

The Maine Department of Transportation

The Contractor will be installing an underground electrical service conduit detailed in a plan and specification provided by the Department in the contract bid book. The proposed pole installation at 104+25,165'Rt to a meter located at Station 103+28.02, 37.47' Right at the bridge approach. MDOT will be responsible for the inspection of the work to be performed.

Underground electrical service work will be paid for under items:

626.11 Precast Concrete Junction Box
626.221 Non-Metallic Conduit, Concrete Encased
634.160 Highway Lighting
634.803 Aesthetic Lighting

Town of Madawaska

The Contractor will be responsible for the installation of an electrical service to be owned by the Town of Madawaska. Plans and specifications are contained in the contract book for the project.

In general, all 240-volt upgrade projects will require a new electric service account. For those upgrades and other projects that require new electric service accounts, the Contractor shall request that a new account be established by contacting the Municipal Official, for all locally owned facilities. **The contact to establish a new service account is Gary Picard 207-728-6351 ext.104.** The Contractor shall provide the following information with the new electric service account request:

- Electrician's name performing the work
- Voltage
- Amperage
- Pole number of the power supply
- Distance from the pole to the control box
- The number of the closest meter to the pole and utility.

The Contractor shall allow at least 4 weeks for the Municipality to establish the account.

Twin Rivers Paper Company

A plan for access to the project area exists through Twin Rivers property, located to the north side of Mill Street. Should the Contractor choose to utilize this option the existing train spurs would be removed by New Brunswick-Maine Railways (NBR) for the passage of equipment and materials. Two existing water hydrants are located within this area. The hydrants will need to remain in operation and shall be protected from any damage for the duration of the project with a clearance of 3' around the hydrant for service access. Also, a sewer manhole exists within the access area that will also need to be protected and reman in service.

RAILROAD

A plan for access to the project area exists through Eastern Maine Rail Company property, located to the north side of Mill Street. Should the Contractor choose to utilize this option, the existing train spurs would be removed by New Brunswick Maine Railway for the passage of equipment and materials. New Brunswick Maine Railway has entered into an agreement with MDOT for the duration of the project for railroad protection services, the removal of sections of railroad spur near Mill Street (if requested by the Contractor), as well as the installation of a light pole, underground electrical service conduit, and all lighting equipment.

PLEASE NOTE

All underground utilities require **3 working days' notice** for any/all excavation or any other subsurface work around any underground facilities to schedule an on-site representative to be present. The Contractor shall hand dig around all the underground facilities.

MAINTAINING UTILITY LOCATION MARKINGS

The Contractor will be responsible for maintaining the buried utility location markings following the initial locating by the appropriate utility or their designated representative.

UTILITY SIGNING

Any utility working within the construction limits of this project shall ensure that the traveling public is adequately protected at all times. All work areas shall be signed, lighted, and traffic flaggers employed as determined by field conditions. All traffic controls shall be in accordance with the latest edition of the Manual on Uniform Traffic Control Devices for Streets and Highways, as issued by the Federal Highway Administration.

SPECIAL PROVISIONS
SECTION 104
UTILITIES IN NEW BRUNSWICK, CANADA

UTILITY COORDINATION

The Contractor has primary responsibility for coordinating their work with utilities and/or railroad after contract Award in both Edmundston, NB, Canada and Madawaska, ME, US. The Contractor shall communicate directly with the utilities and/or railroad regarding any utility work necessary to maintain the Contractor's schedule and prevent project construction delays. The Contractor shall notify the Resident of any issues.

THE CONTRACTOR SHALL PLAN AND CONDUCT WORK ACCORDINGLY.

MEETING

A Preconstruction Utility Conference, as defined in Subsection 104.4.6 of the Standard Specifications **IS REQUIRED**.

GENERAL INFORMATION FOR UTILITES IN NEW BRUNSWICK

Utility poles, lines and/or cables within the Work Site shall be moved by the appropriate Utility company.

The Contractor shall contact Francois Morin, (506) 735-2037 at the NBDTI District Office and all relevant agencies (NB Power, Rogers, Bell Aliant, Fiber360, Liberty Utilities, Maritimes & Northeast Pipeline, the City of Edmundston Public Works, Edmundston Energy, etc.) to review the Work near transmission lines, utility lines and gas lines, as required. The Contractor shall plan and conduct his activities in accordance with the safety requirements of the affected relevant agencies.

Delays due to Work performed by others related to Utility moves in New Brunswick shall not be considered as a basis of claim.

Although the New Brunswick Department of Transportation (NBDTI) makes every reasonable effort to collect and present complete details concerning Utility installations, the NBDTI makes no guarantees, representations, warranties, either expressed or implied, with respect to any such information, and the Contractor shall have no claim on that account.

The Contractor shall assume full responsibility for determining exact locations of, as well as safeguarding, all existing and relocated Utility installations within the work area on the Canadian side of the border during the progress of the Work.

The Contractor shall be responsible, at his own expense, for any damage to existing or relocated Utility installations and shall be responsible for any repairs resulting from damage to these installations.

The Contractor shall participate in the Call Before You Dig awareness program provided free of charge by Liberty Utilities and shall have a copy of the Third-Party Requirements in the Vicinity of Natural Gas Facilities prior to starting the work.

UNDERGROUND IN NEW BRUNSWICK

Utility Specific Issues:
City of Edmundston

The City of Edmundston Underground has services including but not limited to water, sewer and/or drainage pipes located within the project work limits.

Plans are included in the contract documents for the replacement of a portion of the sewer. Pay items for the City of Edmundston sewer replacement are shown on page two of the contract plan set and noted under Items Specific to the City of Edmundston. The Contractor must follow the specifications listed on the plans and adhere to the requirements of the Canadian National Railroad (CN) agreement when performing the work.

RAILROAD IN NEW BRUNSWICK

The Contractor is advised to contact Canadian National (CN) when working in the vicinity of the Railway Crossings at mile 219.92 to 219.21 of CN Napadongan Subdivision in Edmundston, New Brunswick.

Prior to beginning work on railway property, a meeting shall be organized to discuss safety issues relating to work on railway property. CN shall be notified at least two weeks in advance by contacting Mr. Mark LeBlanc, (506) 853-2885 in order to arrange for railway personnel to attend.

The Contractor will be required to be familiar with all sections and schedules of the attached Work Permit Application and Codes of Practice prior to accessing CN property. The Contractor will be required to complete Work in accordance with the Work Permit and Codes of Practice issued by CN. The Work Permit will be completed once the contract has been awarded and the Contractor has been identified.

The Contractor, its agents, representatives and invitees shall be bound by CN's "Policy on Alcohol and Other Drugs" when entering railway property.

The Contractor, its agents and employees must visit the web site www.contractororientation.com in order to become familiar with CN's safety guidelines for Contractors when working on CN's right-of-way. The costs associated with having all the participants take the web-based safety training and registering on the web site is $11.00 US per person. All field personnel must complete the web-based training and be registered before entering the CN right-of-way.

The Contractor, it's agents, representatives and invitees shall be bound by CN's Policy and Safety Guidelines and Regulations. Failure of compliance can result in temporary or permanent termination of work on CN property and shall not be considered as a basis of claim.

Flagging

Railway flaggers will be required for any activity within 10 m of the nearest railway or when crossing the rail line with heavy equipment when not at a designated crossing.

The Contractor shall plan his operations to minimize flagging requirements.

Should the Contractor not be present at the time and location agreed with the Track Supervisor for flagging services, four (4) hours of flag person fees shall be borne by the Contractor. A minimum of forty-eight (48) hours of notice must be faxed to the Track Supervisor to cancel flagging work already scheduled.

A flagging inspection form shall be completed and signed by the Contractor and the CN flag person on a daily basis.

Work Execution on CN Property

30 days after the contract is awarded, the Contractor shall submit a description of work, construction methods and schedule for review.

No work or access will be permitted on Railway property without the presence of a CN flag person.

Handling of structural components over the track area will have to be done during a block on rail traffic. The availability of work blocks will depend on rail traffic at the time of construction. A concept for temporary support of the structural steel has been pre-vetted and is presented in the Contract documents. Refer to Special Provision Section 524 – Temporary Structural Supports (Temporary Structural Support - Girder) and the plans for additional requirements.

During demolition of the existing bridge, the track shall be protected at all times against falling debris, including small particles that could contaminate the ballast. Any debris resulting from demolition work shall be contained and removed from Railway property. A plan signed and sealed by a professional engineer, showing the proposed protection, shall be submitted to NBDTI for railway approval four (4) weeks prior to execution of the work. Refer to Special Provision Section 524 – Temporary Structural Supports (Protective Shield) for additional requirements.

During the staged construction of the Canadian abutment, temporary structural support of the roadway will be required. Refer to Special Provision Section 524 – Temporary Structural Supports (Roadway Support during Staged Construction) and the plans for additional requirements with regards to the construction of any temporary walls located within the limits of CN property.

Heavy equipment and other vehicles will not be permitted to cross the track except at a location where a temporary crossing has been approved by the Railway and constructed under a temporary crossing agreement. The Contractor will be responsible to construct the crossing approaches, including culverts to ensure adequate drainage, stop signs as well as a gate on both sides of railway to control access. These gates shall be locked at all times when the crossing is not in use, and only a CN representative

will be allowed access when crossing is not in use. Use of the crossing without flagging protection will not be permitted.

The Railway will be responsible for the construction of the crossing surface and the cost will be assessed to the Contractor.

A minimum temporary overhead clearance of 6.7 meters from the top of rail and a minimum side clearance of 3.5 meters from the centerline of track shall be maintained at all times during construction.

No equipment, machines or tools shall be stored within 10 meters of the track.

A lease agreement has been drafted between NBDTI and CN for access and construction on CN property. No work may be done on CN property or that may affect CN operations until an Agreement between CN and NBDTI has been ratified. The agreement will be ratified after the Contract has been awarded and the Contractor has proposed their plan for access roads as required in Special Provision Section 105 – General Scope of Work (Temporary Access Roads and Embankments), clause 105.04.

CN Site Conditions

Existing drainage conditions shall be maintained for the duration of construction and CN's property shall be left in the same or in better condition than that prevailing before the work.

Utilities on CN Property

The Contractor shall be responsible for locating and protecting existing public utilities during construction and, if required, to make necessary arrangements with the concerned authorities.

All signal and communication cables will have to be located and identified. It shall be noted that a fibre optics cable owned by 360 Network, is buried on the railway property. For fibre optics locate, the Contractor shall contact representatives of 360 Network at least 3 weeks in advance of locate requirement at (877) 865-6193.

CN Railway Operations

The Contractor shall in no way interfere with railway activities including track maintenance work done by CN employees or its agents. When judged necessary, for safety reasons or if required for railway operation, CN may postpone, interrupt or cancel Contractor's activities or its permission to occupy the property, without being penalized or held liable for delays or additional costs incurred by the Contractor.

Penalties

In order to increase safety on CN property, CN has adopted a zero-tolerance policy with respect to trespassing on its right-of-way. As a result, no work will be permitted on CN Property without flagging protection. If work is carried out on CN property without the presence of a flag person and without

having previously contacted CN authorized personnel, the Contractor will be liable for $5,000 (Canadian dollars) per occurrence as a penalty.

If one or more trains are delayed, the Contractor must pay the Railway, under title of Damages of Liquid Assets and not under title of penalties, the following amounts (Canadian dollars) depending on the situation:
Passenger Trains: $2,500.00 per delay + $25.00 per minute of delay.
Freight Trains: $200.00 per minute of delay.

One delayed train may result in the delay of several other trains, generating additional costs to be borne by the Contractor.

The cost of penalties or damages due to the operations or work schedule of the Contractor shall be borne entirely by the Contractor and will not be cost shared by NBDTI.

Other Fees and Costs

The cost of all other requirements of CN Railway relative to the Contractor's operations, other than flagging, shall be the responsibility of the Contractor.

Insurance Requirements

The Contractor shall provide a proof of insurance covering both Canadian National and the Contractor performing the work, including their respective employees, agents, representatives, subcontractors or invitees as per Schedule C in the CN Work Permit Application. This insurance coverage shall be against public liability and property damage, and shall contain an endorsement to the effect that Canadian National is named additional insured under the provision of cross liability clauses.

PLEASE NOTE
All underground utilities require **3 working days' notice** for any/all excavation or any other subsurface work around any underground facilities to schedule an on-site representative to be present. The Contractor shall hand dig around all the underground facilities.

MAINTAINING UTILITY LOCATION MARKINGS
The Contractor will be responsible for maintaining the buried utility location markings following the initial locating by the appropriate utility or their designated representative.

Instructions to Excavators for the Protection of Underground S&C Cables

Purpose

The purpose of this standard is to define the minimum requirements for safe, effective excavating practices in the vicinity of underground Signals and Communications ("S&C") cable on the Railway Right-of-Way.

Importance of Buried Cables

S&C cables are installed to provide power, signal control, wayside communications, and in the case of fibre optic cables, telecommunications which are important to safe and reliable Railway operation.

CN has several external customers who have fibre optic cables along CN's Right-of-Way. The economic importance of fibre optic facilities continues to increase, as these fibre networks expand in both scope and capacity.

Excavation Definition

Excavating includes any activity that results in an opening being made in the ground, including, but not exclusive to, digging, trenching, plowing, auguring, pile driving, blasting, directional boring, installing sign posts and pipe pushing. This may include surfacing activities where machinery or equipment can damage or break cable and support structures which have been installed at or near ground level e.g.: bridges, culverts, underground passageways, station platforms.

Fibre Territories Definition

Fibre territories are those segments of the Right-of-Way where fibre optic cables are found. Fibre optic cables are now installed on all of CN's main corridors and may be located anywhere along the Right-of-Way. The limits of the Right-of-Way should be considered from the center of track(s) to the CN property line.

Contractors

Before a contractor or its employees are allowed to excavate on CN Right-of-Way they must be familiar with this Code of Practice. The contractor or his designated representative shall sign the document "Important Memo to Contractors" found in Appendix 1 of this Code of Practice confirming they have read and that they will abide by the associated terms and conditions.

Continued on next page

Instructions to Excavators for the Protection of Underground S&C Cables, Continued

Potential Impact of Disruptions to CN and Its Fibre Customers

Damage to underground cables can have a severe impact on the operations of both CN and its external customers. CN Centralized Traffic Control, Engineering and Train to Wayside Radio Communications and CN's WAN/LAN backbone can be disrupted resulting in service and operational problems.

In addition, the fibre optic network installed on CN is utilized by clients that offer important services such as, cable, banking, national defense, air-traffic control and emergency communication services (i.e. 911). Damage or cuts to cable thereby affects a much wider range of operations and services.

Network Management Centre (NMC)

NMC can be reached at: 1-800-661-3687 (1-800-661-FOTS).

The NMC is responsible for the day-to-day operation of the fibre plant and is the primary contact for CN's fibre optic customers. Prior to the commencement of any work that could jeopardize the fibre optic plant, the responsible S&C representative or foreman-in-charge will notify NMC of the situation.

If such work poses a threat to the integrity of the fibre optic plant NMC will advise its fibre optic customers, who may in turn set up alternate routes for their priority traffic.

NMC will notify the Operations Centre of each customer potentially affected by the excavation work. The list of possibilities includes, but is not limited to: threat of washout, landslides, derailments, major track work such as undercutting, rail-pick-up and tie replacements, relocation of the fibre cable, drilling or digging near the fibre cable. The S&C representative will provide: his name and location, a description of the work to be performed and instructions on how he can be reached during the course of these activities. NMC will open a trouble ticket to record all instances of fibre work being performed on the Right-of-Way.

Use the document "Protection of Underground Signals & Communications Facilities" found in Appendix 2 of this Code of Practice to collect the required information before calling NMC.

Continued on next page

Instructions to Excavators for the Protection of Underground S&C Cables, Continued

At Bridges, Pedestals & Bungalows

Cables are usually coiled near cable ends, at splice pedestals, tunnels, bridges, bungalows, road and track crossings and some culverts. Cable coils can be of unequal size, unequal depth, and are nearly impossible to locate accurately with cable locating equipment.

Where excavating or digging near fibre cable coils, the entire coil shall be located and exposed by hand digging or using CN approved vacuum equipment. Locating a portion of the cable coil and assuming the location of the remainder of the coil is not acceptable.

Direct Buried Cables

Signal, power, fibre optic and other high capacity communication cables are typically buried directly in the sub grade, and generally, but not always, parallel to the railroad tracks typically at a distance of 1.2 to 2.1 meters (4 to 7 feet) from the edge of ties. The preferred depth of burial is typically 1.2 meters (4 feet), however depths of only 45 centimeters (18 inches) or less may be encountered near underground obstructions such as culverts, station platforms, passageways or approaches to bridges and tunnels. Cables may be located on either side of the track or between tracks. In addition, cables may pass under the tracks as the cable is routed from one side of the track to the other.

Common Trench

Wherever possible, a common trench is used when installing power, fibre optic and other S&C cables. Voltages used in underground power systems range from 120-volts to 7200-volts AC or more. Special precautions outlined in section "Work Near Buried Power Cables" must be followed when excavating near power cables.

Continued on next page

Instructions to Excavators for the Protection of Underground S&C Cables, Continued

Cable Markers

Permanent cable markers are installed only to indicate the presence of buried cable and are not meant to indicate the precise location of the cable. Permanent cable markers are not necessarily placed directly above buried cables.

Preparation for Excavation Work

Excavators must contact the Network Management Centre (NMC) before excavating along the railway Right-of-Way. The NMC will arrange to have Division S&C forces locate and mark the location of fibre optic, power, and other S&C cables prior to excavation.

Division Engineering (Engineering Services) shall be responsible to ensure that outside contractors, who are hired to perform various excavation services on CN's Right-of-Way, are familiar with the instructions contained in this document. Division Engineering shall advise the local S&C Supervisor and NMC of the location, date and nature of the work to be performed.

Precautions Prior to Excavating

Prior to commencement of any type of excavation along the Right-of-Way, the S&C employee (Foreman-in-charge) must notify NMC. The S&C employee shall provide their name, location where work will be performed, a description of the work and instructions on how they can be contacted. Excavation work shall not proceed unless authority has been granted by NMC.

When excavation activities are being conducted by outside contractors or Track forces, within 2 meters of an underground cable, the designated S&C Maintainer or other qualified S&C employee shall remain at the excavation site until all excavation work is completed.

Cable Locates

Cable locates are to be completed in accordance with the Guidelines for Cable Location. These guidelines are located on the CN Intranet S&C Homepage under Documents/Fibre/Guidelines for Cable Location.

Cable locates shall be requested a minimum of 72 hours in advance of the scheduled excavation work. Outside contractors responsible for the excavation work shall be present when the cable locate is being performed.

Continued on next page

Instructions to Excavators for the Protection of Underground S&C Cables, Continued

Cable Location Marking

The following cable location marking guideline, which is representative of industry standards, is a good practice to follow when identifying the location of underground cables and utilities prior to excavation:

Mark the location of the underground	**With…**	**Using…**
Fibre or communications cable	A series of 4 foot long lines directly over the cable	Fluorescent orange paint
Power or signal cables	A series of 4 foot long lines directly over the cable	Fluorescent red paint
Gas, chemical or petroleum utility distribution pipe	A series of 4 foot long lines directly over the pipe	Fluorescent yellow paint
Water or sewer pipe	A series of 4 foot long lines directly over the pipe	Blue paint

Mark the limits of the…	**With….**	**Using…**
Hand Excavation only zone	A series of 8 foot straight lines, (1) meter parallel to and on each side of the cable or utility line	White spray paint

Continued on next page

Instructions to Excavators for the Protection of Underground S&C Cables, Continued

Precautions When Excavating

Railway excavation experience has proven there are certain situations where the risk to damaging in service S&C cables is increased and special precautions are necessary. The following describes various situations and the method to use to avoid damaging any buried cables:

1. Whenever excavating is performed within 1 meter (3 feet) of a buried cable the ground shall only be excavated by hand digging or using CN approved equipment especially designed for exposing cables utilizing a vacuum system to remove the surrounding soil. Under no circumstances are mechanical excavating machines of any kind to be used unless the cable is fully exposed and pulled clear of the work area.

2. Whenever parallel trenching or excavating is performed with a back hoe or cable plow unit, beyond the 1M (3 feet) hand excavation zone, but within 2M (6.6 feet) of the existing cable, the preferred method of protecting the fibre cable is to install a temporary by-pass communication cable with "protection" circuits connected prior to excavating.

   The intent is to eliminate the possibility of unexpected service disruptions or failures due to the excavating equipment snagging and forcing sharp rocks or foreign objects through the cable(s) while plowing or trenching.

3. If the precautions described items 1 or 2 are impractical, a Method of Procedure (MOP) shall be developed by the responsible Supervisory officer. *Refer to MOP section in this document.*

4. When exposing cables, use extreme care to avoid damage to cable or wire insulation. Dig down 15 cm to 30 cm (6 to 12 inches) to one side of the established cable route. When at a depth below the established burial depth, carefully dig toward cables to expose them.

5. The use of mechanical excavating equipment shall be restricted to situations where it is known that there is no danger of contacting or damaging buried cables Mechanical excavating equipment may be used ONLY AFTER ALL BURIED FACILITIES INVOLVED HAVE BEEN EXPOSED and are clear of the excavation area.

Continued on next page

Instructions to Excavators for the Protection of Underground S&C Cables, Continued

Precautions When Excavating (continued)

6. If buried cable is encountered while excavating - Stop operations immediately, expose it and investigate with extreme caution. The buried cable shall not be cut, chopped through or broken off without first determining if it serves a useful purpose. Under no circumstances is a buried cable to be disturbed unless authorized by the responsible S&C employee.

7. If any underground obstruction is encountered while excavating - Stop operations immediately. Expose and investigate the obstruction with extreme caution. Do not attempt to remove the obstruction until you are satisfied that removing it will not disturb or damage the buried cable. Under no circumstances is the buried cable to be disturbed unless authorized by the responsible S&C employee.

8. To prevent breaking or fracturing internal conductors or fibres, excavators shall avoid moving or bending fibre optic, power or signal cables at any time. The responsible S&C employee shall provide extra mechanical protection using split steel ducts and/or other protective materials, as required.

9. In the event that damage to a cable still occurs, - Stop operations immediately and report the location of damaged cable to the appropriate S&C employee. At no time shall unauthorized persons attempt to, move splice or repair damaged cables.

Continued on next page

Instructions to Excavators for the Protection of Underground S&C Cables, Continued

Method of Procedures

A Method of Procedure (MOP) shall be developed for situations where it is impractical to comply with items 1 or 2 of the preceding section – Precautions When Excavating. The MOP shall be developed by the Supervisor responsible to protect the cable, in conjunction with either outside contractors or CN Track and Roadway personnel involved in the excavation work. The MOP shall contain the following information:

- ☞ Limits of proposed work (Subdivision – mile points)
- ☞ Date and time duration i.e. yy/mm/dd 13:00 to 18:00
- ☞ Identity of S&C employee (Forman in charge) and Supervisor including their emergency contact information i.e. phone number(s)
- ☞ Detailed explanation of alternative excavation methods, excavation supervision and/or special excavation equipment to be used.
- ☞ Risk Assessment.
- ☞ Contingency Plan (Description; location and availability of temporary by-pass cable; splicing kits; and additional personnel.)

The completed MOP shall be submitted to CN's NMC center for authorization at least 14 days in advance of the planned work. The NMC will in turn submit a copy of the proposed MOP to CN's Fibre customers involved for approval of the MOP. The excavation work shall not proceed until the S&C employee and responsible Supervisor have received final authorization from CN's NMC center.

Important:

The employee responsible for the excavation work shall inform all individuals, outside contractors, involved in the excavation work and ensure that they fully understand the work procedures described in the MOP.

Continued on next page

Instructions to Excavators for the Protection of Underground S&C Cables, Continued

Work Near Buried Power Cables

1. Use extreme care when excavating near buried power cables to avoid damaging cable insulation and armor protection.

2. Properly rated protective clothing i.e. gloves.

3. Properly rated non-conductive tools.

4. When necessary, to protect persons excavating in proximity to hazardous equipment and cables, power circuits in the effected area may be de-energized for work safety. The decision to de-energize circuits for work safety will be based on a site-specific inspection and evaluation by the responsible S&C employee.

   Regardless of the alternate work method selected, all employees required to work in close proximity of the cable should consider it as possibly energized and use the same level of caution, gloves and tools as described in the above items 1, 2, and 3.

   Accidental contact with a live power cable, or piece of equipment that is in contact with a live power cable, can result in loss of life.

Safety During Work with Fibre Optic Cables

In a typical fibre optic system the transmitting light source emits a concentrated beam of light that may not be visible to the naked eye. The level of radiation may be sufficient to cause eye injury and caution must be exercised to avoid exposure. This precaution applies to any point in the system where the laser signal can be addressed (for example in inside shelters at the optical connectors or on the optical interface circuit packs). As there is no requirement to stare directly at the end of a severed fibre optic cable, as a practical safety precaution, one should avoid doing so.

A fibre optic cable is comprised of strands of glass that guide the light pulses down the cable. These glass strands have sharp ends that will readily penetrate the skin. Therefore unnecessary manipulation of bare fibres should be avoided to ensure that the fibre does not damage skin or eyes. Safety glasses are mandatory when working with fibre optic cables.

Continued on next page

Instructions to Excavators for the Protection of Underground S&C Cables, Continued

Safety During Trenching or Excavating

Supervisors and the employees in charge of excavating operations should be familiar with all applicable safety regulations. These regulations are designed to ensure the safety of workers involved in the excavation operations and may be enforced by safety inspectors on behalf of state, provincial or federal regulators.

Protect all openings, construction material, excavated material, or equipment with approved warning devices and/or barricades. Observe any other precautions that may be required by local conditions.

Completion of Work

After all work has been completed, backfill carefully, ensuring it does not contain materials that may cause damage to the cables. Restore the surface, as near as practicable, to its original condition, ensuring that any cable markers removed or damaged during work are replaced.

Maintenance of Way SPC 6100

Standards for work on CN's Right-of-Way are covered in Maintenance of Way Standard Practice Circular, SPC 6100 entitled "Precautions to be Taken During Maintenance of Track to Avoid Interference with Signal & Communications Systems". This document covers the general practices and precautionary measures to be taken when work is to be performed on CN's right of way near Signal and Communication facilities.

Continued on next page

Instructions to Excavators for the Protection of Underground S&C Cables, Continued

Risk and Track & Structures Work Activities

There are many CN Track and Structures work activities that could pose considerable risk to above ground and buried S&C cables. This table is provided as a guideline only, to assist in assessing the associated risk with these and equivalent types of activities.

Work Activity	Risk
Ditching	High
Ballast Regulation	Medium
Undercutting	High
Culvert Replacement	High
Brooming	Low
Tie Replacement	Medium
Bridge deck replacement	High

Important:

High and medium risk work activities shall not start without prior consultation with the responsible S&C Supervisor and if necessary with the development and approval of a MOP. When in doubt – review the proposed work with the S&C Supervisor.

Operations
Signals & Communications

Canadian National
935 de La Gauchetiere Street West
Montrèal, Quèbec, Canada
H3B 2M9

March 1, 2001

Important Memo to Contractors - Fibre Optic Cable Protection

Fibre optic cables are in service along the Right-of-Way on most of the mainline subdivisions across the CN system. These installations are well marked and carry high speed communications systems used by CN for telephone and data applications; including inter-city telephone tie trunks, Wide Area Network, CTC, wayside monitoring and radio. In addition, the fibre optic network installed on CN is utilized by clients that offer important services such as, cable, banking, national defense, air-traffic control and emergency communication services (i.e. 911).

Damage or cuts to cable thereby affects a broad range of operations and services. CN expects its employees, and any contractor working on its right-of-way, to take every precaution to avoid disruption to CN's fibre installations. CN's goal is to avoid all preventable disruptions to fibre optic installations.

Enclosed herewith is CN's Code of Practice SCP - 1005, "Instructions to Excavators for the Protection of Underground S&C Cables" which outlines the practice to ensure protection of underground S&C cables during excavation work on CN's Right-of-Way. All contractors performing work on CN property are expected to comply with this practice. Each contractor must confirm by signature that they have read and will abide by the terms and conditions set forth in this Code of Practice.

All incidents resulting in the disturbance of underground facilities, especially those that result in an interruption of service, will be investigated thoroughly. Disregard of this practice will not be tolerated and will result in punitive action being taken.

Asst. Chief Engineer S&C
Canadian National
Edmonton, Alberta

CAUTION – MISE EN GARDE

Stakes or markings may disappear or be displaced. If any delays are incurred in acting on the locate information as given or should sketch and markings not coincide, a new locate must be obtained. Note that a cable locate is valid for only 30 days.

Risque de disparition ou de déplacement des piquets ou des marquages. En cas de retard dans l'exécution du travail conformément aux données fournies ou en cas de non-correspondance des marquages et du croquis, obtenir de nouvelles données de localisation. Prendre note que les données de localisation ne sont valide que pour une durée de 30 jours.

Depth of cable plant varies and must be determined by hand digging.
Comme la profondeur des installations câbles varie, creuser a la main pour la déterminer.

``THANK YOU FOR CALLING BEFORE YOU DIG``
APPELEZ-NOUS AVANT DE CREUSER!

Acknowledgment of Code of Practice SCP - 1005 Governing the Protection of Underground S&C Cables.

We ,_____, acknowledge having received and read a copy of Code of Practice SCP - 1005 "Instructions to Excavators for the Protection of Underground S&C Cables" and declare that the contents thereof have also been brought to the attention of our employees, contractors and agents who will be performing work on CN's Right-of-Way. We undertake, on behalf of our Company, its employees, contractors and agents to abide by the terms and conditions set forth in that Plant Practice Bulletin while performing our services for CN.

Signed

_____ _____
Authorized Representative Date

Note to responsible CN employee:

The original of this document shall be placed on the corresponding Division project file.

Importance of buried cables to CN

Damage to underground cables have a severe impact on the operations of both CN and its external customers. CN Centralized Traffic Control, Engineering and Train to Wayside Radio Communications and CN's WAN/LAN backbone can be disrupted resulting in service and operational problems. In addition, the fibre optic network installed on CN is utilized by clients which offer important services such as, cable, banking, national defense, air-traffic control and emergency communication services (i.e. 911). Damage or cuts to cable thereby affects a much wider range of operations and services.

Scope of Policy

All excavating work in the vicinity of buried S&C plant is covered by this policy. Excavating includes any activity which results in an opening being made in the ground, including, but not exclusive to, digging, trenching, plowing, auguring, pile driving and pipe-pushing

Preparations for Excavation Work

Excavators must contact the Network Management Centre (NMC) before excavating along the railway Right-of-Way. The NMC will arrange to have Division S&C forces locate and mark the location of fibre optic, power, and other S&C cables prior to excavation.

Network Management Centre (NMC) 1-800-661-3687

The NMC is responsible for the day-to-day operation of the fibre plant and is the primary contact for CN's fibre optic customers.

Prior to commencement of any excavation along the right-of-way, the foreman or other employee in charge must notify NMC and should be ready to provide the pertinent details describing the work: their name, the location where work will be performed, a description of the work and instructions on how they can be contacted.

Location of Underground Cable

- Fibre optic and other Signals & Communication cables are buried directly in the sub-grade generally, but not always parallel to the railroad tracks.
- Cables usually pass under the tracks as the route changes from one side of the track to the other.
- Cables installed using off-track plowing equipment may be located anywhere along the right-of-way.
- Fibre optic cable is usually coiled near cable ends, at splice pedestals, tunnels, bridges, bungalows, road and track crossings and some culverts.

Never assume the location or path of an underground cable. Expose the cable by hand-digging, or CN approved vacuum equipment.

Cable markers

Permanent cable markers are installed only to indicate the presence of buried cable and are not meant to indicate precise location of the cable.

Precautions while Excavating

Railway excavation experience has proven there are certain situations where the risk to damaging in service S&C cables is increased and special precautions are necessary. The following describes various situations and the method to use to avoid damaging any buried cables:

1. Whenever excavating is performed within 1 meter (3 feet) of a buried cable the ground shall only be excavated by hand digging or using CN approved equipment especially designed for exposing cables utilizing a vacuum system to remove the surrounding soil. Under no circumstances are mechanical excavating machines of any kind to be used unless the cable is fully exposed and pulled clear of the work area.

2. Whenever parallel trenching or excavating is performed with a back hoe or cable plow unit, beyond the 1M (3 feet) hand excavation zone, but within 2M (6.6 feet) of the existing cable, the preferred method of protecting the fibre cable is to install a temporary by-pass communication cable with "protection" circuits connected prior to excavating.

   The intent is to eliminate the possibility of unexpected service disruptions or failures due to the excavating equipment snagging and forcing sharp rocks or foreign objects through the cable(s) while plowing or trenching.

3 If the precautions described items 1 or 2 are impractical, a Method of Procedure (MOP) shall be developed by the responsible Supervisory officer. *Refer to MOP section in SCP 1005.*

4 When exposing cables, use extreme care to avoid damage to cable or wire insulation. Dig down 15 cm to 30 cm (6 to 12 inches) to one side of the established cable route. When at a depth below the established burial depth, carefully dig toward cables to expose them.

5. The use of mechanical excavating equipment shall be restricted to situations where it is known that there is no danger of contacting or damaging buried cables Mechanical excavating equipment may be used ONLY AFTER ALL BURIED FACILITIES INVOLVED HAVE BEEN EXPOSED and are clear of the excavation area.

6. If buried cable is encountered while excavating - Stop operations immediately, expose it and investigate with extreme caution. The buried cable shall not be cut, chopped through or broken off without first determining if it serves a useful purpose. Under no circumstances is a buried cable to be disturbed unless authorized by the responsible S&C employee.

7. If any underground obstruction is encountered while excavating - Stop operations immediately. Expose and investigate the obstruction with extreme caution. Do not attempt to remove the obstruction until you are satisfied that removing it will not disturb or damage the buried cable. Under no circumstances is the buried cable to be disturbed unless authorized by the responsible S&C employee.

8. To prevent breaking or fracturing internal conductors or fibres, excavators shall avoid moving or bending fibre optic, power or signal cables at any time. The responsible S&C employee shall provide extra mechanical protection using split steel ducts and/or other protective materials, as required.

9 In the event that damage to a cable still occurs, - Stop operations immediately and report the location of damaged cable to the appropriate S&C employee. At no time shall unauthorized persons attempt to, move splice or repair damaged cables.

Information for NMC

When calling NMC please have the following information available:

Foreman

Name: _____

Cell: _____

Pager: _____

Radio: _____

Work Site

Location: _____

Subdivision: _____

Mile at: _____ to: _____

X-Street: _____

Description of Work:

_____

_____

_____

_____

_____

_____

Date: ____/____/____

Start Time: ____:____

End Time: ____:____

Have the Cables Been Marked? _____

NMC will provide you with a PNMS ticket (tracking) number.

PNMS Ticket: _____

Typical Cable Marker

SIGNALS AND COMMUNICATIONS

WARNING

BEFORE DIGGING
OR DRIVING STAKES
ON RIGHT-OF-WAY

CONTACT SIGNALS AND COMMUNICATIONS SUPERVISOR

BURIED
CABLE
ENFOUI

ATTENTION

AVANT DE CREUSER OU DE POSER DES JALONS SUR L'EMPRISE AVISER LE SUPERVISEUR SIGNALISATION ET COMMUNICATIONS

1-800-661-3687

Protection of Underground Signals & Communications Facilities

Call Before You Dig
1-800-661-3687

System Engineering
Engineering Services

935 de la Gauchetière Street West
Montreal, Quebec
H3B 2M9

WORK PERMIT APPLICATION

For Railway Use Only:

Mile:
Sub:
Location:
CN Ref. #: FLAG-
Cust. Ref. #: _____

CONTENTS:

SECTION A: INSTRUCTIONS & PERMIT FEES 2

INSTRUCTIONS 2
RATES & BILLING INFORMATION (2020) 3

SECTION B: APPLICANT & WORK INFORMATION 4

SECTION C: TERMS AND CONDITIONS 5

SECTION D: SAFETY GUIDELINES FOR CONTRACTORS AND NON-CN PERSONNEL 6

SECTION E: RIGHT OF ENTRY FOR CONTRACTORS 11

RIGHT OF ENTRY 11
SCHEDULE A: INFORMATION 14
SCHEDULE B: PLANS 15
SCHEDULE C: INSURANCE 16

SECTION G: AGREEMENT AND AUTHORIZATION 18

SECTION A: INSTRUCTIONS & PERMIT FEES

Instructions

Definitions:
"CN" and "Railroad" refers to Canadian National Railway Company or such of its affiliates or associates (within the meaning ascribed to those terms under the Canada Business Corporations Act) to whose property this Authorization and Consent relates.

"Applicant" refers to public road authority, company or individual that is requesting authorization and consent to perform work on or adjacent to CN property and/or requesting flagging services.

"Contractor" refers to authorized employees, servants, agents, contractors or sub-contractors representing or working on behalf of the Applicant.

Complete the Work Permit Application as follows:

1. Complete Section B, "Applicant & Work Information" (page 3)
2. Review Section E, "Right of Entry for Contractors" (page 11)
3. Read and initial each page of the Work Permit Application (page 1 to 18)
4. Provide signature in Section G, "Agreement and Authorization" (page 18)

Return the following:

1. Pages 1 through 18 of the completed Work Permit Application
2. Proof of Insurance, as per Section E, "Right of Entry for Contractors"
3. Payment for the Permit Fee (If required)
4. **Please return all of the above to the following address:**

MARK LEBLANC P.Tech
ENGINEERING SERVICES
255 Hump Yard Road
Moncton, New Brunswick E1E 4S3

mark.leblanc**@cn.ca**

Upon receipt of the signed documents, CN will provide contact names and numbers to the Applicant to arrange for required work.

Rates & Billing Information (2020)

Where applicable, HST/PST/GST will be added to the prices described on this page.

Application Fees*

Permit Fee	$ 0.00 plus HST

Flagging and Cable Locate/Protection Costs*

STANDARD - ZONE PRICING*		
Service	**Hourly Rate**	**Daily Minimum**
Flagging Services	$ 143.00	4 hours
Cable Locate	$ 143.00	4 hours
N.B. Travel time exceeding 1 hour to travel to and 1 hour to travel from the work site is recoverable and will be charged in addition to the time spent on site at the above rates.		

The daily time invoiced per employee will be rounded up to the next full hour.

Disclaimer – The above rates are on a "per worker/ per day" basis.

Notification Delays

- CN requires 10 working days notice for flagging / signal protection services.
- CN requires 10 working days notice for cable locates.
- **CN requires two (2) business days' notice to cancel scheduled work. Notice must be given in writing via email. Cancellations received without the required notice will be invoiced at the minimum daily rates.**

Penalties/Additional Fees*

If work is performed without any CN flagman being present or without proper locates, an amount of $5,000 per incident shall be billed to the Applicant as a penalty. Penalties will also be issued for any practices deemed as unsafe per railroad safety requirements. Safety is necessary to ensure that no worker and/or passerby is/or will be in any danger.

If one or more trains are delayed, Applicant must pay to CN, under title of Damages of Liquid Assets and not under title of penalties, the following amounts depending on the situation:

- Passenger Trains: $2,500 per delay + $25 per minute of delay
- Freight Trains: $200 per minute of delay
- Each train delay can lead to additional costs that you will be responsible to pay

Fees are subject to yearly changes without notification

CN Tax Registration Information

- CN GST/HST Registration Number 10076 8779 RT0001
- CN QST Registration Number 10000 43156 TQ0514

SECTION B: APPLICANT & WORK INFORMATION

ROAD AUTHOURITY / COMPANY: _____
("Applicant")

BILLING ADDRESS: _____
_____
_____

CONTACT ADDRESS: _____
_____
_____

PHONE NO.: _____
FAX NO.: _____
EMAIL ADDRESS: _____

NAME OF SUB-CONTRATOR: _____
(if applicable)
FIELD CONTACT: _____
MOBILE PHONE: _____

1. DESCRIPTION AND LOCATION OF WORK (including details of ***all excavations*** on or adjacent to the CN right-of-way):

WARNING - CN right-of-way contains buried communication, power and fibre optic lines. Cable locates by CN Signals and Communications personnel and implementation of appropriate protective measures are mandatory prior to all excavations.

DATE(S) WORK TO BE PERFORMED: from December 14, 2020 to , 2021.

N.B. Actual date(s) of work will be dependent upon availability of CN flagging and cable locates / protection.

SECTION C: TERMS AND CONDITIONS

1. The Applicant shall:

1.1. Execute the attached Application and submit the required documentation and payments (including applicable taxes) as per Section A "Instructions & Permit Fees" of this application.

1.2. Read and be aware of "CN Safety Guidelines for Contractors and Non-CN Personnel" (See Section D).

1.3. Have all employees working on CN property complete the CN contractor orientation course at www.contractororientation.com if employees do not already have their E-RailSafe certification.

2. The Applicant shall be liable for all costs, direct and indirect, incurred by CN due to the settlement of track(s) or any other problems related to CN's operations, property or infrastructure, that occur as a result of this work, for a period of one (1) year from the date of completion of the work.

2.1. Should CN be unable to maintain normal operating speed during installation or within a period of one (1) year from the date of completion of the work, the Applicant shall be responsible for the cost of train delays resulting from the train slow order, and shall be assessed a daily penalty as per the rates established in calculated according to the rates in Section A until such time as normal operating speed is resumed.

2.2. CN, at its option, may undertake the necessary measures to ensure safety, at the risk and expense of the responsible party.

2.3. The Applicant shall be responsible for the cost of flagging and cable locates / protection work. The cost of flagging and cable locates / protection work shall be based on actual time on site, calculated according to the rates in Section A.

3. Payment terms and conditions:

3.1. Payments shall be made at CN's remittance address indicated on the invoice and is due 30 days after invoice date.

3.2. CN reserves the right to charge and be paid interest on all sums due from the Customer at the rate of 12% per annum compounded monthly, calculated from the date upon which payment is due until the date upon which it is received. Invoices are payable in full without set-off retention or counterclaim.

3.3. CN reserves the right to invoice Goods and Services upon delivery, regardless of whether other Goods or Services remain outstanding or not. The Applicant understands and accepts that failure to adhere to the payment terms and conditions may result in the termination of part or all services provided by CN, recuperation of goods sold, and escalated collection and legal procedures.

3.4. The Applicant acknowledges and agrees that all decisions with respect to the extension, continuation and termination of credit shall be at the sole discretion of CN.

3.5. Chargeable labour hours for CN personnel are tabulated through CN's time-keeping and payroll system, and are maintained electronically. The Applicant waives any right to acquire timesheets for labour hours charged.

SECTION D: SAFETY GUIDELINES FOR CONTRACTORS AND NON-CN PERSONNEL

Introduction

This document is a condensed version of CN's mandatory safety training for Contractors and non-CN personnel. It should be noted that this document is not a substitute for the mandatory safety training for Contractors and non-CN personnel including eRailsafe or Contractor Orientation as the case may be. For the purposes of this document "Contractor" may also apply to individuals on CN property, whether under contract to CN or not.

These guidelines are not to be considered as a substitute for the applicable government regulations. These guidelines are the minimum requirement and must be exceeded where the hazard or government regulations warrant.

It is not possible to deal with every hazard in this one document. These guidelines are to be employed in conjunction with Government Acts, Regulations, local Ordinances, CN Safety and Operating Rules Standards, and good judgment to facilitate the safe completion of the work.

Additional information regarding safe work practices may be included in contract documents and specifications. In the event of a discrepancy between these guidelines and the contract, the contract shall govern.

GENERAL RULES AND INFORMATION

"Expect the movement of a train, engine, rail car or track unit at any time, on any track, in either direction. Protect yourself and others from the movement of trains, engines, railcars and track units and do not expect them to stop."

If any situation arises which affects the safe movement of trains, CN must be contacted immediately at:

1-800-465-9239.

Alternatively, contact CN's Network Operations Centre in Edmonton at:

1-800-661-3963.

Before any digging is performed on CN property, proper clearance and instructions must be obtained through the Information Technology Command Centre (ITCC Network Management Centre) at:

1-800-661-3687 or 1-800-NO1-FOTS.

In an emergency, any object waved violently by anyone on or near the track is a signal for trains to stop.

Violation of CN's mandatory Contractor Safety training or contravention of these guidelines may result in the immediate removal of the Contractor or the offending personnel from CN property.

Compliance with Government Regulations

Contractors shall follow all applicable Federal, Provincial, and Municipal Acts, Regulations, Laws and Codes, including but not limited to those related to the licensing of workers, occupational health and safety, transportation or handling of dangerous substances, inspection and certification of equipment. As CN is a federally regulated enterprise, Contractors are advised that work undertaken on CN right-of-way may be governed by Federal regulation.

The Contractor must become familiar with all applicable regulations and must ensure compliance by workers at the job site. Supplementary instructions may be issued by CN representatives from time to time.

Contractor's Responsibility

1. Before entering upon CN right-of-way, the Contractor must have all documentation properly executed and available for review by CN personnel at the working site. (i.e. Permits, Licenses, Contract Documents, Contractor Safety Approved identification card and/or Waivers).
2. Daily briefings must be held at every work site to review the contents of these guidelines and any unique conditions at the site relating to safety. A record must be kept of such briefings by the Contractor's responsible person at the work site. Work site briefings must be updated regularly as the job conditions change
3. Unless explicitly permitted by CN, no equipment or vehicle may enter upon the operated right-of-way.
4. Unless explicitly permitted by CN, no work shall take place within thirty (30) feet of the nearest rail except in the presence of a CN Protecting Foreman. The CN Protecting Foreman is concerned only with the safe movement of trains and will not be responsible for the safety of the Contractor, the Contractor's personnel or the Contractor's equipment.
5. Contractor's personnel must not crawl under, climb over or pass through standing railway equipment.
6. Contractor's personnel must not cross a track within thirty (30) feet, of standing railway equipment.
7. CN has many power and/or communication cables buried within the CN right-of-way. The Contractor shall be sure of their location before making any excavation, driving stakes or otherwise penetrating the ground surface. In the event of any excavation work that strikes an underground cable adjacent to CN's track, the contractor must make immediate contact with CN
8. In accordance with CN's safety standards, Contractor's personnel must wear CN required personal protective equipment at all times while on CN right-of-way. Such equipment will include hard hats, safety glasses, reflective apparel, safety footwear (protective footwear shall meet or exceed CSA Z195 and/or ASTM F2413, shall cover and support the ankle and have a defined heel. In Canada, the defined heel must be a minimum of 9 mm (3/8 inch) and shall not exceed 25 mm (1 inch). In the US, the defined heel must be a minimum of 12 mm (1/2 inch and shall not exceed 25mm (1 inch). Boots must be equipped with laces, which must be laced to the top and tied. Hearing and respiratory protection and fall arrest equipment shall be worn where signs are posted or when a potential hazard exists.
9. No CN plant, signal, structure, equipment or property of any kind may be tampered with, modified or removed.
10. "Hi-rail" equipment shall only be operated on the track by personnel qualified in the latest version of the "Canadian Rail Operating Rules".
11. Horseplay, practical jokes, fighting or any other activity that may create a hazard will not be tolerated.
12. Contractor's personnel must immediately abide by instructions from CN personnel.

Approaching Train

1. On the approach of a train, the Protecting Person will communicate to the Contractor's Responsible Person, either by radio or by personal contact, that a train is approaching.
2. After receiving the train information from the Protecting Person, the Contractor's Responsible Person must ensure that all workers, equipment and materials are "Clear Of The Track" (as defined in 5.3.5. below) then communicate this to the Protecting Person.
3. The Protecting Person will not authorize any trains through the working limits nor authorize cancellation of protection before receiving confirmation that all workers have been alerted, stopped working and the track is clear of workers and machinery.
4. After the train has passed, no one is to foul or occupy the track until the Protecting Person has given the authorization. Authorization will be communicated to the Contractor's Responsible Person.

Clear Of The Track

To be Clear of the Track shall be defined as:

1. All work has been stopped.
2. All workers are made aware of the approaching train and route to be followed.
3. All workers, equipment and material have been positioned beyond the clearance limits or at any other location deemed safe by CN. (at least 5 meters (15 feet) from the nearest rail of the track on which the train is to pass with additional allowances for curvature and super elevation).
4. All off-track equipment by special approval less than 5 (15 feet) meters of the nearest rail has stopped working and operators have left their equipment.
5. All off-track equipment more than 5 meters (15 feet) from the nearest rail has stopped working. Operators may remain in their cabs unless directed otherwise by the Contractor's Responsible Person. All equipment must be properly secured against unintentional movement
6. All on-track equipment has been moved into the siding or other track as per the Protecting Person's instruction. Operators will leave their equipment unless directed otherwise by the Contractor's Responsible Person. All unattended equipment must be properly secured against unintentional movement
7. Booms, cranes or other similar equipment have been immobilized and the boom is parallel to the railway track(s), and clear of the nearest rail be 5 meters (15 feet)
8. Provided there is no possible way for the worker to become unintentionally foul of a passing train, and at the discretion of the CN Supervisor, workers may continue working.

POLICY TO PREVENT WORKPLACE ALCOHOL AND DRUG PROBLEMS

Policy standards

The Contractor, subcontractors, employees, suppliers and visitors must remain free from any adverse effects of alcohol or other drugs and conduct themselves in an appropriate manner while on CN business or premises. The Contractor must ensure that all those having access to the site adhere to the following standards when on CN business or premises, including vehicles and equipment:

1. No use, possession, distribution or sale of illegal drugs or drug paraphernalia.
2. No use, possession, distribution or sale of beverage alcohol or any form of alcohol.
3. Responsible use of prescribed and over-the-counter medications.
4. No distribution, offering or sale of prescription medications.
5. To report for duty and remain during the entire period of duty free of the negative effects of alcohol and other drugs, including the after effects of such use.

Consequences of violation

Failure to meet these standards will be considered a breach of the contract. This may at CN's sole discretion, trigger the suspension or termination of the contract.

Policy violation procedures

Where CN has reasonable grounds to believe any individual in the employ of the Contractor or a supplier is on duty in an unsafe condition or otherwise in violation of the Policy, or where during the preliminary phase of any investigation such an individual has been identified as being directly involved in the chain of acts or omissions leading up to an accident or incident:

1. CN will escort the individual(s) to a safe place.
2. CN will notify the Contractor or supplier.
3. The Contractor will investigate the situation.
4. The Contractor must satisfy CN that there has been no policy breach.
5. If a policy breach has occurred, the individual will not be allowed to continue providing services to CN without written permission from a CN official, and he/she will be required to adhere to any conditions governing his/her return.

Firearms

Firearms (loaded or empty) are not permitted on CN property, except for CN Police officers and other designated persons performing authorized work and when authorized to do so. In all cases, any firearms must be accompanied with a written authorization from the Chief of CN Police and the person should have in his possession all pertinent government permits.

Explosives

No explosives will be permitted on CN property without written CN approval.

Vehicles

Contractor's vehicles on the site must be in safe operating condition. Operators must observe all site speed limits. Unattended vehicles must not be left running unnecessarily. Where they must be left running, the parking brake must be applied. The operator is responsible for the safety of all passengers and the stability of materials being transported.

All vehicles will be parked in a pre-determined area and where required, a designated Contractor entrance shall be used.

Smoking in the Workplace

Smoking is not permitted in any CN interior workplace or motor vehicle.

Security

Contractor's personnel will proceed directly to the Contractor's work location. Contractor's employees must remain at their designated work site and must not wander about the site.

The Contractor shall not permit persons other than the Contractor's personnel to enter the site without the prior written authority of the CN representative.

Emergency Evacuation Procedures

Prior to commencing work, all Contractor's employees must be familiar with the emergency evacuation plan for that work site. The Contractor shall issue written emergency and rescue procedures to the Contractor's personnel and shall post such procedures on the job site.

Unsafe Conditions or Practices

Contractors shall correct or report any unsafe conditions or practices they observe. All such conditions or practices shall be reported to the CN representative at the work site as soon as practical.

Reporting Accidents/Incidents

All accidents/incidents occurring on CN property, that result in or had the potential of causing serious injury, lost work days, vehicle or property damage must be reported to the CN representative within twenty-four (24) hours. All such incidents will be fully investigated by the Contractor.

The Contractor shall subsequently provide a written report to CN (i.e. Company Officer assigned as Liaison to Contractor) within seven (7) days detailing the nature of the incident, the cause(s), regulatory authorities notified, and a specific action plan to prevent recurrence.

Treatment of Injured Personnel (Contractors)

Contractors shall ensure the following is provided for their personnel as required by CN and in accordance with applicable government regulations:

1. Adequate first-aid supplies and equipment.
2. Qualified personnel to render first-aid treatment.

Audio and Visual Recording Equipment

Cameras and audio-visual equipment are not permitted on CN property without prior approval. Use of personal electronic devices such as smart phones for the purpose of recording video, photographic or audio information is prohibited while on CN property.

Summary

In conclusion, CN requires the full cooperation of the Contractor and the Contractor's employees with these guidelines and all other applicable regulations. Should there be any doubt as to the meaning or interpretation of these guidelines, consult with the CN representative responsible for the worksite.

Contractor Acknowledgement

Contractor/Sub-contractor personnel must read and understand CN's "Safety Guidelines for Contractors and Non-CN Personnel". The Contractor/Sub-contractor must also follow the appropriate Contractor Safety training.

SECTION E: RIGHT OF ENTRY FOR CONTRACTORS

Right of Entry

General Conditions

1. "Railroad" refers to Canadian National Railway Company or such of its affiliates or associates (within the meaning ascribed to those terms under the *Canada Business Corporations Act*) to whose property this Right of Entry relates.

2. This Agreement is entered into as described in Section G "Agreement and Authorization" of this document (page 18).

3. The Railroad, solely to the extent of its right, title and interest, without any warranty, expressed or implied, at law, under contract or otherwise, hereby grants to Company and its authorized employees, servants, agents or contractors, authorization and consent to enter upon the property described under Schedule "A" hereto (the "Railroad property") for the sole purpose described under Schedule "A" hereto. This Right of Entry shall only extend to such actions as are necessary or required to fulfill the purpose described under Schedule "A" hereto.

4. This Right of Entry shall terminate forthwith upon expiration of the term noted in Schedule "A" hereto, it being understood that Railroad shall have entire discretion to revoke this Right of Entry at any time prior to the expiration of the term, upon notice to that effect to the Company, which notice shall be effective forthwith upon receipt by the Company or at such later date indicated by Railroad in the aforesaid notice.

5. The Railroad grants this consent subject to the understanding that Company and its authorized employees, servants, agents or contractors who enter upon Railroad property will:

   5.1. See that any activities conducted on said Railroad property are done in a good workmanlike manner, in compliance with applicable laws, statutes, regulations, policies, directives, orders, approvals and other legal requirements and in such manner and at such time as not to obstruct or interfere with Railroad's operation, trains or the functioning of its signal and communications systems or any fiber optic cable system or unduly delay the safe passage of Railroad's trains;

   5.2. For the purposes hereof, the following expressions shall have the meanings hereinafter noted:

      5.2.1. "Applicable Laws" means the applicable and enforceable statutes, regulations, policies, directives, orders, approvals and other legal requirements of an Authority or of the common law in effect from time to time, including, without limitation, those, together with the guidelines of an Authority, relating to the protection, conservation or restoration of the natural environment;

      5.2.2. "Authority" means the federal, provincial, municipal, state, county and, generally local governments, the courts, administrative and quasi-judicial boards and tribunals and any other organizations or entities with the lawful authority to regulate, or having a power or right conferred at law or by or under a statute;

   5.3. Observe, abide by and comply with any and all guidelines, directives and policies adopted from time to time by Railroad including, without limitation eRailsafe, Contractor Orientation (as the case may be).

   5.4. Take due precautions against injury and damage to persons or property located upon said Railroad property; and

   5.5. Unless otherwise agreed to, return said Railroad property to the same condition, reasonable wear and tear excepted, as existed prior to such work, failing which Railroad, after providing written notice to Company, and allowing Company a reasonable amount of time to return the Railroad property to the same condition, may do so at Company's sole cost and expense.

Work

6. Any work carried out by Company shall be carried out at those locations described in Schedule "A" or shown on the Plan attached hereto as Schedule "B" and, as the case may be, in the manner described therein.

7. Company agrees to advise Railroad's representative identified in Schedule "A" hereto (the "Representative") or such other representative designated from time to time by Railroad as to the dates and times when the work will be conducted on Railroad property and to provide him with at least ten (10) working days advance notice before entering upon Railroad property to commence any work or for any other purpose. Unless otherwise agreed to in writing, Company agrees to assume the costs of engineering services, Railroad's Representative's costs and its designee, signal locates, flagman, track labor and all other associated costs incurred by Railroad. Railroad shall, at its option, invoice Company directly for such costs or, if any of those services have been provided by a third party, Railroad may direct such third party to invoice directly Company, in which case Company undertakes and agrees to pay such third party forthwith upon receipt of (i) Railroad's direction to pay such third party; (ii) proper invoice for the relevant services.

8. The Railroad, its employees, agents or representatives shall have the right to view and inspect any activity or work on Railroad's property. If, in the sole opinion of Railroad, any activity or work is undesirable for any safety-related reason, Railroad shall notify Company, its authorized employees, servants, agents or contractors and if appropriate corrective action is not taken, Railroad shall have the right to terminate this Agreement at once.

9. Railroad shall have the right to restrict Company's activity on Railroad's property in any way that Railroad may deem necessary from time to time to assure normal railroad operations or for safety reasons and, after consultation with Company, shall also have the right to require Company, its authorized employees, servants, agents or contractors to comply with Railroad's instructions and take any safety precautions that Railroad may reasonably deem necessary from time to time. No work shall be performed or equipment located within thirty (30) feet of the centerline of the nearest railroad track without flagging protection being provided by Railroad, at the Company's expense or as otherwise agreed to in writing. Said work must be arranged no less than ten (10) business days in advance of starting work.

10. Company shall not suffer or permit any construction lien or similar lien to be filed or registered against Railroad property. If such a lien shall at any time be filed or registered, Company shall forthwith procure its discharge at its sole costs and expenses. Railroad shall have the right, if Company fails to forthwith procure such discharge, to discharge any lien filed or registered at any time against Railroad property, and any amount paid by Railroad in so doing together with all reasonable costs and expenses of Railroad including its legal fees and costs shall be paid to Railroad by Company on demand.

Confidentiality

11. Company covenants and agrees that any information of whatsoever nature (whether such information is written, verbal or otherwise), relating to Railroad, its operations, properties, business, assets, liabilities and financial condition (together with any and all memoranda, notes, reports, documents based upon and relating to such information, all copies and extracts thereof and all studies and data prepared on the basis of such information), is strictly confidential and Company represents and warrants that neither Company nor those for whom it is responsible at law will release the reports or any of the information contained therein (including to any Authority), without the express written consent of Railroad, and Company shall refuse all requests for such reports or information in the absence of Railroad's express written consent, unless compelled to do so by competent judicial or administrative authority and only to the extent that (i) Company gives Railroad timely notice of any proceeding and/or hearing related thereto; and (ii) Company has taken no action that would hinder Railroad from seeking a protective order to prevent such disclosure of its confidential information. Company further undertakes and agrees to share with Railroad, at no cost to Railroad, any and all conclusions, studies, reports or data incorporating, based upon or relying on any such information.

Indemnity

12. Company shall indemnify and hold harmless Railroad from any losses, liens, damages, liability, and expenses ("Damages") incurred by Railroad arising from Company's, or its employees, agents, contractors or sub-contractors', breach of its obligations or warranties under this Right of Entry; any third party claims associated with or arising under this Right of Entry; or Company's access to Railroad's or Railroad's affiliates' premises. In the event that Railroad has incurred Damages, Railroad shall notify Company and Company shall indemnify Railroad for the Damages and defend

and hold harmless Railroad against any third party legal claims associated with the Damages. No third party claim may be settled without the consent of Railroad, which consent shall not be unreasonably withheld.

Insurance

13. Company, its contractors or any sub-contractors shall each provide and keep in force and effect throughout the term of this Right of Entry such insurance, in amounts and for risks as Railroad may prescribe from time to time including, if applicable, the kinds and minimum amounts of insurance set out under Schedule "C" – "General requirements".

14. If Company, its contractors or any sub-contractors shall perform sub-surface work, Company, its contractors or any sub-contractors shall also provide and keep in force and effect throughout the term of this Right of Entry the additional insurance specified under Schedule "C" – "Sub-Contractor Insurance Coverage".

    The Company, its contractors or any sub-contractors will not enter Railroad property without having obtained a certificate certifying that they have obtained all of the insurance coverage required hereunder. The Railroad may at any time require the Company to furnish said certificate and failure to so may result in removal from Railroad property, cancellation of agreement and other consequences including without limiting damages or consequential losses resulting from the non-completion of the work, as Railroad may determine. Said insurance shall state that no material changes will be made to the policies unless Railroad is given a prior written notice of thirty (30) days before such change or cancellation. Any insurance coverage required under the terms and conditions of this contract shall in no manner restrict or limit the liabilities assumed by Company nor shall they release Company from any of its obligations under this contract.

Exceptions

15. Any exception or variation to the terms and conditions of this Right of Entry shall be specifically identified in Schedule "A" hereto. No such exception or variation shall be binding upon Railroad unless Schedule "A" is properly initialed by Railroad's duly authorized representative(s).

Miscellaneous

16. Company shall not have the right to transfer and/or assign this Right of Entry or any of its rights hereunder without Railroad's prior written consent, which consent Railroad shall have entire discretion to withhold or delay.

17. All notices provided for under this Right of **En**try shall be in writing and sent by pre-paid registered mail, fax or hand-delivered to the other party at the addresses herein first noted or at such other address as either party may notify the other from time to time.
    Such notices, if given by mail, shall be deemed to have been received on the third business day following the postage thereof; if by fax or hand delivery, at the date and time the fax is sent or the hand delivery is made.

18. Either party's exercise or failure to exercise any rights under this Agreement shall not relieve the other party of any responsibility under this Agreement.

19. In the event of conflict between the terms hereof and the terms of any other agreement between Railroad and Company, the most stringent standards and conditions shall govern.

20. This Right of Entry shall be governed by the laws of the jurisdiction where Railroad property accessed under the authority hereof is located, as noted under Schedule "A" hereto.

Schedule A: Information

Railroad Property	Mile
Limited Access Purpose	For the limited purpose of
Term	A term of six months, beginning on December 14, 2020 and terminating on 2021, unless sooner terminated as provided hereunder.
Representative (name and address)	Mark LeBlanc 255 Hump Yard Rd., Moncton, NB E1E 4S3 506-853-2885

Schedule B: Plans

(Appended hereto)

Schedule C: Insurance

General Requirements

To the extent Company carries out work on its behalf or on behalf of Railroad, the Contractors or the Sub-contractors shall, throughout the term of this Right of Entry agreement, maintain in force the following coverage. The insurance limits may be met by a combination of primary and umbrella insurance policies.

1) **Commercial General Liability Insurance** - occurrence based - in an amount no less than **$10,000,000** per occurrence, or such greater amount as Railroad may from time to time reasonably require, covering liability for bodily injury, including death, property damage or destruction of property (including loss of use), contingent employers liability, sudden and accidental pollution, product and completed operations, broad form property damage, non-owned automobile, blanket contractual liability, and unlicensed vehicles on and off premises owned or controlled by the owner.

   Company shall provide to Railroad a certificate of insurance evidencing the above and include:
   a) a waiver of subrogation in favour of CN and its subsidiaries;
   b) name CN and its subsidiaries as additional insured;
   c) contain a cross liability and severability of interest clause ;
   d) specifically include liability for operations within or around railroads and railway tracks;
   e) contain a clause stating that CN's interests will not be prejudiced in the event the First named insured breaches any warranty of the policy;
   f) provide a 30 days written notice of cancellation, modification or material change in coverage.

2) **Automobile Liability Insurance** on all licensed vehicles owned, hired, leased to or operated by or on behalf of the Company's contractor in the amount of not less than **$5,000,000** per occurrence. The certificate of insurance must include a waiver of subrogation in favour of CN and its subsidiaries.

3) **Workers' Compensation -** if available in the jurisdiction(s) covered by this Agreement, Company must be compliant with statutory Worker's Compensation and hold the relevant clearance letter(s). Otherwise, Company must provide Employer's Liability Insurance in an amount no less than **$5,000,000**.

   WHERE APPLICABLE, THE FOLLOWING COVERAGES ARE TO BE PROVIDED IN ADDITION TO THE ABOVE

- **For professional advice or design (architects/engineers/inspectors/training, etc.)**

4) **Professional Liability Insurance/Errors and Omissions** (incl. Pollution Liability) with a limit of no less than **$5,000,000**.

- **For contractors leasing large machinery and equipment**

5) **All Risks Contractor's Equipment Insurance** covering construction machinery and equipment used by the Contractor and Sub-Contractors for the performance of the Work, as any structures being built or assembled, shall be in a form acceptable to the Contractor and Railroad and shall not allow subrogation claims by the Insurers against the Contractor and Railroad. The policy shall be endorsed to provide the Contractor with no less than 30 days written notice in advance of cancellation, change or amendment restricting coverage.

- **For building construction**

6) **All Risk Builders Insurance / Course of Construction Insurance** must be provided if required, in order to cover the construction of the building, the building foundations, fixtures, machinery, equipment used to service the building, building materials and supplies, and debris removal in the event of a loss.

- **<u>For construction projects estimated at $5,000,000 and more (ex.: rail, bridges, roads, structures, buildings)</u>**

7) **Project Wrap-Up Liability Insurance** subject to limits of not less than **$25,000,000** per occurrence. Such insurance shall be in the joint names of the owner and contractor and name as additional insures all subcontractors and consultants. The Wrap-Up Liability insurance shall include, but is not limited to: bodily injury including death and property damage including loss of use; personal injury; contractual liability; premises and operations; products and completed operations liability coverage extension of twenty-four (24) months; contingent employers liability; shoring, blasting, excavation, underpinning, demolition, pile driving, caisson work and work below ground surface including tunnelling and grading; non-owned automobile; limited pollution coverage (Insurance Bureau of Canada Form 2313); non-cancellable or at least 120 days notice of cancellation, contingent medical malpractice; and fire fighting expense. This insurance policy shall be the primary insurance coverage in all cases for all risks of liability associated with the operations of this project. The policy shall be in force from commencement of work until substantial completion and include coverage for unfinished construction, maintenance and repair for a period of 12 months following substantial completion.

SECTION G: AGREEMENT AND AUTHORIZATION

This Agreement is entered into as of this _____ day of _____, 2020 between CN, having its registered office at 935 de la Gauchetière West, Montreal, Quebec, H3B 2M9, and _____ ("Applicant"), having a place of business at _____.

For a term of six months, beginning on December 14, 2020 and terminating on , 2021, unless sooner terminated as provided hereunder.

CN

(Signature)_____

Print Name: Mark LeBlanc P.Tech

Title: Engineering Services

APPLICANT

(Signature)_____

Print Name:

Title:

SPECIAL PROVISION
SECTION 104
(WAGE RATES)

When two or more wage rate schedules appear in the bid Book, the highest rate shall prevail for each classification.

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

I. In-water work is allowed anytime provided that the Contractor meets all terms, conditions, and requirements of the permits, approvals, and documents listed in Sections II, III, IV & V.

II. Work shall be completed in accordance with the following permits applicable to work on the Maine (ME), United States (U.S.) side of the International Boundary. These permits include general requirements and standard and special conditions of approval. They are included in the contract documents and shall be kept on site. Disturbance of wetlands or waterbodies outside of areas specifically authorized in permits is prohibited.

1. Maine Department of Environmental Protection (DEP) Natural Resources Protection Act Individual Permit
2. Army Corps of Engineers Maine Programmatic General Permit
3. U.S. Coast Guard Bridge Permit

III. Work shall be completed in accordance with the following permits, authorizations, and approvals applicable to work on the New Brunswick (NB), Canada side of the International Boundary. These documents include general requirements and standard and special conditions and shall be kept on site and furnished to provincial and federal officials upon request. Disturbance of wetlands or waterbodies outside of areas specifically authorized in permits is prohibited. The items listed in **bold** are currently pending and will be provided to the contractor as soon as they are available. Work may not begin until they have been issued and the Department has issued written permission to the contractor. All other items are included in the bid documents.

1. Environmental Impact Assessment (EIA) Certificate of Determination (CoD)
2. **Environmental Management Plan (EMP) required as part of the EIA CoD Conditions**
3. **Watercourse and Wetland (WAWA) permit**
4. **Fisheries Act Authorization (FAA)**
5. **Canadian Navigable Waters Act (CNWA) Approval**
6. **International Bridges and Tunnels Act (IBTA) Approval**
7. **Lease Agreement between the Canadian National (CN) railway company and New Brunswick Department of Transportation and Infrastructure (NBDTI).**

IV. Special Conditions (BOTH SIDES of the International Boundary):

1. The Contractor shall hold a pre-construction meeting to review procedures and requirements for avoiding and minimizing environmental impacts. The Contractor shall include, but is not limited to, representatives from the following organizations: MaineDOT and MaineDOT Environmental Office; New Brunswick Department of

Transportation and Infrastructure (NBDTI); NB Departments of Environment and Fisheries and Oceans Canada (DFO); Indigenous Archaeological and Environmental Monitors. The Resident shall provide a list of contact information for required attendees. The meeting shall include a review of the following:

a. Conditions of Approval from applicable permits, authorizations, and approvals
b. MaineDOT Best Management Practices for Erosion and Sedimentation Control
c. All additional project-specific environmental mitigation measures outlined in the Environmental Management Plan for the project in Canada
d. Special Provisions that include environmental requirements, including but not limited to the following:
   (i) 105-General scope of work (Temporary Work Trestle)
   (ii) 105-General scope of work (Environmental Requirements)
   (iii) 105.9 Historic and Archeological Resources
   (iv) 610-Stone fill, riprap, stone blanket, stone ditch protection
   (v) 202-Existing Bridge Removal

2. The Contractor shall allow Indigenous Environmental and Archaeological Monitors retained by NBDTI to observe construction activities.

3. See Special Provision 105.9 for Historic and Archaeological Resources requirements.

4. Special Conditions for temporary work trestles and cofferdams:
   a. Work trestles shall be removed each winter before the freshet occurs to avoid flooding due to potential ice jams. See Special Provision 105-General Requirements (Temporary Work Trestles).
   b. Any access trestle required by the Contractor shall be as outlined in Special Provision 105 – General Requirements (Temporary Work Trestles) and shall provide a navigational channel, as shown on the Plans, so that boats will have access from May to November during the contract period.
   c. For all in-water impact pile driving, the Contractor shall carry out a warning strike on the pile 30 seconds prior to commencing pile advancement.
   d. The Contractor shall prevent fish from re-entering enclosed areas (cofferdams).

5. The contractor shall monitor the water level in the river[1]. Machinery, materials and pollutants shall not be stored in flood-prone zones when it is reasonable to expect high water levels and shall never be stored below elevation 138.7 meters (455 feet).

6. In-water blasting is prohibited.

[1] Environment Canada operates a gauge in Edmundston, and measurements are available at: https://wateroffice.ec.gc.ca/report/real_time_e.html?stn=01AD004

7. To minimize the spread of noxious weeds into the riparian zone, all off-road equipment and vehicles (operating off of existing open and maintained roads) shall be cleaned prior to entering the construction site to remove all soil, seeds, vegetation, or other debris that could contain seeds or reproductive portions of plants. All equipment shall be inspected prior to off-loading to ensure that they are clean, and again before the equipment leaves the site.

8. No washing of tools or machinery shall occur within 30 meters (98.5 feet) of a watercourse or wetland.

9. The contractor shall submit for review and approval a site-specific Spill Control and Countermeasures (SPCC) Plan that addresses the requirements of the Standard Specification 656 and the requirements of the New Brunswick DTI Environmental Management Plan, including but not limited to the following:
    a. Refueling and maintenance activities shall be undertaken on level terrain, at a suitable distance from environmentally sensitive areas including watercourses, and on a prepared impermeable surface with a collection system.
    b. Equipment shall not be fueled within 30 meters (98.5 feet) of a groundwater source (private well). Private wells in the vicinity of the project are provided in Figure 1 of the New Brunswick EMP.
    c. Fueling activities within the work area shall occur using mobile fueling equipment (fuel trucks). Fueling activities shall require fuel spill kits and a watertight spill basin with a capacity of at least 150% of the equipment being refueled. The spill basin shall be inspected to confirm it is in good condition and will be positioned beneath the equipment prior to the commencement of fueling activities. Fueling activities shall cease immediately if fuel leakage occurs.
    d. Fuel and other hazardous materials shall be stored within a designated, clearly marked area that is compliant with Workplace Hazardous Materials Information System (WHMIS) requirements and lined with a non-permeable membrane capable of containing 150% of the capacity of the storage containers.
    e. All spills or leaks, such as those from machinery or storage tanks, shall be promptly isolated, contained, and cleaned up (sorbents and booms shall be available for quick containment and recovery) and reported to New Brunswick 24-hour environmental emergencies reporting system (Canadian Maritime Provinces 1-800-565-1633) and U.S. Maine DEP Spill Response and the National Response Center and all other appropriate emergency response contacts. An assessment of wells in the affected area must be conducted, and remediation must be completed as required.
    f. The contractor shall incorporate the requirements of the wildlife specific spill response plan provided in Appendix D of the NBDTI Environmental Management Plan.

10. The contractor shall submit for review and approval a site-specific Soil Erosion and Water Pollution Control Plan (SEWPCP) that meets the requirements of MaineDOT Standard Specification 656, NBDTI Environmental Management Plan, and that addresses the following:
    a. Temporary access roads shall be constructed on geogrid or geotextile and using clean rock material. All temporary fill shall be removed following construction and the area shall be restored to pre-construction grade or permanently stabilized as shown on the project plans.
    b. Additional requirements for temporary access roads as listed in Special Provision 105 (Temporary Access Roads and Embankments).
    c. Temporary fill and riprap shall consist of non-erodible material.

11. Riprap used to armor the channel banks shall not be considered sulfide-bearing rock (SBR). For additional information regarding what constitutes SBR, see Special - 610-Stone Fill, Riprap, Stone Blanket, Stone Ditch Protection (Sulfide-Bearing Rock).

V. Additional Special Conditions for work in New Brunswick

1. The contractor shall complete the work in accordance with NBDTI's Environmental Management Manual. The Contractor shall designate an onsite representative that has successfully completed Environmental Management Manual (EMM) training prior to the start of construction. The designated onsite representative shall be responsible for providing the same training and appropriate material to all the Contractor's field staff who will be working on the Project. The EMM and information on online training and certification is posted on NBDTI's website: https://www2.gnb.ca/content/gnb/en/departments/dti/highways_roads/content/management_manual.html Telephone (506) 453-3939 for the purchase of printed copies of the Manual or for information on EMM online training and certification.

2. The contractor shall also adhere to the following guidelines:
    a. Watercourse and Wetland Alteration Technical Guidelines (NBDELG 2012). Available at: https://www2.gnb.ca/content/dam/gnb/Departments/env/pdf/Water-Eau/WatercourseWetlandAlterationTechnicalGuidelines.pdf
    b. Guidelines for the Use of Explosives in or Near Canadian Fisheries Waters (DFO 1998). Available at: https://www.racerocks.ca/wp-content/uploads/2015/09/DND-explosive-guidelines.pdf
    c. Sand and Gravel Pit Guideline (NBDELG 2014). Available at: https://www2.gnb.ca/content/dam/gnb/Departments/env/pdf/Air-Lair/SandAndGravelPitGuideline.pdf
    d. Rock Quarry Siting Standards (NBDELG 2012). Available at: https://www2.gnb.ca/content/dam/gnb/Departments/env/pdf/Air-Lair/RockQuarrySitingStandards.pdf

e. Operational Policy for the Extraction of Consolidated Rock with the use of Explosives (NBDELG 2014). Available at: https://www2.gnb.ca/content/dam/gnb/Departments/env/pdf/Air-Lair/ExtractionOfRock.pdf
f. Asphalt Plant Siting Standard (NBDELG 2012). Available at: https://www2.gnb.ca/content/dam/gnb/Departments/env/pdf/Air-Lair/AsphaltPlantSitingStandard.pdf

3. Natural materials produced and/or supplied by excavation or from pits and quarries shall not contain any friable, soluble or reactive minerals, or other deleterious materials or conditions that would make the material prone to decomposition or disintegration, or present any environmental hazard, from the presence of the parent material or its by-products, when exposed to the natural elements after placement in the Work.

4. The Contractor shall ensure that any turbid water runoff from the construction site or turbid water pumped out of excavations or cofferdams does not exceed 8 NTUs above background levels when background levels are between 8 and 80 NTUs; or does not exceed 10% of control background levels when background is > 80 NTUs.
   a. Water quality monitoring shall be undertaken by NBDTI if visible plumes are observed in the river.
   b. Background levels shall be measured in the closest undisturbed area adjacent to the work. Background and in-plume turbidity samples shall be measured in as close a timeframe to each other as technically possible.
   c. If turbidity is found to exceed the above-listed limits, the Department shall notify the Department of Fisheries and Oceans Canada (DFO) at 1-506-851-6082 or gulfhabitatgolfe@dfo-mpo.gc.ca

5. The Contractor shall notify the DFO Fisheries Protection Program (DFO-FPP) at least 48 hours before starting the project. Such notification should be directed to Mr. George Brown, Senior Fisheries Protection Biologist, DFO Gulf Region [(506) 851-6501 or email at George.Brown@dfo-mpo.gc.ca].

6. The Contractor shall Notify DFO if they have caused, or are about to cause, the death of fish by means other than fishing and/ or the harmful alteration, disruption or destruction of fish habitat. Such notifications should be directed to Fish and Fish Habitat Protection Program: 1-506-851-6082 or gulfhabitatgolfe@dfo-mpo.gc.ca

7. The contractor shall comply with the Avian Management Plan (Appendix E, NBDTI Environmental Management Plan) for all phases of construction in New Brunswick, which includes but is not limited to the following requirements:

    a. The amount of clearing and disturbance shall be limited to that which is necessary.
    b. Clearing vegetation within the bird-breeding season (April 15 to August 31) shall be avoided to the extent feasible
    c. If vegetation clearing must take place within the bird-breeding season (April 15 to August 31), the Contractor shall retain a Qualified Birder[2] to complete a non-intrusive nesting survey of the Project Area prior to clearing. Breeding bird surveys shall be carried out in accordance with the Avian Management Plan referenced above.
    d. If an active bird nest is encountered, all disturbance work shall temporarily stop. The contractor (or its qualified birder) shall consult with Environment and Climate Change Canada (ECCC)'s Canadian Wildlife Service or the New Brunswick Department of Natural Resources (NBDNR)'s Species At Risk Section (506-453-5873) to establish an appropriately sized buffer around the nest. No construction, clearing, or grubbing activities within the established buffer areas shall occur until after the qualified birder has determined that nesting and fledging are complete, or if the status of the nest has been changed from active to inactive.
    e. The Qualified Birder will return for a follow-up survey following a time period that typically spans laying, incubating and fledging for the species identified. The area will be re-surveyed at that time for any potentially new nesting activity.
    f. If grubbed or cleared areas are left inactive for periods greater than two weeks during the breeding bird season, the area shall be surveyed for ground nests prior to recommencement of activity, using nonintrusive monitoring methods in accordance with the Avian Management Plan.
    g. Any exposed spoil and aggregate piles that could present nesting opportunities to migratory birds shall be covered (e.g., with tarp or similar material) when inactive during the breeding season.
    h. The Owner will not entertain any claims for delays while waiting for bird surveys or for nesting birds to fledge.
    i. Delays resulting from the presence of breeding birds will not be considered as a basis for claims.

[2] A Qualified Birder is someone with expertise and experience in conducting accurate bird surveys according to established Canadian protocols including point counts, transects, and other standard methods and should be recognized the regulatory community as having this expertise. They know all or most of the birds in the region by site and/or sound without the aid of a field guide. They should be familiar with the nesting habitats of native bird species and understand the various indicators and evidence of breeding for birds.

8. Ancillary Facilities: The Contractor shall not utilize lands outside of the Project Area shown on Figure 1, Appendix A of the Environmental Management Plan, for construction activities without permission of NBDTI's Environmental Branch and the Environmental Impact Assessment Section of the New Brunswick Department of Environment. Should the Contractor require any ancillary facilities outside of the Project Area, including but not limited to, waste disposal areas, sources of borrow or aggregates, staging and/or laydown areas, worksite office areas, work camp areas, etc., the Contractor shall complete the following items for the proposed ancillary facility areas:
    a. The Contractor shall identify the proposed ancillary facilities on lands outside of the Project Area to the Resident and shall be responsible to hire Qualified Environmental Consulting Services[3] to complete field surveys and assessments of the following: vascular plants; birds; wetlands; aquatics; species at risk; and archaeological resources. Ancillary facilities shall avoid these sensitive features. The consultant shall prepare a report that describes the methodology used for the field surveys, outline the results of the assessment and identify any proposed mitigation.
    b. The Contractor shall submit the report to the Department for submittal to the NB Department of Environment for review and approval by the Technical Review Committee (TRC) per the provincial Environmental Impact Assessment (EIA) process. The Contractor is advised that Environmental Regulatory review time can take between 30 – 120 days depending on the level of information provided and the issues that are identified. Development of the ancillary facilities shall not commence until approval from the NB Department of Environment is received.
    c. The Contractor shall be responsible for obtaining any additional required environmental approvals and permits for the development of the ancillary facilities. These permits shall be provided to the Department prior to performing work on the ancillary facilities.
    d. All costs and delays associated with assessment, review and permitting of proposed ancillary facilities, including any required mitigation, are the sole responsibility of the contractor.

9. Dust and noise generation shall be avoided during the operation of the Farmer's Market on Rue Court. The market typically operates on Saturday mornings from 8:30 am to 1:00 pm, from mid-June to mid-September. Additional information about the market can be obtained from the City of Edmundston's website.

[3] Qualified Environmental Consulting Services is any consulting firm that regularly successfully completes Environmental Impact Assessments (EIAs) in New Brunswick.

10. If complaints of excess noise are received during construction, NBDTI shall conduct noise monitoring and the contractor shall take corrective action taken if warranted, where noise levels exceed 65 dBA over a 24 hour period (Leq). Construction activities may be restricted to daylight hours if complaints and follow-up noise monitoring identify a problem.

11. The Contractor shall minimize greenhouse gas emissions during construction. The following minimum measures shall be implemented:
    a. Optimize equipment use and efficiency (use the right size of equipment for the work)
    b. Keep equipment well-maintained.
    c. Switch off all equipment and unnecessary lighting when not required
    d. Minimize the use of gas-powered and diesel-powered generators, and use the right size of generators

VI. Approvals:

1. Temporary Soil Erosion and Water Pollution Control Plan
2. Spill Prevention Control and Countermeasures Plan
3. Existing Bridge Removal Plan

SPECIAL PROVISION
SECTION 105
GENERAL SCOPE OF WORK
(United States Coast Guard)

Upon completion of all construction activities, the Contractor shall provide the following to the Department and the U.S. Coast Guard:

1. As-built measurements for the main navigation span: minimum vertical clearance above ordinary High Water and ordinary Low Water and the horizontal clearance between piers.
2. The start and end dates for construction.

The final submittal product shall be as directed by the Resident.

No additional payments to the Contractor will be associated with this submittal.

SPECIAL PROVISION
SECTION 105
GENERAL SCOPE OF WORK
(Temporary Access Roads and Embankments)

105.01 Description This work shall include temporary access roads and corresponding embankments and/or structures constructed along the existing riverbanks (herein identified as "Temporary Embankments") deemed necessary by the Contractor to adequately complete the Work. Temporary Embankments shall be constructed in accordance with the provisions set forth on the Plans and as noted herein.

105.02 Materials Temporary Embankments shall be constructed of the materials identified in the following table. In the absence of laboratory test results for the proposed materials, the engineering properties below shall be utilized for these materials.

Fill Material	Maine DOT Spec.	Unit Weight (lb/ft^3)	Friction Angle
Granular Borrow for Underwater Backfill	703.19	125	32
Gravel Borrow	703.20	125	36
Plain Riprap	703.26	140	42
Underdrain Backfill	703.22	125	36

105.03 Construction Permanent embankment construction, at and below the level of the temporary embankment and access road, may be completed in accordance with the Plans prior to temporary embankment construction. If permanent riprap is placed before the temporary fill, the material shall be protected with suitable geotextile fabric to prevent migration of temporary fill into the riprap.

Unless otherwise noted on the Plans, all material used to construct temporary embankments and access roads, atop the limits of the permanent fill slope, shall either be constructed with:

- Gravel Borrow with a side slope of 1.75H:1V or flatter

  or

- Granular Borrow for Underwater Backfill with a side slope of 2H:1V or flatter.

Temporary Embankment construction shall be performed in general accordance with Standard Specification Section 203 – Excavation and Embankment except as specified otherwise herein, including moisture-density control in accordance with Section 203.12.

Embankment construction methods shall be developed that consider the river water/ice level at the time of construction and the possible need to construct the lower portion of the embankment below river levels.

Vegetation removal above the level of the temporary access road prior to final slope construction shall be limited to the greatest extent practical to maintain its function in promoting stability of the surficial soil. Any required clearing above the temporary access road level shall be approved in advance by the Resident. Grubbing of the existing riverbanks will not be allowed.

105.04 Submittals The Contractor shall submit a procedure narrative, for approval, at least thirty (30) days prior to constructing the Temporary Embankments. This submittal shall describe the Contractor's schedule and approach for construction of the embankments in accordance with the Plans and define the frequency of proposed laboratory moisture-density testing and sieve analyses for proposed materials. This submittal shall describe procedures and materials to place fill within the limits of existing river water and/or ice, if warranted by the river levels at the time of construction. . The Departments approval will be limited to considerations related to maintaining stability of the existing embankment and achieving the assumed engineering parameters for the fill material. Construction means and methods and ensuring stability during construction of the Temporary Embankment are the responsibility of the Contractor and will not be approved by the Department.

Should the Contractor elect to construct a Temporary Embankment that varies in any way from that defined herein and shown on the Plans, the Contractor shall submit a Temporary Embankment design submittal, stamped by a Professional Engineer, licensed in the State of Maine, at least sixty (60) days prior to commencing construction, which shall include:

1. Design computations including but not limited to assessment of slope stability and impacts to the adjacent railroad tracks

2. Detailed plans of the temporary embankments

3. A procedure narrative describing the Contractor's approach for construction of the embankments in accordance with the Plans and define the frequency of proposed laboratory moisture-density testing and sieve analyses for proposed materials.

Global stability analyses shall demonstrate that the Contractor's Temporary Embankment configuration does not worsen the stability of the riverbank slopes. The factor of safety of the existing riverbank slope is less than 1.3. Any proposed Temporary Embankment construction shall not negatively impact the existing stability above the temporary roadway elevation (i.e., top of Temporary Embankment). The stability of the Temporary Embankment shall achieve a minimum factor of safety of 1.3. If structural elements are incorporated to supplement or modify the Temporary Embankment, the system shall achieve a minimum factor of safety of 1.3 against global instability, and the design calculations shall also include a structural assessment demonstrating the adequacy of the proposed members for the intended use. The design calculations shall include

statements of all assumptions made and references used in the calculations and analyses demonstrating compliance with applicable geometry and surcharges as specified below.

If the Contractor's Temporary Embankment design incorporates either fill materials not defined herein or proposed alternative soil strength parameters, laboratory test results shall be provided that justify the proposed parameters for design. The peak angle of internal friction shall be determined by the Standard Method of Test for Direct Shear, AASHTO T236 (ASTM D3080-72), on the portion finer than the 2mm [#10 sieve], compacted to the specific percentage of the maximum dry density that is proposed by the Contractor as a compaction criteria for the temporary embankment, determined in accordance with AASHTO T 180, Methods C or D (with oversized correction as outlined in Note 7) at optimum moisture content. Three bulk samples shall be collected of the proposed material source. A laboratory moisture-density test shall be performed in accordance with AASHTO T 180 on each sample (the portion finer than the 2mm [#10 sieve]) to identify the maximum dry density and optimum moisture content that will be used as a basis for test sample preparation. Three Direct Shear Tests shall be completed including one from each bulk sample. Each direct shear test shall include a minimum of three (3) confining pressures consistent with the range of overburden pressure that will exist in the temporary embankment. Compliance with the test requirements shall be the responsibility of the Contractor and their temporary embankment designer, who shall furnish a copy of the laboratory test results as part of the Temporary Embankment design submittal.

At a minimum, the following additional design inputs shall be included in the Contractor's Temporary Embankment design submittal:

1. The geometry and material properties for the existing soil strata (Existing Fill, Alluvium, Glacial Till), proposed permanent fills and the water levels shall be consistent with the geotechnical design basis shown on Figures 1 and 2 of this Special Provision. GeoStudio input files (Slope/W software; *.gsz format) including the geometry shown in Figures 1 and 2 can be made available to the Contractor upon request.

2. A uniform surcharge load of at least 250 psf shall be applied on the Access Road roadway surface to account for construction equipment

3. A uniform surcharge load of at least 1,882 psf shall be applied over an 8.5-foot width to the railroad to account for a Cooper E80 train surcharge on each rail line (rail lines shown on Figures 1 and 2 of this special provision).

If the Department requires changes to the Contractor's Temporary Embankment design, based on Contract requirements, then the Contractor shall implement the changes at no additional cost to the Department. No additional payments to the Contractor will be associated with this submittal and review process. The Contractor shall implement any corrective measures deemed necessary by the Resident due to evidence of instability of slopes.

The Department shall have no obligation to review or comment on any design, construction, maintenance or removal of Temporary Embankments. No review or comment by the Department, or any lack of review or comment by the Department, shall relieve the Contractor of its responsibility to properly design, construct, maintain in good condition, and remove Temporary Embankments in accordance with the Contract, or shall shift any responsibility to the Department.

The Contractor shall be responsible for all damages resulting from the failure of the Temporary Embankments not built in accordance with the Plans, this special provision, and any alternative Temporary Embankment design submittals.

105.05 Basis of Payment All costs associated with design (as applicable), clearing, material testing, installation, maintenance, and removal of Temporary Embankments, regardless of location or use, shall not be measured separately for payment and will be considered incidental to Contract Pay Items.

Figure 1 – Madawaska Permanent Slope Geometry

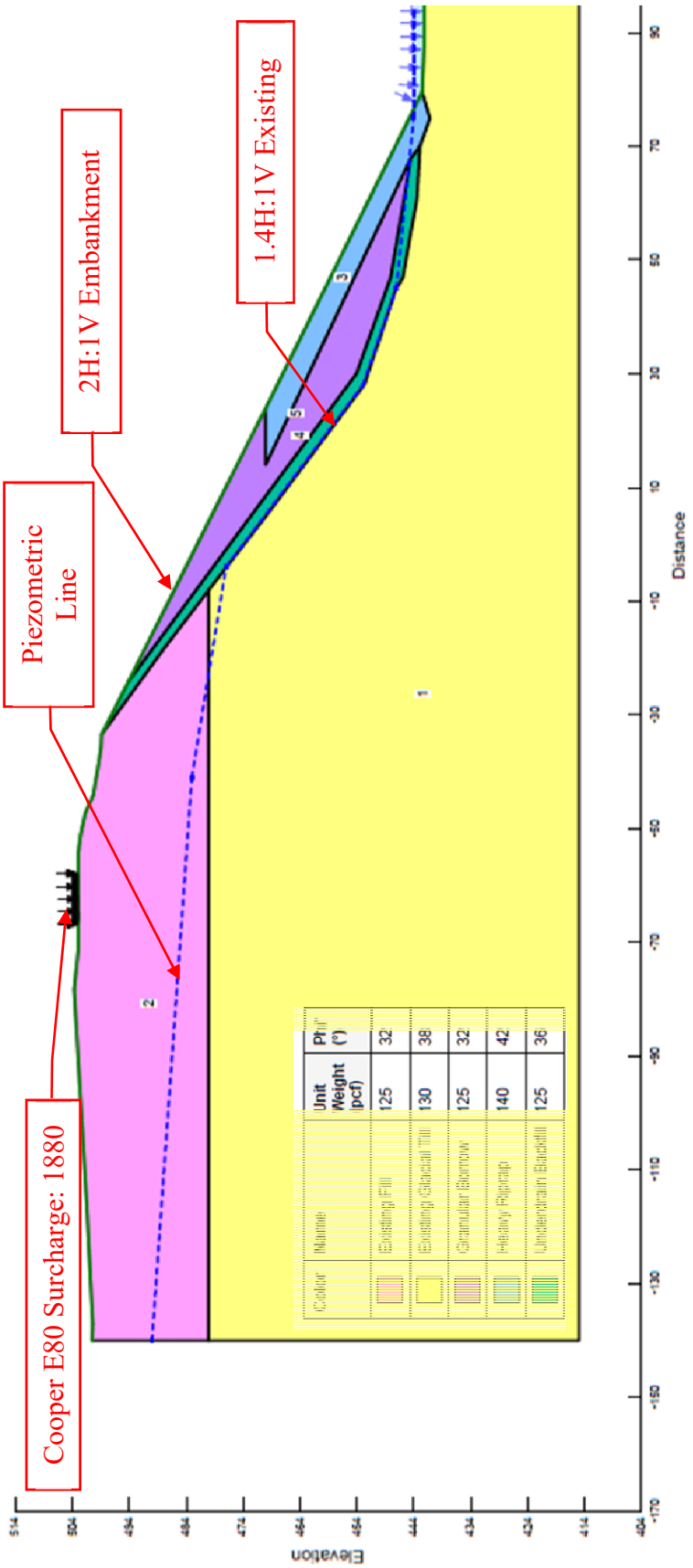
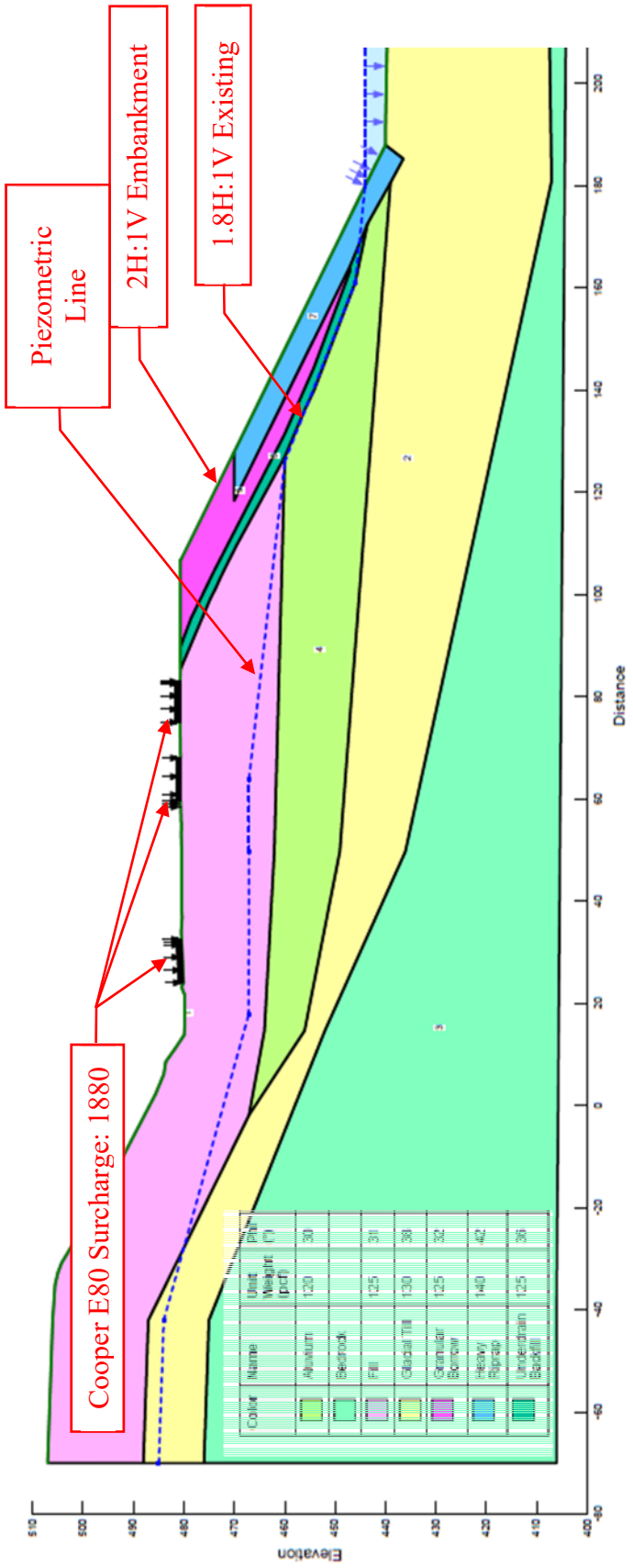


Figure 2 – Edmundston Permanent Slope Geometry



SPECIAL PROVISION
SECTION 105
GENERAL SCOPE OF WORK
(Temporary Work Trestles)

105.01 Description This work shall include the design, furnishing, installation, maintenance, removal, reinstallation/removal as necessary, and for all labor and materials required to construct temporary work trestles, structures, and platforms (herein identified as "Trestle") deemed necessary by the Contractor to adequately complete the Work.

105.02 Submittals The Trestle(s) shall be designed by a Professional Engineer, licensed in the State of Maine or Province of New Brunswick. The Contractor shall submit the design computations and detailed plans of the Trestle(s) to the Resident prior to beginning construction of the Trestle.

If the Department requires changes to Trestle plans or computations, based on Contract requirements, then the Contractor shall implement the changes at no additional cost to the Department. No additional payments to the Contractor will be associated with this submittal and review process.

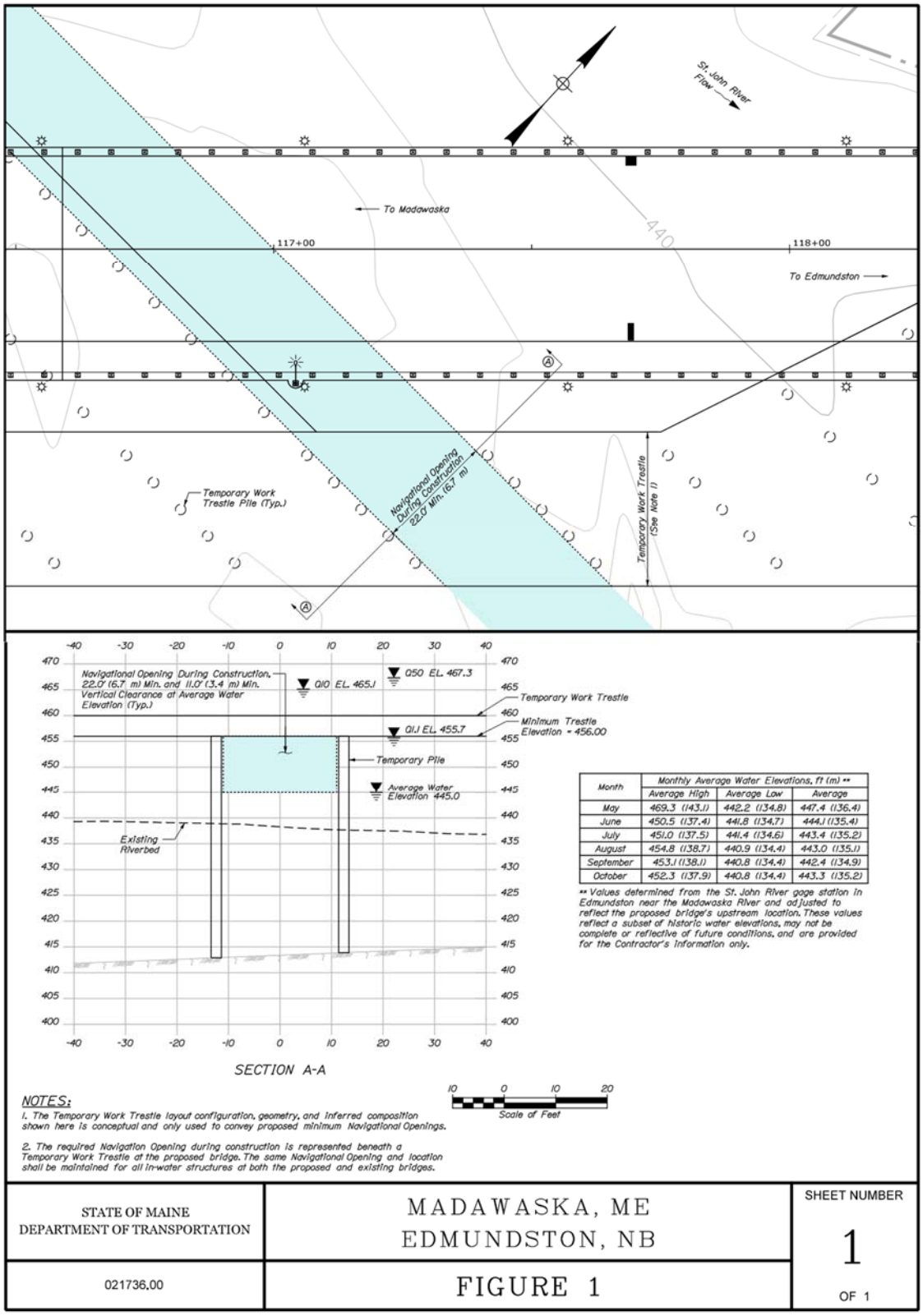
The Department shall have no obligation to review or comment on any design, construction, maintenance or removal of Trestles. No review or comment by the Department, or any lack of review or comment by the Department, shall relieve the Contractor of its responsibility to properly design, construct, maintain in good condition, and completely remove Trestles in accordance with the Contract, or shall shift any responsibility to the Department. The Contractor shall be responsible for all damages resulting from the failure of the Trestles.

105.03 General Requirements Any Trestles located within the waterway shall meet the following requirements:

1. Trestles and components of Trestles, located within the river, and located at or above elevation 450.00-ft, shall be removed seasonally prior to February 1 each year and shall not be reinstalled until the spring freshet (high river flow from snow melt and ice breakup) has passed and as directed by the Resident.
2. Any trestle support elements positioned beneath elevation 455.00-ft shall be aligned with the flow of the river.
3. The minimum marine navigational opening shall be 22 feet measured perpendicular to flow. The minimum marine navigational opening shall be maintained at all times through the entire Project site, including in the vicinity of Span No. 5 of the new bridge and Span No. 3 of the existing bridge. Additional markers or signage to designate the navigation opening may be required – refer to project permits.
4. The minimum low elevation of the low chord of the Trestle shall be 456.00-ft.

Any damage or loss of components inflicted upon trestle resulting from ice floes, river current, or other circumstances shall not relieve the Contractor of its responsibility to properly assess risk, design, construct, maintain the Trestle(s) in good condition nor shall shift any responsibility to the Department. The Contractor shall be solely responsible for all damages resulting from the failure of the Trestles.

105.04 Basis of Payment All costs associated with design, installation, maintenance, removal and reinstallation (regardless of location or use) of Trestles shall not be measured separately for payment and will be considered incidental to Contract Pay Items.



Month	Monthly Average Water Elevations, ft (m) **		
	Average High	Average Low	Average
May	469.3 (143.1)	442.2 (134.8)	447.4 (136.4)
June	450.5 (137.4)	441.8 (134.7)	444.1 (135.4)
July	451.0 (137.5)	441.4 (134.6)	443.4 (135.2)
August	454.8 (138.7)	440.9 (134.4)	443.0 (135.1)
September	453.1 (138.1)	440.8 (134.4)	442.4 (134.9)
October	452.3 (137.9)	440.8 (134.4)	443.3 (135.2)

Figure 1: Temporary Navigation Opening During Construction.

SPECIAL PROVISION 105
CONSTRUCTION AREA

A Construction Area located in the **Town of Madawaska** has been established by the Maine Department of Transportation (MDOT) in accordance with provisions of 29-A § 2382 Maine Revised Statutes Annotated (MRSA).

(a) The section of highway under construction in the town of Madawaska, Aroostook County on Bridge Avenue over the Maine Northern Railway and St John River.

(b) (Bridge Avenue) over Maine Northern Railway and St John River preceding Abutment Number 1 and extending to approximate station 114+25.00 of the construction plus approaches.

Per 29-A § 2382 (7) MRSA, the MDOT may "*issue permits for stated periods of time for loads and equipment employed on public way construction projects, United States Government projects or construction of private ways, when within construction areas established by the Department of Transportation. The permit:*

A. Must be procured from the municipal officers for a construction area within that municipality;

B. May require the contractor to be responsible for damage to ways used in the construction areas and may provide for:

(1) Withholding by the agency contracting the work of final payment under contract; or

(2) The furnishing of a bond by the contractor to guarantee suitable repair or payment of damages.

The suitability of repairs or the amount of damage is to be determined by the Department of Transportation on state-maintained ways and bridges, otherwise by the municipal officers;

C. May be granted by the Department of Transportation or by the state engineer in charge of the construction contract; and

D. For construction areas, carries no fee and does not come within the scope of this section."

The Municipal Officers for the **Town of Madawaska** agreed that an Overlimit Permit will be issued to the Contractor for the purpose of using loads and equipment on municipal ways in excess of the limits as specified in 29-A MRSA, on the municipal ways as described in the "Construction Area".

As noted above, a bond may be required by the municipality, the exact amount of said bond to be determined prior to use of any municipal way. The MDOT will assist in determining the bond amount if requested by the municipality.

The maximum speed limits for trucks on any town way will be 25 mph (40 km per hour) unless a higher legal limit is specifically agreed upon in writing by the Municipal Officers concerned.

SPECIAL PROVISION
SECTION 105.9
HISTORIC AND ARCHAEOLOGICAL CONSIDERATIONS

This Special Provision is in addition to the Standard Specification 105.9 of the State of Maine Standard Specifications.

The MaineDOT has conducted consultation in accordance with Section 106 of the National Historic Preservation Act (16 U.S.C. 470f), the Regulation (36 CFR Part 800), and the 2004 Section 106 Maine Programmatic Agreement and New Brunswick Environmental Impact Assessment (EIA) Process. The following requirements are project specific:

I. Special Conditions (Both sides of the International Boundary)

1. The Contractor shall allow Indigenous Environmental and Archaeological Monitors retained by the New Brunswick Department of Transportation and Infrastructure (NBDTI) to observe construction activities.

2. If it is suspected that objects or features of archaeological significance are found during construction, the Contractor shall cease all activities within 30 meters (98.4 feet) of the suspected find and the Contractor shall notify the Resident.

    a. The Resident shall notify NBTDI and NBDTI will contact the Manager of the Research and Assessment Section, Archaeology and Heritage Branch, New Brunswick Department of Tourism, Heritage and Culture for further direction.
    b. The Resident shall notify the MaineDOT Cultural Coordinator [Julie Senk, Julie.senk@maine.gov, (207) 592-3486]. The Cultural Coordinator will contact the Maine Historic Preservation Commission (MHPC) and Maine's Federally Recognized Tribes for further direction.
    c. All work shall cease until such time as the Resident advises and authorizes resumption of the work after consulting with the following entities: NBDTI, the Heritage and Archaeological Services Branch of the New Brunswick Department of Tourism, Heritage and Culture and First Nations Representatives; MaineDOT Environmental Office; MHPC; and Maine Federally recognized Tribes.

II. Additional Special Conditions for work in New Brunswick

1. Several archaeological sites have been identified in close proximity of the project area in Canada. A location map and coordinates of the archaeological sites are provided in Appendices A and B of the New Brunswick Environmental Management Plan (EMP), provided as part of the bid documents. Ground disturbance shall be avoided within 20 meters (65.6 feet) of these sites as indicated on the project plans.

2. A terrace area on the Canadian bank was identified as having high potential for archaeological features. This high-potential area is shown on the bid plans. A location map and the coordinates of the corners of this terrace area are provided in Appendices A and B of the EMP. Excavation or other earth disturbance within this terrace area is prohibited. Vegetation clearing may occur in this

terrace area provided that the natural ground/sediment is not disturbed. Any access roads or staging, constructed by the Contractor within this region, shall, at a minimum, consist of a 1-foot (0.3 m) thick layer of clean granular material underlain by a layer of geotextile and bi-axial geogrid (as indicated on the plans) placed over the existing ground prior to traversing the area with construction equipment.

3. The high-potential terrace area and the buffers around the archaeological sites as shown on the plans shall be flagged in the field by the Contractor prior to ground disturbance in New Brunswick.

SPECIAL PROVISION
SECTION 106
QUALITY

106.6 Acceptance

Revise this Subsection by replacing the first two paragraphs with:

"**106.6 Acceptance The Department is responsible for determining the acceptability of the Work. Acceptance of the Material is based on the visual inspection of the construction, monitoring of the Contractor's QCP, and Acceptance Test results. Acceptance sampling and testing is the responsibility of the Department (unless alternate procedures are specified) except for furnishing facilities, testing equipment, transportation, and Material samples as required.**

Acceptance of Hot Mix Asphalt Pavement will be based on Method A or C Statistical Acceptance, or Method B or D Acceptance as specified. The method of acceptance for each item is defined in Special Provision, Section 403, Hot Mix Asphalt Pavement. When items of Hot Mix Asphalt Pavement are not so designated, Method A will be utilized whenever there are more than 1000 tons per Hot Mix Asphalt Pavement item, and Method B will be utilized when there are less than or equal to 1000 tons per Hot Mix Asphalt Pavement item."

Revise Subsection "B" by replacing it with:

"B. Items not designated for Statistical Acceptance will utilize Method B or D Acceptance testing to validate the quality of the material incorporated into the Project. For material paid under Item 403.209 – Method D, or designated to be visually accepted, the Contractor shall provide the Department with a Certification Letter that indicates that the material supplied complies with the Specifications. Test results representative of the certified material shall be attached to the letter.

The Department will randomly sample and test the certified Material for properties noted in Table 1 of Section 502 - Structural Concrete or Table 14 of Section –401.21 Acceptance Method B & D. Material will be subject to rejection as noted in Structural Concrete Section 502.195 - Quality Assurance Method C Concrete or Hot Mix Asphalt, Section 401.2022 Pay Adjustment – Method B & D."

106.7.1 Standard Deviation Method Revise 106.7.1, subsection H by removing the following from the first paragraph:

"Method B: PF = [70 + (Quality Level * 0.33)] * 0.01"

SPECIAL PROVISION
SECTION 107
TIME
(Contract Time)

The specified Contract Completion Date is November 22, 2024.

SPECIAL PROVISION
SECTION 107
TIME
(Scheduling of Work)
(United States Coast Guard Bridge Permit)

Add the following to Section 107.4.2, Schedule of Work Required:

The Contractor shall submit a plan and construction schedule to the United States Coast Guard (USCG) for approval prior to any in-water work on the project. The plan shall include the location of falsework, cofferdams, trestles, and any in-water obstructions necessary for bridge construction and demolition. The Contractor shall also comply with the USCG Bridge Administration General Construction Requirements and the USCG Bridge Permit requirements. The General Construction requirements is attached to this Special Provision. All costs for complying with all Coast Guard requirements will be considered incidental to the contract.

U.S. Coast Guard Bridge Administration

GENERAL CONSTRUCTION REQUIREMENTS

1. All bridge closures, or bridge operating schedule changes, must be requested in writing, 30 days in advance, from the First Coast Guard District Bridge Branch Office. No channel restrictions, or vertical clearance reductions may be made without written approval from the above office.

2. Waterway closures/restrictions, barge placement or safety zones must also be requested a **minimum** of 90-days in advance. Please contact USCG Sector Northern New England, 259 High Street, South Portland, ME 04106-2028. Ph: (207) 741-5421.

3. All submissions to the Coast Guard for review and approval must first be approved by the owner of the bridge or their authorized agent. All submission of plans, scope of work, and schedules of operation must be sent to the First Coast Guard District, Bridge Branch Office.

4. At least 30 days prior to commencement of any work, we must have for our review, a copy of the construction plans, contractor schedule, preferably depicted in a time line graphic format, and the contractor's daily hours of operation. The construction plan package must include the following: (1) a plan of the entire waterway area in the vicinity of the project; (2) the location of work barges during working and off-hours; (3) a drawing, if applicable, depicting scaffolding or containment used and the location of any reduction of vertical or horizontal clearance. All vertical clearance reductions below low steel or concrete under the bridge as a result of scaffolding must be detailed on the drawings shown in total feet; and (4) emergency 24 hour telephone numbers for responsible individuals for this project.

5. Scaffolding used under any span of the bridge must be lighted with constant burning red lights every 50 feet and on all corners. The placement of scaffolding must not interfere with the ability of a moveable bridge to open for vessel traffic. Moveable bridges must continue to operate according to their normal schedule unless special drawbridge operation regulation changes have been requested. Warning signs must be posted on both sides of the bridge, visible for a 1-mile range, to warn mariners of the vertical clearance reduction. The signs shall face upstream and downstream so as to draw the mariner's attention to the fact that the clearance has been reduced.

6. All barges placed in the waterway must be lighted with constant burning white lights on all four corners of the barge. The contractor is required to comply with all provisions of the Navigation Rules International-Inland**,** regarding the use of work barges or floating equipment in the waterway. www.navcen.uscg.gov .

7. Placement of construction barges in the navigable channel shall be done so as to provide a minimum horizontal clearance reduction. Only one navigation channel of a swing bridge may be blocked by work equipment at anytime. Barges must be moved out of the navigable channel after working hours unless approved in writing by the USCG.

8. Barges held in place by anchor lines must be marked by anchor buoys, which should be lighted.

ENCLOSURE (1)

9. The vertical and horizontal clearances through the navigable channel of the completed structure (as-built clearances) shall be certified in writing to this office by a responsible official of the permittee, a licensed surveyor or a registered professional engineer upon completion of bridge work. As built clearances consist of: vertical clearance in the navigational channel measured from mean high and mean low water to the lowest point of the superstructure; horizontal clearance through the navigational channel between piers or fenders measured normal to the axis of the channel. Documentation shall state the horizontal and vertical datum (e.g., NAVD88) used for all measurements. Please contact this office if there are questions regarding the required clearance data for specific bridge types, i.e. fixed or movable.

10. The on-scene contractor must have a VHF-FM marine radio set to the bridge communication channels 16/13 or the designated channel for the bridge. Additional marine radios monitoring the above channels must also be maintained at the main control of any floating equipment or barges on station.

11. Preventive measures must be taken to prevent any hot work, debris, or construction material from entering the waterway. This includes sandblasting material, paint, and any concrete work by-products. Welding and burning must cease upon approach of a vessel and shall not start again until the vessel has passed the bridge.

12. If permanent bridge navigational lighting cannot be maintained operational during any phase of this project, temporary battery/power lights must be installed at the same locations. These temporary lights must be visible for a distance of 2,000 yards on 90% of the nights of the year. Generally, a lamp of (50 candela) will meet these requirements. Plans for temporary lighting shall be submitted to this office for written approval. Deviations from the approved temporary lighting shall be permitted only upon written authorization from this office.

13. All newly constructed bridge piers, or those in the process of demolition, must be lighted with either red or white flashing (60 flashes per minute) lights. All cofferdams used during construction must also be lighted with red or white flashing (60 flashes per minute) on all four corners.

14. Bridge protective fenders shall not be constructed or rebuilt with any metal surfaces on the rubbing face of the fender system. All bolts, spikes, or other metal fastening devices must be countersunk. Metal splicing plates, if used, shall be mounted on back of outer wales.

15. All piles including those previously damaged or broken that are not being used in the new or repaired fender shall be extracted rather than cut off at the mud line. Upon completion of all fender repairs a bottom sweep is required to determine if any piles or debris are present in the waterway. A wire-drag sweep or side-scan sonar is the preferred method.

16. It is the owners' responsibility to ensure that channel depths are not affected by this work. Any material, machinery or equipment lost, dumped, thrown into, or otherwise entering the waterway must be removed immediately. If immediate removal is impractical and the object entering the waterway could possibly obstruct or hazard navigation, the object must be marked immediately to protect navigation and the Coast Guard shall be notified as soon as possible. Such notification shall give the location and type of obstruction and the navigational markings installed.

17. Spillage of oil and hazardous substances is specifically prohibited by Section 311 of the Clean Water Act, as amended. Measures including properly maintaining construction equipment, designating fuel/hazardous substances handling areas to allow spills to be contained before reaching the waterway, instructing personnel not to dispose of oil/hazardous substances into drains or into the waterway directly, and other necessary procedures should be implemented to prevent spillage. If oil/hazardous substances are spilled into the waterway in spite of such planning, the U.S. Coast Guard is to be notified immediately at 800-424-8802. An adequate supply of absorbent material should be readily accessible to soak up any possible spillage pending Coast Guard arrival. The use of chemical dispersing agents and emulsifiers is not authorized without prior, specific, federal approval.

18. The bridge owner/contractor shall provide any and all necessary equipment and personnel to determine the presence of obstructions in the waterway at any time during or following bridge construction or demolition operations.

19. The owner or registered professional engineer shall certify that the waterway depths have not been impaired and that the waterway is clear of materials or debris resulting from bridge construction or demolition.

20. This approval may be revoked and/or civil penalties imposed for failure to ensure that the above listed stipulations are adhered to or if work is determined to hazard or impair navigation.

21. This bridge work authorization does not relieve the project proponent of the responsibility to comply with applicable state, local or other federal requirements for this project.

SPECIAL PROVISION
SECTION 107
TIME
(Bridge Closure Period)

Temporary bridge closures will be permitted for specific operations occurring wholly within the Canadian Port of Entry property limits. These specific operations include:

- installation of temporary earth support systems,
- placing/removing temporary concrete barrier,
- existing bridge or abutment removal, and
- other operations that cannot be completed through the use of temporary lane closures and flaggers, as approved by the Resident.

All Work during the daily lane closure shall be continuous and the closure duration shall be limited to the extent practical. The Contractor shall request approval from the Resident for a bridge closure a minimum of two weeks prior to the commencement of the intended closure; approval is not guaranteed.

Temporary bridge closures will only be permitted within the timeframes noted in the following table:

Day	Daytime Closure	Overnight Closure
Monday – Friday	7:00 AM – 2:30 PM	7:00 PM – 5:00 AM
Saturday – Sunday	N/A	7:00 PM – 5:00 AM

All times are noted in Eastern Standard/Daylight Time.

Advance notification shall be provided as noted in Special Provision 104, Bridge Closure Notification.

SPECIAL PROVISION
SECTION 107
TIME
(Supplemental Liquidated Damages)

The new bridge shall be open to traffic on or before November 17, 2023. The bridge will be considered open to traffic when two lanes of two-way traffic and pedestrian traffic are able to be maintained on the new bridge and the following items are complete, in place, inspected, and accepted:

- base and surface pavement applied to the Stage I bridge deck to the limits identified on the Plans;
- temporary striping, temporary pavement ramps, and traffic control devices are installed to accommodate Stage II construction;
- bridge railing installed along the entire upstream side of the bridge and along the downstream side of the bridge from the U.S. abutment through STA 121+00;
- transition barriers installed at the U.S. abutment and the northwest corner of the Canadian abutment;
- roadway lighting installed and operational within the U.S.; and
- temporary concrete barrier, chain link fence, and other maintenance of traffic devices and construction signs are in place.

The Contractor will be assessed Supplemental Liquidated Damages at the rate of three thousand U.S. dollars ($3,000.00) per Day for each Day, or any portion of a Day, that the new bridge is not open to traffic beyond the bridge opening date above. This assessment of Supplemental Liquidated Damages will be in addition to the Liquidated Damages specified in Standard Specifications Section 107. These damages will not be assessed if the above work is completed and accepted by November 17, 2023 but the port facilities are not yet capable of receiving traffic.

Once the new bridge is opened to traffic, the Contractor may use flaggers, with approval of the Resident, to maintain a single lane of alternating one-way traffic to complete remaining work activities. The use of temporary lane closures will only be allowed when work is actively occurring on, or immediately adjacent to, the roadway – two lanes of traffic shall be maintained at all other times. Pedestrian traffic shall be maintained at all times.

Madawaska-Edmundston
International Bridge
WIN: 021736.00
September 16, 2020

SPECIAL PROVISION
SECTION 107
TIME
(Supplemental Liquidated Damages for Fabrication Time)

107.8.1 Fabrication Time The Department has budgeted for the following amounts of continuous full time fabrication/shop QA inspection for the following Work components:

Element	Time	Supplemental LD
Structural Plate Girders	210 Calendar Days	$1,000 per Calendar Day

The Contractor is responsible for requiring their fabricators and suppliers to produce these products for the Work continuously until finished, including any needed actions to correct unacceptable workmanship or materials. If the Department determines that QA inspection beyond these times is required, then the corresponding Supplemental Liquidated Damages will be deducted as they occur from the amounts otherwise due to the Contractor. These allowed Fabrication Time begins on the first day of fabrication and runs consecutively until expiration.

If a fabricator or supplier works more than one shift per day and the Department determines that inspection is required for each shift, each shift will count as a calendar day and the LD rate will be the noted amount per shift per Calendar Day in lieu of per Calendar Day.

QA inspector presence is required but not limited to the following activities:

> For metal fabrication work: material verification, welding, including tack welding, heat correcting, non-destructive examination, assembly verification, and any other times as required in the Standard Specifications or Special Provisions.

SPECIAL PROVISION
SECTION 109
CHANGES
(Third Party Delays)

The Contractor has primary responsibility for coordinating their work with the U.S. Land Port of Entry (LPOE) contractor and Canadian Port of Entry (POE) contractor after contract award. The Contractor shall communicate directly with the LPOE and POE contractors regarding any work necessary to maintain the Contractor's schedule and prevent project construction delays. The Contractor shall notify the Resident of any issues and have no claim against the Department if the Contractor's Work progression is impeded.

The new LPOE, located immediately south of Abutment No. 1, is scheduled to be complete and operational by November 17, 2023 thereby allowing traffic to cross on the new bridge. This date is an estimate only and is dependent upon favorable weather, working conditions, LPOE contractor work progression, LPOE contract modifications, and other potential factors. If the new LPOE is not operational by the identified date, and such failure affects the Contractor's Critical Path, the Contractor may request a suspension of Work pursuant to Section 107.5.2 and such Delay will be analyzed in accordance with Section 109.5 – Adjustments for Delay.

SPECIAL PROVISION
SECTION 110
Indemnification, Bonding, and Insurance

Subsection 110.1 is amended by adding the following requirements:

Where work is being performed over, under, across or adjacent to Railroad premises, the Contractor shall defend, indemnify and save harmless Maine Northern Railway Company, Eastern Maine Railway Company and the Maine Department of Transportation from and against any and all loss, cost, damage, claims, suits, demands, or liability for damages for personal injury including death and for damage to property, which may arise from or out of the operations conducted under his contract, occurring by reason of any act or omission of the Contractor, his agents, servants or employees, or by reason of any act or omission of any subcontractor, his agents, servant or employees.

The Contractor shall sign the Eastern Maine Railway Company and Maine Northern Railway Company indemnification documentation provided with this special provision.

Subsection 110.3 is amended by adding the following requirements:

The Contractor will be required to procure and maintain, at its sole cost and expense, the following insurance coverages.

(a) Railroad Protective Liability Insurance with limits not less than **$2,000,000** per single occurrence and **$5,000,000** per aggregate total occurrences.

(b) Comprehensive General Liability Insurance protecting against liability from bodily injury or property damage arising out of the Construction Project with limits of not less than **$2,000,000** per single occurrence and **$5,000,000** per aggregate total occurrences.

(c) Workers Compensation and Occupational Disease Insurance, as required by law.

(d) Automobile Liability Insurance covering all motor vehicles used about or in connection with the Construction Project naming Eastern Maine Railway Company and Maine Northern Railway Company as additional insureds.

If any part of the work is sublet, these insurance coverages shall be provided by or on behalf of the subcontractors to cover their operations

Each policy shall carry an endorsement covering the "save harmless" clause in favor of Eastern Maine Railway Company and Maine Northern Railway Company and the Maine Department of Transportation, as set forth in the paragraph, "Responsibility for Damage Claims". Each policy (other than Workers Compensation) shall include a cross liability ad severability of interest clause and a waiver of subrogation in favour or each of Eastern Maine Railway Company, Maine Northern Railway Company.

If blasting is to be done in the vicinity of the Railroad, the insurance policies shall include such coverage.

The policies shall be in force before any work is done on the project and shall remain in effect until all work required to be performed under the terms of the contract is satisfactorily completed as evidenced by the formal acceptance by the State and the Railroad.

Before any work is done on the project, the Department of Transportation and the Railroad's Chief Engineer shall be furnished certificates of the policy. Further, the original policy of the Comprehensive General Liability Insurance and the Railroad Protective Liability Insurance shall be furnished to the Railroad's Chief Engineer and a duplicate shall be furnished to the Department of Transportation.

The policy or policies of the Railroad's protective public liability and property damage liability shall be written by a Company authorized to do business in the State of Maine and shall be signed by the President and Secretary of the Insurance Company and shall be countersigned by an authorized representative of the Company.

Subsection 110.3.9 is amended by adding the following requirements:

Each insurance policy, with the exception of Worker's Compensation and Professional Liability insurance, shall list Eastern Maine Railway Company and Maine Northern Railway Company as an additional insured.

INDEMNITY AGREEMENT

TO: **EASTERN MAINE RAILWAY COMPANY**, a corporation organized and existing under the laws of the State of Maine ("**EMR**"), and **MAINE NORTHERN RAILWAY COMPANY**, a corporation organized and existing under the laws of the State of Delaware ("**MNR**"), each having an office at 300 Union Street, Saint John, New Brunswick, Canada, E2L 4Z2

REFERENCE is made to that certain Deed of Easements dated December 11, 2020 pursuant to which EMR granted to the State of Maine, acting by and through its Department of Transportation its successors and assigns, an elevated highway easement, construction and maintenance easements, perpetual access rights, and temporary construction rights, as shown on a Maine Department of Transportation Right of Way Map entitled, "State Highway "50", Bridge Avenue / Mill Street, Madawaska, Aroostook County, State Project No. 21736.00, dated September 2020, Sheets 1 through 5 of 5, DOT File No. 2-619", on file in the Property Office of the State of Maine Department of Transportation at Augusta, all in furtherance of the Madawaska-Edmundston International Bridge Project (the "**Project**").

NOW FOR value received, including the benefit of accessing EMR's lands for a commercial purpose pursuant to the rights granted by EMR in the Deed of Easements, the undersigned contractor (the "**Contractor**") hereby agrees and covenants with EMR and MNR as follows:

1. The Contractor forever waives, releases, relinquishes, remises and discharges EMR, MNR and their respective officers, directors, shareholders, employees, agents, successors and assigns from any and all losses, costs or expenses (including legal counsel fees), damages, demands, liabilities, claims, actions, causes of action, suits or judgments whatsoever of every name and nature, in law or equity, including those related in any manner to any accident or injury to, or death of, any person, or any damage to property occurring on, or in the vicinity of EMR's or MNR's property, or any part thereof, arising out of the use of such property by the Contractor, its employees, agents, subcontractors and/or invitees.

2. The Contractor hereby agrees to defend, indemnify and hold harmless EMR, MNR and their respective officers, directors, shareholders, employees, agents, successors and assigns from any and all losses, costs or expenses (including legal counsel fees), damages, demands, liabilities, claims, actions, causes of action, suits or judgments whatsoever of every name and nature, in law or equity, including those related in any manner to any accident or injury to, or death of, any person, or any damage to property occurring on, or in the vicinity of EMR's or MNR's property, or any part thereof, arising out of the use of such property by the Contractor and its employees, agents, sub-contractors and/or invitees; provided, however, the foregoing waiver shall not apply to losses, costs, expenses, damages, demands, liabilities or claims proven to have been caused by the negligence of EMR or MNR.

3. The Contractor covenants that it shall name EMR and MNR as additional insured on the following insurance policies (other than in respect of subparagraph (iv)) to be obtained as required by Special Provision Section 110 of the State of Maine's request for proposals related to the Project: (i) railroad protective liability insurance with a limit of not less than $2 million per occurrence and $5 million in the aggregate, (ii) commercial general liability insurance with a limit of not less than $2 million per occurrence and $5 million in the aggregate, (iii) automobile liability insurance with a limit of not less than $1 million per accident covering claims for bodily injury, death and property damages, and (iv) workers' compensation insurance in compliance with Maine state law. The Contractor (a) shall ensure that each of the foregoing insurances shall be in place prior to the Contractor entering on EMR's land or working alongside MNR's operations for any of purpose, (b) shall ensure that each of the foregoing insurances include a cross liability and severability of interest clause and a

waiver of subrogation in favour or each of EMR and MNR, and (c) covenants that each of the foregoing insurances shall remain in place at all times when the contractor is on EMR's land or working alongside MNR's operations. The Contractor will provide to the State of Maine certificates of insurance evidencing the foregoing obligations and consents to the State of Maine providing copies of such certificates to EMR and MNR.

4. This agreement shall be governed by and interpreted in accordance with the laws of the State of Maine.

The foregoing is agreed to by _____ (the Contractor) as of the ____ day of _____, 20___.

By: _____

Name:

Title:

SPECIAL PROVISION
SECTION 202
REMOVING STRUCTURES AND OBSTRUCTIONS
(Existing Bridge Removal)

202.01 Description The following paragraphs are added:

This work shall also include removal of privately owned utility pipes supported by the existing bridge and plugging the ends of the pipes below grade.

This work shall also include careful removal of portions of the bridge identified by the Municipalities.

202.03 Removing Existing Superstructure, Structural Concrete, Railings, Curbs, Sidewalks and Bridges The following paragraphs are added:

The Contractor shall submit a Bridge Demolition Plan to the Resident on, or before, December 1, 2021. This Plan shall outline the methods and equipment to be used to remove and dispose of all materials included in the existing bridge. This Plan shall also identify debris containment plans, impact mitigation and erosion control measures, and emergency response plans associated with this work.

The Bridge Demolition Plan will be reviewed by MaineDOT for appropriateness and completeness and will be reviewed for approval by the Director of the Environmental Impact Assessment (EIA) Branch, Department of Environment and Local Government (DELG). No work related to the removal of the bridge shall be undertaken by the Contractor until the MaineDOT has reviewed the Bridge Demolition Plan and approval has been granted by the applicable permitting agencies. Payment for all work necessary for developing, submitting and finalizing the Demolition Plan will be considered incidental to the bridge removal Pay Item.

The existing piers shall be completely removed to 2-feet below stream bed. The existing U.S. abutment and corresponding wingwalls shall be completely removed to a minimum of 2-feet below finished grade, within the limits shown on the Bridge Removal Details sheet. The existing Canadian abutment and wingwalls shall be completely removed to EL 473.5, where the proposed Abutment No. 2 overlaps the existing Canadian abutment in plan, and to 2-feet below grade in all other locations. Cofferdams and/or earth retention systems used for removal of the existing piers and abutments will not be measured for payment and will be considered incidental to the bridge removal Pay Item.

The steel portions of the existing bridge were originally coated with a lead-based paint system. Although the bridge has been repainted and a lead-abatement effort has occurred, traces of lead paint may be present. The Contractor is responsible for the containment, proper management and disposal of all lead-contaminated hazardous waste generated by the process of demolishing the

bridge. The Contractor is responsible for implementing appropriate OSHA, and/or Worksafe NB, mandated personal protection standards related to this process. Once the existing bridge is removed, the Contractor is solely responsible for the care, custody and control of the components of the existing bridge and any hazardous waste generated as a result of the storage, recycling or disposal of the bridge components, including lead-coated steel. The Contractor shall recycle or reuse the steel in accordance with the Maine Department of Environmental Protection's "Maine Hazardous Waste Management Regulations," Chapter 850. A copy of this regulation is available at MaineDOT's offices on Child Street in Augusta. The disposal of hazardous materials, goods, or residue, within New Brunswick, shall be disposed of off the Project Site and by the Contractor using methods meeting the latest New Brunswick Department of Transportation and Infrastructure Environmental Management Manual and in accordance with the Project's Environmental Management Plan. Payment for all labor, materials, equipment and other costs required to remove and dispose of the existing bridge will be considered incidental to the bridge removal Pay Item.

Existing utility pipes, conduits, and ancillary components and attachments shall be removed by the Contractor. All utility pipes, abandoned by Twin Rivers Paper Company, will be inactive prior to bridge demolition. These pipes are anticipated to be flushed by Twin Rivers; however, the pipes may contain residue and insulation that may be considered a hazardous material. These pipes include an abandoned 5-inch fuel oil pipe, two 12-inch wastewater pipes, a 16-inch wastewater pipe, and an 18-inch wastewater pipe (five total utility pipes abandoned by Twin Rivers). The Contractor shall not proceed with demolition of the Twin Rivers utility pipes without Resident authorization. Within the existing bridge approaches, the Twin Rivers utility pipes shall be removed to a minimum of 2-ft below finish grade and plugged with grout, flowable fill, or as directed by the Resident.

The Contractor shall carefully remove portions of the existing bridge as shown on the Plans and make them available to the Town of Madawaska and City of Edmundston. Demolition procedures for the identified portions of the bridge shall be included within the Contractor's demolition plan.

Both the MaineDOT and New Brunswick Department of Transportation and Infrastructure have executed lead abatement and field painting projects for the existing bridge. However, recent paint samples indicate trace amounts of lead remain present. The Contractor shall provide the Department with access to collect paint samples, for lead testing, of the bridge portions to be transferred to the communities.

Once the bridge demolition plan has been accepted, additional coordination between the Contractor and Resident is required to determine a temporary storage location of the bridge portions to be transferred to the communities and duration of the temporary storage to allow for paint testing and coordination for the communities to collect the bridge portions.

International Boundary markers attached to the existing bridge are not to be disturbed and shall be retained by the International Boundary Commission prior to bridge demolition. The Contractor shall provide the Resident with five weeks' notice of the Contractor's intent to commence bridge demolition to allow for coordination and removal of the markers.

202.08 Basis of Payment The following paragraph is added to the end of the first paragraph:

The lump sum payment of removing existing bridge shall also include removal and plugging existing utilities, careful removal of identified bridge sections, and for all materials, labor, equipment, and all other incidentals necessary to complete the work.

SPECIAL PROVISION
SECTION 203
EXCAVATION AND EMBANKMENT
(Dredge Materials)

Management and Disposal: Dredge Material (See MaineDOT Standard Specifications § 101.2) is regulated as a Special Waste.

Work associated with the Madawaska/Edmundston International Bridge Construction initiative will require the excavation of select Dredge Material from the St John River. It is anticipated that up to 7,000-cubic yards of Dredge Material may be excavated. This Dredge Material shall be disposed of at an appropriately licensed landfill.

The Contractor shall dispose of Dredge Material from the project at a landfill licensed by the Maine Department of Environmental Protection for the disposal of Special Waste. The Contractor shall be responsible for making necessary arrangements for dewatering, transport and proper disposal of the Dredge Material, including any laboratory testing, in accordance with the landfill's license. The Contractor shall provide documentation to the Resident that the Dredge Material was disposed of as specified. The submitted documentation shall consist of truck manifests, waybills, or such documentation as may be acceptable to the Resident and shall clearly document the disposal site location and the quantity of Dredge Material.

It is acknowledged that the excavation of Dredge for this work may include some boulders. The Maine Department of Environmental Protection has determined that sound boulders (rock 12-inches or more in diameter), that are free of adhering sediment or other contaminants, shall be deemed to be Inert Fill material and shall not be included in the Dredge Material Quantities.

Method of Measurement: Dredge Material will be measured by the cubic yard of material removed. Special Waste properly disposed of will be measured by the ton.

Basis of Payment: The accepted quantity of Dredge Material properly disposed of, as Special Waste, will be paid for at the contract unit price bid for Disposal of Special Waste.

Payment shall be full compensation for excavation, dewatering, testing, managing, transporting, disposal or placement, and all associated fees.

Payment will be made under:

Pay Item		Pay Unit
203.2318	Disposal of Special Waste	Ton

Madawaska-Edmundston
International Bridge
WIN 21736.00
November 30, 2020

SPECIAL PROVISION
SECTION 203
EXCAVATION AND EMBANKMENT
(Dredge Materials)

Management and Disposal: Dredge Material (See MaineDOT Standard Specifications § 101.2) is regulated as a Special Waste.

Work associated with the Madawaska-Edmundston International Bridge construction will require the excavation of select Dredge Material from the St John River. It is anticipated that up to 7,000-cubic yards of Dredge Material may be excavated. This Dredge Material shall be disposed of at an appropriately licensed landfill.

The Contractor shall dispose of Dredge Material from the project at a landfill licensed by the Maine Department of Environmental Protection for the disposal of Special Waste. The Contractor shall be responsible for making necessary arrangements for dewatering, transport and proper disposal of the Dredge Material, including any laboratory testing, in accordance with the landfill's license. The Contractor shall provide documentation to the Resident that the Dredge Material was disposed of as specified. The submitted documentation shall consist of truck manifests, waybills, or such documentation as may be acceptable to the Resident and shall clearly document the disposal site location and the quantity of Dredge Material.

It is acknowledged that the excavation of Dredge for this work may include some boulders. The Maine Department of Environmental Protection has determined that sound boulders (rock 12-inches or more in diameter), that are free of adhering sediment or other contaminants, shall be deemed to be Inert Fill material and shall not be included in the Dredge Material Quantities.

Method of Measurement: Dredge Material will be measured by the cubic yard of material removed. Special Waste properly disposed of will be measured by the ton.

Basis of Payment: The accepted quantity of Dredge Material properly disposed of, as Special Waste, will be paid for at the contract unit price bid for Disposal of Special Waste.

Payment shall be full compensation for excavation, dewatering, testing, managing, transporting, disposal or placement, and all associated fees.

Payment will be made under:

Pay Item		Pay Unit
203.2318	Disposal of Special Waste	Ton

DIVISION 400
SPECIAL PROVISION
SECTION 401 - HOT MIX ASPHALT PAVEMENT

401.01 Description The Contractor shall furnish a uniformly blended, homogeneous mixture placed as one or more courses of Hot Mix Asphalt Pavement (HMA) on an approved base in accordance with the contract documents and in reasonably close conformity with the lines, grades, thickness, and typical cross sections shown on the plans or established by the Resident. The Department will accept this work under Quality Assurance provisions, in accordance with these specifications and the requirements of Section 106 – Quality, the provisions of AASHTO M 323 except where otherwise noted in sections 401 and 703 of these specifications, and the MaineDOT Policies and Procedures for HMA Sampling and Testing.

401.02 Materials Materials shall meet the requirements specified in Section 700 - Materials:

Asphalt Cement	702.01
Aggregates for HMA Pavement	703.07
RAP for HMA Pavement	703.08
HMA Mixture Composition	703.09

401.03 Composition of Mixtures The Contractor shall compose the Hot Mix Asphalt Pavement with aggregate, Performance Graded Asphalt Binder (PGAB), approved antistrip, warm mix additive, and/or mineral filler if required. HMA shall be designed and tested according to AASHTO R 35 and the volumetric criteria in Table 1. The Contractor shall size, uniformly grade, and combine the aggregate fractions in proportions that provide a mixture meeting the grading requirements of the Job Mix Formula (JMF). Unless otherwise noted in Special Provision 403 - Hot Mix Asphalt Pavement, the design, verification, Quality Control, and Acceptance tests for this mix will be performed at 65 gyrations.

TABLE 1: VOLUMETRIC DESIGN CRITERIA

Design ESAL's (Millions)	**Required Density (Percent of G_{mm})**			**Voids in the Mineral Aggregate (VMA) (Minimum Percent)**					**Voids Filled with Binder (VFB) (Minimum %)**	**Fines/Eff. Binder Ratio**
				Nominal Maximum Aggregate Size (mm)						
	$N_{initial}$	**N_{design}**	**N_{max}**	**25.0**	**19.0**	**12.5**	**9.5**	**4.75**		
< 3.0	≤90.5	96.0	≤98.0	13.0	14.0	15.0	16.0	16.0	65-80*	0.6-1.2
3 to <10	≤89.0									
≥ 10										

*For 9.5 mm nominal maximum aggregate size mixtures, the maximum VFB is 82. For 4.75 mm nominal maximum aggregate size mixtures, the maximum VFB is 84.

The Contractor shall submit a JMF to the Department for each mixture to be supplied. The JMF will be approved by the Department in accordance with the MaineDOT HMA Policies and Procedures for HMA Sampling and Testing Manual. At the time of JMF submittal, the Contractor shall identify and make available the stockpiles of all proposed aggregates at the plant site. There must be a minimum of 150 ton for coarse aggregate stockpiles and 75 ton for fine aggregate stockpiles before the JMF

may be submitted. The Contractor shall provide aggregate samples to the Department unless otherwise required. The Contractor shall also make available to the Department the PGAB proposed for use in the mix in sufficient quantity to test the properties of the asphalt and to produce samples for testing of the mixture. The first day's production shall be monitored, and the approval may be withdrawn if the mixture exhibits undesirable characteristics such as checking, shoving or displacement. The Contractor shall be allowed to submit aim changes for a JMF as outlined in the MaineDOT HMA Policies and Procedures for HMA Sampling and Testing Manual: Mix Design Approval Section.
The Contractor shall submit a new JMF for approval each time a change in material source or materials properties is proposed. The same approval process shall be followed. The cold feed percentage of any aggregate may be adjusted up to 10 percentage points from the amount listed on the JMF, however no aggregate listed on the JMF shall be eliminated. The cold feed percentage for RAP may be reduced up to 10 percentage points from the amount listed on the JMF and shall not exceed the percentage of RAP approved in the JMF or for the specific application under any circumstances.

401.031 Warm Mix Technology The Contractor may place Hot Mix Asphalt Pavement produced with an accepted WMA technology if approved by the Department. Methods or technologies shall generally be at the Contractors option, but will be limited to proven, Agency and Industry accepted practice. Mixture production, placement and volumetric testing details, including temperatures, shall be included in the project specific QCP, and submitted to the Department for approval prior to any work.

401.04 Temperature Requirements The temperature of the mixture shall conform to the tolerances in Table 2 as measured at the truck at the mixing plant and at the paver unless otherwise authorized by the Department.

TABLE 2: ALLOWABLE TEMPERATURE RANGES

PGAB Grade(s)	**Temperature Range (°F)**
PG58-28 / PG64-28	275-325
PG64E-28 / PG70E-28	285-335

401.05 Performance Graded Asphalt Binder The Contractor shall utilize either a PG58-28, PG64-28, PG64E-28, PG70E-28, or other grade as specified in the 403 Special Provision. The Contractor shall utilize a PG64-28 if no liquid grade is specified within the 403 Special Provision.

401.06 Weather and Seasonal Limitations The State is divided into two paving zones as follows:

a. Zone 1 Areas north of US Route 2 from Gilead to Bangor and north of Route 9 from Bangor to Calais.
b. Zone 2 Areas south of Zone 1 including the US Route 2 and Route 9 boundaries.

TABLE 3: SEASONAL AND TEMPERATURE LIMITATIONS

Use	Minimum Ambient Air Temperature	Zone 1 Allowable Placement Dates	Zone 2 Allowable Placement Dates
Surface course (travelway & adjacent shoulders) less than 1 in. thick placed during conditions defined as "night work"	50°F	June 1 to Saturday following September 1	
Surface course (travelway & adjacent shoulders) less than 1 in. thick	50°F	May 15 to Saturday following September 15	
Travelway surface course greater than or equal to 1 in. thick	50°F	May 1 to Saturday following October 1	April 15 to Saturday following October 15
HMA for surface course on bridge decks	50°F	May 1 to Saturday following October 1	April 15 to Saturday following October 15
HMA for base or shim course on bridge decks	50°F	April 15 to November 15	
HMA for use other than travelway surface course	40°F	April 15 to November 15	
HMA for curb, driveways, sidewalks, islands, or other incidentals	40°F	N/A	N/A
HMA produced with an approved WMA technology for base or shim course	35°F	April 15 to November 15	

The ambient air temperature shall be determined by an approved thermometer placed in the shade at the paving location. Unless otherwise specified, the Contractor shall not place Hot Mix Asphalt Pavement on a wet or frozen surface regardless of the ambient air temperature. The Hot Mix Asphalt Pavement produced with an approved WMA technology shall meet the requirements of section 401.04 - Temperature Requirements, unless otherwise approved by the Department. For the purposes of this Section, the traveled way includes truck lanes, ramps, approach roads and auxiliary lanes.

401.07 Hot Mix Asphalt Plant

401.071 General Requirements HMA plants shall conform to AASHTO M 156, Standard Specification for Requirements for Mixing Plants for Hot-Mixed, Hot-Laid Bituminous Paving Mixtures with exception of Section 4.2.1, 4.2.2, 4.3.4, 4.3.5, and 4.12.2.

All HMA plants will be inspected annually by the Department prior to producing HMA for Department projects. The Contractor shall provide the Department at least 72 hours' notice that the plant is ready for inspection. The Contractor shall equip the plant with ladders and platforms that are accessible and safe to obtain samples of PGAB, aggregate and mix from the relevant tanks, collector belts and haul units. Silo storage time of mixtures shall not exceed 36 hours.

401.072 Stockpiles The Contractor shall provide sufficient space for stockpiles and maintain a minimum of supply for 2 days production of all aggregate products used in MaineDOT approved mix designs currently under production. A minimum stockpile supply of 100 ton (70 yards) shall be maintained at all times. The Contractor shall construct stockpiles to prevent intermingling and to

minimize segregation. All stockpiles used in MaineDOT mixes shall be identified with weatherproof signs at least 12" high and 24" wide, with reflective lettering at least 2" high.

401.073 Cold Feeds Cold Feed Bins will have bin dividers to keep aggregate products separated. Adequate means must be provided for obtaining samples of the combined flow of all Cold feed bins.

401.074 Dryer Dryer shall be capable of heating aggregate to required mixing temperature and shall be in good operation and condition. Dryer shall be subject to annual inspection prior to start-up. The Contractor shall dry and heat the aggregates for the HMA to the required temperature, adjusting flames to avoid damaging the aggregates. The Contractor shall provide the Department a minimum period of 72 hours to inspect the dryer and provide at least 24 hours' notice that the dryer is ready for inspection.

401.075 Asphalt Binder The plant shall include a heating system and insulation to maintain the asphalt binder at a uniform temperature for proper mixing and compaction. A thermometer shall be provided in the asphalt binder line. No direct flame may come in contact with tank. A sampling valve shall be provided in the circulation line downstream of any binder additive used unless otherwise approved by the Department. The Contractor shall drain down the asphalt as low as safely possible in any tank that will be switched to a new source or grade prior to adding the new PGAB.

401.076 Additives Additives (WMA, anti-strip, etc.) introduced into the binder at the HMA plant shall be introduced per the supplier's recommendations and shall be approved by the Department. The system for introducing additives shall be interlocked with the aggregate feed or weigh system to maintain correct proportions for all production rates and batch sizes. Additive introduction systems shall be controlled by a proportioning device to the amount required on the JMF plus or minus 0.1% of the target. Additive introduction systems shall be interlocked with the plant and the recordation (batch tickets or drum recordation) shall display the additive and the weight and percentage added.

401.077 Batch Plants

Hot Bins Hot bins shall provide uniform continuous operation and be in good working condition. The plant shall be able to provide samples of hot bins upon request. Overflow shall be provided for each hot bin. Hot bin gates shall close without leaking. Bin walls must prevent intermingling between bins. Each hot bin shall have low level indicators which will alert the operator when the bin is empty.

Mixer Unit Clearance between blades and liner shall be 1" maximum, unless the aggregate exceeds 1 ¼" then the clearance shall be 1 ½". The spray bar length shall be at least 75% of the mixer length. The mixer unit shall be a twin pug mill-type mixer capable of mixing continuously for at least 45 seconds after all materials have been introduced into the mixer. The blades in the mixer shall be capable of producing a homogenous mixture. If the mixer is not enclosed, it shall be equipped with an adjustable hood to prevent loss of dust by dispersion. The mixer unit shall be subject to annual inspection prior to removal of safety features and being readied for service. The Contractor shall provide the Department the opportunity to inspect the mixer unit prior to the annual inspection. The Contractor shall provide the Department a minimum period of 72 hours to inspect the mixer unit and provide at least 24 hours' notice that the mixer unit is ready for inspection.

Mineral Filler Mineral filler and fiber shall utilize separate bins and feed systems to store and proportion the required quantity into the mixture. The feed systems shall be accurate to no more than 10% of the required weight with a convenient and accurate means of calibration. Mineral filler and

fiber shall be introduced in the weigh hopper and uniformly distributed prior to the injection of the asphalt binder.

Automation The HMA batch plant shall automatically batch, mix and discharges mixes. The batch plant shall accurately proportion the various materials in the proper order by weight. The entire batching and mixing cycle shall be continuous and shall not require any manual operations. The batch plant shall use auxiliary interlock circuits to trigger an audible alarm whenever an error exceeding the acceptable tolerance occurs. Along with the alarm, the printer shall print an asterisk on the delivery slip in the same row containing the out-of-tolerance weight. The automatic proportioning system shall be capable of consistently delivering material within the full range of batch sizes. When RAP is being used, the plant must be capable of automatically compensating for the moisture content of the RAP.

The HMA batch plant shall be operated within the following tolerances:

Each aggregate component	+/- 1.5% cumulative, per bin
Mineral Filler	+/- 0.5%
Bituminous Material	+/- 0.1%
Zero return (aggregate)	+/- 0.5%
Zero Return (AC)	+/- 0.1%
Additives	+/- 0.1%

Recordation All plants shall be equipped with an approved digital recording device. The printer shall mark any weight on the ticket that exceeds tolerance. The delivery slip shall contain information required under Section 108.1.3 - Provisions Relating to Certain Measurements, Mass and paragraphs a, b, and c of Section 401.078.

401.078 Drum Plants

Cold Feeds and Delivery System A scalper screen shall be used to remove oversize material. The accuracy of the belt scale shall be within +/- 1.0% of the actual weight being measured. The plant shall be capable of correcting for aggregate moisture. Mineral filler and fiber shall utilize separate bin(s) and feeder systems to store and proportion the required quantity into the mixture. The feed systems shall be accurate to no more than +/- 10% of the required weight with a convenient and accurate means of calibration. The plant shall be equipped with a single control to change all feed rates. Mineral filler and fiber shall be introduced such that dry mixing is accomplished no less than 18 inches prior to the injection of the asphalt binder. The Contractor shall ensure that the mineral filler does not become entrained in the exhaust stream of the dryer.

Binder System The flow of asphalt binder shall adjust automatically with dry aggregate weights. The Department will conduct an asphalt flow meter check annually and after each change of plant location. The flow meter check must be performed prior to producing mix for Department projects. The plant must be configured to provide a convenient means to check accuracy of the flow meter. The flow meter will be considered accurate if the measured weight is within 1% of actual weight.

Drum Mixer The plant shall be equipped with a diversion system where mix can be diverted at startup/shutdown and any time. The drum mixer shall be subject to annual inspection prior to removal

of safety features and being readied for service. The Contractor shall provide the Department a minimum period of 72 hours to inspect the drum mixer while providing at least 72 hours' notice that the drum mixer is ready for inspection.

Recordation An approved automatic ticket printer system shall be used to print delivery slips. The requirements for delivery slips for payment of materials measured by weight, as given in the following Sections, shall be waived: 108.1.3 a., 108.1.3 b., 108.1.3 c., and 108.1.3 d. The automatic printed ticket will be considered as the Weight Certificate. The dry aggregate weights and binder flow shall be recorded as well as mineral filler and all binder additives. The recordation of materials shall be printed a minimum of every ten minutes while in production.

The requirements of Section 108.1.3 f. - Delivery Slips, shall be met by the delivery slip printed by the automatic system, which accompanies each truckload, except for the following changes:

a. The quantity information required shall be individual weights of each batch or total net weight of each truckload.
b. Signatures (legible initials acceptable) of Weighmaster (required only in the event of a malfunction as described in 401.074 c.).
c. The MaineDOT designation for the JMF.

401.079 Scales and Weight Checks Scales shall meeting the requirements of Section 108 - Payment. The scales shall be inspected and sealed by the State Sealer (or approved alternative) as often as the Department deems necessary to verify their accuracy. Plant scales shall be checked prior to the start of the paving season, and each time a plant is moved to a new location. Subsequent checks will be made as determined by the Resident. The Contractor will have at least ten 50 pound masses for scale testing at batch plants. At Contractor's option, the Contractor can use one single test weight that has been checked on sealed scales. This weight shall be 1,000 lbs. or greater. At least twice during each 5 days of production either of the following checks will be performed:

a. A loaded truck may be intercepted and weighed on a platform scale that has been sealed by the State Sealer of Weights and Measures within the past 12 months. The inspector will notify the producer to take corrective action on any discrepancy over 1.0%. The producer may continue to operate for 48 hours under the following conditions.

1. If the discrepancy does not exceed 1.5%; payment will still be governed by the printed ticket.
2. If the discrepancy exceeds 1.5%, the plant will be allowed to operate as long as payment is determined by truck platform scale net weight.

If, after 48 hours the discrepancy has not been addressed and reduced below 1.0%, then plant operations will cease. Plant operation may resume after the discrepancy has been brought within 1.0%.

b. Where platform scales are not readily available, a check will be made to verify the accuracy and sensitivity of each scale within the normal weighing range and to assure that the interlocking devices and automatic printer system are functioning properly. If platform scales are not readily available, a weight with a known mass-verified and sealed annually by a licensed scale company, may be used by hanging weight from silo or surge hopper, at lower middle and upper third levels upon request to verify scale accuracy.

c. In the event of a malfunction of the automatic printer system, production may be continued without the use of platform truck scales for a period not to exceed the next two working days, providing total weights of each batch are recorded on weight tickets and certified by a Licensed Public Weighmaster.

401.08 Hauling Equipment Units hauling HMA shall have tight, clean, and smooth metal bodies, which have been thinly coated with a small amount of approved release agent to prevent the mixture from adhering to the bodies. Release agents that dissolve or strip asphalts, including diesel fuel, will not be allowed.

All mix haul units shall have a cover of water repellent material capable of heat retention, which completely covers the mixture. The cover shall be securely fastened on the truck, unless unloading. Haul units shall have an opening on both sides near the midpoint of the body, at least 12 in above the bed, which will accommodate a thermometer stem.

401.09 Pavers The Contractor shall use pavers meeting the requirements of this section unless otherwise authorized by the Department. Pavers shall meet the requirements of Table 4: Paver Requirements.

TABLE 4: PAVER REQUIREMENTS

Use	Paver Requirement
Traveled Way & Auxiliary Lanes	Equipped with a 10 ft minimum main screed with activated extensions. The minimum tractor weight shall be 30,000 pounds.
	Equipped with automatic grade and slope controls that automatically adjust the screed and increase or decrease the layer thickness to compensate for irregularities in the preceding course. The controls shall maintain the proper transverse slope and be readily adjustable so that transitions and superelevated curves can be properly paved. The controls shall operate from a fixed or moving reference such as a grade wire or ski type device (floating beam) with a minimum length of 30 ft, a non-contact grade control with a minimum span of 24 ft, except that a 40 ft reference shall be used on interstate and divided highway projects.
All HMA Placement	Self-contained, self-propelled units of sufficient class and size to place Hot Mix Asphalt Pavement in full lane widths specified in the contract on the main line, shoulder, or similar construction.
	Equipped with a free-floating activated heated main screed with activated extensions. Pavers with extendible screeds shall have auger extensions and tunnel extenders as per the manufacturer's recommendations, a copy of which shall be available if requested.
	Equipped with a receiving hopper with sufficient capacity for a uniform spreading operation and a distribution system to place the mixture uniformly, without segregation in front of the screed.
	Operated in such a manner as to produce a visually uniform surface texture and a thickness within the requirements of Section 401.11 - Surface Tolerances. The screed assembly shall produce a finished surface of the required evenness and texture without tearing, shoving, or gouging the mixture.

The Contractor shall have the paver at the project site sufficiently before the start of paving operations to be inspected and approved by the Department. The Contractor shall repair or replace any paver found worn or defective, either before or during placement, to the satisfaction of the Department. Pavers that produce an unevenly textured or non-uniform mat will be repaired or replaced before

continuing to place HMA on MaineDOT projects. On a daily basis, the Contractor shall perform density testing across that mat as detailed in Section 401.191 Quality Control - Method A, B & C.

401.10 Rollers Rollers shall be static steel, pneumatic tire, oscillatory, or approved vibrator type. Rollers shall be in good mechanical condition, capable of starting and stopping smoothly, and be free from backlash when reversing direction. Rollers shall be equipped and operated in such a way as to prevent the picking up of hot mixed material by the roller drums or tires. Crushing of the aggregate or displacement of the HMA during rolling will not be permitted. Any HMA Pavement that becomes loose, broken, contaminated, shows an excess or deficiency of PGAB, or is in any other way defective shall be removed and replaced at no additional cost with fresh material which shall be immediately compacted to conform to the adjacent area.

The Contractor shall repair or replace any roller found to be worn or defective, either before or during placement, to the satisfaction of the Department. Rollers that produce grooved, unevenly textured or non-uniform mat will be repaired or replaced before continuing to place HMA. The type of rollers to be used and their relative position in the compaction sequence shall generally be the Contractor's option unless otherwise specified in the contract, provided specified density is attained and with the following requirements:

a. On variable-depth courses, the first lift of pavement over gravel, reclaimed pavement, on irregular or milled surfaces, or on bridges, at least one roller shall be 16 ton pneumatic-tired. Pneumatic-tired rollers shall be equipped with skirting to minimize the pickup of HMA materials from the paved surface. When required by the Resident, the roller shall be ballasted to 20 ton.
b. Compaction with a vibratory or steel wheel roller shall precede pneumatic-tired rolling, unless otherwise authorized by the Department.
c. Vibratory rollers shall not be operated in the vibratory mode on bridge decks.
d. Any method, which results in cracking or checking of the mat, will be discontinued and corrective action taken.
e. The use of an oscillating steel roller shall be required to compact all mixtures placed on bridge decks.

The maximum operating speed for a steel wheel or pneumatic roller shall not exceed the manufacturer's recommendations, a copy of which shall be available if requested.

401.11 Surface Tolerances The Department will check the following surface tolerances:

a.) Longitudinally: The pavement surface profile shall be free of deviations in excess of +/- ¼ inches from the required pavement surface profile grade. To verify the surface tolerance a straight plane shall be established using 16 foot straight edge or a taught string line placed parallel to the direction of travel and checked continuously across the width of the lane.

b.) Transversely: The pavement surface profile shall be free of deviations in excess of 0 inches below and ¼ inches above the required cross-sectional profile grade. To verify the surface tolerance a straight plane shall be established using a 10 foot straight edge or taught string line placed perpendicular to the direction of travel and checked continuously along the length of the lane.

The Contractor shall correct defective areas by removing defective work and replacing it with new material as directed by the Department. The Contractor shall furnish a 10 foot straightedge for the Department's use.

401.12 Preparation of Existing Surface The Contractor shall thoroughly clean the surface upon which Hot Mix Asphalt Pavement is to be placed of all objectionable material. When the surface of the existing base or pavement is irregular, the Contractor shall bring it to uniform grade and cross section. All surfaces shall have a tack coat applied prior to placing any new HMA course. Tack coat shall conform to the requirements of Section 409 – Bituminous Tack Coat, Section 702 – Bituminous Material, and all applicable sections of the contract.

401.13 Spreading and Finishing On areas where irregularities or unavoidable obstacles make the use of mechanical spreading and finishing equipment impracticable, the Contractor shall spread, rake, and lute the HMA with hand tools to provide the required compacted thickness. Release agents that dissolve or strip asphalts, including diesel fuel, will not be allowed. On roadways with adjoining lanes carrying traffic, the Contractor shall place each course per the conditions in Table 5, unless otherwise noted by the Department in Section 403 - Hot Mix Asphalt Pavement.

TABLE 5: PLACEMENT CONDITIONS FOR ADJOINING LANES

Depth (at centerline)	**Placement Conditions**
Vertical Longitudinal Joint	
¾" and less (incl. shim)	The Contractor may place the HMA course over the full single travel lane width for each production day.
1" to 1 ¼"	The Contractor may place the HMA course over the full single travel lane width for each production day and will be required to place a matching course of HMA over the adjacent section of travel lane before weekend or holiday suspension.
1 ½" to 2"	The Contractor may place the HMA course over the full single travel lane width for each production day and will be required to place a matching course of HMA over the adjacent section of travel lane before the end of the following calendar day.
Greater than 2"	The Contractor shall place each course over the full width of the traveled way section being paved that day.
Notched-Wedge Longitudinal Joint	
1 ½" to 2"	The Contractor may place the HMA course over the full single travel lane width for each production day and will be required to place a matching course of HMA over the adjacent section of travel lane before weekend or holiday suspension. A maximum unmatched centerline joint length of 0.5 miles will be permitted over the weekend.
Greater than 2"	The Contractor may place the HMA course over the full single travel lane width for each production day and will be required to place a matching course of HMA over the adjacent section of travel lane before the end of the following calendar day.

The Contractor shall place the specified course over the full width of the mainline traveled way being paved, regardless of use, depth, or longitudinal joint type prior to Memorial Day, July 4th, Labor Day, paving suspensions exceeding three days, or other dates as specified by special provision.

The Contractor shall install additional warning signage that clearly defines the centerline elevation differential hazard. Unless otherwise addressed in the contract, the Contractor shall install additional

centerline delineation such as a double application of raised pavement markers at 100 foot intervals, or temporary painted line. For any exposed vertical edge between the shoulder and traveled way, at

a minimum, the use of temporary painted line, or RPMs placed along the edge of traveled way at 200 foot intervals is required. The Traffic Control Plan shall be amended to include this option and the additional requirements. All signs and traffic control devices will conform to Section 719.01, and Section 652, and will be installed prior to the work, at a maximum spacing of 0.50 mile for the entire length of effected roadway section. If this option is utilized, all additional signing, labor, traffic control devices, or incidentals will not be paid for directly, will be considered incidental to the appropriate 652 items.

401.14 Hot Mix Asphalt Placement on Bridge Decks Hot mix asphalt pavement placed on bridges shall also conform to Section 508.04 and the following requirements.

a. The minimum production and placement temperature for the Hot Mix Asphalt placed over membrane shall conform to the manufacturer's recommendations.
b. The bottom course shall be placed with an approved rubber mounted paver of such type and operated in such a manner that the membrane waterproofing will not be damaged in any way.
c. The top course shall not be placed until the bottom course has cooled sufficiently to provide stability.
d. The Contractor will not be required to cut sample cores from the compacted pavement on the bridge deck, unless otherwise directed by Special Provision.
e. After the top course has been placed, the shoulder areas shall be sealed 3 ft wide with two applications of an emulsified bituminous sealer meeting the requirements of Section 612.03 – Sealing and Section 702.12 - Emulsified Bituminous Sealing Compound. The first application shall be pre-mixed with fine, sharp sand, similar to mortar sand, as needed to fill all voids in the mix in the area being sealed. The second application may be applied without sand. The sealer shall be carried to the curb at the gutter line in sufficient quantity to leave a bead or fillet of material at the face of the curb. The area to be sealed shall be clean, dry and the surface shall be at ambient temperature. The furnishing and applying of the required quantity of sealer for the bridge shoulder areas shall be incidental to placing the hot mix asphalt pavement.
f. The area between the edge of the membrane and the vertical surface shall be completely sealed with hot-applied rubberized asphalt material, meeting the requirements of Type 4 crack seal; shall be applied to form a complete seal between the membrane and the vertical surface and shall extend up the vertical surface to within ½ inch of the top of the HMA wearing surface. This work shall be considered incidental to the contract pavement items unless 508 membrane items are included in the contract.

401.15 Compaction Immediately after the Hot Mix Asphalt Pavement has been spread, struck off, and any surface irregularities adjusted, the Contractor shall thoroughly and uniformly compact the HMA by rolling.

The Contractor shall roll the surface when the mixture is in the proper condition and when the rolling does not cause undue displacement, cracking, or shoving. The Contractor shall prevent adhesion of the HMA to the rollers or vibrating compactors without the use of fuel oil or other petroleum-based release agents. Solvents designed to strip asphalt binders from aggregates will not be permitted as release agents on equipment, tools, or pavement surfaces.

The Contractor shall immediately correct any displacement occurring as a result of the reversing of the direction of a roller or from other causes to the satisfaction of the Department. Any operation other than placement of variable depth shim course that results in breakdown of the aggregate shall be discontinued. Any new pavement that shows obvious cracking, checking, or displacement shall be removed and replaced for the full lane width as directed by the Resident at no cost to the Department.

Along forms, curbs, headers, walls, and other places not accessible to the rollers, the Contractor shall thoroughly compact the HMA with mechanical vibrating compactors. The Contractor shall only use hand tamping in areas inaccessible to all other compaction equipment. On depressed areas, the Contractor may use a trench roller or cleated compression strips under a roller to transmit compression to the depressed area.

Any HMA that becomes unacceptable due to cooling, cracking, checking, segregation or deformation as a result of an interruption in mix delivery shall be removed and replaced with material that meets contract specifications at no cost to the Department.

For all items requiring pavement density testing, the Contractor shall cut 6-inch diameter cores at no additional cost to the Department by the end of the working day following paving. Cores shall be cut such that the nearest edge at least 9 inches from any joint. Pre-testing of the cores will not be allowed. If the Contractor and the Department mutually determine that a core is damaged, the Contractor shall cut new core(s) at the same offset and within 3 ft of the initial sample. The Contractor and the Department will mutually determine if underlying material is adhered to the core and if so will mark the core at the point where sawing is needed. The Department will place the cores in a secure container and the Contractor shall transport the cores to the designated MaineDOT lab. The cores will be saw cut by the Department to remove underlying layers. No recuts are allowed at a test location after the core has been tested.

On all sections of overlay with wearing courses designed to be 1 in or less in thickness, there shall be no pay adjustment for density otherwise noted in Section 403 - Hot Mix Asphalt Pavement. For overlays designed to be 1 in or less in thickness, density shall be obtained by the same rolling train and methods as used on mainline travelway surface courses with a pay adjustment for density, unless otherwise directed by the Department.

There shall be no pay adjustment for density on shoulders unless otherwise noted in Section 403 - Hot Mix Asphalt Pavement. Density for shoulders shall be obtained by the same rolling train and methods as used on mainline travelway, unless otherwise directed by the Department. Efforts to obtain optimum compaction will not be waived by the Department unless it is apparent during construction that local conditions make densification to this point detrimental to the finished pavement surface course.

401.16 Joints The Contractor shall construct wearing course transverse and longitudinal joints in such a manner that minimum tolerances shown in Section 401.11 - Surface Tolerances are met when measured with a straightedge. The paver screed shall maintain a uniform head of HMA during transverse and longitudinal joint construction. The HMA shall be free of segregation and meet temperature requirements outlined in Section 401.04. Transverse joints of the wearing course shall be straight and neatly trimmed. The Contractor may form a vertical face exposing the full depth of the course by inserting a header, by breaking the bond with the underlying course, or by cutting back

with hand tools. The Contractor shall apply a coating of emulsified asphalt immediately before paving all joints to the vertical face and 3 in of the adjacent portion of any pavement being overlaid except those formed by pavers operating in echelon. The Contractor shall use an approved spray apparatus designed for covering a narrow surface. The Department may approve application by a brush for small surfaces, or in the event of a malfunction of the spray apparatus, but for a period of not more than one working day.

Where pavement under this contract joins an existing pavement, or when the Department directs, the Contractor shall cut the existing pavement along a smooth line, producing a neat, even, vertical joint. The Department will not permit broken or raveled edges. The cost of all work necessary for the preparation of joints is incidental to related contract pay items. Longitudinal joints shall be generally straight to the line of travel and constructed in a manner that best ensure joint integrity. Methods or activities that prove detrimental to the construction of straight, sound longitudinal joints will be discontinued.

The Contractor may utilize an approved notched wedge joint device on all HMA layers 1 ½ inches in depth or greater. A notched wedge joint shall be constructed as shown in Figure 1 using a device that is attached to the paver screed and is capable of independently adjusting the top and bottom vertical notches.

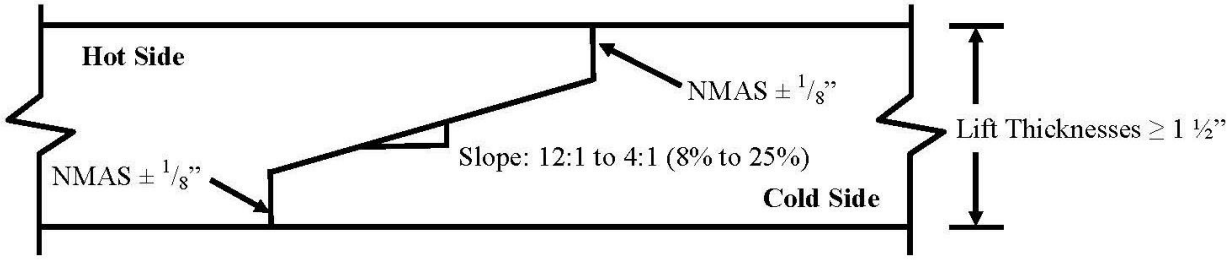


FIGURE 1: Notched Wedge Joint

Notes

1. An emulsified tack coat shall be applied to the vertical edges and the wedge surface so that the total rate is 0.05 G/SY plus the normal specified rate prior to placing the adjacent layer. The Contractor may elect to apply the emulsified tack coat in one or multiple passes.
2. Dimensions shown are compacted depths (after rolling is complete).

The Department reserves the right to have centerline cores cut by the Contractor's QC personnel for informational purposes to monitor the density along the joint. Informational cores at the centerline joint will be taken centered over the tapered part of the wedge joint.

Any notched wedge joint constructed areas that become cracked or broken shall be trimmed back to the limits affected prior to placing the adjoining lane. Any materials that become unbound or separated from the wedge or tapered joint section, or contaminated by materials determined by the Department as being detrimental to the construction of a sound construction joint, shall be removed by sweeping, compressed air and lance, or by hand tools as required. This work, if necessary, will not be paid for directly, but shall be considered incidental to the related contract items.

The Contractor shall apply a coating of emulsified asphalt on the vertical and tapered surface of the longitudinal centerline joint immediately before paving if the notched wedge joint device is used. The total rate of application shall be 0.050 G/SY plus the normal specified tack coat rate. The Contractor

shall use an approved spray apparatus designed for covering a narrow surface. The Department may approve application by a brush for small surfaces.

401.17 Hot Mix Asphalt Documentation The Contractor and the Department shall agree on the amount of Hot Mix Asphalt Pavement that has been placed each day. All delivery slips shall conform to the requirements of 401.078.

401.18 Prepave Meeting Prior to placing any mix, the Department and the Contractor shall hold a Pre-paving conference to discuss the paving schedule, source of mix, type and amount of equipment to be used, sequence of paving pattern, rate of mix supply, random sampling, project lots and sublots and traffic control. A copy of the density QC random numbers to be used on the project shall be provided to the Resident. The Departments' random numbers for Acceptance testing shall be generated and on file with the Resident and the Project Manager. All personnel of the Department and the Contractor who have significant information relevant to the paving items shall attend, including the responsible onsite paving supervisor for the Contractor. The Resident will prepare minutes of the conference and distribute them to all attendees. Any requests to revise the minutes must be made to the Resident within 7 Days of Receipt. These minutes will constitute the final record of the Pre-paving conference. On the first day of paving and whenever there is a change in the onsite paving foreman or paving inspector, the Department and the Contractor shall hold an informal onsite meeting to review the minutes of the Pre-paving conference, Project Specific QCP, Plans, Typicals, Special Provisions and communication process. This meeting shall be held prior to placing any mix. The onsite paving supervisor, QCT, Superintendent, Resident and/or paving inspector shall attend.

401.19 Contractor Quality Control – Method A, B, C & D
The Contractor shall operate in accordance with the approved Quality Control Plan (QCP) to assure a product meeting the contract requirements. The Contractor shall not begin paving operations until the Department approves the QCP in writing.

401.191 Quality Control The QCP shall meet the requirements of Section 106.6 - Acceptance and this Section. The QCP shall address any items that affect the quality of the Hot Mix Asphalt Pavement, and shall include the following personnel meeting these minimum requirements:

a. QCP Administrator - The QCP Administrator must be a full-time employee of or a consultant engaged by the Contractor or paving subcontractor. The QCP Administrator shall have full authority to institute any and all actions necessary for the successful operation of the QCP. The QCP Administrator (or their designee in the QCP Administrator's absence) shall be available to communicate with the Department at all times.

- For items accepted under Methods A and B, the QCP Administrator shall be certified as a Quality Assurance Technologist (QAT) by NETTCP.
- For items accepted under Methods C and D, the QCP Administrator shall be certified by NETTCP as a Quality Assurance Technologist (QAT), Plant Technician, or Paving Inspector.

b. Process Control Technician(s) (PCT) shall utilize test results and other quality control practices to assure the quality of aggregates and other mix components and control proportioning to meet the JMF(s). The PCT shall inspect all equipment used in mixing to assure it is operating properly and that mixing conforms to the mix design(s) and other Contract requirements, and that delivery

slips and plant recordation accurately reflects the mix being produced with all the required information. The QCP shall detail how these duties and responsibilities are to be accomplished and documented, and whether more than one PCT is required. The Plan shall include the criteria to be utilized by the PCT to correct or reject unsatisfactory materials. The PCT shall be certified as a Plant Technician by the NETTCP.

c. Quality Control Technician(s) (QCT) shall perform and utilize quality control tests at the job site to assure that delivered materials meet the requirements of the JMF(s). The QCT shall inspect all equipment utilized in transporting, laydown, and compacting to assure it is operating properly and that all laydown and compaction conform to the Contract requirements. The QCP shall detail how these duties and responsibilities are to be accomplished and documented, and whether more than one QCT is required. The QCP shall include the criteria utilized by the QCT to correct or reject unsatisfactory materials. The QCT shall be certified as a Paving Inspector by the NETTCP.

The QCP shall detail the coordination of the activities of the Plan Administrator, the PCT and the QCT. The Project Superintendent shall be named in the QCP, and the responsibilities for successful implementation of the QCP shall be outlined.

The QCP shall address any items that affect the quality of the Hot Mix Asphalt Pavement including, but not limited to, the following:

a. General Requirements:
    - Job Mix Formulas (JMFs)
    - Name of QCP Administrator, and certification number
    - Description of corrective action process
    - Disposition of defective material
    - A procedure to take immediate possession of acceptance samples once released by MaineDOT and deliver said samples to the designated acceptance laboratory.

b. Process Control Requirements: Each Hot Mix Asphalt plant shall have a Plant Specific Process Control Plan. At minimum the plan shall include:
    - Name of Plant Specific Process Control Technician(s) and certification number(s)
    - Hot mix asphalt plant details
    - Stockpile Management
    - Mixing & transportation
    - Silo management and details
    - A detailed description of RAP processing, stockpiling and introduction into the plant
    - PG Binder management:
        - Tanks and storage (including polymer modified binders if applicable)
        - Binder temperature
        - Sample points
        - Method to ensure mixture contains the specified binder grade
        - Additive introduction details if introduced at the plant
    - Testing and inspection plan for control of aggregates and RAP
    - Mix Testing and inspection plan

c. Quality Control Requirements – Method A & B
   - Name of Quality Control Technicians(s) and certification number(s)
   - Laydown operations
   - Longitudinal joint construction including the tacking of all joints.
   - Procedures for avoiding paving in inclement weather
   - Compaction of shoulders
   - Methods to ensure that segregation is minimized
   - Procedures to determine the maximum rolling and paving speeds based on best engineering practices and past experience in achieving acceptable pavement smoothness.
   - Sequence for paving around drainage structures, under guard rail, around curb, at bridges, intersections, drives and minor approaches to ensure proper compaction, finish, and drainage.
   - Type of release agent to be used on haul units, tools and rollers.

d. Quality Control Requirements – Method C and D
   - Name of QCP Administrator and certification number(s) as specified in Section 401.19.
   - Name of Process Control Technicians(s) and certification number(s).
   - Name of Quality Control Technicians(s) and certification number(s).
   - Anticipated Compaction Temperature Zones for each roller pass during placement.
   - Mix TMD to be used for density gauge setting for method spec density work
   - Procedures for avoiding paving in inclement weather.
   - Type of release agent to be used on haul units, tools and rollers.
   - A note stating that the use of petroleum-based fuel oils, such as diesel or kerosene, or asphalt stripping solvents will not be permitted.

Unless otherwise noted in section 401.192, or Special Provision 403 - Hot Mix Asphalt Pavement, the Contractor shall submit a QC Plan detailing what equipment is to be used, and what HMA plant is to be used for items covered under the Plan. All mix designs (JMF) shall be approved and verified by MaineDOT prior to use. The Contractor shall also supply a Laydown Operation Plan that addresses sequence of work, layout of work, longitudinal joint construction, compaction of shoulders, methods to minimize segregation, and procedures to achieve acceptable pavement smoothness.

For each production day, a summary of each day's results, including a daily paving report, summarizing the mixture type, mixture temperature, equipment used, environmental conditions, and the number of roller passes, shall be recorded and signed by the QCT and presented to the Department's representative by 1 PM the following working day.

The Contractor shall certify the mix and the test results for each item by a Certificate of Compliance.

The Contractor shall have a testing lab at the plant site, equipped with all testing equipment necessary to complete the tests in Table 6. The Contractor shall generate QC sampling random numbers for each approved mix design. A copy of the random numbers shall be emailed to the QC.mainedot@maine.gov email address and remain on-file (in print) and be available for inspection at the QC laboratory.

The Contractor shall sample, test, and evaluate Hot Mix Asphalt Pavement in accordance with the minimum frequencies per each approved mix design:

TABLE 6: MINIMUM QUALITY CONTROL FREQUENCIES

Test or Action	Frequency	Test Method
Temperature of mix	6 per day at street and plant	-
Temperature of mat	4 per day	-
%TMD (In-Place Density - Surface)	1 per 125 ton	AASHTO T 355 or AASHTO T 343
%TMD (In-Place Density - Base)	1 per 250 ton	AASHTO T 355 or AASHTO T 343
Fines / Effective Binder	1 per 500 ton	AASHTO T 312*
Gradation	1 per 500 ton	AASHTO T 30
PGAB Content	1 per 500 ton	AASHTO T 164 or AASHTO T 308
Voids at N_{design}	1 per 500 ton	AASHTO T 312*
VMA at N_{design}	1 per 500 ton	AASHTO T 312*
Rice Specific Gravity	1 per 500 ton	AASHTO T 209
Percent Fractured Particles	1 per 5,000 ton	AASHTO T 335
Flat and Elongated Particles	1 Per 5,000 ton	ASTM D4791
Fine Aggregate Angularity	1 Per 5,000 ton	AASHTO T 304

*Method A and B only

The Contractor shall monitor plant production on each approved mix design using running average of three control charts as specified in Section 106 - Quality. Control limits shall be as noted in Table 7 below. The UCL and LCL, shall not exceed the allowable gradation control points for the particular type of mixture as outlined in Table 1 of Section 703.09.

TABLE 7: CONTROL LIMITS

Property	UCL and LCL
Percent Passing 4.75 mm and larger sieves	Target +/- 4.0
Percent Passing 2.36 mm sieve	Target +/- 2.5
Percent Passing 0.075 mm sieve	Target +/- 1.0
PGAB Content	Target +/- 0.25
VMA at N_{design}	LCL = LSL + 0.2
Voids at N_{design}	JMF Target +/- 1.2
Theoretical Maximum Specific Gravity	JMF Target +/- 0.020

The Contractor shall retain splits of the previous 5 QC tests, with QC results enclosed for random selection and testing by the Department. Test results of splits that do not meet the Dispute Resolution Variance Limits in Table 18 shall trigger an investigation by the MaineDOT Independent Assurance Unit and may result in that lab losing NETTCP certification and the ability to request a dispute [Section 401.50 - Process for Dispute Resolution].

The Contractor shall make density test results, including randomly sampled densities, available to the Department onsite. Summaries of each day's results, including a daily paving report summarizing the mixture type, mixture temperature, equipment used, environmental conditions, and the number of roller passes, shall be recorded and signed by the QCT and provided to the QC.mainedot@maine.gov

email address and Resident in writing by 1:00 p.m. the next working day. The Contractor shall fill all holes in the pavement resulting from cutting cores by the Contractor or the Department with a properly compacted, acceptable mixture no later than the following working day. Before filling, the Contractor shall carefully clean the holes and apply a coating of emulsified asphalt. The Contractor may only cut additional cores for verification of the densometer, at a rate not to exceed 3 per day or 2 per 1000 ton placed.

If the Contractor's control chart shows the process for a given mix design to be out of control (defined as a single point outside of the control limits on the running average of three chart) on any property listed in Table 7: Control Limits, the Contractor shall notify the Resident of all affected projects in writing of the corrective action by 1:00 PM the next working day. The written description shall detail what action is being taken by the Contractor to bring the property in question back within control limits. Subsequent quality control results are expected to demonstrate an improvement and regression towards the aim. The Department reserves the right to take action, to include cessation of production, in the case of repeated results outside the Table 7 control chart control limits.

On a daily basis, or whenever equipment type or sequence is modified, the Contractor shall perform density testing across the mat being placed, prior to being compacted by equipment at 12 in intervals. If the density values vary by more than 2.0% from the mean, the Contractor shall make adjustments to the screed until the inconsistencies are remedied. Failure to replace or repair defective placement equipment may result in a letter of suspension of work and notification of a quality control violation resulting in possible monetary penalties as governed by Section 106 – Quality.

The Contractor shall cease paving operations whenever one of the following occurs:

a. The quality level for density using all quality control tests for the current Lot is less than 60 PWL.
b. The Coarse Aggregate Angularity or Fine Aggregate Angularity value falls below the requirements of Section 703.07, Table 3: Aggregate Consensus Properties Criteria for the design traffic level.
c. The Flat and Elongated Particles value exceeds 10% by ASTM D4791.
d. There is any visible damage to the aggregate due to over-densification other than on variable depth shim courses.
e. The Contractor fails to follow the approved QCP.

The Contractor shall notify the Resident in writing as to the reason for shutdown, as well as the corrective action, by the end of the workday. Failure to do so will be treated as a second incident under 106.4.6 QCP Non-compliance. The Department will only allow the continuation of paving operations when it is satisfied the corrective action will result in an improvement in results. The Department may require the submittal of a passing verification sample to allow further production. The Department

retains the exclusive right, with the exception of the first day's production of a new JMF, to determine whether the resumption of production involves a significant change to the production process. If the

Department so determines, then the current lot will be terminated, a pay factor established, and a new lot will begin.

The Contractor may utilize innovative equipment or techniques not addressed by the Contract documents to produce or monitor the production of the mix, subject to approval by the Department.

401.192 Prepave and Quality Control requirements for Sidewalks, Drives, Islands & Incidentals - Method D and Visual Acceptance Items

Unless otherwise noted in Special Provision 403, a QCP, certified QC personnel, or Prepave Meeting shall not be required for Item 403.209 - Hot Mix Asphalt, 9.5 mm Nominal Maximum Size (sidewalks, drives, islands & incidentals) accepted under Method D, or for any items visually accepted. An approved JMF shall be provided to the Resident prior to placement.

401.20 Acceptance Method A & C

These methods utilize Quality Level Analysis and pay factor specifications. For Hot Mix Asphalt Pavement designated for acceptance under Quality Assurance provisions, the Department will sample once per sublot on a statistically random basis, test, and evaluate in accordance with the Acceptance Properties as outlined in Table 8:

TABLE 8: ACCEPTANCE PROPERTIES – METHOD A & C

Properties	**Point of Sampling**	**Test Method**
Gradation	Paver Hopper	AASHTO T 30
PGAB Content	Paver Hopper	AASHTO T 308
% TMD (In-Place Density)	Mat behind all Rollers	AASHTO T 269
Voids at N_{design}	Paver Hopper	AASHTO T 312
VMA at N_{design}	Paver Hopper	AASHTO T 312
Fines to Effective Binder	Paver Hopper	AASHTO T 312
VFB	Paver Hopper	AASHTO T 312

The Department will obtain samples of Hot Mix Asphalt Pavement in conformance with AASHTO R 97, Sampling Asphalt Mixtures, and the MaineDOT Policies and Procedures for HMA Sampling and Testing.

The Contractor shall transport the samples in containers provided by the Department to the designated MaineDOT Laboratory within 48 hours except when otherwise noted in the project specific QCP or as directed by the Resident. Failure to deliver an acceptance sample to the designated acceptance laboratory will be considered the second incident under 106.4.6–QCP Non-Compliance.

Target values shall be as specified in the JMF. The Department will withhold reporting of the test results for the Acceptance sample until 7:00 AM, on the second working day of receipt of the sample, or after receipt of the Contractors results of the Acceptance sample split.

Upon conclusion of each lot being evaluated under quality level analysis, where there is a minimum of four sublots, results shall be examined for statistical outliers, as stated in Section 106.7.2 - Statistical Outliers.

Lot sizes and sublot sizes shall be determined as outlined in Table 9.

TABLE 9: LOT AND SUBLOT SIZES – METHOD A & C

Lot Size*	Entire production per item per contract up to 6000 ton
Maximum Sublot Size – Mix	750 ton
Maximum Sublot Size – Density	Surface Layers – 250 ton Base / Intermediate Layers – 500 ton
Minimum Number of Samples – Mix	Four
Minimum Number of Samples – Density	Five

*Unless otherwise agreed upon at the Prepave Meeting

If there is less than one-half of a sublot remaining at the end, then it shall be combined with the previous sublot. If there is more than one-half sublot remaining at the end, then it shall constitute the last sublot and shall be represented by test results. If it becomes apparent partway through a Lot that, due to an underrun, there will be insufficient mix quantity to obtain the minimum number of sublots needed, the Resident may adjust the size of the remaining sublots and select new sample locations based on the estimated quantity of material remaining in the Lot. Unanticipated over-runs of up to 1500 ton shall be rolled into the last lot. Cases where the lot is terminated prior to reaching completion shall be handled in accordance with Section 106.7.3 Early Termination of Lots. In cases where density incentive/disincentive provision apply, additional cores shall be taken to attain a minimum of three for the Lot.

Isolated Areas During the course of inspection, should it appear that there is an isolated area that is not representative of the lot based on a lack of observed compactive effort, excessive segregation, a change in process or any other questionable practice, that area may be isolated and tested separately. An area so isolated that has a calculated pay factor below 0.80 for Method A, based on three random tests shall be removed and replaced at the expense of the Contractor for the full lane width and a length not to be less than 150 ft.

TABLE 10: ACCEPTANCE LIMITS – METHOD A & C

Property	**USL and LSL**	
	Method A	**Method C**
Percent Passing 4.75 mm and larger sieves	Target +/- 7%	Target +/- 7%
Percent Passing 2.36 mm to 1.18 mm sieves	Target +/- 4%	Target +/- 5%
Percent Passing 0.60 mm sieve	Target +/- 3%	Target +/- 4%
Percent Passing 0.30 mm to 0.075 mm sieve	Target +/- 2%	Target +/- 2%
PGAB Content	Target +/- 0.4%	Target +/- 0.4%
Voids at N_{design}	4.0% +/- 1.5%	N/A
Fines to Effective Binder	0.9 +/- 0.3	N/A
VMA at N_{design}	LSL from Table 1	N/A
VFB	Table 1 plus a 4% production tolerance for USL	N/A
% TMD (In-place Density)	94.5% +/- 2.5%	94.5% +/- 2.5%

Cease Production The Contractor shall cease paving operations whenever one of the following occurs on a lot in progress:

TABLE 11: CEASE PRODUCTION – METHOD A & C

Property	Percent Within Limits (PWL)	
	Method A	**Method C**
Percent Passing NMAS sieve*	<60 PWL	<60 PWL
Percent Passing 2.36 mm sieve*		
Percent Passing 0.30 mm sieve*		
Percent Passing 0.075 mm sieve*		
PGAB Content		
Voids at N_{design}		N/A
Fines to Effective Binder*		
VMA at N_{design}		
VFB		
% TMD (In-place Density)		<60 PWL

*Paving operations shall not be required to cease if the mean test value is equal to the LSL or USL and s = 0.

In cases where the Contractor is to cease paving operations based upon an Acceptance result or payfactor, the Contractor will submit a corrective action plan to the Department. The Department will only allow the continuation of paving operations when it is satisfied the corrective action will result in an improvement in results. The Department may require the submittal of a passing verification sample to allow further production.

401.2021 Pay Adjustment - Method A & C The Department will use the following criteria for pay adjustment at the completion of the Lot using the pay adjustment factors under Section 106.7 - Quality Level Analysis:

Density Upon conclusion of each lot, density results shall be examined for statistical outliers as stated in Section 106.7.2. If the pay factor for Density falls below 0.80, all of the cores will be randomly re-cut by Sublot. A new pay factor will be calculated that combines all initial and retest results. If the resulting pay factor is below 0.80 , the entire Lot shall be removed and replaced with material meeting the specifications at no additional cost to the Department, except that the Department may, when it appears that there is a distinct pattern of defective material, isolate any defective material by investigating each mix sample sublot and require removal of defective mix sample sublots only, leaving any acceptable material in place if it is found to be free of defective material. Pay factors equal to or greater than the reject level will be paid accordingly.
Mix Properties The Department will determine a pay factor (PF) using the applicable Acceptance Limits. If all three pay factors for PGAB Content, VMA at N_{design}, and Voids at N_{design} fall below 0.80 for Method A, then the composite pay factor for PGAB Content, VMA at N_{design}, and Voids at N_{design} shall be 0.50.

The following variables will be used for pay adjustment:

PA = Pay Adjustment
Q = Quantity represented by PF in ton
P = Contract price per ton
PF = Pay Factor

The Department will determine a pay adjustment using Table 12: Pay Adjustment Calculations as follows:

TABLE 12: PAY ADJUSTMENT CALCULATIONS – METHOD A & C

Acceptance Method	Mix Properties / Gradation	Density
Method A	PA = (Voids @ N_d PF - 1.0)(Q)(P)x0.20 + (VMA @ N_d -1.0)(Q)(P)x0.20 + (PGAB Content PF- 1.0)(Q)(P)x0.10	PA = (density PF-1.0)(Q)(P)x0.50
Method C	PA = (% Passing Nom. Max PF-1.0)(Q)(P)x0.05+(% passing 2.36 mm PF-1.0)(Q)(P)x0.05+(%passing 0.30 mm PF-1.0)(Q)(P)x0.05+(%passing 0.075 mm PF-1.0)(Q)(P)x0.10+(PGAB Content PF-1.0)(Q)(P)x0.25	PA = (density PF-1.0)(Q)(P)x0.50

In addition, for 9.5 mm NMAS mixtures the following pay adjustment shall also apply:

The average percent passing for the 0.075 mm sieve shall be evaluated for each Lot. If the average is greater than 6.5%, a pay adjustment according to Table 13 below shall apply in addition to the other pay adjustments for the given method of testing.

TABLE 13: 0.075 MM SIEVE PAY ADJUSTMENT

Average Percent Passing 0.075 mm Sieve	Pay Adjustment
6.6% - 7.0%	-5%
> 7.0%	-10%

The Department shall notify the Contractor whenever the average of at least three samples in a given Lot is greater than 6.5%.

401.21 Acceptance Method B & D

Unless otherwise stated in the 403 Special Provision, the Lot shall be the entire mix quantity per item per contract. The Department will sample once per sublot per pay item on a statistically random basis, test, and evaluate in accordance with the Acceptance Properties in Table 14.

TABLE 14: ACCEPTANCE PROPERTIES – METHOD B & D

Properties	Point of Sampling		Test Method
	Method B	Method D	
Gradation	Paver Hopper	Paver Hopper or Truck	AASHTO T 30
PGAB Content	Paver Hopper	Paver Hopper or Truck	AASHTO T 308
% TMD (In-Place Density)	Mat behind all Rollers	Mat behind all Rollers	AASHTO T 269
Voids at N_{design}	Paver Hopper	N/A	AASHTO T 312
VMA at N_{design}	Paver Hopper	N/A	AASHTO T 312
Fines to Effective Binder	Paver Hopper	N/A	AASHTO T 312
VFB	Paver Hopper	N/A	AASHTO T 312

TABLE 15: LOT AND SUBLOT SIZES – METHOD B & D

Lot Size*	Entire mix quantity per item per contract	
Maximum Sublot Size – Mix	(Lot size ≤ 1000 tons)	(Lot size > 1000 tons)
	250 ton	750 ton
Sublot Size – Density	125 ton (Max 5 Sublots)	250 ton

*General – Lot and Sublot size may be adjusted to accommodate the work scope and schedule, or as otherwise agreed upon at the Prepave Meeting

TABLE 16: ACCEPTANCE LIMITS – METHOD B & D

Property	**USL and LSL**	
	Method B	**Method D**
Percent Passing 4.75 mm and larger	Target +/- 7%	Target +/- 7%
Percent Passing 2.36 mm sieve	Target +/- 5%	Target +/- 7%
Percent Passing 1.18 mm sieve	Target +/- 5%	Target +/- 5%
Percent Passing 0.60 mm sieve	Target +/- 4%	Target +/- 4%
Percent Passing 0.30 mm sieve	Target +/- 3%	Target +/- 3%
Percent Passing 0.075 mm sieve	Target +/- 3%	Target +/- 3%
PGAB Content	4.0% +/- 2.0%	Target +/- 0.5%
Voids at N_{design}	4.0% +/- 2.0%	N/A
Fines to Effective Binder	0.9 +/- 0.3	N/A
VMA at N_{design}	LSL from Table 1	N/A
VFB	Table 1 plus a 4% production tolerance for USL	N/A
% TMD (In-place Density)	95.0% +/- 2.5%	LSL of 92.0%

The Contractor shall cease paving operations whenever two consecutive Method B or D tests fall outside specification limits on the same property. The Contractor will submit a corrective action plan to the Department. The Department will only allow the continuation of paving operations when it is satisfied the corrective action will result in an improvement in results. The Department may require the submittal of a passing verification sample to allow further production.

401.2022 Pay Adjustment - Method B & D For items accepted under Method B or D, if the mix is within the tolerances listed in Table 16, the Department will pay the contract unit price, otherwise pay adjustments as shown in Table 17 shall be applied to the quantity of mix represented by the test.

The Contractor shall cut one 6 inch core per sublot unless otherwise noted in Section 403 - Hot Mix Asphalt Pavement. If the density result is not within the specified limits the disincentive shall apply.

If the sublot density is less than 88.5 percent or greater than 99.0 percent of the sublot TMD, two additional cores shall be cut at random locations determined by the Department. If either of the additional cores has a density less than 88.5 percent or greater than 99.0 percent of the sublot TMD, the sublot shall be removed and replaced at no cost to the Department; otherwise, the average of the three cores will be used to determine the sublot pay adjustment.

TABLE 17: PAY ADJUSTMENTS – METHOD B & D

Property	**Method B**		**Method D**	
Percent Passing 2.36 mm sieve	N/A		-2.0%	
Percent Passing 0.30 mm sieve	N/A		-1.0%	
Percent Passing 0.075 mm sieve	-2.0%		-2.0%	
PGAB Content	-5.0%		-5.0%	
Voids at N_{design}	-3.0%		N/A	
% TMD (In-place Density)	91.5% - 91.9% or 97.1% - 97.5%	-5.0%	91.5% - 91.9%	-5.0%
	90.5% - 91.4% or 97.6% - 98.5%	-10.0%	90.5% - 91.4%	-10.0%
	89.5% - 90.4% or 98.6% - 99.0%	-20.0%	89.5% - 90.4%	-20.0%
	88.5% - 89.4%	-30.0%	88.5% - 89.4%	-30.0%
	<88.5% or >99.0%	Reject	<88.5% or >99.0%	Reject

401.30 Method of Measurement The Department will measure Hot Mix Asphalt Pavement by the ton in accordance with Section 108.1 - Measurement of Quantities for Payment.

401.40 Basis of Payment The Department will pay for the work, in place and accepted, in accordance with the applicable sections of this Section, for each type of HMA specified.

The Department will pay for the work specified in Section 401.12, for the HMA used, except that cleaning objectionable material from the pavement and furnishing and applying bituminous material to joints and contact surfaces is incidental.-Payment for this work under the appropriate pay items shall be full compensation for all labor, equipment, materials, and incidentals necessary to meet all related contract requirements, including design of the JMF, implementation of the QCP, obtaining core samples, transporting cores and samples, filling core holes, applying emulsified asphalt to joints, and providing testing facilities and equipment. The Department will make a pay adjustment for quality as specified in Section 401.20 Acceptance Method A & B or 401.21 Acceptance Method C & D.

401.50 Process for Dispute Resolution At the time of Hot-Mix Asphalt sampling, the Department will obtain a split sample of each Acceptance test random sample for possible dispute resolution testing. The Contractor shall also obtain a split sample of the HMA at this same time. If the Contractor wishes to retain the option of requesting dispute testing of the initial Acceptance sample, the Contractor will test their split of the Acceptance sample in accordance with applicable AASHTO procedure and accepted supplemental practice as described in the Department's HMA Sampling and Testing Policies and Procedures manual. The Contractor shall report their results to the Resident, with a copy to Contractor.mainedot@maine.gov by 7:00 AM, on the second working day from time of QA sampling, otherwise dispute resolution will not be initiated. The Department's dispute resolution split sample will be properly labeled and stored for a period of at least two weeks after it has been reported, or until the sample is tested. The properties eligible for dispute and the respective variances are shown in Table 18.

The Contractor may dispute the Department's Acceptance results and request that the dispute resolution split sample be tested by notifying the Department's Resident and QA Engineer in writing within two working days after the results of the Acceptance test are reported. The following shall be provided in the request:

- Acceptance sample reference number
- The specific test result(s) or property(ies) being disputed, and
- The complete, signed report of the Contractor's testing (In a lab certified by the NETTCP and MaineDOT) of their split of the Acceptance sample indicating that the variances in Table 18 for the specific test result(s) or property(ies) were exceeded.

TABLE 18: DISPUTE RESOLUTION VARIANCE LIMITS

Property	**Method A & B**	**Method C & D***	**Variance Limits**
PGAB Content	Yes	Yes	+/- 0.4%
G_{mb}	Yes	No	+/- 0.030
G_{mm}	Yes	No	+/- 0.020
Voids at N_{design}	Only if G_{mb} or G_{mm} is not disputable	No	+/- 0.8%
VMA at N_{design}	Only if G_{mb} or G_{mm} is not disputable	No	+/- 0.8%
Percent Passing 4.75 mm and larger sieves	No	Yes	+/- 4.0%
Percent Passing 2.36 mm to 0.60 mm sieves	No	Yes	+/- 3.0%
Percent Passing 0.30 mm to 0.15 mm sieves	No	Yes	+/- 2.0 %
0.075 mm sieve	Only for 9.5 mm NMAS mixes	Yes	+/- 0.8%

*****Disputes will not be allowed on Item 403.209

The value of any disputed result or property reported for the initial Acceptance sample shall stand if the value reported for the dispute resolution sample is not closer to the value the Contractor reported for their split sample than to the value reported for the initial Acceptance sample. If the value reported for the dispute resolution falls precisely half-way between the other two values the value reported for the dispute resolution will replace the original acceptance value. Otherwise, the value reported for the dispute resolution sample will replace the value reported for the initial Acceptance sample and will be used to re-calculate any other affected results or properties.

SECTION 402 - PAVEMENT SMOOTHNESS

402.00 Smoothness Projects Pavement smoothness shall be analyzed in accordance with this Specification will be so noted in Special Provision 403 - Hot Mix Asphalt Pavement.

402.01 Pavement Smoothness The final pavement surface shall be evaluated for smoothness using a Class I or Class II profiler as defined by ASTM E950 (94). Smoothness measurements will be expressed in terms of the International Roughness Index (IRI) as defined by the World Bank, in units of inches/mile.

402.02 Lot Size Lot size for smoothness will be 3000 lane-feet. A sublot will consist of 50 lane-feet. Partial lots will be included in the previous lot if less than one-half the size of a normal lot. If equal to or greater than one-half the normal lot size, it will be tested as a separate lot.

402.03 Acceptance Testing The Department will conduct Acceptance testing following completion of the surface course. Sections to be excluded from testing include the following:

Bridge decks and joints (no smoothness measurements will be taken within 100 ft of bridge joints)
Acceleration and deceleration lanes
Shoulders and ramps
Side streets and roads
Within 100 ft of transverse joints at the beginning and end of the project
Within 100 ft of railroad crossings
Urban areas with speed limits of 30 mph or lower

Each lot shall have 2 measurements made in each wheel path. The average of the 4 measurements will determine the smoothness for that lot. The smoothness measurements will be statistically evaluated for pay factors as described in Subsection 106.7 - Quality Level Analysis, using the specification limits shown below.

TABLE 1: ACCEPTANCE LIMITS

Level	**USL**
I	55 in/mile
II	65 in/mile
III	75 in/mile

Computation of Smoothness Pay Adjustment:

PA = (PF-1.0)(Q)(P)
where:
Q = Quantity of surface course in the Lot (excluding shoulders, side streets, bridge decks, ramps, acceleration and deceleration lanes)
PF = smoothness pay factor for the Lot
P = Contract unit price for surface pavement
PA = pay adjustment

402.04 Unacceptable Work In the event that any Lot is found to have a pay factor less than 0.80, the Contractor shall take whatever remedial action is required to correct the pavement surface in that Lot at no additional expense to the Department. Such remedial action may include but is not limited to removal and replacement of the unacceptable pavement. In the event remedial action is necessary, the Contractor shall submit a written plan to the Resident outlining the scope of the remedial work. The Resident must approve this plan before the remedial work can begin. Following remedial work, the Lot shall be retested, and will be subject to the specification limits listed above. The resulting pay factor, if within the acceptable range, will be used in the final pay adjustment. The Contractor shall pay the cost of retesting the pavement following corrective action.

Localized surface tolerance defects will be subject to the provisions outlined in Section 401.11 Surface Tolerances.

Payment will be made under:

Pay Item		Pay Unit
402.10	Incentive/Disincentive - Pavement Smoothness	Lump Sum

SECTION 403 - HOT MIX ASPHALT PAVEMENT

403.01 Description This work shall consist of constructing one or more courses of Hot Mix Asphalt pavement on an approved base in accordance with these specifications, and in reasonably close conformity with the lines, grades, thickness and typical cross sections shown on the plans or established. The HMA pavement shall be composed of a mixture of aggregate, filler if required, and asphalt material.

403.02 General The materials and their use shall conform to the requirements of Section 401 - Hot Mix Asphalt Pavement.

403.03 Construction The construction requirements shall be as specified in Section 401 - Hot Mix Asphalt Pavement.

403.04 Method of Measurement Hot mix asphalt pavement will be measured as specified in Section 401.21- Method of Measurement.

403.05 Basis of Payment The accepted quantities of hot mix asphalt pavement will be paid for at the contract unit price per ton for the mixtures, including hot mix asphalt material complete in place. Method A, Method B, Method C and Method D shall be used for acceptance as specified in Section 401 - Hot Mix Asphalt Pavements. (See Complementary Notes, Section 403 - Hot Mix Asphalt Pavement, for Method location).

Payment will be made under:

Pay Item		Pay Unit
403.102	Hot Mix Asphalt Pavement for Special Areas	Ton
403.206	Hot Mix Asphalt, 25 mm Nominal Maximum Size	Ton
403.207	Hot Mix Asphalt, 19.0 mm Nominal Maximum Size	Ton
403.2071	Hot Mix Asphalt, 19.0 mm Nominal Maximum Size (Polymer Modified)	Ton
403.2072	Asphalt Rich Hot Mix Asphalt, 19.0 mm Nominal Maximum Size (Asphalt Rich Base and Intermediate course)	Ton
403.208	Hot Mix Asphalt, 12.5 mm Nominal Maximum Size	Ton
403.2081	Hot Mix Asphalt - 12.5 mm Nominal Maximum Size (Polymer Modified)	Ton
403.209	Hot Mix Asphalt, 9.5 mm Nominal Maximum Size (Sidewalks, Drives, Islands & Incidentals)	Ton
403.210	Hot Mix Asphalt, 9.5 mm Nominal Maximum Size	Ton
403.2101	Hot Mix Asphalt, 9.5 mm Nominal Maximum Size (Polymer Modified)	Ton
403.2104	Hot Mix Asphalt, 9.5 mm Nominal Maximum Size (Thin Lift Surface Treatment)	Ton
403.211	Hot Mix Asphalt, 9.5 mm Nominal Maximum Size (Shimming)	Ton

403.2111	Hot Mix Asphalt, 9.5 mm Nominal Maximum Size (Shimming, Polymer Modified))	Ton
403.212	Hot Mix Asphalt, 4.75 mm Nominal Maximum Size	Ton
403.213	Hot Mix Asphalt, 12.5 mm Nominal Maximum Size (Base and Intermediate Base course)	Ton
403.2131	Hot Mix Asphalt, 12.5 mm Nominal Maximum Size (Base and Intermediate Base course, Polymer Modified)	Ton
403.2132	Asphalt Rich Hot Mix Asphalt, 12.5 mm Nominal Maximum Size (Base and Intermediate Base course)	Ton
403.214	Hot Mix Asphalt, 4.75 Nominal Maximum Size (5/8” Surface Treatment)	Ton

SPECIAL PROVISION
DIVISION 400
PAVEMENTS

SECTION 401 - HOT MIX ASPHALT PAVEMENT
(HMA-ARGG Hamburg Wheel Tracker Specification)

The Special Provision 400 – Pavements; Section 401 – Hot Mix Asphalt Pavements; the following subsections have been modified with the following:

401.03 Composition of Mixtures The Contractor shall compose the Asphalt Rubber Gap-Graded Hot Mix Asphalt Pavement (HMA-ARGG) with aggregate, Performance Graded Asphalt Binder (PGAB), and mineral filler if required. HMA shall be designed and tested according to AASHTO R35 and the volumetric criteria in Table 1.

The Contractor shall submit for Department approval a JMF to the Asphalt Pavement Engineer for each mixture to be supplied. The Department shall then have 15 calendar days in which to process a new design before approval, not including time needed for Hamburg Wheel Tracker verification testing. The JMF will be approved by the Department in accordance with the MaineDOT HMA Policies and Procedures for HMA Sampling and Testing Manual. Before the start of paving, the Contractor shall provide the Department with eight boxes of plant produced HMA. The Contractor shall test its split of the sample and determine if the results meet the requirements of the Department's written policy for mix design verification (See Maine DOT Policies and Procedures for HMA Sampling and Testing). If the results are found to be acceptable, the Contractor will forward their results to the Department's Lab, which will test the Department's split of the sample. The results of the two split samples will be compared and shared between the Department and the Contractor. If the HMA meets the requirements for mix design verification, the mixture will be tested for rutting and moisture sensitivity in the Hamburg Wheel Tracker according to AASHTO T324, "Hamburg Wheel-Track Testing of Hot Mix Asphalt (HMA)." The sample will be required to meet the applicable requirements of Table 1A below for approval, depending on the PG binder grade required by the 403 Special Provision. If the sample meets the requirements of Table 1A, an approved JMF will be forwarded to the Contractor and paving may commence. The Department will have five business days from receipt of the sample at the Central Laboratory to process, test, and report the Hamburg Wheel Tracker sample. The first day's production shall be monitored, and the approval may be withdrawn if the mixture exhibits undesirable characteristics such as checking, shoving or displacement.

TABLE 1A: HAMBURG WHEEL TRACKER REQUIREMENTS

Specified PG Binder Grade	Test Temperature (°C)	Maximum Rut Depth (mm)	Minimum Number of Passes	Minimum Allowable SIP*
HMA-ARGG	50	12.5	20,000	15,000

* As calculated by the most recently published version of the MaineDOT HWT worksheet, which is available online at http://www.maine.gov/mdot/contractors/publications/

401.18 Quality Control Method A, B & C The following language has been added to Section 401.18:

The project specific QCP shall address the sampling, transport, and testing of Hamburg Wheel Tracker QC samples and what potential steps will be taken if QC samples do not meet the requirements in Table 1A.The project-specific QCP shall also contain a sample Hamburg Wheel Tracker test report for approval. The Contractor shall sample and test HMA Pavement in the Hamburg Wheel Tracker according to AASHTO T324 in accordance with the following minimum frequencies:

TABLE 2A: MINIMUM QUALITY CONTROL FREQUENCIES

Test or Action	Frequency	Test Method
Hamburg Wheel Tracker	1 per 4,000 ton and at least once per Acceptance Lot	AASHTO T 324

The Contractor shall sample the HMA on the first day of production and test the sample in the Hamburg Wheel Tracker according to AASHTO T324. This sample will not count towards the minimum quality control frequency specified in Table 2A. The Contractor shall submit all Hamburg Wheel Tracker test reports in writing, signed by the appropriate technician and present them to the Department within ten working days of initial sampling, except when otherwise noted in the project specific QCP due to local restrictions. The Contractor shall make the raw Hamburg Wheel Tracker data from QC samples available to the Department upon request. If a QC sample fails to meet the criteria in Table 1A, the Contractor will be required to submit a corrective action letter to the Resident, Materials Engineer, Pavement Quality Manager, and Pavement Quality Engineer by the end of the following working day with the proposed changes to bring the mixture back into compliance. The Department will respond and either accept or reject the Contractor's proposed corrective action by the end of the following working day from when the letter was received.

The Department will sample and test the HMA during production to verify compliance with the Hamburg Wheel Tracker Requirements. If a verification sample fails to meet the criteria in Table 1A, the Contractor will be required to submit a corrective action letter to the Resident, Materials Engineer, Pavement Quality Manager, and Pavement Quality Engineer by the end of the following working day with the proposed changes to bring the mixture back into compliance. The Department will respond and either accept or reject the Contractor's proposed corrective action by the end of the following working day from when the letter was received.

SPECIAL PROVISION

SECTION 403
HOT MIX ASPHALT PAVEMENT

Desc. Of Course	Grad Design.	Item Number	Total Thick	No. Of Layers	Comp. Notes
3" – International Bridge Deck					
Wearing	12.5 mm	403.2081	1½"	1	2,4,7,12,17,28,30
Base	12.5 mm	403.2081	1½"	1	2,4,7,12,17,28,30

COMPLEMENTARY NOTES

2. The incentive/disincentive provisions for density shall not apply. A **Quality Control Technician (QCT) equipped with a density meter** shall be required for all roadway mixtures placed under this contract. Rollers shall meet the requirements of section 401.10 Rollers and this special provision. The use of an oscillating steel roller shall be required to compact all mixtures pavements placed on bridge decks.
4. The design traffic level for mix placed shall be 0 to <3 million ESALS. The design, verification, Quality Control, and Acceptance tests for this mix will be performed at **65 gyrations**.
7. Section 106.6 Acceptance, (1) Method A.
12. The combined aggregate gradation required for this item shall be classified as a 12.5mm "**fine graded "** mixture, (using the Primary Control Sieve control point) as defined in 703.09.
17. Compaction of the new Hot Mix Asphalt Pavement will be obtained using a minimal roller train consisting of a **10 ton** vibratory**, 12 ton** pneumatic, and a **10 ton** finish roller for roadway work. Density testing of the mixture will be performed by the QCT using a density meter (according to ASTM D 2950). The mixture will be rolled until the density readings show less than 1 pcf change for the final roller passes. This density will be used as the target TMD for the mixture. The remaining mixture shall be compacted to a minimum density of 95% of the target density as determined in the control section. The Contractor shall make density test results, including randomly sampled densities, available to the Department's representative onsite. Summaries of each day's results, including a daily paving report, summarizing the mixture type, mixture temperature, equipment used, environmental conditions, and number of roller passes, shall be recorded and signed by the QCT and presented to the Department's representative by the end of the working day. The Department may require cores for informational purposes.
28. The mixture shall meet the minimum requirements of Special Provision 401 – HMA Hamburg Wheel Tracker Specification.
30. The required PGAB shall be a storage-stable, homogeneous, polymer modified asphalt binder that meets **PG 64E-28** grading requirements in AASHTO M 332. All polymer modified asphalt grades utilized on the Project shall be treated with an approved liquid anti-strip. PG binders shall be treated either at the asphalt source terminal with the required dose rate on the delivery documentation, or at the hot mix asphalt plant utilizing a system integrated with the plants controls that will introduce a minimum 0.50 percent anti-strip by weight of asphalt binder used unless a rate is otherwise recommended by the anti-strip manufacturer. The PGAB and anti-strip blend shall meet the **PG 64E-28** requirements. The Contractor shall provide supporting test data showing the PGAB and anti-strip blend meet the required criteria.

Tack Coat

A tack coat of emulsified asphalt, RS-1, RS-1h, CRS-1 or CRS-1h, Item 409.15 shall be applied to any existing pavement at a rate of approximately 0.030 gal/yd², and on milled pavement approximately 0.05 gal/yd² prior to placing a new course. A fog coat of emulsified asphalt shall be applied between shim /base courses and surface course as well as to any bridge membrane prior to the placement of HMA layers at a rate not to exceed 0.030 gal/yd². Tack used will be paid for at the contract unit price for Item 409.15 Bituminous Tack Coat.

SPECIAL PROVISION
SECTION 501
FOUNDATION PILES
(Drilled Shafts)

Specification Section 501 - Foundation Piles is amended by the addition of the following:

501.01 Description

This work shall consist of all labor, materials, equipment and services necessary to perform all operations to complete the drilled shaft installation. Drilled shafts shall consist of reinforced concrete with permanent steel casing seated in bedrock.

501.011 Definitions

Drilled Shaft. Deep foundation element constructed by excavating soil and bedrock and backfilling with cast-in-place concrete reinforced with a reinforcing steel cage.

Drilled Shaft Rock Socket. The top of the drilled shaft rock socket and minimum rock socket length are shown on the Plans. The top of the drilled shaft rock socket is coincident with the bottom of the permanent casing and is defined as elevation "TOR". The bottom of the drilled shaft rock socket is defined as elevation "BOR" and is based on the minimum required socket length. The "TOR" and "BOR" elevations may be modified by the Resident based on the results of confirmation coring. The diameter of the rock socket shall be as shown on the Plans.

Drilled Shaft Earth Excavation Earth excavation is excavation accomplished with conventional tools such as augers fitted with either soil or rock teeth, drilling buckets, and over reaming (aside) buckets attached to drilling equipment of the size, power, torque, and down thrust (crowd) approved for use by the Resident.

Obstructions. Obstructions are defined as man-made materials, stones, and other materials or debris, or as natural material such as boulders, that require the use of special procedures and/or tools by the Contractor when the hole advancement slows to less than 10 percent of the normal hole advancement rate while using conventional augers fitted with soil or rock teeth, drilling buckets, core barrels, and/or under-reaming tools. Surficial boulders, riprap, stumps, or other visible debris shall be removed prior to placing casing and are not considered obstructions. Drilling tools or parts thereof that are lost in the excavation shall not be considered obstructions and shall be promptly removed by the Contractor without compensation.

Top of Rock. The depth in a test boring below which continuous bedrock is penetrated using a rock core bit. Weathered rock shall not be considered Top of Rock. Where sloping rock conditions are encountered, the top of rock shall be considered as the point to which permanent casing must be advanced to achieve bedrock bearing around its full circumference.

The Top of Rock elevations at the available test borings within each substructure location are shown on the Plans and on the boring logs. These data consist of a limited number of widely spaced borings; therefore, actual conditions will vary. The Contractor is responsible for the means and methods of excavating the rock sockets for the drilled shafts.

Sloping Rock. Sloping rock is defined as a change in top of rock elevation exceeding 1.5 feet in any direction across the diameter of the permanent casing. A potential sloping rock condition will be initially determined within a pile cap based on interpolation of the top of rock elevations encountered in the design phase borings and construction confirmation borings. If the Contractor believes that sloping rock is present, they are required to probe using cased wash test boring procedures and roller cone advancement along the perimeter of the permanent casing of each shaft in at least two locations to determine if the minimum rock elevation difference exists. Roller cone advancement rate per minute shall be recorded to assess the top of rock elevation.

501.02 Materials

Provide materials for constructing drilled shafts as follows:

1. All reinforcing steel shall conform to the Standard Specifications and Plans except as modified and supplemented herein.
2. Concrete with a minimum 28-day compressive strength of 4,000 psi and a maximum aggregate size of 1/2-inch.
3. Steel for the permanent drilled shaft casings with a minimum thickness of 3/4-inch and conforming to ASTM A-252, Grade 3.
4. Schedule 40 black steel pipe shall be used for Crosshole Sonic Logging (CSL) Tubing.
5. Sand-cement grout to fill in CSL tubes and core holes in concrete. Sand-cement grout shall consist of Portland cement, ASTM C150, Type II; clean natural sand, ASTM C404; and water to result in grout with a minimum 28-day compressive strength of 5,000 psi.

501.03 Qualifications and Submittals

The Contractor performing the work described in this specification shall have installed drilled shafts of similar diameter, length, difficulty of installation, and subsurface conditions to those shown on the Plans for a minimum of five years prior to the bid date for this project.

No later than sixty (60) Days prior to the start of installation of the Drilled Shafts, the Contractor performing the work described in this Special Provision shall submit:

1. A list containing at least three projects completed in the last five years on which the Contractor installed drilled shafts of a similar diameter, length, and of similar difficulty and subsurface conditions, to those shown on the Plans. The Contractor's experience list shall include at least one project where drilled shafts were installed over a body of water from temporary working platform. The list of projects shall contain names and phone numbers of owner's representatives who can verify the Contractors participation on those

projects.

2. A signed statement that the Contractor has inspected both the project site and all the subsurface information including any soil or rock logs made available in the contract documents.

The Resident shall approve or reject the Contractor's qualifications and staff within fourteen (14) Working Days after receipt of the submission.

The Contractor will not be allowed to begin work until all related submittal requirements are satisfied and found acceptable to the Resident. At least sixty (60) days prior to start of installation of drilled shafts, the Contractor shall prepare and submit a Drilled Shaft Installation Plan. All submittals will be reviewed by the Resident in accordance with Standard Specification Section 105.7, Working Drawings. This plan shall, at a minimum, provide information on the following:

1. Qualifications
    - Name and experience record of the Contractor's Drilled Shaft On-site Supervisor in charge of drilled shaft operations for this project. The on-site supervisor shall have at least five years' experience in drilled shaft construction.
    - Qualifications of the Contractor's Drilled Shaft Inspector. The inspector shall have a minimum five years' experience in drilled shaft inspection.
    - Qualifications of the driller engaged by the Contractor to perform the confirmatory core borings.
    - Qualifications of the driller engaged by the Contractor to perform the coring of drilled shafts.
    - Name and experience of the Contractor's independent special testing firm(s) to supply equipment and personnel to conduct CSL testing and drilled shaft inspection device testing of the drilled shafts.
2. Details of overall construction operation sequence and the sequence of shaft construction, including descriptions of construction staging and installation methods used to deal with variable river levels, strong currents and strong wind/wave action.
3. The drilled shaft Contractor's quality control plan, including methods to monitor the shaft installations to determine that they are installed in accordance with this Special Provision. Provide sample inspection forms, including at a minimum: drilled shaft soil and rock excavation log, obstruction log, drilled shaft inspection log, drilled shaft inspection device log, concrete placement log, and concrete placement form with concrete volume curve.
4. List of proposed equipment to be used including temporary work platforms or trestles, cranes, barges, falsework, drills, augers, baling buckets, final cleaning equipment, core sampling equipment, tremies or concrete pumps, casing, etc. Include a review of equipment suitability based on the Contractor's understanding of site and subsurface conditions.

5. If temporary casing is proposed, include dimensions and detailed procedures for installation and removal.
6. Details of shaft excavation methods in soils and rock, including methods for seating the casing in sloping bedrock, methods for excavating sloping bedrock, methods of maintaining shaft vertical and horizontal alignment, methods of advancing casing, methods of removing any potential obstructions, and methods for maintaining a positive head of fluid in the shaft during excavation and in shafts left open overnight or over an extended period of time.
7. Details of methods to advance permanent casing several feet into rock as may be necessary to develop a positive seal for rock socket drilling.
8. Methods of handling and disposition of drilling fluids, spoil materials, and contaminated/excess concrete. Discharge of such into any water body is prohibited.
9. Methods and procedures to clean the bottom of the drilled shaft excavations and determine the thickness of sediment in the bottom of drilled shafts. Also describe methods and procedures to determine length, diameter and alignment of the rock socket, and the cleanliness and soundness of the rock socket bearing surface.
10. Details of the drilled shaft inspection device to be used to inspect the bearing surface at each shaft. The drilled shaft inspection device shall be capable of measuring the sediment thickness on the bottom of the rock socket and viewing and recording the condition of the bottom of the prepared rock socket.
11. Details of reinforcement placement including support, centralization materials/methods and concrete reinforcement cage supports at bottom of socket.
12. The concrete mix design, including admixtures (if any) to be used, and details of concrete placement, curing and protection.
13. Details of concrete placement including proposed equipment and operational procedures for tremie methods (and pumping, if approved by the Resident).
14. Details for CSL testing.
15. All of the above submittal information shall be provided in a single comprehensive package to the Resident for review.

Prior to commencement of drilled shaft construction, the Contractor shall arrange for and conduct a drilled shaft pre-construction meeting. At a minimum, attendees shall include the Resident, the Geotechnical Engineer, the Contractor's Drilled Shaft On-site Supervisor and the Contractor's Drilled Shaft Inspector.

The Contractor shall submit confirmatory core boring logs for each pier a minimum of seven (7) days before commencement of drilled shafts at that pier in accordance with Subsection 501.04 Confirmatory Core Borings.

After commencement of drilled shaft construction, submit drilled shaft installation logs, drilled shaft testing data and reports and concrete coring logs within 48 hours of completion of the given activity in accordance with the following Subsections:

- 501.043 Installation Inspection – Drilled shaft installation logs
- 501.047 Non-Destructive Testing (paragraph Crosshole Sonic Logging) – Drilled shaft testing data and reports
- 501.047 Non-Destructive Testing (paragraph Core Drilling of Drilled Shaft Concrete) – Concrete coring logs

501.04 Construction Requirements

501.041 Confirmatory Core Borings

To confirm the depth and nature of the bedrock at some of the proposed shaft locations, the Contractor shall take confirmatory core borings (rock cores) prior to commencement of drilled shaft foundation installation at the following minimum locations:

Pier	Number of Confirmation Borings	Coordinates (Northing, Easting [feet]) and *Verbal Description*	Required Minimum Core Depth(s)
1	2	1285746, 2182993 1285769, 2183018 *Shaft locations at opposite corners of cap*	1 @ 20 feet 1 @ 5 feet
2	1	1285954, 2183236 *Shaft furthest from Design Phase boring*	5 feet
3	1	1286168, 2183468 *Shaft furthest from Design Phase boring*	5 feet
4	2	1286399, 2183683 1286398, 2183717 *Shaft locations at opposite corners of cap*	1 @ 20 feet 1 @ 5 feet
5	3	1286613, 2183914 1286596, 2183930 1286630, 2183932 *3 Shafts furthest from Design Phase boring*	5 feet each

Confirmatory core borings will be completed at additional locations as directed by the Resident or their Agent. The Contractor shall collect rock cores continuously. At all confirmatory borings, except for Pier 4 upstream, the Contractor shall cut rock cores to the minimum depths below the top of bedrock presented in the table above and continue until at least two (2) consecutive feet of rock having a Rock Quality Designation (RQD) value of 25 percent or greater is encountered. Calculation of minimum RQD shall consist of at least two pieces of rock core greater than 4 inches long in the final 2 feet of the core.

Borings shall be advanced to bedrock by driving or spinning casing and washing. Casing shall have a minimum outside diameter (O.D.) of 3.5-inches. Minimum NQ2-size rock cores shall be cut with a double or triple tube core barrel. Bedrock shall be drilled and cores recovered, stored, and transported in accordance with ASTM D2113 and D5079 "Routine Level" of care. Rock core shall be measured, visually identified and described on a boring log form accepted by the Resident.

The Contractor shall provide access to the Resident or their Agent to the drilling operation to allow for borehole observation and logging, and measurement of RQD from the rock core samples. The Contractor shall give a minimum 72-hour notice to the Resident prior to starting the drilling operation. The top of rock at a given drilled shaft location shall be based on the results of the confirmatory core borings and existing borings. The Resident will be the sole judge as to the classification of rock encountered during drilling of the confirmatory borings, including the quality of the rock, depth to top of rock, and elevation of top of rock.

The core samples shall be placed in suitable wooden boxes with hinged box covers, divided into separate compartments for individual core runs, identified by shaft location, elevation, and project number and delivered with the Contractor's field log to the Resident within 24 hours after the exploration is completed. If the encountered rock conditions are not consistent with design assumptions, the Resident may require the Contractor to collect additional core samples at depths greater than the bottom of the proposed rock sockets. The Resident or their Agent will review the field logs and cores and determine the final depth of required excavation based on the quality of rock encountered in the borings and advise the Contractor of any adjustments to the rock socket lengths shown on the Plans within three (3) days of receipt of the confirmation core logs.

501.042 Drilled Shaft Construction

Construction Control The Contractor shall control their operations to prevent damage to existing structures and utilities. Preventive measures shall include, but are not limited to, selecting construction methods and procedures that will prevent caving of the shaft excavation, monitoring and controlling vibrations from construction activities such as the driving of casing or sheeting, or drilling of the shaft or socket.

Excavation and Drilling Equipment The Contractor shall perform the excavations required for shafts, through whatever materials are encountered, to the dimensions and elevations shown in the Plans or otherwise required by the Specifications and Special Provisions. The Contractor's methods and equipment shall be suitable for the intended purpose and materials encountered. Blasting shall not be permitted.

Shaft excavations shall be made at locations and to the elevations, shaft geometry and dimensions shown on the Plans unless modified by the Resident. The Contractor shall extend the drilled shaft tip elevations when the Resident determines that the material encountered during excavation is unsuitable or differs from that anticipated in the design of the drilled shaft.

The excavation and drilling equipment shall have adequate capacity including power, torque and down thrust to excavate a hole of both the diameter and to a depth of 20 percent beyond what is the Plans.

Excavated solid and fluid materials which are removed from shaft excavations shall be reused on site as shown on the Plans or legally disposed of by the Contractor in accordance with all applicable local, state, and federal laws. No direct discharge of drill water, cuttings, or other spoils into any water body shall be allowed.

Construction activities, including drilling, within a radius of three shaft diameters of the center of a newly concreted drilled shaft shall not be permitted until the concrete has been in place for at least 72 hours and at the acceptance of the Resident.

Drilled Shaft Rock Socket Excavation The Resident may modify the elevation "TOR" and/or elevation "BOR" and the length of the rock socket based on results of the confirmatory core borings conducted as a part of this work. Such changes will also apply to the pay quantities for related items.

After removal of the overburden from within the casing, the casing shall be further advanced into bedrock, as shown on the Plans or directed by the Resident, or if necessary to achieve sealing against the entry of overburden. Then the excavation shall continue into rock below the casing as an uncased rock socket of the length and diameter indicated on the Plans. The inside surface of the casing shall be cleaned free of extraneous material prior to placing the concrete. The rock socket shall not be constructed until the casing is seated in the rock and until the casing has been checked for plumbness by the Contractor to the satisfaction of the Resident. The Contractor shall use a method of rock socket excavation that is capable of providing a cylindrical opening of the specific diameter and to the full depth shown on the Plans or to the depth directed by the Resident. Excavation shall not result in overbreakage of the rock surface, or compromise the seal at the bottom of the steel casing. The methods of excavating the rock socket shall be controlled to prevent undercutting of the steel casing.

Blasting will not be allowed under this contract to excavate the rock for shafts.

Sloping Rock If sloping rock is present as defined herein, the Contractor shall notify the Resident if the rock needs to be leveled before the permanent casing can be advanced.

Obstructions The Contractor shall remove surface and subsurface obstructions at drilled shaft locations. Man-made obstructions have not been identified at the site. The Contractor shall employ special procedures and/or tools if the hole advancement slows to less than 10 percent of the normal hole advancement rate using conventional augers fitted with soil or rock teeth, drilling buckets, core barrels and/or under reaming (aside) tools. The normal advancement rate shall be determined based on the Contractor's drill logs that record shaft excavation depths as a function of time. The Contractor shall make a good faith effort to penetrate through potential obstructions using conventional tooling/drilling methods. Special procedures/tools may include but are not limited

to: chisels, boulder breakers, air tools, hand excavation, temporary casing, and increasing the hole diameter. Blasting will not be permitted.

When suspected obstructions are encountered, the Contractor shall notify the Resident and recommend a course of action to advance the drill hole in an expedient manner. The Resident shall determine if an obstruction has been encountered.

Permanent Casing Permanent casing shall be used at the locations shown on the Plans. The casing shall be continuous between the top and bottom elevations (at a minimum) shown on the Plans. After installation is complete, the permanent casing shall be cut off at the elevation shown on the Plans and the shaft completed by installing necessary reinforcing steel and concrete in the casing. Open hole excavation for shafts will not be allowed.

Permanent steel casings shall be provided to aid shaft alignment and position, to prevent sloughing of the top of the shaft excavation and to prevent excessive deformation around the hole. The casing shall be advanced through the ground by spinning and/or vibrating before being cleaned out to a depth below TOR as they deem necessary to maintain a stable excavation and facilitate construction of the sockets. The casing shall be installed in a manner that will produce a positive seal at the bottom of the casing so that no piping of water or other materials occurs into or from the shaft excavation. The Contractor shall be responsible for providing equipment and tooling with the ability to seat the casing in sloping bedrock, if encountered, to provide a stable rock socket.

Casings may be seamless or have straight or spiral butt-welded seams. Lap welded seams are not acceptable. Casing material shall be permanent and shall conform to the dimensions and material requirements shown on the Plans. Casings shall be steel, smooth, clean, and of ample strength to withstand both handling and driving stresses and the pressure of both concrete and the surrounding earth materials. Permanent casing thickness and the inside diameter of casing shall not be less than that shown on the Plans. The Contractor shall determine the actual thickness and inside diameter of the casing needed to safely advance and seat the casing into rock without overstressing and damaging the casing. Temporary casing, if used, shall be removed from shaft excavations. Permanent casing shall not be retracted from the deepest installed tip elevation.

The procedures and methods to install the steel casings shall not damage the casing. After installation, each casing shall be inspected using methods proposed in the accepted Contractor's Drilled Shaft Installation Plan (refer to Subsection 501.03 above). Any casing that shows bends or kinks or other deformations that would impair the strength or efficiency of the completed shaft shall be replaced or repaired in a manner satisfactory to the Resident.

Temporary Casing All subsurface casing shall be considered temporary unless specifically shown as permanent casing on the Plans. The Contractor shall be required to remove temporary casing before completion of concreting the drilled shaft.

If the Contractor elects to remove a casing and substitute a longer or larger diameter casing through caving soils, the excavation shall be backfilled up to ground level before the existing casing is

removed and replaced. Other methods, as approved by the Resident, may be used to control the stability of the excavation and protect the integrity of the foundation soils.

Temporary casings which become bound or fouled during shaft construction and cannot be practically removed shall constitute a defect in the drilled shaft. The Contractor shall be responsible to improve such defective shafts to the satisfaction of the Resident. Such improvements may consist of, but are not limited to, removing the shaft concrete and extending the shaft deeper to compensate for loss of frictional capacity in the cased zone, providing straddle shafts to compensate for capacity loss, or providing a replacement shaft. All corrective measures including redesign of drilled shaft transition to the column caused by defective shafts shall be done to the satisfaction of the Resident, by the Contractor, without either compensation or an extension of the completion date of the project.

Drilling Fluid Drilling fluid shall consist of river water. Drilling slurry shall not be used for this project.

Each drilled shaft excavation shall be filled and maintained with drilling fluid at all times. Drilling fluid shall be added to the excavation as necessary to maintain a positive head above the existing water elevation in the surrounding water body.

501.043 Installation Inspection

The drilled shaft installation shall be inspected by the Contractor. The Department or their agent will also inspect the drilled shaft installation and record installation data/information. The Contractor shall keep a daily construction record.

For each drilled shaft foundation installed, record on the drilled shaft installation logs:

- shaft number and location
- names of driller, superintendent, and engineer
- make and model of drill rig and ancillary equipment
- dates and times of the start and completion of all activities, including interruptions to the work
- weather conditions
- shaft excavation dimensions
- elevations of top and bottom of temporary and permanent casings
- depth/elevation of Top of Rock
- description of materials encountered at particular depths/elevations and drill tools used to excavate the shaft at all elevations
- horizontal and vertical alignment, including the results of verticality testing during shaft excavation
- condition of bottom of excavation upon completion of excavation, prior to placement of steel reinforcement, and prior to placement of concrete
- verticality and deviation from plan location
- the theoretical volume of excavation, volume of concrete placed vs. depth, and total volume

of concrete placed. Report observed irregularities to the Department or their agent within 24 hours of discovery. Provide a chart of concrete volume placed versus theoretical and actual rise of concrete in the shaft during placement.

- other pertinent data relevant to installation of the drilled shaft

Refer to FHWA-NHI-18-024, GEC 010 “Drilled Shafts: Construction Procedures and Design Methods” for minimum record keeping information.

Submit draft record information for each completed shaft weekly. Submit final record of each drilled shaft installed no more than three weeks after completion of the Work.

The Contractor shall provide access to the Department or their agent at all times during shaft installation to allow the Department or their agent to make observations and/or measurements. Casing installation, shaft excavation, rock socket inspection, reinforcing installation, concrete placement and non-destructive shaft testing shall only be performed when the Department or their agent is present at the shaft location. The Contractor shall also provide equipment for checking the dimensions and alignment of each shaft excavation and for evaluation of the rock socket. Final shaft depths will be measured by the Department or their agent after final cleaning. A minimum of 50 percent of the base of each shaft shall have less than 1 inch of sediment at the time of placement of the concrete. The maximum thickness of sediment or debris at any place at the base of the socket shall not exceed 1.5 inches. The Department or their agent will determine if shaft cleanliness requirements are met using methods deemed appropriate to the Department or their agent for wet shafts including but not limited to probing and underwater inspections (see below).

The Contractor shall provide equipment for checking the length of each rock socket and alignment of each installed permanent casing using means approved by the Resident. Electronic measuring equipment may be used, but is not required. The Department or their agent will measure the final bottom of socket depth after cleaning. Prior to the placement of underwater concrete and prior to making final measurements of bottom of rock socket (by Department or their agent), the Contractor shall use an approved drilled shaft inspection device as outlined in Contractor Submittal to provide a comprehensive underwater inspection of the prepared rock socket bearing surface at each shaft. The Contractor shall record drilled shaft inspection device observations on reliable digital media. The date, shaft number, and camera position shall be recorded. Copies of all data (written, electronic, DVDs, digital files, etc.) obtained during inspections shall be submitted to the Resident for review and become property of the Department.

The Contractor shall provide and maintain facilities for the Department or their agent to inspect each drilled shaft as needed during advancement of the excavation, to evaluate conditions at the bottom of shaft excavation immediately prior to placing reinforcing steel, and if requested by the Department or their agent, prior to placement of drilled shaft concrete. Concrete placement shall not begin until all inspection reports related to drilled shaft excavation, tolerances, drilled shaft excavation soundness and cleanliness, including drilled shaft inspection device records, are submitted to the Resident and the Resident’s acceptance has been obtained.

501.044 Construction Tolerances

The following construction tolerances apply to drilled shafts unless otherwise stated in the contract documents:

1. The drilled shaft shall be within 2 inches of plan position in the horizontal plane at the plan elevation for the top of the shaft.
2. The vertical alignment of a vertical shaft excavation shall not vary from the plan alignment by more than ¼ inch per foot of depth.
3. After all the concrete is placed, the top of the reinforcing steel cage shall be no more than 6 inches above and no more than 3 inches below plan position.
4. Reinforcing steel bars shall be placed to meet the minimum cover shown on the Plans.
5. All casing diameters shown on the Plans refer to I.D. (inside diameter) dimensions. The dimensions of casings are subject to American Pipe Institute tolerances applicable to regular steel pipe. When approved by the Resident, the Contractor may provide a casing larger in diameter than shown on the Plans.
6. The rock socket length of the shaft shall have a tolerance of minus 3 inches from the plan dimension of the shaft.
7. Excavation equipment and methods shall result in a completed shaft excavation with a planar bottom. The cutting edges of excavation equipment shall be normal to the vertical axis of the equipment within a tolerance of +/- 3/8 inch per foot of diameter.

Drilled shaft excavations and completed shafts not constructed within the required tolerances are unacceptable. The Contractor shall be responsible for correcting all unacceptable shaft excavations and completed shafts to the satisfaction of the Resident.

501.045 Reinforcing Steel Cage Materials, Construction and Placement

Reinforcing steel for drilled shafts shall be as noted on the Plans and conform to the Specifications and Plans.

The reinforcing steel cage, consisting of longitudinal bars, couplers, spirals, ties, cage stiffener bars, spacers, centralizers, CSL tubes, and other necessary appurtenances, shall be completely assembled and placed as a unit immediately after the shaft excavation is inspected and accepted, and prior to concrete placement. The reinforcing steel cage and concrete shall be placed within 48 hours of the last sounding/inspection by the Department or their agent.

Hooks at the top of the rebar cage should not be bent outward if there is any chance that temporary casing will be used. Interior hooks must be designed to permit adequate clearance for a concrete tremie pipe with a minimum 12 inch diameter.

Tie and support reinforcing steel in the shaft so that the reinforcing steel will remain within the allowable tolerances given above. Use concrete spacers or other approved non-corrosive spacing devices at sufficient intervals (near the bottom and at intervals not exceeding 10 feet up the shaft)

to ensure concentric spacing for the entire cage length. Spacers shall be equal in quality and durability to the concrete specified for the shaft. The spacers shall be of adequate dimension to insure a minimum 3 inch concrete cover between the reinforcing cage and the sidewalls of the rock socket. Provide cylindrical concrete feet (bottom supports), or other means to ensure that the bottom of the cage is maintained the proper distance above the bottom of the rock socket and shall be as accepted by the Resident in the Drilled Shaft Installation Plan (refer to Subsection 501.03 above).

Check the elevation of the top of the steel cage before and after the concrete is placed. If the rebar cage is not maintained within the specified tolerances, corrections shall be made by the Contractor to the satisfaction of the Resident. No additional shafts shall be constructed until the Contractor has modified the rebar cage support in a manner satisfactory to the Resident.

If the bottom of the constructed shaft is lower than the bottom of the shaft shown on the Plans or as determined by the confirmatory core borings, the Contractor shall submit a detail sketch drawing that clearly shows a proposed method for maintaining the reinforcing cage in the design location.

Dropping or forcing reinforcing steel into the shaft shall not be permitted. If the reinforcing steel does not properly or smoothly enter the excavation, the Contractor shall pull the cage and adjust and properly clean the excavation until the reinforcing fits smoothly.

501.046 Concrete: Material and Placement

The Contractor has the option to propose self-consolidating concrete (SCC) for drilled shafts. If the Contractor chooses to use SCC for drilled shafts, the SCC shall conform to the requirements stated herein. SCC shall meet the requirements for strength, entrained air and permeability for Class A concrete. SCC shall be tested for slump flow in accordance with ASTM C1611; the visual stability index (VSI) shall be 0 or 1. The SCC mix design shall be submitted and approved by the Resident.

SCC or other proposed drilled shaft concrete mix design shall meet the requirements outlined in Section 502 of the MaineDOT Standard Specifications for Class A concrete.

Portland cement concrete shall meet the requirements shown in the Plans and specified in the Special Provisions and Section 502 of the MaineDOT Standard Specifications with a maximum aggregate size of 1/2 inch. The use of a water-reducing admixture is permissible to provide a workable mix that will surround the reinforcement bars without the use of vibrators. Actual slump shall be within the range stated in the Contractor's proposed mix design, with water-reducing admixture for non-SCC mixes. Concrete placement shall be performed in accordance with Section 502 of the Standard Specifications on concrete materials and with the requirements herein.

Concrete shall not be placed in the shaft until the shaft excavation has been accepted by the Resident. Concrete shall be placed within 48 hours after reinforcing steel placement. Concrete placement shall be conducted in one continuous operation from the bottom to the top of the shaft.

Concrete placement shall continue after the shaft excavation is full until good quality concrete is flowing out of the casing at the top of shaft. Concrete shall be placed by tremie methods only.

All admixtures, when approved for use, shall be adjusted for the conditions encountered on the job so the concrete remains in a workable plastic state throughout the placement operation. Prior to concrete placement, the Contractor shall provide test results of a trial mix conducted by an approved testing laboratory using approved methods to demonstrate that the concrete meets this requirement. The trial mix tests shall be conducted using concrete and ambient temperatures appropriate for site conditions.

CSL tubes shall be filled with water and capped prior to concrete placement.

Contractor shall contain and dispose of all waste or overflow concrete to prevent entrance into any water body. The Resident will approve the method of containment.

Tremies Tremie pipes shall be used for concrete placement of the drilled shafts. Concrete shall not be placed using any other methods.

Tremies used to place concrete shall consist of a tube of sufficient length, weight, and diameter to discharge concrete at the bottom of the drilled shaft excavation. The tremie shall not contain aluminum parts which will have contact with the concrete. The tremie inside diameter shall not be less than 10 inches. The inside and outside surfaces of the tremie shall be clean and smooth to permit both flow of concrete and unimpeded withdrawal during concreting. The wall thickness of the tremie shall be adequate to prevent crimping or shear bends which restrict concrete placement.

The tremie used for concrete placement shall be watertight. Underwater placement shall not begin until the tremie is placed to the shaft base elevation. Valves, bottom plates or plugs may be used only if concrete discharge can begin within one tremie diameter of the base. Plugs shall either be removed from the excavation or be of material, approved by the Resident, which will not cause a defect if the plug is not removed. The discharge end of the tremie shall be constructed to permit the free radial flow of concrete during placement operations. The tremie discharge end shall be immersed at least 5 feet in concrete at all times after starting the flow of concrete. The flow of the concrete shall be continuous. The concrete in the tremie shall be maintained at a positive pressure differential at all times to prevent water intrusion into the shaft concrete. The concrete mix shall be of such design that the concrete remains in a workable plastic state throughout the placement of the concrete for the entire drilled shaft.

If at any time during concrete placement, the tremie line orifice is removed from the fluid concrete column and discharges concrete above the rising concrete level, the shaft shall be considered defective. In such cases, the Contractor shall remove the reinforcing cage and concrete, complete any necessary side wall removal directed by the Resident and repour the shaft. If removal of the reinforcing cage and concrete is not feasible, the Contractor shall submit methods of repair for acceptance by the Resident.

501.047 Non-Destructive Testing

All of the completed drilled shafts shall be subject to non-destructive testing to evaluate their structural integrity. Such tests include (a) thermal integrity profiling of all drilled shafts and (b) CSL tests on shafts as directed by the Resident or their agent.

Thermal Integrity Profiling The Contractor shall coordinate for thermal integrity profiling (TIP), provide access for Agents of the Department to install thermal wires on reinforcing cages while they are laying on the ground, provide protection of thermal wires during installation of reinforcing cages, and provide access for Agents of the Department to connect data loggers to the exposed ends of the wires within 2 hours after completion of concrete placement. Data loggers shall be connected to the wires for up to 72 hours, after which the Contractor shall provide access for Agents of the Department to remove the data loggers.

The Contractor shall provide the proposed reinforcing installation and concrete placement schedule to the Resident with sufficient notice to provide a minimum 48 hour window in which to install thermal wires on the cage while it is on the ground, and a minimum of 48 hours notice prior to concrete placement. The Contractor shall assume the Department's testing Agent requires 8 hours of uninterrupted access to the cage for each shaft for connection of the thermal wires. In the event that the Contractor does not provide access to the cage and/or place concrete according to the schedule they provide to the Resident, and the Department's testing Agent is required to make additional or longer site visits as a result, the additional cost of the Department's testing Agent shall be paid by the Contractor.

The Contractor shall take measures to not damage TIP thermal wires and testing equipment. Any thermal wires or equipment damaged due to Contractor operations, as determined by the Resident, shall be replaced at no additional cost to the Department.

Crosshole Sonic Logging The Contractor shall perform CSL testing on production drilled shafts, when directed by the Resident. CSL testing will be conducted in the event of an indication of discontinuities, anomalies or defects in a shaft from the TIP results, or in the event of thermal wire damage or malfunction. However, CSL access tubes shall be installed in each drilled shaft as shown on the Plans and specified below.

CSL testing shall be completed within 10 calendar days after notification from the Resident that CSL testing is required for a shaft.

The Contractor shall employ a licensed professional engineer who is qualified to perform, evaluate and report the results of CSL. The report on the CSL tests on any given shaft shall include CSL logs with analyses of initial pulse arrival time or compression wave velocity versus depth, and pulse energy/amplitude versus depth. A CSL log shall be prepared for each tube pair tested, with any anomaly/defect zones indicated in the logs and discussed in the report. The Contractor shall submit the CSL test results and the report for each shaft to the Resident within three working days of the performance of the test. Within three working days of receipt of the report, the Resident will

evaluate the CSL results report and provide to the Contractor a response regarding the acceptability of the shaft that was tested.

If the Resident determines that the results of TIP and CSL testing are unacceptable, the Contractor shall be required to repair the unacceptable shaft to the satisfaction of the Resident and (a) prove to the satisfaction of the Resident the acceptability of all shafts constructed since the unacceptable shaft was constructed and the acceptability of the procedure to be used in constructing future shafts, or (b) cease all drilled shaft construction until a new construction procedure acceptable to the Resident has been proposed by the Contractor and acceptable by the Resident. In the latter case, those drilled shafts constructed after the unacceptable shaft will be repaired to the satisfaction of the Resident. If any repair procedures or revisions to the Contractor's installation procedure are proposed by the Contractor, the Contractor shall submit a written plan to the Resident to repair defects and revise construction procedures. If these plans involve changes to the structural design of the shafts or transition to the column, or to the geometry of the shafts, any redesign proposed in the Contractor's plan to the Resident shall be performed by a licensed professional engineer hired by the Contractor.

Access tubes for CSL testing shall be placed on each reinforcing cage in the position and at the frequency shown on the Plans. The access tubes for CSL testing shall consist of Schedule 40 black steel pipe conforming to ASTM A 53, Grade A or B, Type E, F or S. The inside diameter of the tubes shall be at least 1.5 inches.

All access tubes shall have a round, regular inside surface free of defects and obstructions, including all pipe joints, in order to permit the free, unobstructed passage of probes to the bottoms of the tubes. The access tubes shall be watertight, free from corrosion and free of deleterious material on the outside that can prevent bonding with the concrete. All access tubes shall be fitted with watertight caps on the bottom and top.

The number of tubes installed in each shaft are summarized below:

Socket Diameter	Number of Tubes Per Shaft	Configuration of Tubes around the inside of the Circular Reinforcing Cage
66 inches	6 minimum	60 degrees

Install the tubes in accordance with the pattern shown in the Plans.

Tie or otherwise secure the tubes to the interior of the reinforcing cage at intervals of no greater than 3 feet such that the tubes stay in position during insertion of the reinforcing steel cage and concrete placement. The tubes should be as near to vertical and parallel as possible and extend from 3 inches above the shaft bottom to at least 3 feet above the shaft top, or ground or water surface, whichever is higher.

Under no circumstance should the tubes be allowed to rest on the bottom of the drilled shaft excavation.

Make any joints required to achieve full length tubes watertight. Take care not to damage the tubes and to maintain tube alignment during reinforcement installation operations in the drilled shaft hole.

After placement of the reinforcement cage, fill the tubes with potable water as soon as possible (before concrete placement), and cap or seal the tube tops to keep debris out of the tubes. Before the placement of concrete, measure a minimum of one tube per drilled shaft, and record the length of the tube, including a notation of the stickup of the tubes above the shaft top. Provide this information, along with information on the shaft bottom and top elevations and/or length, and the construction date, to the Resident before the CSL tests.

The CSL equipment shall consist of a microprocessor-based CSL system for display of individual CSL records, analog-digital conversion and recording of CSL data, analysis of receiver responses, and printing of CSL logs; ultrasonic source and receiver probes for 1.5 inch I.D. pipe; an ultrasonic voltage pulsar to excite the source with a synchronized triggering system to start the recording system; a depth measurement device to determine and record depths; and appropriate filter/amplification and cable systems for CSL testing.

The Contractor shall conduct CSL testing at selected drilled shafts requested by the Resident. Testing shall be conducted between adjacent tubes on the shaft perimeter and between diagonal tube pairs, unless otherwise modified by the Resident. Additional logs may be conducted in the event any anomalies are detected in the specified logs. The full length of all tubes will be used for conducting CSL tests. Should an access tube be blocked, the Resident will determine what action should be taken by the Contractor in response. The Contractor shall exercise care in the removal of caps or plugs from the tubes after installation so as not to apply excess torque, hammering, or other stresses which could break the bond between the tubes and the concrete.

CSL tests will be carried out with the source and receiver probes in the same horizontal plane unless test results indicate potential anomalies/defects in which case the questionable zone may be further evaluated with angled tests (source and receiver vertically offset in the tubes). CSL measurements will be made at depth intervals of 2 inches or less, performed from the bottom to the top of each shaft. The probes will be pulled simultaneously, starting from the bottoms of the tubes, over the depth-measuring device. Slack from the cables will be removed prior to pulling to provide accurate depth measurements in the CSL records.

Any anomalies or defects indicated by longer pulse arrival times and significantly lower amplitude/ energy signals may require that further testing be carried out to evaluate the extent of such anomalies or defects. Supplemental non-destructive test methods which could be used if anomalies are identified include but are not limited to Angled Crosshole Sonic Logging, Crosshole Tomography, Single Hole Sonic Logging, and/or Sonic Echo and Impulse Response tests.

The acceptance of each drilled shaft will be determined by the Resident, based primarily on the results of the TIP testing and concrete placement records, including volume curves and field and

laboratory concrete test results. Where conducted, CSL will be evaluated based on the acceptance criteria guidance developed by the Federal Highway Administration (FHWA) called the Concrete Condition Rating Criteria (CCRC). Rejection of a shaft will require conclusive evidence that a defect exists in the shaft which will result in inadequate or unsafe performance under service loads. If the non-destructive test records are complex or inconclusive, the Resident may require coring or excavation of the shaft to verify shaft conditions.

In the event testing discloses voids or discontinuities in the concrete that indicate the drilled shaft is not structurally adequate as determined by the Resident, the shaft will be cored to assess the presence of a void or unsuitable concrete as described in paragraph "Core Drilling of Drilled Shaft Concrete" below. The Contractor will submit a plan for remedial action to the Resident for acceptance. Any modifications to the foundation shafts and load transfer mechanisms caused by the remedial action will require calculations and working drawings stamped by a professional engineer licensed in the State of Maine hired by the Contractor for all foundation elements affected. Construction of additional drilled shafts will be suspended until the Contractor repairs, replaces or supplements the defective work, and the Resident approves the remedial work.

Prior to the beginning of downhole logging, the Contractor shall assure that the test probes can pass through every tube to the bottom. If a tube is obstructed, the Contractor shall core a hole within the drilled shaft near the obstructed tube to the depth of the obstructed tube that is large enough to accommodate the probe for the full length of the hole. The coring equipment, coring procedure and location of the core hole shall be approved by the Resident prior to beginning the coring process. The coring method shall provide for complete core recovery and shall minimize abrasion and erosion of the core. The core hole shall be placed at a position in the shaft that will not produce damage to the reinforcing steel in the shaft. The core hole shall be logged, voids or defects indicted on the log and the log submitted to the Resident. Core shall be preserved and made available for inspection by the Resident. The core hole will be treated as an access tube and downhole testing shall then commence.

Upon completion of the CSL testing and acceptance of the CSL results by the Resident, remove all water from the tubes and any other drilled holes and then completely fill the tubes and core holes with grout having strength properties equivalent to or better than those of the drilled shaft concrete.

Core Drilling of Drilled Shaft Concrete When directed by the Resident, the Contractor shall core production drilled shafts that are determined by the Resident to be unacceptable based on the results of non-destructive tests. The Contractor shall collect core samples from each defective shaft for the full depth of the irregularity and for a minimum 5 feet above and below the irregularity.

Obtain cores with a minimum diameter of 3.75 inches. Set the core drill machine so that the drill force will be exactly vertical and so there will not be more than 5 feet of laterally unsupported drill rod between the bottom of the drill spindle (chuck) and the top of the shaft concrete when the hydraulic feed is in the up position. If longer laterally unsupported sections of drill stem are necessary, use braced casing or rigidly braced guides to prevent lateral whip. Drill, log, and store

the cores in accordance with the requirements provided in Section 501.041, Confirmatory Core Borings. The Contractor shall perform the coring work in the presence of the Resident or their agent.

Provide the Resident with the cores along with two copies of the coring log for inspection and testing. Do not proceed with construction above the drilled shaft until the quality of the concrete in the shaft, as represented by the core samples and as indicated by laboratory testing, is determined to be acceptable and notification to continue construction is given by the Resident.

If the quality of the concrete in the drilled shaft is determined to be acceptable, the Contractor shall fill the core hole with grout having strength properties equivalent to or better than those of the drilled shaft concrete.

Cored Test Cylinders from Shaft Concrete When directed by the Resident, the Contractor shall utilize a hand coring machine or similar equipment to collect concrete cylinders from the top of production drilled shafts that are determined by the Resident to be unacceptable based on visual indication of contamination with soil or rock debris. The Contractor shall collect a 4-inch diameter, 12-inch long concrete cylinder that is suitable for unconfined compressive strength testing. The Contractor shall submit the portion of the cylinder selected by the Resident to a testing laboratory for testing in accordance with ASTM C39-20, "Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens."

Provide the Resident with the laboratory test results. Do not proceed with construction above the drilled shaft until the results are determined to be acceptable and notification to continue construction is given by the Resident.

If the compressive strength meets the project requirements, the concrete shall be considered to be acceptable, and the Contractor shall fill the core hole with grout having strength properties equivalent to or better than those of the drilled shaft concrete.

501.05 Method of Measurement

Drilled Shaft Equipment Mobilization: Drilled Shaft Equipment Mobilization shall be measured as a lump sum.

Drilled Shafts: The quantities to be measured shall be the length in feet of the completed concrete drilled shaft of the diameter and containing the reinforcement shown on the Plans. The length shall be determined as the difference between elevation "D" and elevation "TOR". Elevation "TOR" shall either be as shown on the plans or as redefined by the Resident based on the results of confirmation cores.

Drilled Shaft, Rock Socket: Drilled shaft, rock socket will be measured by the length in feet of complete bedrock excavation of the diameter shown on the Plans measured in linear feet along the centerline of the rock socket in place. The length shall be determined as the difference between

elevation "TOR" and elevation "BOR" as shown on the Plans or as redefined by the Resident based on the results of confirmation cores.

Drilled Shaft, Sloping Rock: Measurement for rock leveling for sloping rock commences once the Resident is notified by the Contractor in writing (e.g., via email) that sloping rock exists and once the Contractor has advanced drill tooling to the highest encountered top of rock elevation identified via probing, and only after direction to proceed under the appropriate pay item is provided by the Resident. Measurement shall cease after the drill tooling reaches the lowest encountered top of rock elevation identified via roller cone probing, at which point the top of rock will be considered leveled. Measurement will be to the nearest quarter-hour. The Contractor shall have available on site at all times appropriate equipment, tools, materials and labor for the effective leveling of sloping rock. No separate measurement will be made for the time spent advancing the shaft above or below the highest and lowest encountered rock elevations or for any work prior to the Contractor receiving direction to proceed from the Resident.

Drilled Shaft Confirmatory Borings: Confirmatory core borings, including collection of rock core samples, will be measured by linear foot for rock coring as measured from the top of the first rock core run to the bottom of the last rock core run.

Removal of Obstructions: Measurement for obstruction removal commences once the Resident is notified by the Contractor in writing (e.g., via email) that the drilling progress has unavoidably been reduced to less than 10 percent of the normal advancement rate due to a potential obstruction, despite the continuing diligent efforts of the Contractor to progress the Work, and only after direction to proceed under the appropriate pay item is provided by the Resident. The Contractor shall take reasonable and diligent steps to remove such potential obstructions using conventional tools and drilling methods prior to notifying the Resident. As part of the Contractor's notification of an obstruction, they shall provide documentation to the Resident supporting the normal advancement rate (for the subject shaft or nearby shafts) and the reduced rate corresponding to the encountered obstruction, which will serve as the basis for the Resident to evaluate and approve obstruction removal time.

Measurement shall cease after the obstruction is removed from the excavation or broken through to a point where the drilled shaft foundation drilling can continue using conventional tooling/methods, as determined by the Resident. Measurement will be to the nearest quarter-hour. The Contractor shall have available on site at all times appropriate equipment, tools, materials and labor for the effective removal of all types of potential obstructions. No separate measurement will be made for the time spent dealing with any potential obstruction or obstruction prior to the Contractor notifying the Resident.

Concrete Coring - Shafts Without Defects: Coring of drilled shafts for the purpose of confirming the presence of defects indicated by non-destructive testing, where the drilled shafts are subsequently determined by the Resident to not contain defects, will be measured per linear foot of concrete core. Coring of shafts that are determined by the Resident to contain defects will not be measured.

Concrete Test Cylinders - Shafts Without Defects: Coring and laboratory testing of 4-inch diameter, 12-inch long concrete cylinders from the top of drilled shafts for the purpose of confirming the presence of defects indicated by the presence of debris either during or following concrete placement, where the drilled shafts are subsequently determined by the Resident to not contain defects, will be measured per each cylinder, which includes a laboratory test. Coring and laboratory testing of cylinders of shafts that are determined by the Resident to contain defects will not be measured.

Thermal Integrity Profiler Test – Providing Access For. Providing access for Department personnel to install thermal wires and providing access and time for TIP testing will be measured per each test/ shaft.

Crosshole Sonic Access Tubes: CSL tube materials and personnel and equipment required for installation, and filling the tubes with grout upon completion of testing, will not be measured, but will be incidental to the Drilled Shaft pay item.

Crosshole Sonic Testing: CSL testing, including material, equipment and personnel required for testing, evaluation and reporting, will be measured per each test requested by the Department in which defects are not found. If CSL testing is requested by the Department based on review of TIP results and defects are found, the CSL testing will not be paid for by the Department.

Drilled Shaft Inspection Device Test: Drilled shaft inspection device testing will be measured per each test.

501.06 Basis of Payment

Drilled Shaft Equipment Mobilization: Drilled shaft equipment mobilization and demobilization will be paid for at the contract lump sum price. Such payment shall be full compensation for furnishing all labor, materials, and equipment necessary for transporting, providing access to all proposed shaft locations to perform the complete shaft installation, erecting, dismantling and removing all of the necessary drilled shaft installation and construction equipment.

Drilled Shafts: Drilled shafts shall be paid for at the contract unit price per linear foot for accepted lengths of drilled shaft of the diameter specified. Such payment shall include the cost of excavation of overburden soils, weathered rock, fractured rock and rock from mudline to elevation “TOR”, reinforcing steel in the shaft and rock socket, concrete in the shaft and rock socket, concrete placement, all labor, materials, equipment, temporary casings, permanent casings, CSL tube materials and installation, non-destructive testing, inspection, and other incidentals necessary to complete the drilled shaft, including rock socket. Such payment shall include full compensation for development of a Drilled Shaft Installation Plan and amendments (if required) acceptable to the Resident, drilled shaft personnel, and all drilled shaft excavation and inspection record keeping and reports. Such payment shall include full compensation for use of special tools and drilling equipment to excavate the shaft to the depth indicated on the Plans.

Management and disposal of excavated material from the drilled shaft will be paid for under Special Provision Section 203, Excavation and Embankment, Dredge Materials.

The Contractor shall perform the necessary excavation for the drilled shaft under the drilled shaft pay items. With the exception of materials that are accepted by the Resident as obstructions, no separate payment will be made for either excavation of materials of different densities or employment of special tools and procedures necessary to accomplish the excavation in an acceptable fashion.

All costs due to lost tool removal shall be borne by the Contractor including but not limited to, costs associated with hole degradation due to removal operations or the time the hole remains open.

No extra compensation will be allowed for concrete required to fill an oversized casing or oversized excavation or for loss of concrete through an unsealed casing or any concrete plug that may need to be utilized to seal the casing or rock socket. Repairing or replacing damaged casing will be at the sole expense of the Contractor. In addition, no compensation will be paid to the Contractor for furnishing, installing, removing or leaving temporary casings in place.

Materials and work necessary, including engineering analysis and redesign to complete corrections for out of tolerance drilled shaft excavations shall be furnished without either cost to the Department or an extension of the completion dates of the project.

Corrections made if the rebar cage is not maintained within the specified tolerances shall be at no additional cost to the Department. The Contractor shall repair or replace any damaged reinforcing as needed at no additional cost to the Department.

All costs to replace or provide remedial actions for defective or unacceptable shafts shall be fully borne by the Contractor.

Drilled Shaft, Rock Socket: Rock socket excavation shall be paid at the contract unit price per linear foot of rock socket of the diameter specified. Such payment shall be full compensation for all labor, materials, and equipment, tools, and drilling equipment to excavate the shafts to the required depths, and furnishing all other labor, materials and equipment necessary to complete the work. Payment for excavating the rock, and handling and managing of the resulting rock chips shall be included in the Drilled Shaft, Rock Socket payment item. Any costs associated with handling, management, dewatering and reuse on site, or disposal, of the resulting rock chips will be considered incidental to related Contract Pay Items.

Rock socket excavation is excavation in rock and requires rock specific tools or procedures to advance the excavation and is covered under the Drilled Shaft, Rock Socket pay item. All excavation, performed more than 6 inches below the bottom of the reinforcement cage in the rock socket as determined by the Resident based on the results of the confirmatory core borings shall

be considered incidental regardless of the density or character of materials encountered.

Cost for evaluation of bottom and sides of drilled shaft by probing and other methods shall be included as part of excavating the rock socket.

Use of rock specific tools or procedures to advance the drilled shaft excavation through glacial till, weathered bedrock or fractured bedrock will not be considered rock socket drilling.

Drilled Shaft, Sloping Rock: Flattening a sloping rock surface prior to installation of temporary casing will be paid for at the Contract unit price per hour under Drilled Shaft, Sloping Rock, paid to the nearest quarter-hour. Payment for removal of flattening of a sloping rock surface will be for a crew that is comprised of labor, equipment, and materials most effective and efficient for the flattening process.

No payment will be made for any lost time due to the Contractor's failure to have such equipment, tools, materials and labor available at the site.

Drilled Shaft Confirmatory Borings: Confirmatory core borings authorized by the Resident will be paid for at the contract unit price per linear foot of rock core, including additional core depth as directed by the Resident. Such payment shall include full compensation for casing advancement, soil drilling, rock coring, extracting, packaging and classifying the cores, delivering samples to the Department, and all other expenses necessary to complete the work. Payment shall also include equipment necessary to access the core locations shown on the Plans.

Removal of Obstructions: Removal of obstructions encountered during drilled shaft foundation drilling will be paid for at the Contract unit price per hour under Obstruction Removal, paid to the nearest quarter-hour. Payment for removal of obstructions will be for an obstruction removal crew that is comprised of labor, equipment, and materials most effective and efficient for the removal of obstructions during drilled shaft foundation drilling and for any and all other costs related to the removal or penetration of the obstructions.

No payment will be made for any lost time due to the Contractor's failure to have such equipment, tools, materials and labor available at the site. No separate payment will be made for the time spent dealing with any potential obstruction or obstruction prior to the Contractor notifying to the Resident.

Thermal Integrity Profiler Test – Providing Access For. Providing access for Department personnel to install thermal wires and providing access and time for TIP testing will be paid for at the unit price for each test.

Crosshole Sonic Access Tubes: Separate payment will not be made for CSL tube materials, preparation, installation and filling the tubes with concrete upon completion of testing, but will be incidental to the Drilled Shaft pay item.

As described in Section 501.101, if a CSL tube is obstructed, the Contractor will core a hole within the drilled shaft near the obstructed tube, at no additional cost.

Crosshole Sonic Testing: CSL testing will be paid for at the unit price for each test that indicates no defects in the concrete, including material, equipment and personnel required for testing, evaluation and reporting. CSL testing will not be paid for if the results indicate concrete defects.

Drilled Shaft Inspection Device Test: Drilled shaft inspection device testing will be paid for at the unit price for each test.

Coring of Shafts Without Defects: Coring of drilled shafts for the purpose of confirming the presence of defects (if suspected based on the results of non-destructive TIP and CSL testing), where the drilled shafts are subsequently determined by the Resident to not contain defects, will be paid for at the contract unit price per linear foot of concrete core. This shall constitute full compensation for all costs incurred for the coring in shafts without defects, including set-up, access, materials, labor, observation, reporting, delivery of samples to the Resident, core bit wear, core disposal, and grouting of core holes.

Concrete Test Cylinders of Shafts Without Defects: Coring 4-inch diameter, 12-inch long cylinders from drilled shafts for the purpose of confirming the presence of defects (if suspected based on visual indications during or following the pour), where the drilled shafts are subsequently determined by the Resident to not contain defects, will be paid for at the contract unit price per each cylinder. This shall constitute full compensation for all costs incurred for the cylinder coring in shafts without defects, including set-up, access, materials, labor, observation, laboratory testing of samples, core bit wear, and grouting of core holes.

Payment will be made under:

Pay Item		Pay Unit
501.8016	6 Foot Diameter Drilled Shaft	Linear Foot
501.804	Drilling Equipment Mobilization (Drilled Shaft)	Lump Sum
501.807	Removal of Obstructions	Hour
501.82	Crosshole Sonic Logging Testing	Each
501.83	Drilled Shaft Confirmatory Borings	Linear Foot
501.831	Drilled Shaft - Rock Socket (5.5 ft dia.)	Linear Foot
501.832	Drilled Shaft - Sloping Rock	Hour
501.85	Coring of Drilled Shafts without Defects	Linear Foot
501.86	Drilled Shaft Inspection Device Test	Each

501.861	Concrete Test Cylinders of Shafts without Defects	Each
501.87	Thermal Integrity Profiler Test, Providing For	Each

SPECIAL PROVISION
SECTION 501
FOUNDATION PILES
(Dynamic Loading Test)

Description This work shall consist of driving foundation piles in accordance with Section 501 of the Standard Specifications, except as amended herein.

Under Section 501.046 Driven Pile Capacity, Pile Testing, and Acceptance, replace the subsection labeled Dynamic Pile Tests, with the following:

Dynamic Pile Testing: This work shall consist of coordinating for dynamic pile load testing, furnishing equipment and personnel to drive piles for testing, and providing access to foundation piles for Agents of the Department to perform dynamic pile load tests. Included with this work is Contractor stand-by-time to allow for dynamic pile load testing. Dynamic pile load tests shall be performed on foundation piles noted on the Plans, and as directed by the Engineer. Dynamic pile test measurements shall be recorded for the full length of the test pile during initial drive.

The Contractor will provide the proposed dynamic pile testing schedule to the Resident a minimum of 48 hours before the start of testing. In the event that the Contractor is not able to perform the dynamic testing according to schedule, the cost of the Department's testing Agent shall be paid by the Contractor.

Drilling, Tapping, and Attaching/Removing Instruments: The Contractor shall provide the Department's Agents reasonable means of access to the piles for drilling and tapping purposes. Preference shall be given to drilling and tapping piles on the ground. For drilling and tapping of H-pile on the ground, the Department's Agent will need up to 30 minutes per pile to be tested. The Contractor shall assist the Department's Agent by moving pile as necessary to complete drilling and tapping.

If the Contractor elects to place the pile in the leads prior to drilling and tapping, the Department's Agent will need up to one hour per H-pile for drilling and tapping per pile to be tested. The Contractor shall provide reasonable means of access to the piles in the leads for drilling and tapping, as required.

At the Contractor's option, the piles may be drilled and tapped by the Contractor. The drilling and tapping layout for H-piles are shown on Figure 1 of this Section. If the Contractor elects to drill and tap the piles, the holes shall be center-punched prior to drilling. Care shall be taken to prevent over-drilling and rounding of drill-holes. Prior to instrument attachment, the Department's Agent will inspect the drilled and tapped holes for conformance. If determined necessary by the Department's Agent, the holes will be redrilled and tapped by the Department's Agent. No additional time, or compensation, will be allowed for redrilling and tapping of holes done by the Contractor

The Contractor shall provide reasonable means of access to the piles in the leads for attaching and removing instruments to the piles. It is estimated that the Department's Agents will need up to one hour per pile to attach instruments. The Department's Agent will need up to 30 minutes per pile to remove instruments.

General Accommodations: The Contractor shall provide access to electric power for the dynamic test equipment. The power supply at the outlet shall be 10 amp, 115 volt, 55-60 cycle, AC only.

The Contractor shall provide a location that has a line-of-sight to the test piles and is within 75 feet of the piles to be tested, where the Department's Agents can park a wheeled, passenger vehicle (either van or car), from where dynamic pile testing measurements can be processed and analyzed.

The Contractor shall provide access to and a location within 10 feet of the test pile where a representative of the Department can stand and maintain a field driving log for all test piles.

Testing: With the dynamic testing equipment attached, the Contractor shall drive the pile to the minimum tip elevation, or to the required capacity, as shown on the Plans. The stresses in the piles will be monitored during driving with the dynamic test equipment to ensure that the driving stresses do not exceed the allowable stress shown on the Plans. If necessary, the Contractor shall reduce the driving energy transmitted to the pile by using additional cushions or reducing the energy output of the hammer in order to maintain stresses below the allowable driving stresses shown on the Plans. If non-axial driving is indicated by the dynamic test measurements, the Contractor shall immediately realign the driving system.

When directed by the Resident, the Contractor shall wait up to 24 hours and, after instruments are reattached, retap (redrive) load test piles. A cold hammer shall not be used for the redrive. The hammer shall be warmed-up before redrive begins by applying at least 20 blows to another pile. The maximum amount of penetration required during redrive shall be 6 in., or the maximum total number of hammer blows will be 50, whichever occurs first. After retapping, the Resident will either provide the cutoff elevation or specify additional pile penetration and testing. The time for the Department's Agent to attach and remove instruments for retapping shall be as specified herein. The general accommodations provided by the Contractor to perform retap testing shall be as specified herein.

Equipment Damage: The Contractor shall take measures to not damage dynamic pile load testing equipment. Any equipment of the Department's Agents damaged due to Contractor operations, as determined by the Resident, shall be replaced at no additional cost to the Contract. The compensation due to the Department's Agents for equipment damaged by Contractor operations shall be as follows:

Main Cable	$495.00
Pigtail Cable	$540.00
Force Transducer	$670.00

Piezoresistive Accelerometer	$1225.00
Piezoelectric Accelerometer	$925.00
Accelerometer Cable	$350.00

Driving Equipment Malfunction. If pile driving equipment is underperforming as required by the rated energy in the Wave Equation rated energy or not functioning correctly, and a relevant dynamic pile test cannot be completed, then the Contractor will compensate the Department's Agent for travel, unsuccessful field testing and overnight stay (if required) according to the schedule below:

Travel	$ 700.00 /trip
Field Testing	$1,275.00 /day
Overnight Stay	$ 165.00 /day

Pile Acceptance: Acceptance of foundation piles shall be based on the results of the dynamic testing completed by the Department's Agents. Within 24 hours of the completion of testing, the Resident will provide the Contractor a determination of whether the dynamic load test results are acceptable.

501.11 Method of Measurement. The method of measurement for Dynamic Loading Tests, as described herein, shall be as described in Section 501.05g, of the Standard Specifications.

501.12 Basis of Payment. Payment for Providing for Dynamic Loading Tests, as described herein, shall include coordinating for dynamic pile load testing, moving piles on the ground and providing access to drill and tap piles, drilling and tapping piles (at the Contractor's option), providing access to electric power, providing a location to monitor foundation piles during driving, providing access to foundation piles to attach/remove instruments, furnishing equipment and personnel to drive piles for testing, Contractor time to drive test piles, Contractor time to allow replacement of dynamic testing equipment damaged by the Contractor (as determined by the Resident), and Contractor stand-by-time.

Payment will be made under:

Pay Item		Pay Unit
501.239	Dynamic Loading Tests –Providing For	Each

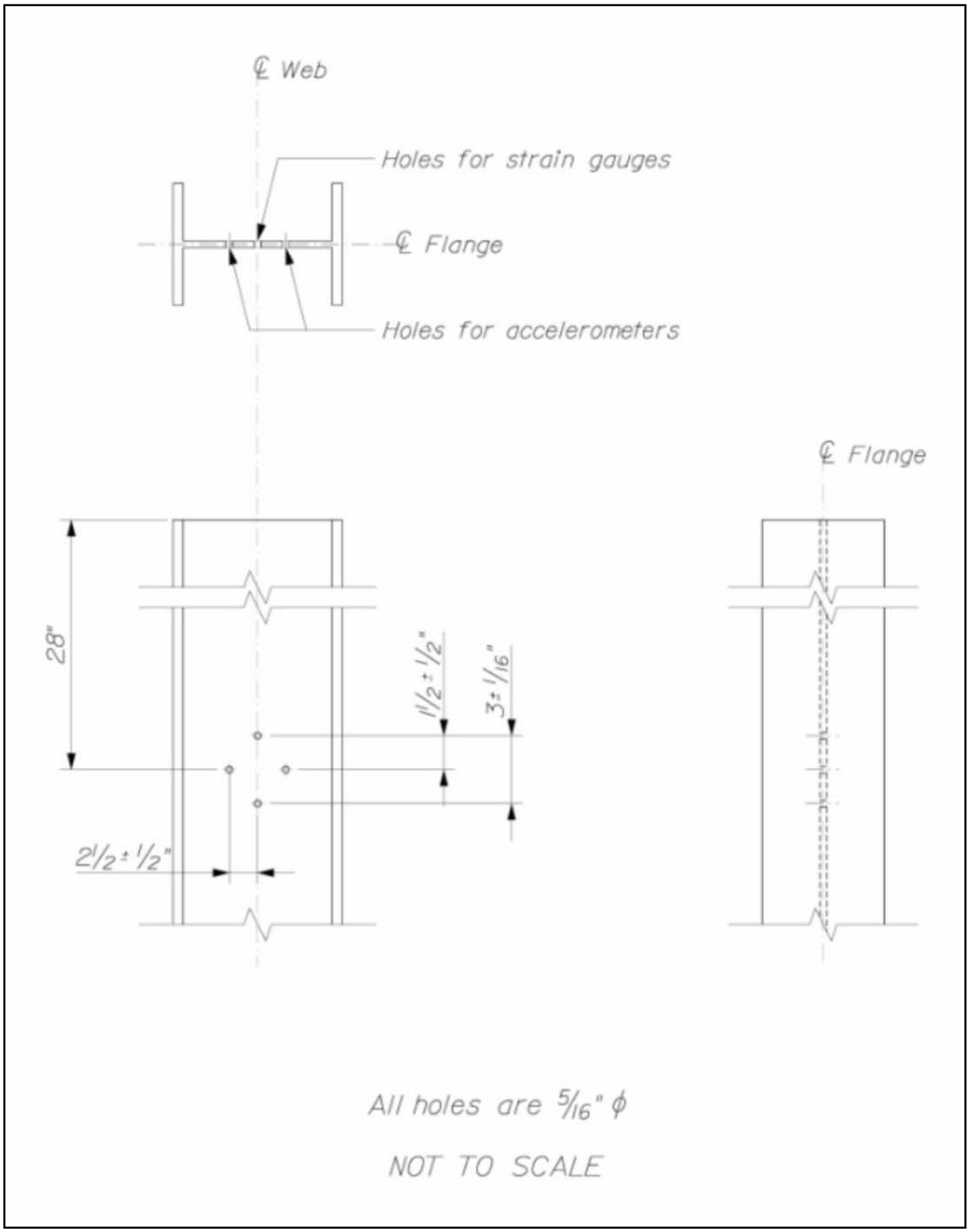


Figure 1. Drill-Hole Layout for H-Piles

SPECIAL PROVISION
SECTION 501
FOUNDATION PILES
(Micropiles)

Specification Section 501 - Foundation Piles is amended by the addition of the following:

501.01 Description

This work shall consist of furnishing and constructing a micropile foundation as shown in the Plans and as specified herein. The Contractor is responsible for furnishing all materials, products, accessories, tools, equipment, services, transportation, labor and supervision, and manufacturing techniques required for installation of micropiles for this project as shown on the Plans, approved submittals and specified herein. Accessibility varies throughout the site, and it is the responsibility of the Contractor to select equipment and construction methods accordingly.

The Contractor shall coordinate the work so the micropiles are safely constructed adjacent to existing structures. The Contractor shall perform the micropile construction and related excavation in accordance with the Plans and approved submittals.

The Contractor shall determine the micropile installation means and methods, confirm the estimated grout-to-bedrock bond value by load testing, and ensure that their operations prevent damage to adjacent structures including but not limited to railroad infrastructure, and underground utility infrastructure. The minimum micropile and casing diameters are shown on the Plans. The micropile load capacities shall be verified by verification and proof load testing and must meet the load test acceptance criteria specified herein.

The Contractor shall install micropiles so that ground loss or densification and any resulting settlement or vibration does not damage existing structures or facilities to remain. The Contractor is responsible for advancing through any boulders, cobbles or obstructions that may interfere with the installation of micropiles.

Where proposed micropiles overlap with existing foundations to remain, the Contractor shall install micropiles through existing substructure concrete after any required partial demolition, including complete penetration of permanent casing through the concrete and into bedrock.

The Contractor shall monitor all aspects of micropile construction and load testing. The Contractor shall perform load testing as required. The Contractor shall provide access so that the Resident and/or their representative can monitor all aspects of micropile construction. The Contractor shall not install or load test micropiles unless the Department’s authorized representative is present at the site to monitor the work.

501.011 Definitions

Definitions that apply within this Special Provision are:

Alignment Load (AL) A minimum initial load (no greater than 4 percent of the Factored Design Load) applied to micropile during testing to keep the testing equipment correctly positioned.

Bond Breaker A device, sleeve or special treatment incorporated into a length of micropile that will prevent load transfer to the soil over that length. A bond breaker also provides full lateral support of the micropile over the length of the bond breaker. Grout placed in contact with the soil using gravity pressure only will not be considered to constitute a bond breaker. A bond breaker shall be included above the top of the bond zone to isolate the soil adjacent to the sacrificial micropiles installed for verification testing (test piles).

Bond Zone The gravity grouted, pressure grouted, and/or post grouted length of a micropile that is bonded to the ground and transfers the applied loads to the surrounding bedrock.

Centralizer A device to support and position the reinforcing steel in the drill hole and/or casing so that a minimum grout cover is provided.

Coupler The means by which load capacity can be transmitted from one partial length of reinforcement to another.

Free (Unbonded or Cased) Length The designed length of the micropile that is not bonded to the surrounding ground with grout.

Factored Design Load (FDL) The maximum factored compressive or tension axial load for a micropile as indicated on the Plans.

Micropile A small diameter, bonded, cast-in-place friction pile formed by removing material using non-vibratory and non-displacement methods to create a cased open, cylindrical hole in the ground, which is subsequently filled with grout and steel reinforcement.

Mill Secondary Mill rejected American Petroleum Institute (API) casing, a.k.a. “Mill Rejects,” “Structural Grade,” “Limited Service,” or “Minimum Test Pipe”.

Non-Production Micropile Sacrificial micropiles that are not incorporated into the substructure. For example, test micropiles which are abandoned after testing has been completed.

Overburden Material, natural or placed, that may require cased drilling methods to provide an open borehole to underlying strata.

Permanent Steel Casing A steel pipe of flush joint type installed in the upper portion of a micropile to increase the micropile's moment capacity and lateral capacity to resist horizontal loads, and to stabilize the drill hole and support adjacent soils.

Positive circulation or flush A method of progressing and cleaning out a hole for a micropile wherein drilling fluid is injected into the hole and returns upward along the outside of the drill casing.

Post-grouting The injection of additional grout into the bond zone of a micropile after the primary grout has set. Also known as regrouting or secondary grouting.

Pressure grouting A method used to develop pile capacity wherein pressure is applied continuously to the top of the fluid grout column through the drill head as the casing is removed from the bond zone.

Primary Grout Portland-cement-based grout injected into the micropile hole prior to or after the installation of the reinforcement to achieve the load transfer from the structure to be supported to the surrounding ground within the micropile bond zone.

Production micropile A micropile which will be incorporated into the structure's foundation.

Recirculation A method of handling drilling fluid where the fluid coming back out of the hole is captured in a pan and reused.

Reinforcing Steel A bar placed through the full length of the pile, in the center of the pile to provide load transfer into the bond zone.

Reverse circulation A method of cleaning the inside of the drill casing. Drilling fluid is circulated down through the drill rods and returns upwards through the inside of the drill casing to flush the drill casing clean.

Tremie grouting A method used to place grout in a drill hole. A grout tube is placed to the bottom of the drill hole. While keeping the grout tube opening submerged in the grout, grout is pumped into the hole, causing the drilling fluid to be displaced upward.

501.012 Qualifications and Submittals

The Contractor performing the work described in this specification shall have installed micropiles of similar diameter, length, difficulty of installation, and subsurface conditions to those shown on the Plans for a minimum of five years prior to the bid date for this project.

Thirty (30) days prior to the start of installation of the Micropiles, the Contractor performing the work described in this Special Provision shall submit:

1. Proof of successfully constructed and load tested Micropiles using non-displacement methods at three (3) projects in the last 5 years under similar site conditions to those indicated in the Contract Documents.

2. A list identifying the on-site supervisors, drill rig operators, and load testers assigned to the project. On-site supervisors shall have supervised the successful installation of Micropiles on at least three (3) projects in the last 5 years under similar site conditions to those indicated in the Contract Documents. Drill rig operators shall have at least one (1) year experience in construction of Micropile foundations. The load test engineer responsible for design and execution of all micropile Proof and Verification load tests shall have designed and administered load tests on micropiles of similar size and capacity on a minimum of three (3) projects in the last five (5) years.

The Resident shall approve or reject the Contractor's qualifications and staff within fourteen (14) Working Days after receipt of the submission.

The Contractor will not be allowed to begin work until all related submittal requirements are satisfied and found acceptable to the Resident. At least thirty (30) days prior to the start of installation of the micropiles, the Contractor shall prepare and submit the information outlined below. All submittals will be reviewed by the Resident in accordance with Standard Specification Section 105.7, Working Drawings.

The Contractor shall submit a Micropile Installation Plan, which shall include:

1. List and description of proposed equipment and materials to be used for micropile installation, including drilling equipment, cleaning method, centralizers, reinforcing steel, bond breakers, primary grouting, post-grouting (if needed), tensioning, load testing and load transfer. Include model, size, type, manufacturer’s information, lifting capacities, and vertical and horizontal clearance compared to clearance available, for each piece of equipment.
2. Details of proposed procedures for micropile installation including, but not limited to, anticipated means/methods for: advancing and cleaning out the casing; sealing casing into rock; checking cleanliness of drill holes; installation of reinforcing; primary grouting and post-grouting. Identify the consecutive steps and the approximate time required for each step, labor and equipment usage schedule, any interference to any existing structures, facilities, or utilities as a result of the micropile installation, and the methods to be used to control and verify micropile position and vertical or battered alignment.
3. Methods to accurately identify the horizontal and vertical location of the existing sewer main between the proposed abutment and adjacent railroad tracks. This effort shall include manual, mechanical, or nondestructive methods (e.g.: vacuum excavation) to physically expose the utility for survey measurement. Exposure of the utility shall occur at each side

of the proposed abutment and a minimum of three additional points in between.

4. Procedures and anticipated means/methods and equipment/tooling for advancing through boulders, cobbles, and obstructions.
5. Procedures for containment of drilling fluid and spoils, and disposal of spoils.
6. Shop drawings, including the micropile components, all structural steel, micropile top attachment and bond zone details. Provide information on the length of the permanent steel casing sections and reinforcement sections to be used, as dictated by the length of the drill mast and by the available overhead clearance, and the resulting location of joints. Shop drawings shall provide details and dimensions of all micropile components, including, but not limited to, nominal diameter, length, size and length of permanent casing, reinforcement, splicing, centering devices, post-grout tube, grouting pressure, grout compressive strength, micropile to footing connection details, and shall include a plan showing micropile designations and working and staging areas.
7. Grout mix design and documentation from an independent testing laboratory. This item shall include the proportions of the batch, the manufacturer of the components, the specific gravity, and grout compressive strength test results completed within the last year.
8. If proposed, details of post-grouting materials/mix design, equipment and procedures, including the method, sequence of operations and equipment required.
9. Layout drawings showing the proposed sequence of micropile installation and proposed micropile verification load test location. Coordinate this sequence with the proposed phasing and scheduling.
10. Estimated sequencing and duration of the work, including mobilization, micropile installation, grouting, and demobilization.
11. Example micropile drilling log, installation log and grouting form.

For API steel pipe used as permanent steel casing, the Contractor shall submit a minimum of two representative coupon tests or mill certifications (if available) on each truckload delivered to the project. Certified mill test reports for the reinforcing steel shall be submitted for record purposes as the materials are delivered. The ultimate strength, yield strength, elongation, and material properties composition shall be included. Mill certificates for hex nuts and couplers shall also be submitted to the Resident.

The Contractor shall submit a Quality Control Plan (QCP) for the grout, in accordance with Standard Specification Section 502.1701, Quality Control, Method A and B, with the following exception: there are no permeability or entrained air requirements. This plan shall also include a description of the procedures and equipment for placing the grout and the method for monitoring quality control of the mix. At a minimum, quality control shall include: Use of a Baroid Mud Balance per American Petroleum Institute (API) Recommended Practice (RP) 13B-1, Standard Procedure for Testing Water Based Drilling Fluids, to check the specific gravity of the mixed grout prior to placement of the grout into each micropile; and compressive strength testing in accordance

with AASHTO T106/ASTM C109 at a frequency of no less than one set of three (3) 2-inch grout cubes each day of operation, or per every six (6) micropiles, whichever occurs more frequently.

The Contractor shall submit a Micropile Testing Submittal containing detailed plans for the method proposed for load testing (both verification and proof tests) the micropiles to the Resident for review and acceptance prior to beginning load tests. This shall include all necessary drawings and details to clearly describe the proposed verification load test locations, load test method and equipment, as well as calculations to ensure that the central reinforcement, load test equipment and subgrade are adequate to accommodate the proposed test loads, and shall bear the seal of a Professional Engineer registered in the Province of New Brunswick.

The Micropile Testing Submittal shall also include calibration reports for each test jack, pressure gauge, master pressure gauge and load cell to be used. The calibration tests shall have been performed by an independent testing laboratory and tests shall have been performed within sixty (60) days of the date submitted. The Resident shall approve or reject the calibration data within five (5) working days after receipt of the data. Testing shall not commence until the Resident has approved the jack, pressure gauge and master pressure gauge calibrations.

Micropile installation records shall be submitted to the Resident within 24 hours after each micropile installation is completed. As a minimum the records shall include: micropile drilling duration and observations; description and depth of soil and bedrock encountered; micropile inclination; approximate final drill hole, casing, reinforcement, and centralizer elevations; cut-off elevation; description of unusual behavior and/or conditions; deviations from planned parameters; grout volumes pumped; grout pressures; micropile materials and dimensions; micropile location; inspector name; drill method; grout method; drill rig operator.

The Contractor shall submit to the Resident within thirty (30) calendar days after completion of the micropile work a report containing:

1. As-built drawings showing the locations of the micropiles and the micropile lengths.
2. Steel manufacturer's mill test reports for the reinforcing steel, and coupon test results for permanent steel casing.
3. Detailed drilling records including depth to bedrock and bedrock quality.
4. Grouting records indicating the cement type, quantity injected and pressure.
5. Results of grout cube breaks.
6. Micropile load test results and graphs.

501.02 Materials

For all steel remaining as a permanent part of the work, including “mill secondary” casing, all Buy America provisions shall apply. Refer to Standard Specifications Subsection 105.11, Other

Federal Requirements, and Standard Specifications Appendix A to Division 100, Section 3, Other Federal Requirements.

Water Water shall meet the requirements of Subsection 701.02.

Grout Cement grout for grouting the micropiles shall be either neat cement grout, or sand-cement grout with a water-cement ratio not more than 0.45 by weight. Water content and consistency of grout may be varied only by written approval by the Resident or their agent. Minimum 28-day unconfined compressive design strength of grout shall be 5,000 psi per AASHTO T106. The grout design strength shall be achieved prior to placing pile cap concrete. Materials for cement grout shall be in accordance with the approved submittal. All cement shall be Portland cement conforming to AASHTO M85, Types I, II, III or V.

The grout shall be pumpable and consist of a mixture of Portland cement, mineral filler, plasticizer, sand and water so proportioned and mixed as to provide a grout capable of maintaining the solids in suspension without appreciable water gain, yet which will laterally penetrate and fill any voids in foundation material.

Mineral filler shall be finely powdered siliceous material, which possesses the property of chemically reacting in the presence of moisture with calcium hydroxide at ordinary temperatures to form compounds possessing cementitious properties. Plasticizer shall be a compound possessing characteristics which will increase the flowability of the mixture, assist in the dispersal of cement grains, and neutralize the setting shrinkage of the cement mortar.

Admixtures shall conform to the requirements of AASHTO M 194. Expansive admixtures and those with chlorides shall not be used. Admixtures shall be compatible with the grout and mixed in accordance with the manufacturer's recommendations. Their use shall only be permitted after field tests on fluid and set grout properties. Admixtures shall be submitted for review and approval by the Resident.

Fine Aggregate If sand-cement is used, sand shall conform to AASHTO M45 (ASTM C144).

Grout Protection Provide a minimum 1-inch grout cover over bars and ½ inch grout cover over couplers.

Reinforcing Steel Reinforcement steel shall be continuously threaded bar conforming to AASHTO M31 (ASTM A615), Grade 75 or better, except as noted for proof test piles. When a bearing plate and nut are required to be threaded onto the top end of the reinforcing bars for micropile top to footing anchorage, the threading may be continuous spiral deformed ribbing provided by the bar deformations or may be cut into the reinforcing bar. If threads are cut into a reinforcing bar, the next larger bar number designation from that shown on the Plans shall be provided at no additional cost.

Proof test micropile reinforcing steel shall consist of continuously threaded bar conforming to AASHTO M275 (ASTM A722), Grade 150 or better.

Reinforcing steel shall be galvanized in accordance with AASHTO M232 (ASTM A153)

Hex Nuts and Couplers Hex Nuts and Couplers shall conform to ASTM A576, Grade 75 or better. Hardened washers shall conform to ASTM F436, Grade 75 or better. Tension couplers shall be able to develop 1.25 times the theoretical yield strength of the spliced bar. Couplers shall be sized such that they allow the passage of grout between the casing and coupler, and shall be placed no shallower than 15 feet below the cutoff elevation.

Hex nuts and couplers shall be galvanized in accordance with AASHTO M232 (ASTM A153).

Permanent Steel Casing Steel casing for micropiles shall have the minimum outside diameter and wall thickness shown on the Plans and shall meet the tensile requirements of API 5CT Grade N80 (80 ksi) or better. The casing should be able to withstand the stresses associated with advancing it into the ground, in addition to the stresses due to hydrostatic and earth pressures. Casing shall be straight-seamed. Lap welded seams are not acceptable. Casing shall be either:

1. New “mill secondary” steel casing without mill certification, provided it is free from defects (dents, cracks, tears) and has a minimum of two unique coupon tests per truckload meeting the requirements of ASTM A 370-14, or

2. "Prime” steel casing meeting the requirements of API 5 CT Grade N80 or better.

If welding of high strength steel casing is required, a welding procedure conforming to AWS D1.1 *Structural Welding Code – Steel* specifications and recommendations shall be submitted to the Resident for review and acceptance, prior to any welding operation.

Permanent Steel Casing splices shall conform to the requirements of ASTM A148/A148M, Grade 725-585 (Grade 105-85). Casing splices or threads shall develop the required nominal strength of the pile cross section and shall provide proper alignment so that no eccentricity or angle occurs between the axes of the two lengths spliced.

The Permanent Steel Casing shall be flush joint and the pipe joint shall be completely shouldered and with no stripped threads.

The manufacturer or fabricator of steel pipe piling shall furnish a certificate of compliance stating that the piling being supplied conforms to these specifications. The certificate of compliance shall include test reports for tensile and chemical tests. Samples for testing shall be taken from the base metal, steel or coil or from the manufactured or fabricated piling. The certificate of compliance shall be in Imperial units.

Plates and Shapes Structural steel plates and shapes for micropile top attachment shall conform to AASHTO M 223 Grade 50 (ASTM A572).

Plates and Shapes shall be galvanized in accordance with Section 506, Shop Applied Protective Coating – Steel.

Centralizers and Spacers for Reinforcing Steel Centralizers and spacers shall be fabricated from schedule 40 PVC pipe or tube, steel, or material non-detrimental to the reinforcing steel. Wood shall not be used.

Centralizers and spacers shall be securely attached to the reinforcement; sized to position the reinforcement within 3/8 inch of plan location from center of micropile; sized to allow grout tremie pipe insertion to the bottom of the drill hole; and sized to allow grout to freely flow up the drill hole and permanent steel casing without misalignment of the reinforcement.

501.04 Construction Requirements

Progress all micropiles using permanent steel casing. If replacement micropiles are needed because installed micropiles are unacceptable, location of the replacement micropile(s) shall be approved by the Resident or their Agent. All installation techniques shall be determined and scheduled such that there will be no interconnection (grout flow between holes) or damage to previously installed micropiles.

Tolerances Install the top of the permanent steel casing to the elevation indicated in the Plans. Install the permanent steel casing so that the center of each casing does not vary from the plan location by more than 3 inches. Micropile-hole alignment of vertical micropiles shall be within 2% of design alignment. Micropile-hole alignment of micropiles inclined up to 1:6 shall be within 4% of design alignment. Micropile-hole alignment of micropiles inclined greater than 1:6 shall be within 7% of design alignment. Top elevation of the micropile as measured at the cutoff elevation of the casing shall be within plus or minus 1 inch of the design vertical elevation. Centerline of reinforcing steel shall not be more than ¾ inch from centerline of piling.

Drilling, Soil Removal, and Permanent Casing Installation The drilling equipment and methods shall be suitable for drilling through the conditions to be encountered, with minimal disturbance to these conditions or any overlying or adjacent structures or services, or previously installed micropiles. The drilling equipment shall be capable of installing micropiles to a depth and size shown on the Plans and to an additional depth of twenty (20) percent of the micropile length beyond the tip depths shown in the Plans. Drill so that the micropile is not moved out of horizontal alignment or out of specified inclination. Drill casing shall be extended to and sealed into bedrock prior to drilling the rock sockets. Open/unsupported drill holes will not be permitted. Do not drill or flush ahead of the drill casing by more than 6 inches in soil. Perform drilling and excavation in such a manner as to prevent the collapse of the hole. Use of bentonite slurry is not permitted. Use of polymer slurry to remove cuttings from the cased hole must be approved by the Resident. Install micropiles so that the permanent steel casing is in intimate contact with the surrounding soil. If a cutting shoe is used for advancing the casing, the cutting shoe diameter shall

not exceed the outer diameter of the casing plus 0.25 inches. Advance the hole using duplex drilling methods and reverse circulation within the drill casing. Positive circulation or flushing, a method of progressing and cleaning out a hole for a micropile wherein water is injected into the hole and returns upward along the outside of the drill casing, will not be allowed. The use of air to clean the casing will be allowed at the discretion of the Engineer. These methods are allowed provided the Specialty Contractor exercises caution to prevent over-excavation or heaving.

Micropile sockets or bond lengths shall be drilled to the minimum rock socket or bond length shown in the Plans. The bond length must be confirmed by approved methods to be open to the defined nominal diameter, full length, prior to placing reinforcing steel and grout.

The Contractor is responsible for removing and/or advancing through any cobbles, boulders, and all obstructions that may interfere with the installation of Micropiles. The Contractor shall have and maintain on site at all times the proper equipment, tools, materials, and labor necessary for the effective removal or penetration of such materials, if encountered. An impact or vibratory hammer shall not be used to advance casing; this requirement does not apply to rotary percussive techniques that use top-drive hammers or down-the-hole hammers.

Control the procedures and operations to prevent undermining, damage or settlement to adjacent structures, tunnels, utilities or adjacent ground, or previously installed micropiles. If any undermining, damage or settlement occurs, halt operations. Provide a written plan to the Resident for review with procedures to avoid reoccurrence. Resume work only after the Resident or their agent have approved the plan in writing. Repair all damage and settlement at no additional cost to the Department. Delays resulting from the plan preparation and review process shall be the sole responsibility of the Contractor, and shall be at no additional cost to the Department.

Control the procedures and operations to prevent soil or rock material from moving into the bottom of the hole at all times during installation and cleaning out. Maintain the fluid level inside the hole above the ground water level at all times during installation and cleaning out. Monitor the rate of fluid flow used to progress the holes. Monitor any adjacent water body for siltation resulting from drilling and flushing.

Control drilling fluid and dispose of spoil in accordance with the approved procedure. Drill fluid and cuttings shall be controlled by diverters, or other methods approved by the Resident, that produce a closed system allowing all drill spoil to be placed in settling tanks for separation of fluid and solids for eventual disposal. Wastes and spoils must be disposed of in an appropriate manner. Deposition of waste and spoil on local streets and in sewers will not be permitted.

Pre-drilling more than one hole or incomplete drilling of holes shall not be permitted unless otherwise approved by the Resident or their agent. All incomplete micropiles that are in progress shall be capped or covered during overnight or weekend breaks for safety and to prevent any objects from falling in. Do not advance a drill hole, clean a completed drill hole, pressure grout, or post-grout, within a radius of five (5) pile diameters or five (5) feet, whichever is greater, of a grouted micropile until the grout for that micropile has set for at least 24 hours, or longer if a

retarder is used. The Resident will determine the longer wait time if a retarder is used based on the results of the grout testing.

All installation techniques shall be determined and scheduled such that there will be no interconnection or damage to micropiles in which grout has not achieved final set.

Reinforcing Steel, Centralizers, and Post Grout Tube Placement Reinforcing Steel shall be placed immediately prior to primary grouting. The Reinforcing Steel surface shall be free of all deleterious substances such as soil, mud, grease or oil that might contaminate the grout or coat the reinforcement and impair bond.

Centralizers shall be provided at 10 ft. maximum spacing on central reinforcement. The uppermost and lowermost centralizers shall be located a maximum of 5 feet from the ends of the micropile. Securely attach the centralizers to withstand installation stresses. Centralizers shall be provided of appropriate size to center the reinforcing steel in the bond zone and the permanent steel casing.

The Contractor shall check micropile top elevations and adjust all installed micropiles to the planned elevations.

After drilling, the hole shall be flushed with water and/or air or other method per approved Contractor submittal to remove drill cuttings and/or other loose debris to the satisfaction of the Department's authorized representative. After the Resident confirms that the hole is clean and open to depth, and immediately prior to grouting, lower the reinforcing steel to its specified location in the hole without dropping. If a post grout tube is used, attach it to the reinforcing steel prior to lowering it. Partially inserted reinforcing steel shall not be driven or forced into the hole. The Contractor shall remove the steel, redrill and reinsert steel when necessary to facilitate inserting at no additional cost to the Department. There shall be no interconnection or damage to micropiles in which the grout has not achieved final set.

Grout Placement The Contractor shall provide calibrated systems and equipment to measure the grout quality (including, at a minimum, compressive strength according to AASHTO T106/ASTM C109 and grout specific gravity), quantity, and pumping pressure during the grouting operations. Pressure is usually applied by attaching a pressure cap to the top of casing or drilling head and injecting additional grout into the casing under controlled pressure. The minimum pump pressure at the top of the steel casing shall be calculated by the Contractor and provided in their submittal. The pressure gauge for grout pressure monitoring shall be capable of measuring pressure of at least 200 psi or twice the actual grout pressure to be used by Specialty Contractor, whichever is greater. Provide pressure gages capable of measuring the actual grout pressures used such that actual pressure readings are within the middle third of the gage. The grouting operations for micropiles shall begin within 4 hours after the micropile has been successfully cleaned.

The grout shall not contain lumps or any other evidence of poor or incomplete mixing. Admixtures, if used, shall be mixed in accordance with manufacturer's recommendations. The grouting equipment shall be sized to enable the grout to be pumped in one continuous operation.

The grout shall be kept in constant agitation prior to pumping. Fill annular space between the Permanent Steel Casing and the Reinforcing Steel with grout meeting the requirements of the approved mix design. Grout shall be placed within one (1) hour or less after mixing or within the time recommended by the manufacturer if admixtures are used and shall be installed without significant interruption. If significant interruption occurs, the Contractor shall replace the micropile or install a new replacement micropile at a location approved by the Resident at no additional cost to the Department. Grout not placed within the allowed time will be rejected.

Provide quality control of the mix by monitoring grout quality per the QCP submitted to, and accepted by, the Department.

The grout shall be injected from the lowest point of the drill hole by means of a tremie pipe/tube in accordance with the approved procedure until clean, pure grout flows from the top of the micropile as determined by the Resident. All grouting operations shall ensure complete continuity of the grout column. For bond lengths in soil, closely control the rate of drill casing removal such that the grout level remains at the top of the casing. Perform pressure grouting and simultaneous casing withdrawal until the required bond zone length is achieved. Maintain a positive flow of grout into the micropile after withdrawal of each length of casing. The use of compressed air to directly pressurize the fluid grout is not permissible. The entire micropile shall be grouted to the design cut-off level and until clean grout flows from the top. Make provisions for checking the grout level in place at the end of each stage of grouting. Record the initial volume of grout required to fill the hole. Upon completion, maintain the grout level at or above the micropile cut off elevation until the grout has set. Record date and time of observed grout loss and volume of added grout.

Upon completion of grouting, the grout tube may remain in the hole, but it shall be filled with grout. If post-grouting is utilized, perform post-grouting at least 48 hours after the primary grout or after the grout for the micropile has hardened. Record the pressure at which the grout was pumped and the volume pumped through each port.

Provide means and access for grout volume measurement at the micropile installation site to the Resident or their agent.

Grout Testing Testing will be performed in accordance with the QCP submitted to, and accepted by, the Department.

Micropile Acceptance Criteria The following shall be achieved in order for the production Micropiles to be acceptable to the Department:

1. Tolerance criteria met
2. Installed in accordance with the approved Micropile Installation Plan and Grouting QCP.
3. Installed to the minimum rock socket embedment or minimum bond zone length shown in the Plans.

4. No damage sustained during construction.
5. Micropile was installed using the same methods as were used to install the accepted test piles.

Unacceptable Micropiles Unacceptable micropiles are micropiles which do not meet the Acceptance Criteria outlined above.

In the event that a Micropile is identified as unacceptable, the Contractor shall submit to the Resident a written plan of remedial action showing how to correct the problem and prevent its reoccurrence within 72 hours of identification of the unacceptable micropile. The Department shall review the remedial plan and approve or reject within one week after submission. The Contract shall revise and resubmit their plan until it is approved by the Department. The Contractor shall repair, augment, or replace the unacceptable micropile in accordance with the approved remedial plan at no additional cost to the Department. No repair shall be permitted until the written plan is approved by the Resident. To mitigate and/or to remedy unaccepted micropiles, the Contractor may be required to provide additional micropiles or supplement micropiles to meet specified requirements. Any associated work required due to unacceptable micropiles shall be at no additional cost. Payment will not be made for a rejected micropile until such time that the micropile is repaired or augmented to the satisfaction of the Resident.

501.041 Verification Load Testing.

One (1) successful, pre-production verification axial load test shall be conducted on a sacrificial, plumb micropile (test pile) installed within 50 feet of the abutment micropile locations for the proposed structure. Location of test pile shall be proposed by the Contractor and approved by the Resident. Verification load testing shall be performed in the presence of the Department's authorized representative and shall verify that the test pile meets the required compression or tension load resistance and the load test acceptance criteria. The Contractor shall provide a minimum of 48 hours notice prior to verification load testing. The test pile shall be installed and tested prior to production micropile installation. The drilling and grouting methods, casing and other reinforcement details, and depth of embedment for the successful test pile shall be identical to the subsequent production micropile installation except where approved otherwise by the Resident. A bond breaker shall be installed above the top of the rock socket in the test pile installed for verification testing to isolate the rock socket. The verification load tests will be conducted in tension. The test piles shall be loaded to 150% of the factored design compression or tension load, whichever is larger. The Contractor shall indicate in their submittal whether higher strength steel is required for the reinforcing to resist the maximum test load. The maximum test load shall be no greater than 80 percent of the Minimum Ultimate Tensile Strength of the reinforcement.

Micropile verification load testing shall be in general conformance with ASTM D-3689 (tension load test) except as modified herein. The Contractor shall provide load testing equipment with a movement-measuring device with a sensitivity of 0.001 inches of displacement. Testing equipment shall include at least two (2) dial gauges, dial gauge support, jack and pressure gauge, electronic load cell, wire, mirror, and scale, and reference beam. A leveling plate shall be attached

to the surface of the test pile and the jack shall be set in position with the load centered on the pile. The hydraulic jack and pressure gauge shall be calibrated by an independent testing laboratory as a unit with the pressure gauge graded to allow 10 kip increments.

The Contractor shall position the jack at the beginning of the load test such that the unloading and repositioning of the jack during the load test will not be required. An Alignment Load (AL) may be applied to the micropile prior to setting the movement recording devices. The AL shall be no more than 0.04 times the Factored Design Load (FDL). Dial gauges shall be zeroed at the first setting of the AL. Loads will be applied based on the calibrated pressure gauge reading.

The Contractor shall perform the sacrificial verification micropile load test by incrementally loading the micropile in accordance with the following schedule and recording the micropile head movement at each step:

Load Steps for Verification Load Testing

AL = Alignment Load FDL = Factored Design Load		
	LOAD	HOLD TIME
1	AL (0.04 FDL)	-
2	0.075 FDL	4 minutes
3	0.15 FDL	4 minutes
4	0.225 FDL	4 minutes
5	0.30 FDL	4 minutes
6	0.375 FDL	4 minutes
7	AL (0.04 FDL)	1 minute
8	0.15 FDL	1 minute
9	0.30 FDL	1 minute
10	0.375 FDL	1 minute
11	0.45 FDL	4 minutes
12	0.525 FDL	4 minutes
13	0.60 FDL	4 minutes
14	0.675 FDL	4 minutes
15	0.75 FDL	4 minutes
16	AL (0.04 FDL)	1 minute
17	0.30 FDL	1 minute
18	0.60 FDL	1 minute
19	0.675 FDL	1 minute
20	0.75 FDL	1 minute
21	0.825 FDL	4 minutes
22	0.90 FDL	4 minutes
23	0.975 FDL	10 to 60 minutes (Creep Test Load Hold)
24	AL (0.04 FDL)	1 minute
25	0.30 FDL	1 minute
26	0.60 FDL	1 minute
27	0.90 FDL	1 minute
28	0.975 FDL	1 minute
29	1.05 FDL	4 minutes
30	1.125 FDL	4 minutes
31	1.2 FDL	4 minutes
32	1.275 FDL	4 minutes
33	1.35 FDL	4 minutes
34	1.425 FDL	4 minutes
35	1.5 FDL	4 minutes
36	1.2 FDL	4 minutes
37	0.90 FDL	4 minutes
38	0.60 FDL	4 minutes
39	0.30 FDL	4 minutes
40	AL (0.04 FDL)	15 minutes

Micropile top movement shall be measured at each load increment. Micropile movement during the creep test shall be measured and recorded at 1, 2, 3, 4, 5, 6, 10, 20, 30, 50, and 60

minutes. The load cell shall be monitored and jack pressure shall be applied as necessary to maintain a constant load throughout the creep test.

The Acceptance Criteria for micropile verification load testing shall be:

1. The micropile shall sustain the axial compression design load (0.75 FDL) in tension with no more than 0.5-inch total vertical movement in addition to the theoretical elongation of the bar, as measured from the top of the bond zone to the bottom of the load cell jacking plate, prior to the start of load testing. If an alignment load is used, then the allowable movement will be reduced by multiplying by a factor of [(0.75 FDL-AL)/0.75FDL].

2. Test micropile shall have a creep rate at the end of the 0.975 FDL increments which is not greater than 0.04 inches/log cycle time from 1 to 10 minutes or 0.08 inches/log cycle time from 6 to 60 minutes and has a linear or decreasing creep rate throughout the creep load hold period.

3. Failure does not occur by the 1.5 FDL test load. Failure is defined as a slope of the load versus defection curve (at end of increment) exceeding 0.025 inch/kip.

If the micropile load test fails to meet the design requirements, the cause(s) shall be established, and the micropile design and/or installation methods shall be modified. These modifications include, but are not limited to, installing replacement micropiles, modifying the installation methods, increasing the bond length, regrouting via pre-placed re-grout tubes, or changing the micropile type. Any modification which requires changes to the structure shall have prior review and acceptance of the Resident. The cause for any modifications of design or construction procedures shall be decided in order to appropriately determine any additional cost implications. Any modifications of construction procedures shall be at the Contractor's expense. Subsequent verification micropiles shall be installed at locations approved by the Resident using the approved modified construction procedures and retested, as detailed previously in this Subsection. If the verification test results meet the acceptance criteria, the Resident shall review and approve the modified design and/or installation methods proposed by the Contractor prior to beginning production micropile installation.

The Contractor shall minimize disturbance to the ground surface when placing and removing blocking.

The Contractor shall provide the Resident a written report confirming micropile details and construction procedures within 7 working days after the completion of the pre-production load tests. This written confirmation shall either confirm the micropile construction methods initially proposed and bond lengths as shown in the drawings for micropiles or propose modifications based upon the results of the verification load tests.

At the completion of verification load testing, test micropiles shall be removed down to the elevation specified by the Resident, but no less than 2 feet below any foundation element or final ground surface elevation.

501.042 Proof Load Testing.

The Contractor shall perform proof load tests on three (3) production micropiles. Micropile proof load testing shall be performed in the presence of the Department's authorized representative. The Contractor shall provide a minimum of 48 hours notice prior to proof load testing. The micropiles to be proof load tested are identified in the Plans. Proof test micropile reinforcing steel shall be sized in accordance with the plans and shall consist of continuously threaded bar conforming to AASHTO M275 (ASTM A722), Grade 150 or better. Proof load tests shall be conducted in tension.

Axial micropile proof load testing shall be made by loading the micropiles in accordance with the following schedule and recording the micropile head movement at each step:

Load Steps for Proof Load Testing

AL = Alignment Load FDL = Factored Design Load		
	LOAD	HOLD TIME
1	AL(0.04 FDL)	4 minutes
2	0.10 FDL	4 minutes
3	0.20 FDL	4 minutes
4	0.30 FDL	4 minutes
5	0.40 FDL	4 minutes
6	0.50 FDL	4 minutes
7	0.60 FDL	4 minutes
8	0.70 FDL	4 minutes
9	0.80 FDL	4 minutes
10	0.90 FDL	4 minutes
11	1.00 FDL	10 to 60 minutes (Creep Test)
12	0.75 FDL	4 minutes
13	0.50 FDL	4 minutes
14	0.25 FDL	4 minutes
15	AL (0.04 FDL)	4 minutes

The Acceptance Criteria for micropile proof load tests shall be:

1. The micropile shall sustain the design loads (0.75 FDL) with no more than 0.5 inch of total vertical movement in addition to the theoretical elastic elongation of the portion of the micropile above the bonded zone as measured relative to the micropile prior to the start of load testing. If an AL is used, then the allowable movement will be reduced by multiplying by a factor of [(0.75 FDL-AL)/0.75 FDL].

2. Test micropiles shall have a creep rate at the end of the 1.00 FDL increment that is not greater than 0.04 inch/log cycle time from 1 to 10 minutes or 0.08 inch/log cycle time from 6 to 60 minutes and has a linear or decreasing creep rate.

3. Failure does not occur by 1.00 FDL test load. Failure is defined as a slope of the load versus defection curve (at end of increment) exceeding 0.025 inch/kip.

If a production micropile that is proof load tested fails to meet the Acceptance Criteria, production micropile installation shall cease until modifications are made to the design, the construction procedures or both. These modifications include, but are not limited to, installing replacement micropiles, incorporating micropiles of reduced load capacities, modifying the installation methods, increasing the bond length, or changing the micropile type. Any modification which requires changes to the structure shall have prior review and acceptance of the Department's authorized representative. Any modifications of construction procedures shall be at the Contractor's expense. The Resident may elect to proof test an additional micropile in consideration of a failed proof test and/or the circumstances of the modification.

501.05 Method of Measurement

Drilling Equipment Mobilization All work related to mobilization, demobilization, and remobilization for separate phases of work of any equipment or temporary access and/or working platforms required to satisfactorily complete all micropile installation and load testing shall be measured on a lump sum basis.

Micropiles shall be measured per each accepted production micropile installed. This measurement shall not include micropiles damaged prior to completion of the work unless remedied to the satisfaction of the Resident.

Micropile Verification Load Test shall be measured per each test performed and accepted for each designated pile load capacity, including installation of accepted test pile. Load tests made at the option of the Contractor or to repeat an unaccepted (failed) load test shall not be measured for payment.

Micropile Proof Load Test shall be measured per each test performed and accepted for each designated pile load capacity. Load tests made at the option of the Contractor or to repeat an unaccepted (failed) load test shall not be measured for payment.

501.06 Basis of Payment

Drilling Equipment Mobilization This item shall include the cost of furnishing all labor, equipment, and materials needed to complete micropile installation, including transporting, erecting, dismantling and removing all micropile construction and load testing equipment. The lump sum price for this item will be paid once all equipment is mobilized to the Project site.

Micropiles The unit bid price shall include cost of the micropiles (installed and accepted), development and execution of an approved Micropile Installation Plan, Micropile Testing Submittal, and Grout QCP, furnishing all labor, materials and equipment necessary to complete the work, and submit reports including efforts to accurately locate the adjacent sewer main. All costs to repair all damage and settlement to adjacent ground and structures shall be incidental to

the pay item for micropiles and at no additional cost to the Department. All costs to repair, augment and/or replace all rejected micropiles shall be incidental to the pay item for micropiles and at no additional cost to the Department. Micropiles that fail to meet the Acceptance Criteria will be rejected and no payment will be made for these micropiles.

The Contractor is responsible for estimating the grout take. There will be no extra payment for grout overruns. All costs associated with micropile installation include full compensation for any casings, augers, grouting operations, drilling equipment, or specialty tools needed to install micropiles shall be incidental to the contract pay item for micropiles.

Micropile Verification Load Test shall be paid for at the contract unit price per each test, satisfactorily completed, and meeting the acceptance criteria as stated herein. Payment for verification load tests includes full compensation for installation of a verification test pile and providing all labor, equipment, and materials needed to perform load tests and submitting reports as specified.

Micropile Proof Load Test shall be paid for at the contract unit price per each test, satisfactorily completed, and meeting the acceptance criteria as stated herein. Payment for verification load tests includes full compensation for providing all labor, equipment, and materials needed to perform load tests and submitting reports as specified.

Payment will be made under:

Pay Item:		Pay Unit
501.220	Micropiles	Each
501.2331	Micropile Verification Load Test (includes Verification Pile)	Each
501.2341	Micropile Proof Load Test	Each
501.804	Drilling Equipment Mobilization (Micropiles)	Lump Sum

Madawaska-Edmundston
International Bridge
WIN: 021736.00
November 17, 2020

SPECIAL PROVISION
SECTION 502
STRUCTURAL CONCRETE
(Roadway Median)

502.01 Description The following paragraph is added:

This work shall also consist of furnishing and placing a Portland Cement Concrete pavement and incidental construction as shown on the Plans and as directed by the Resident. Except as otherwise specified in this Special Provision, all work shall be in conformity with the applicable provisions of Section 502, Structural Concrete and Section 515, Protective Coating for Concrete Surfaces.

502.10 Placing Concrete The following paragraph is added to the end of Section A, General:

The Concrete median shall be of the thickness and geometry shown on the Plans. Concrete shall be placed in a continuous placement operation. Construction joints will not be allowed.

502.13 Finishing Concrete Surfaces The following section is added to the end the Subsection:

> G. Structural Concrete Median Islands The surface of the concrete shall receive a float finish in accordance with Subsection 502.13(A). Immediately following the float finish, the surface shall be textured at right angles to the roadway using an approved open-pile, stiff bristle broom or mat.

502.18 Method of Measurement Structural Concrete, Roadway Median, will be measured per cubic yard of concrete, satisfactorily placed and accepted.

502.19 Basis of Payment The accepted quantity of Structural Concrete, Roadway Median will be paid for at the Contract unit price per cubic yard, which payment will be full compensation for all labor, materials, equipment and incidentals necessary to complete the work.

Pay Item		Pay Unit
502.341	Structural Concrete, Roadway Median	Cubic Yard

SPECIAL PROVISION
SECTION 502
STRUCTURAL CONCRETE
(QC/QA Acceptance Methods)

CLASS OF CONCRETE	ITEM NUMBER	DESCRIPTION	P	METHOD
A	501.8016	6 Foot Diameter Drilled Shaft	$300	B
A	501.831	Drilled Shaft, Rock Socket Concrete (5.5 ft dia)	$300	B
A	502.219	Structural Concrete Abutment and Retaining Walls	$400	A
A	502.239	Structural Concrete Piers	$400	A
S	502.24	Structural Concrete Piers (Placed Under Water)	N/A	C
S	502.249	Structural Concrete Piers (Placed Under Water)	N/A	C
A	502.26	Structural Concrete Roadway and Sidewalk Slab on Steel Bridges	$400	A
A	502.31	Structural Concrete, Approach Slab	N/A	C
LP	502.341	Structural Concrete, Roadway Median	$450	A
LP	502.49	Structural Concrete Curbs and Sidewalks	$450	A
Fill	502.565	Concrete Fill	N/A	C
LP	526.34	Permanent Concrete Transition Barrier	N/A	C

P values listed above reflect the price per cubic yard (yd^3) for all pay adjustment purposes.

The quantity used for Pay Adjustment purposes shall be the actual quantity of concrete placed and accepted. This quantity shall be computed by the Contractor and submitted to the Resident for approval.

Madawaska-Edmundston
International Bridge
WIN: 021736.00
November 4, 2020

SPECIAL PROVISION
SECTION 502
STRUCTURAL CONCRETE
(Shrinkage Reducing Admixture)

502.05 Composition and Proportioning The following shall be added after the Concrete Class Table notes and prior to the paragraph beginning with “Each concrete mix design shall be submitted..”

Concrete used to construct the superstructure deck, sidewalk, and curbs shall contain a shrinkage reducing admixture from the MaineDOT Qualified Products List. The application rate shall be per the manufacturer’s recommendation.

SPECIAL PROVISION
SECTION 502
STRUCTURAL CONCRETE
(Fiber Reinforced Polymer Bridge Drains)

Description

This work shall consist of design, fabrication and delivery of bridge drains using FRP (Fiber Reinforced Polymer) composite materials in accordance with the plans and this specification.

Applicable Standards and References

The design and construction of FRP composite bridge drain components shall be in accordance with this Specification, the relevant requirements of the following standards and specifications, and other applicable Standard Specifications, unless otherwise stipulated in this specification. Standards and specifications specifically cited in the body of the specification establish requirements that shall have precedence over all others. Should the requirements in any reference conflict with those in another, the reference highest on the list shall govern. It is the Contractor's responsibility to obtain clarification of any unresolved ambiguity prior to proceeding with the design or construction.

Specifications

Work shall be done in general accordance with the following specifications:

a. AASHTO LRFD Guide Specifications for Design of Concrete-Filled FRP Tubes for Flexural and Axial Members, 2012.
b. American Composites Manufacturing Association, ACMA Code of Standard Practice, First Edition, 2011.
c. ISO/IEC Guide 58, Calibration and Testing Laboratory Accreditation Systems - General Requirements for Operation and Recognition.
d. ISO/IEC 17025 General Requirements for the Competence of testing and Calibration Laboratories.
e. Applicable MaineDOT Standard Specifications including, but not limited to, Section 504, Structural Steel.

2.3 Standards

A.) ASTM D 2584. *Standard Test Method for Ignition Loss of Cured Reinforced Resins.* American Society for Testing and Materials, West Conshohocken, PA.

B.) ASTM D 3039. *Standard Test Method for Tensile Properties of Polymer Matrix Composite Materials.* American Society for Testing and Materials, West Conshohocken, PA.

C.) ASTM D 3171. *Standard Test Methods for Constituent Content of Composite Materials.* American Society for Testing and Materials, West Conshohocken, PA.

D.) ASTM D 4385. *Standard Practice for Classifying Visual Defects in Thermosetting Reinforced Plastic Pultruded Products.* American Society for Testing and Materials, West Conshohocken, PA.

E.) ASTM D 570. *Test Method for Water Absorption of Plastics.* American Society for Testing and Materials, West Conshohocken, PA.

F.) ASTM E 1356. *Standard Test Method for Assignment of the Glass Transition Temperatures by Differential Scanning Calorimetry.* American Society for Testing and Materials, West Conshohocken, PA.

G.) ASTM E 1640. *Standard Test Method for Assignment of the Glass Transition Temperature by Dynamic Mechanical Analysis.* American Society for Testing and Materials, West Conshohocken, PA.

H.) ASTM C 582. *Standard Specification for Contact-Mold Reinforced Thermosetting Plastic (RTP) Laminates for Corrosion-Resistant Equipment.* American Society for Testing and Materials, West Conshohocken, PA.

Material

Materials shall conform to the following requirements:

1. FRP composite drain and pipe material shall meet the requirements of Appendix A.

2. All material and workmanship will meet or exceed the requirements of the ASTM Specifications above.

Construction Requirements

FRP Drain Manufacturers

The FRP bridge drains shall be supplied by one of the following companies:

1. Kenway Corporation
2. FRP Bridge Drain Pipe-Westfall Company
3. ACO USA

The above suppliers have been pre-certified by providing materials samples that have been tested in accordance with Appendix A. Other suppliers/manufacturers may become certified if FRP bridge drain samples are tested in accordance with the requirements in Appendix A along with meeting the following requirements.

All manufactures or fabricators of FRP bridge drain systems/components are required to have a minimum of 3 years of experience in providing FRP composite structural grade products to the general market. Manufacturers need to provide documentation that personnel involved in manufacture/fabrication hold and maintain American Composites Manufactures Association (ACMA) certifications in a minimum of one of the following disciplines; 1) Open Molding, 2) Corrosion, 3) Vacuum Infusion, 4) Closed Molding and that the Manufacturer/Fabricator have an ISO 9001:(current year) or other independent certification to ensure that the Manufacturer's process has been independently audited for conformance.

Design Guide for FRP Composite Scupper Bodies/Drain Inlets

General

The bridge shall use a drain size specified on the plans. See Appendix B for additional details. The bottom of the downspout shall extend a minimum of 12 inches below the bottom of the beams. For bridge decks with an integral concrete wearing surface, the drain pan depth shall be reduced to provide adequate concrete cover.

Deck/interface drain holes.

For bridge decks with pavement and waterproofing membrane, drain holes are required on both sides of the scupper to capture moisture at the interface between the top of the deck and bottom of the asphalt pavement. Three holes one half inch in diameter spaced at 6 inches on center and three and one quarter inches on center below the top of the grate, or pavement thickness, shall be placed on both sides of the scupper. If the holes are created after the molding process by punching, drilling or other mechanical means the holes shall be sealed using a compatible epoxy compound.

Grates

Grates shall be bicycle friendly and designed for HL-93 Live Load unless otherwise specified. Any gaps in grates shall have a maximum clear width of two inches. The minimum clear opening size in any grating shall be 1 1/8” by 1 1/8“. Grates shall be stainless steel (ASTM A995) or FRP specifically designed and meeting the HL-93 Live Load requirements.

- Steel grating shall be commercial heavy - duty grating with 1 1/2" x 5/16" bearing bars spaced at 2 3/8” and 3/8" diameter cross bars spaced at 2”. The grating shall be centered in the drain top. The bearing bars shall run parallel to traffic.
- FRP grating if used shall provide an opening area at least 75% of steel grating noted above. FRP gratings that do not meet this requirement are not acceptable and shall not be used.

Grates shall be designed so that they can be removed by mechanical means. Fasteners for grates shall be stainless. Where selected grates require orientation to flow, the grates will have orienting features included as required, i.e. for orders of paired drains one drain would have left hand orientation and the other right hand orientation.

Grate Frames
Grate frames may be either integrated FRP composite or of stainless steel construction attached to the scupper/inlet body in a matter consistent with the physical design parameters.

Anchoring provisions
Scupper/inlet anchoring shall be bonded to the grate framing in a manner that provides a load path into the concrete decking. Anchor details to be specified as part of the shop drawings for the bridge drains and be a non-corrosive material.

Cross and Longitudinal Slope Compensation
The scupper/inlet designs shall provide a means to match the grate to the deck angles while maintaining the downspout in a plumb orientation. If purchased in pairs, one left handed version will be required for each right handed version. This may be achieved when a down spout portion is bonded to the scupper body, through the frame attachment to the scupper body.

FRP Composite Drain Sections
Bridge deck downspouts, bridge drain deck extensions, elbows and pipe for under drains shall be constructed using a circular cross section; however, other cross sections are allowed with approval of the Fabrication Engineer. Drain sections shall comply with the material requirements set forth in Appendix A and maintain wall thickness of no less than 1/4 inch.

FRP Composite Deck Drain Extensions.
Down spout drain extensions shall be integrated and bonded directly to the scupper bodies.

Transitions through Connections and Components.
All transitions and joints to be manufactured through the use of smooth radius molds. Miter joint and edged transitions are not allowed. All internal joint connections are to be smooth and continuous.

Pigmented FRP Composite Drain Components
Pipes, fittings, bodies and all FRP composite drain system components shall be pigmented through the wall. The color used shall match the color of the beams unless otherwise allowed by the Fabrication Engineer. Paint, gel-coat or any other exterior coating shall not be accepted.

Joint Connections
Joints may be welded using manufacturer recommended adhesives in accordance to the adhesive manufacturer's application procedures. Adhesives must be compatible with the FRP resins, applied in a way that ensures complete bonding and liquid tight sealing of the resins, and be compatible with the environmental conditions such as temperature, freeze thaw conditions, and wet alkaline environments.

Shop Drawings/Inspection

Drawings The Contractor shall prepare shop detail, erection and other necessary working drawings in accordance with Section 105.7 - Working Drawings. Drawings shall include dimensions and tolerances necessary for manufacture and installation, all hardware, orienting features, anchor details, fastener details, gasket details, cross and longitudinal matching features, joint details, transition details, and material lay-up/composition.

Notice of Beginning Work The Contractor shall give the Fabrication Engineer a minimum of two weeks notice before the beginning of work. No work shall be performed before the Fabrication Engineer has been notified. Before beginning work, a pre-fabrication meeting may be held at the discretion of the Fabrication Engineer or, if requested, by the Contractor.

The Contractor shall advise the Fabrication Engineer of the production schedule and any changes to it. If the Contractor suspends work on a project, the Fabrication Engineer will require 48 hours notice prior to the resumption of work.

Inspection Quality Control (Q.C.) is the responsibility of the Contractor. The Quality Control Inspector (Q.C.I.) shall inspect all aspects of the work and shall supervise all nondestructive examination (NDE). The Q.C.I. shall record measurements and test results in a clear and legible manner. The Q.C.I. shall reject materials and workmanship that do not meet contract requirements. The Contractor may perform NDE in addition to the minimum required. The results of all measurements and testing shall be made available to the Quality Assurance Inspector (Q.A.I.).

Quality Assurance (Q.A.) is the prerogative of the Fabrication Engineer. The Q.A.I. will ensure that the Q.C. Department is performing properly, verify documentation, periodically inspect workmanship and witness NDE. Q.A. testing deemed necessary by the Fabrication Engineer in addition to the minimum testing requirements shall be scheduled to minimize interference with the production schedule.

Inspector's Authority The Q.A.I. will have the authority to reject material or workmanship that does not meet the contract requirements. The acceptance of material or workmanship by the Q.A.I. will not prevent subsequent rejection, if found unacceptable.

Rejections Rejected material and workmanship shall be corrected or replaced by the Contractor.

Bill of Materials The Contractor shall provide the Fabrication Engineer with copies of all bills of materials used in the fabrication of the FRP bridge drains.

Packaging, Storage and Shipping of Components

FRP drains shall be stored and handled in accordance with the manufacturer's recommendation. The drains shall be stored above the ground and not be allowed to come into contact with seawater, mud, grease, dirt or other deleterious materials that may be present on the job site.

Installation

The Contractor shall install the FRP drains in accordance with the manufacturer's installation procedures, Contract Plans, and in accordance with the Contractor's installation drawings. FRP bridge drains will be accurately placed at the locations shown on the Plans or as authorized by the Resident. Adequate means shall be provided for securely holding the drains in place during placement of concrete. Any damaged drain shall be repaired or replaced at the Resident's discretion and at no additional cost to the Department.

Method of Measurement

FRP Bridge Drains will be measured by the number of units, for fabrication and delivery. Installation for the drains will be incidental to the Structural Concrete Superstructure item.

Basis of Payment

FRP Bridge Drains will be paid for at the contract unit price. Such payment will include compensation for the fabrication and delivery of the drains in accordance with this specification.

Payment will be under:

Pay Item		Pay Unit
502.77	FRP Bridge Drain –Type: A	Each
502.77	FRP Bridge Drain –Type: F	Each

SPECIAL PROVISION
SECTION 502
STRUCTURAL CONCRETE
(Fiber Reinforced Polymer Bridge Drains)

APPENDIX A

A.1 Scope
This section specifies the material composition, properties, test requirements and reports that shall be submitted and approved prior to and after product certification of each FRP composite drain component type, e.g. scupper body or pipe component. The manufacturer is responsible for testing using an approved independent lab per section A.5.3. Once certified, the approved product may be manufactured with only internal testing provided the manufacturing process and laminate composition do not change. Changes to process and or composition do require additional testing and product certification. The manufacturer shall report the individual test results per section A.5.3. If the strength is less than the required properties certification will not be granted.

A.2 Material/Laminate Composition

A.2.1 Fibers
Fiber sizings and coupling agents shall be compatible with the resin system used to impregnate them.

A.2.2 Matrix Resins
Commercial grades of vinyl ester and epoxy resin systems are permitted provided the finished product meets the material property requirements before and after durability conditioning as set forth in Section A. Styrene is permitted to be added to the polymer resin during processing. Added styrene shall be less than 10 percent by mass of the polymer resin. The amount of styrene, as a mass percentage of the polymer resin, added during processing shall be reported per Section A.5.3.

A.2.3 Fillers and Additives
Commercial grade inorganic fillers such as kaolin clay, calcium carbonate, and alumina tri-hydrate shall not exceed 20 percent by mass of the polymer resin constituent. Commercial grade additives and process-aids, such as release agents, low profile shrink additives, initiators, promoters, hardeners, catalysts, pigments, fire-retardants, and ultra-violet inhibitors are permitted and depend on the processing method. Shrink additives, if used, shall be less than 20 percent by mass of the polymer resin. Commercial grade inorganic or organic non-woven surfacing mats or veils are permitted.

A.2.4 Fiber Content
Fiber content shall be measured by ASTM D 3171 or ASTM D 2584. Fiber content shall be high enough to meet the mechanical property requirements of the FRP system laminate. The manufacturer shall report the fiber content of the end product by volume or by mass in accordance to the method used. If fiber content is not provided by the manufacturer, then the manufacturer shall provide material data sheets with the weight per unit area of the fiber reinforcement used to manufacture the part.

A.2.5 Glass Transition Temperature
The characteristic value of the glass transition temperature of the composite system, determined in accordance with ASTM E1640, shall be at least 40 degrees Fahrenheit higher than the maximum design temperature, $T_{MaxDesign}$, defined in section 3.12.2.2 of the AASHTO LRFD Guide Specifications for Design of Concrete-Filled FRP Tubes for Flexural and Axial Members, 2012. FRP drain systems may not be used in environments with a service temperature higher than the glass transition temperature of the resin used for their manufacturing.

A.2.6 Longitudinal and Transverse Coefficients of Thermal Expansion (CTE)
The coefficient of Thermal Expansion (CTE) of the tube may vary in the longitudinal and circumferential directions of the component depending on the laminate architecture and type of fibers and resins.

A.3 Mechanical Properties

A.3.1 Tensile Properties
The tensile strength, tensile modulus of elasticity, and ultimate tensile strain shall be determined for both the axial and hoop directions of the tubular components or in transverse and longitudinal directions of inlet bodies, see Section A.5.1 Test Samples. The tensile strength as reported by the manufacturer for product certification shall be measured according to ASTM Test Method D 3039, or other tension test method designed to determine tensile properties of composite laminates at the approved frequency and number of specimens as specified in section A.5.

A.3.4 Compressive Properties
The compressive strength and ultimate compressive strain shall be determined for the longitudinal directions of the tube laminate. The compressive strength and ultimate compressive strains shall be derived from specimens tested in accordance with ASTM Test Method D 6641, or other approved compression test method designed to determine compressive properties of the composite.

A.4 Durability Properties
Material properties shall retain 85% of their baseline values for the material properties listed in Section 2.3 after conditioning for all the durability tests listed below. Durability test methods are adopted from AASHTO Guide Specifications for Design of Bonded FRP Systems for Repair and Strengthening of Concrete Bridge Elements.

Durability property testing is only required for initial product certification and not required for subsequent production orders. The testing is the responsibility of the manufacturer and shall be conducted by an approved independent testing lab per section A.5.2.

A.4.1 Moisture Absorption
Samples will be immersed in distilled water having a temperature of 100 +/-3 degrees Fahrenheit and tested after 1,000 hours of exposure.

A.4.2 Resistance to Alkaline Environment
Samples will be immersed in a saturated solution of calcium hydroxide (pH-11) at ambient temperature of 73 +/-3 degrees Fahrenheit for 1,000 hours prior to testing. The pH level will be monitored and the solution will be maintained as needed.

A.4.3 Alternating Ultraviolet Light and Condensation Humidity
Samples will be conditioned in an apparatus under Cycle I-UV exposure condition according to ASTM G154 Standard Practice. Samples will be tested within two hours after removal from the apparatus.

A.4.4 Freeze-Thaw
Samples will be exposed to 100 repeated cycles of freezing and thawing in an apparatus meeting the requirements of ASTM C666.

A.5 Sampling, Testing & Results.

A.5.1 Test Samples.
The manufacturer is responsible for testing and may use samples in accordance to the test methods and needs of test equipment available. Test coupons may be cut from manufactured products or prepared using identical processes e.g. wet lay-up, vacuum infusion, etc. in a flat sheet, or witness plate, in which test coupons may be cut. Approval of the Fabrication Engineer shall be required for acceptance of test specimens produced by a different manufacturing method. Samples derived from special coupon test sheets shall be taken interior to edge sections 1.5x the width of the required coupon width. Samples shall be prepared from samples oriented with the directions illustrated in figures 1 and 2 for scupper body and drain pipes. For samples from filament wound pipes, samples shall be constructed over polygon mandrels allowing for flat panels to be removed for test purposes. Each test shall use a quantity of three samples. See Tables A.5.4 for tests, material requirements and sample breakdown.

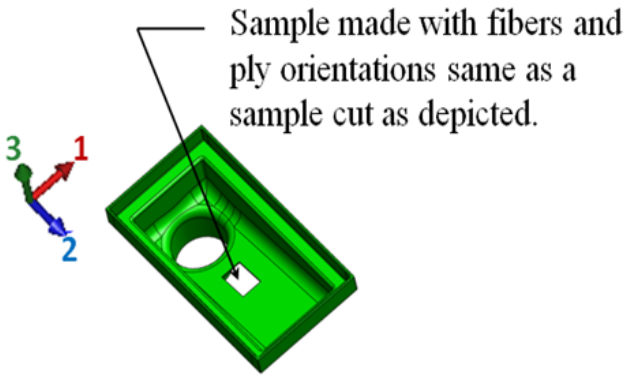


Figure 1.) Scupper Body Sample Orientations.

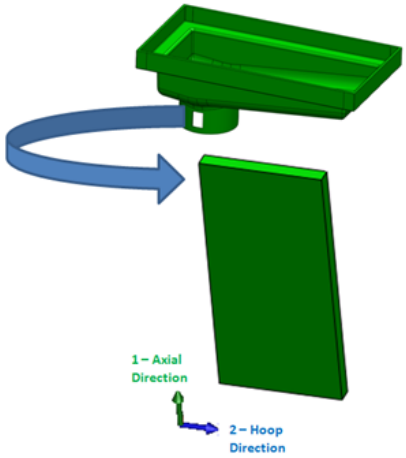


Figure 2.) Drain Pipe Sample Orientations.

A.5.2 Test Lab Requirements.
All testing of FRP material properties is being conducting in accordance to specified standards. Internal or external testing is to be conducted through laboratory facilities in accordance to ISO/IEC Guide 58, *Calibration and Testing Laboratory Accreditation Systems - General Requirements for Operation and Recognition* and ISO/IEC 17025 *General Requirements for the Competence of testing and Calibration Laboratories* as related by AASHTO document R18 "Recommended Practice for Establishing and Implementing a Quality System for Construction Materials Testing Laboratories."

A.5.3 Production Validation (PV) Testing.
Certification of materials used in FRP drain products must undergo PV testing of the specified material properties before and after environmental conditioning as set forth in Section A.5.4 by an independent lab. PV tests may be conducted internally by the manufacturer for development but are not acceptable for certification. Reported values for the material composition is be recorded and reported by the manufacturer, no independent audit is required.

A.5.4 Production Validation Sample Quantities, Minimum Material Properties and Reported Values
The following data shall be reported for material certification. Note that the tables shown use orientations related to FRP scupper or inlet bodies as set forth in Figure 1 of Section A.5.1. When evaluating tubular sections, orientation direction 2 as shown in Figure 2 of Section A.5.1 shall be substituted for orientation direction 3. The required number of samples have been reduced from ASTM requirements.

Table A.5.4.a PV reported material composition data. (Recorded by the manufacturer during the manufacturing process)

Section No.	Characteristic	Applicable Test Standard	Number of Samples	Tolerance	Reported
A.2.2	Styrene, mass percentage of polymer resin	per tolerance	N/A	10% max	
A.2.3	Inorganic fillers, mass percentage of polymer resin.	per tolerance	N/A	20% max	
	Shrink additives, mass percentage of polymer resin.	per tolerance	N/A	20% max	
A.2.4	Fiber Content	ASTM D3171 or ASTM D2584	3	Sufficient to meet mechanical properties	
A.2.5	Glass Transition Temperature	ASTM E1640	3	> Max Design Temperature	

Table A.5.4.b PV Reported Baseline Mechanical Properties

(Conducted by an independent laboratory. Samples as Manufactured w/o additional conditioning per Section A.3)

						Independent Lab Reported Values			
Section No.	Direction	Characteristic	Applicable Test Standard	No. of Samples	Minumum Allowable Values	Sample 1	Sample 2	Sample 3	Avg Value
A.3.1	1	Tensile Strength	ASTM D3039	3	10000 (psi)				
		Tensile Modulas of Elasticity			800000 (psi)				
		Ultimate Tensile Strain			0.003 in/ in				
	2	Tensile Strength		3	10000 (psi)				
		Tensile Modulas of Elasticity			800000 (psi)				
		Ultimate Tensile Strain			0.003 in/ in				
A.3.4	1	Compressive Strength	ASTM D6641	3	22000 (psi)				
		Ultimate Compressive Strain			0.003 in/ in				
	3	Compressive Strength		3	22000 (psi)				
		Ultimate Compressive Strain			0.003 in/ in				

Table A.5.4c PV Reported Mechanical Properties after 1000 hr. Moisture Immersion Condidtioning per Section A.4.1

(Conducted by an independent laboratory)

						Independent Lab Reported Values			
Section No.	Direction	Characteristic	Applicable Test Standard	No. of Samples	Minumum Allowable Values	Sample 1	Sample 2	Sample 3	Avg Value
A.3.1	1	Tensile Strength	ASTM D3039	3	8500 (psi)				
		Tensile Modulas of Elasticity			680000 (psi)				
		Ultimate Tensile Strain			0.0025 in/in				
	2	Tensile Strength		3	8500 (psi)				
		Tensile Modulas of Elasticity			680000 (psi)				
		Ultimate Tensile Strain			0.0025 in/in				
A.3.4	1	Compressive Strength	ASTM D6641	3	18700 (psi)				
		Ultimate Compressive Strain			0.0025 in/in				
	3	Compressive Strength		3	18700 (psi)				
		Ultimate Compressive Strain			0.0025 in/in				

Table A.5.4d PV Reported Mechanical Properties after 1000 hr. of Alkaline Environment Conditioning per Section A.4.2

(Conducted by an independent laboratory)

						Independent Lab Reported Values			
Section No.	Direction	Characteristic	Applicable Test Standard	No. of Samples	Minumum Allowable Values	Sample 1	Sample 2	Sample 3	Avg Value
A.3.1	1	Tensile Strength	ASTM D3039	3	8500 (psi)				
		Tensile Modulas of Elasticity			680000 (psi)				
		Ultimate Tensile Strain			0.0025 in/in				
	2	Tensile Strength		3	8500 (psi)				
		Tensile Modulas of Elasticity			680000 (psi)				
		Ultimate Tensile Strain			0.0025 in/in				
A.3.4	1	Compressive Strength	ASTM D6641	3	18700 (psi)				
		Ultimate Compressive Strain			0.0025 in/in				
	3	Compressive Strength		3	18700 (psi)				
		Ultimate Compressive Strain			0.0025 in/in				

Table A.5.4e PV Reported Mechanical Properties after UV Light Conditioning per Section A.4.3 (ASTM G154).

(Conducted by an independent laboratory)

						Independent Lab Reported Values			
Section No.	Direction	Characteristic	Applicable Test Standard	No. of Samples	Minumum Allowable Values	Sample 1	Sample 2	Sample 3	Avg Value
A.3.1	1	Tensile Strength	ASTM D3039	3	8500 (psi)				
		Tensile Modulas of Elasticity			680000 (psi)				
		Ultimate Tensile Strain			0.0025 in/in				
	2	Tensile Strength		3	8500 (psi)				
		Tensile Modulas of Elasticity			680000 (psi)				
		Ultimate Tensile Strain			0.0025 in/in				
A.3.4	1	Compressive Strength	ASTM D6641	3	18700 (psi)				
		Ultimate Compressive Strain			0.0025 in/in				
	3	Compressive Strength		3	18700 (psi)				
		Ultimate Compressive Strain			0.0025 in/in				

Table A.5.4f PV Reported Mechanical Properties after 100 Freeze-Thaw Cycle Conditioning per Section A.4.4 (ASTM C666).

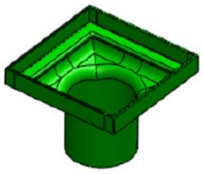
(Conducted by an independent laboratory)

						Independent Lab Reported Values			
Section No.	Direction	Characteristic	Applicable Test Standard	No. of Samples	Minumum Allowable Values	Sample 1	Sample 2	Sample 3	Avg Value
A.3.1	1	Tensile Strength	ASTM D3039	3	8500 (psi)				
		Tensile Modulas of Elasticity			680000 (psi)				
		Ultimate Tensile Strain			0.0025 in/in				
	2	Tensile Strength		3	8500 (psi)				
		Tensile Modulas of Elasticity			680000 (psi)				
		Ultimate Tensile Strain			0.0025 in/in				
A.3.4	1	Compressive Strength	ASTM D6641	3	18700 (psi)				
		Ultimate Compressive Strain			0.0025 in/in				
	3	Compressive Strength		3	18700 (psi)				
		Ultimate Compressive Strain			0.0025 in/in				

SPECIAL PROVISION
SECTION 502
STRUCTURAL CONCRETE
(Fiber Reinforced Polymer Bridge Drains)

APPENDIX B

Standard Details



Bridge Drain – Symmetric Inlet

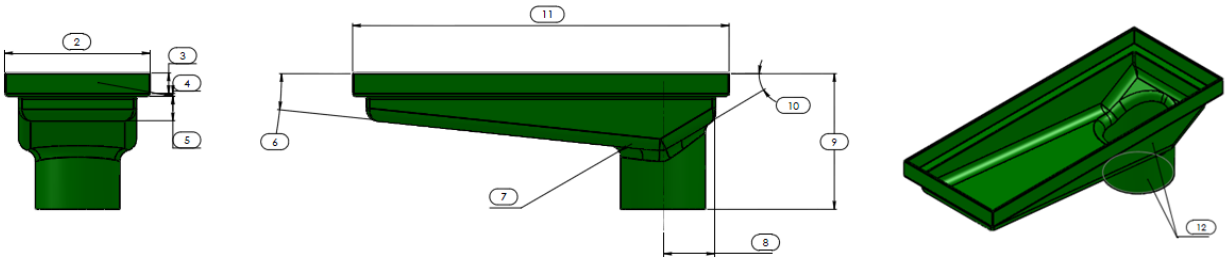
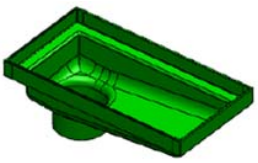


Table B1 Preferred Symmetric FRP Composite Inlet Bodies

	Size Designation	A	B	C		
	Size Dimensions (Grate Length x Width, Down Spout Diameter)	12x12xØ8	14x14xØ10	18x18xØ12		
Dimension		Nominal Dimensions			Nominal Design Tolerance	Manufacturing Tolerance
Number	Name					
1	Down Spout Inner Diameter	8"	10"	12"	min	+/- 0.015"
2	Grate Frame Width	12"	14"	18"	+/- 1"	+/- 0.025"
3	Grate Frame Height	As required to contain grate and recessed from deck surface				
4	Grate Frame Flange & Wall Thickness	0.25"	0.25"	0.25"	min	+/- 0.025"
5	Scupper Toe Depth	4"	4"	4"	+1"/-0"	+/- 0.1"
6	Scupper Toe Slope	1:10	1:10	1:10	min	+ 1 degree
7	Scupper Body Radii	2"	2"	2"	min	+0.1"
8	Down Spout Position to Heel	6"	6"	6"	+/- 0.5"	
9	Height	18"	18"	18"	Open	+/- 0.25"
10	Scupper Heel Slope	1:10	1:10	1:10	min	+0.1"
11	Grate Frame Length	12"	14"	18"	+/- 1"	+/- 0.025"
12	Scupper and Down Spout Wall Thickness	0.25"	0.25"	0.25"	min	+0.015"



Bridge Drain-Offset Scupper

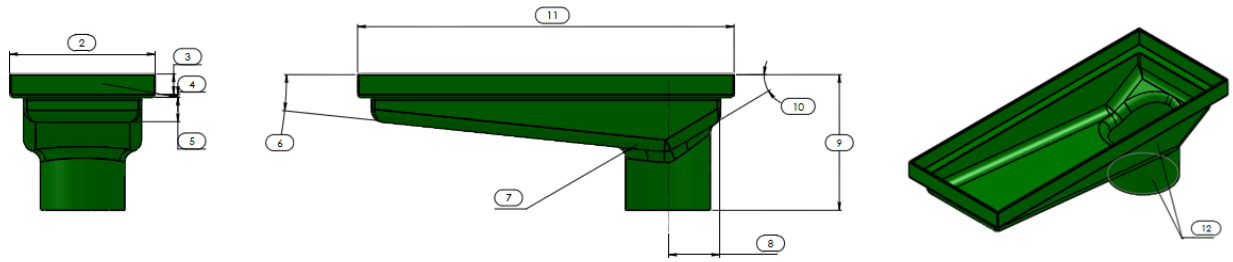


Table B2 Preferred Offset FRP Composite Scupper Bodies

	Size Designation	D	E	F	G		
	Size Dimensions (Grate Length x Width, Down Spout Diameter)	24x12xØ8	30x12xØ10	36x12xØ10	42x12xØ12		
Dimension		Nominal Dimensions				Nominal Design Tolerance	Manufacturing Tolerance
Number	Name						
1	Down Spout Inner Diameter	8"	10"	10"	12"	min	+/- 0.015"
2	Grate Frame Width	12"	12"	12"	12"	+ 2"/-0"	+/- 0.025"
3	Grate Frame Height	As required to contain grate and recessed from deck surface					
4	Grate Frame Flange & Wall Thickness	0.25"	0.25"	0.25"	0.25"	min	+/- 0.025"
5	Scupper Toe Depth	4"	4"	4"	4"	+1"/-0"	+/- 0.1"
6	Scupper Toe Slope	1:10	1:10	1:10	1:10	min	+ 1 degree
7	Scupper Body Radii	2"	2"	2"	2"	min	+0.1"
8	Down Spout Position to Heel	6"	6"	6"	6"	+/- 0.5"	
9	Height	13.5"	16"	18"	18"	Open	+/- 0.25"
10	Scupper Heel Slope	1:10	1:10	1:10	1:10	min	+0.1"
11	Grate Frame Length	24"	30"	36"	42"	+ 2"/-0"	+/- 0.025"
12	Scupper and Down Spout Wall Thickness	0.25"	0.25"	0.25"	0.25"	min	+0.015"

SPECIAL PROVISION
SECTION 507
RAILINGS
(Steel Bridge Railing, 3-Bar S3-TL4)

Standard Specification Section 507 is revised as follows:

507.09 Basis of Payment Add the following to the list of pay items:

Pay Item		Pay Unit
507.0823	Steel Bridge Railing, 3 Bar S3-TL4	Lump Sum

SPECIAL PROVISION
SECTION 511
COFFERDAMS

Section 511 of the Standard Specifications is amended as follows:

511.03 Cofferdam Construction

Section 511.03.A of the Standard Specifications shall be replaced with the following:

A. Design Documents. The Contractor shall prepare and submit Cofferdam Design Documents including, but not necessarily limited to, calculations and Working Drawings, identifying the materials to be used and the proposed methods of construction and inspection of cofferdams. The Cofferdam Design Documents for cofferdams at proposed Piers 1 and 5 shall be designed to meet:

- Canadian National Railway excavation requirements, which are appended to this Special Provision; and

- A safety factor of 1.3 when considering global stability failure of the embankments during proposed cofferdam excavation and work activities.

Design Documents for all cofferdams to be constructed in Maine shall be prepared and sealed by a Professional Engineer licensed in the State of Maine. Design Documents for all cofferdams to be constructed in New Brunswick shall be prepared and sealed by a Professional Engineer registered in the Province of New Brunswick The Cofferdam Design Documents shall be submitted to the Department at least 30 days prior to installing the cofferdam. The Department will review and comment on the Cofferdam Design Documents as specified in Subsection 105.7.2 of the Standard Specifications.

Construction shall not start on the cofferdam before the Department completes its review of the Cofferdam Design Documents and comments on them. If the Department requires changes to Cofferdam Design Documents, based on Contract requirements, then the Contractor shall implement the changes at no additional cost to the Department.

The Department shall have no obligation to review or comment on the Cofferdam Design Documents. No review or comment by the Department, or any lack of review or comment by the Department, shall relieve the Contractor of its responsibility to properly design, construct, maintain in good condition, and remove the cofferdams in accordance with the Contract, or shall shift any responsibility to the Department. The Contractor shall be responsible for all damages resulting from the failure of cofferdams.

Section 511.03.B of the Standard Specifications shall be amended as follows: Replace "submitted Working Drawings" with "reviewed Cofferdam Design Documents."

Section 511.03.C of the Standard Specifications shall be replaced with the following:

C. Inspection of Seal Cofferdams. Seal cofferdam excavations shall initially be inspected by the Contractor after final cleaning and settlement of suspended sediment.

For each seal cofferdam excavation, the Contractor shall submit a written procedure to the Department for sediment/overburden removal and excavation inspection. For cofferdams where seal concrete is to be placed on bedrock, the inspection procedure shall describe the Contractor's final cleaning and inspection process for attaining cleanliness of each cofferdam excavation. For cofferdams where seal concrete is not excavated to bedrock, the procedure shall describe the Contractor's final cleaning and inspection process for attaining the bottom of seal elevation shown on the plans.

For seal concrete placed on bedrock, the seal cofferdam bottom will be considered clean if, at the time of placement of the seal concrete, more than 50 percent of the bottom area has less than 1 inch of sediment or loose soil, and no portion of the area has more than 2 inches of sediment or loose soil/rock.

At a minimum, the inspection for seal concrete placed on bedrock shall consist of measurements using a sediment/overburden measuring system. The Contractor shall provide access, equipment and personnel for checking the cleanliness and condition of the cofferdam excavation. The sediment/overburden measuring system shall consist of manual sounding for depth and hardness via a steel probe consisting of a 24-inch long No. 10 steel reinforcing bar with a flat end suspended on a non-stretch cable or tape. Location-Depth-Hardness-Soil Thickness readings shall be recorded from the soundings. Measurements shall be taken at a spacing of 5 feet along the perimeter cofferdam walls, and on an additional grid of equally spaced internal locations each representative of no more than 25 square feet of the seal base area.

In addition, the cofferdam inspection shall include an illuminated underwater video for seal concrete placed on bedrock. The video shall be recorded by a diver, under live observation by the Department, and communication shall be available between the diver and Department representative to request video coverage of specific locations. The Contractor shall have a spotter that can indicate the general location of the diver within the cofferdam. The video inspection shall continue until the Department is satisfied that the conditions have been adequately recorded. In the event that conditions render visual inspection impossible, the above-described measuring system may utilize hand probing by the divers in lieu of visual inspection.

The Contractor shall prepare and submit an Inspection Report for each cofferdam. The Report shall include results of video inspection/diver probing and soundings that conclusively show the cleanliness and loose soil content of each segment of the seal cofferdam excavation. The

Contractor's Inspection Report will be submitted to the Department at least 48 hours prior to when the cofferdam excavation is ready for final inspection.

The Contractor shall notify the Resident at least 48 hours prior to when each seal cofferdam excavation will be ready for final inspection by the Department. The Contractor shall allow adequate time for each occurrence of cofferdam excavation inspection by the Department. Facilities and equipment shall be provided and maintained for the Department to independently inspect the cofferdam using steel probes and/or the Department's Dive Team prior to depositing the seal concrete.

No seal concrete placement shall begin until the Department has approved the cofferdam excavation.

If the pier seal is placed directly on bedrock, each seal shall be cored full depth in at least three (3) locations to ensure that the seal was satisfactorily placed. The final core run for each location shall sample the concrete/bedrock interface and extend at least one foot into the bedrock. These locations will be approved by the Resident. Seal concrete core samples will be a minimum of 3 inches O.D., be adequately stored in boxes and each core run labeled. In the event that voids or any other defects are found, the Contractor shall correct the defects in a manner approved by the resident. For each core that reveals a void or defect, two additional cores shall be taken after repairs are made. One of the two additional cores shall be taken in approximately the same location as the original core. The other core will be located by the Resident. All core holes shall be refilled using a non-shrink grout. The cost of all coring and repairs will be considered incidental to "Structural Concrete Piers (Placed Under Water)".

2011, November, 22

Design Criteria for the Shoring Walls submitted by the Consultant / Contractor

Changes in this guideline verses 2011/Jan/06:

- Item # 32: The very lean concrete used in filler caissons shall have minimum compressive strength of **6.0 (Six)** MPa.

Solider Piles with Timber lagging:

1. The schemes for the temporary component of the track protection system will be considered, subject to the review of the Engineer. For any deviation from this guideline, it is required to obtain a written approval by CN senior engineer, prior to design and/or construction.

2. The Consultant / Contractor shall design the track protection system to resist the design loads for all tracks, in accordance with AREMA-2010, indicated on the following sketches;
   2.1.1. Temporary-Shoring-Design-Load-Diagrams.pdf
   2.1.2. Temporary-Shoring-Construction Procedure.pdf

3. The Contractor shall investigate all staged excavation.

4. The Consultant / Contractor shall provide for review by the Engineer a copy of;
   4.1. signed and sealed detailed design calculations and
   4.2. signed and sealed proposed shoring wall drawings.

5. The Consultant / Contractor design calculations shall clearly identify the interaction between soil and the track protection system, considering the possible passive reaction of soil in case the soil behind the track protection mobilized due to the pre-stressing of the tiebacks.

6. The Consultant / Contractor shall consider that while prestressing the anchors, the prestressing shall not load the soil behind the wall more than it's available passive resistance (specially for the top row where the passive wedge resistance is limited).

7. The Consultant / Contractor design calculations shall clearly identify the allowable design bond capacity, ultimate bond capacity between anchors and soil, and applied safety factors.

8. The Consultant / Contractor design calculations shall include;
   8.1. all assumptions,
   8.2. detailed design of all structural members, and
   8.3. estimated lateral displacement of the track protection system, especially at the location of all tie-backs or supports. The lateral displacement of the proposed track protection system shall be estimated for hydrostatic pressure (if any), soil pressure, lateral pressure due to all tracks considering the worst case.

8.4. all input and output files used for analysis and design of the proposed track protection system, both hard copy and electronic format.

9. The track protection shall be designed for the surcharge due to the Cooper-E90 loading as per AREMA-2010. (i.e. 90 kips axle load, 5 ft spacing between two consecutive axles. The effect of the strip load surcharge calculated with 8 ft tie length can be assessed as described in AREMA 2008, Chapter 8, Clause 20.3.2.2.

10. The coefficient of earth pressure is determined by the Geotechnical report but shall not be less than 0.50.

11. The distance between the 1st row of tiebacks and the bottom of rail and/or elevation of top of excavation (whichever is closer) shall be maximum 1.50m.

12. The distance between two rows of tiebacks shall be maximum 3.0m.

13. The distance between the lowest row of tiebacks to the bottom of excavation shall be maximum 3.0m.

14. It is required to model the wall based on nonzero deflections at the point of intersection of shoring piles and tieback anchors.

15. The lateral displacement of the track protection system shall be limited to 0.1% of the height of the excavated area.

16. The tieback design shall be in accordance with AREMA 8-20.5.7.a(2).

17. The tieback design load shall be specified on the proposed drawings.

18. The design of the anchorages shall be in accordance to AREMA 8-20.5.5.d,
    18.1. Performance test(s) (2.0 times of the tieback design load) shall be performed to validate the assumed allowable bond stress between soil/rock and tieback.
    18.2. A minimum Safety factor of 2.0 shall be applied to the ultimate bond stress between the tieback and rock/soil.
    18.3. The minimum bond length of the anchorages shall be 4.50 m (15 ft).
    18.4. The maximum bond length of the anchorages should be 10.0 m (33 ft).

19. The timber lagging shall be species (s-p-f), beams and stringers, grade no.1 or better, in accordance with AREMA chapter 7.
    19.1. The allowable bending stresses shall be 6.6 MPa (including all modification factors).
    19.2. The lagging thickness shall be 150 mm minimum for upper 2000 mm and 200 mm minimum for below 2000 mm.

20. As per AREMA 8-28.5.3.2., a minimum depth of 1.5 times of the width of the shaft/pile shall not been considered in providing passive lateral support. Furthermore, a minimum depth equal to 4 feet or 1.2 m shall not be considered in providing passive lateral support to the soldier

piles, this is considered due to possible frost.

21. As per AREMA requirement 8-28.5.1.2, for calculation of the depth of embedment, the passive resistance shall include a factor of safety of 1.5 and be reduced by multiplying Kp by 0.66.

22. The following items shall be written on the drawings:
    - 22.1. The total amount of force applied to one-meter width of the shoring wall for the entire excavated height, due to soil lateral pressure (triangular or trapezoidal) applied to, in kN/m unit.
    - 22.2. The total amount of force applied to one-meter width of the shoring wall for the entire excavated height, due to train load on each individual track, in kN/m.
        - 22.2.1. Total lateral force due to E-90 on track #1 = ### kN/m
        - 22.2.2. Total lateral force due to E-90 on track #2 = ### kN/m
        - 22.2.3. Total lateral force due to E-90 on track #3 = ### kN/m
    - 22.3. The total amount of force applied to one-meter width of the shoring wall for the entire excavated height, due to hydrostatic or any other load, in kN/m unit.
    - 22.4. The total design load applied to each individual tie back.
    - 22.5. The tie-back (thread-bars or strands) size, diameter, number of strands, grade etc.
    - 22.6. The total bonded length of the tie-backs.
    - 22.7. If the tie-back is anchored in rock, the bounded part of the tie-back, shall be started one meter (in vertical direction) below the assumed rock elevation.
    - 22.8. The total un-bonded length of tie-backs.

23. The minimum embedded length of pile into soil or rock shall be 3000 mm (10 ft).

24. The minimum distance between two tiebacks shall be +/- 3.5 times the diameter of the anchorage.

25. The distance between the line of potential failure surface and the anchor zone shall be 0.15 times of excavated height, minimum.

26. The Contractor shall provide a monitoring procedure with no cost to CN to the satisfaction of the Engineer. The monitoring shall be carried out during construction of the temporary shoring wall and must be continued up to the removal of the temporary shoring wall.

27. No skin friction, acting between back of the solider piles and soil above or below the level of bottom of excavation, shall be considered for design of the shoring wall.

28. It is required to establish vertical loads imposed on the pile from the tieback anchors without using any reduction for skin friction or adhesion from the soil behind the wall, (both between the soil-tieback, and soil-pile).

29. The concrete used for the solider piles shall have a minimum compressive strength of 30

(thirty) MPa below the dredge line.

30. The maximum movement of the piles toward the soil - at location of tiebacks - during the stressing of the tieback shall be limited to 5 mm (toward soil). If this recorded movement during the tieback stressing exceeded maximum allowable movement (5 mm toward soil), the tieback stressing shall be stopped, CN engineer shall be notified, and force shall be locked-in.

31. It is required that the design load on the drawings shall match the calculated design load for each row of tiebacks. This has to be done to ensure that excessive tieback force not to be applied to the shoring wall.

Caisson Walls

In addition to items above, the following items are required as well.

32. The very lean concrete used in filler caissons shall have minimum compressive strength of **6.0 (Six)** MPa.

33. The concrete used for the king piles shall have a minimum compressive strength of 30 (thirty) MPa above the dredge line.

34. The maximum spacing between the king piles shall be limited to 2.0 meters.

35. No skin friction, acting between back of the filler / king pile caisson and soil above or below the level of bottom of excavation, shall be considered for design of the caisson shoring wall.

36. It is required to establish vertical loads imposed on the pile from the tieback anchors without using any reduction for skin friction or adhesion from the soil behind the wall, (both between the soil-tieback, and soil-caisson).

Monitoring Plan:

37. The monitoring plan shall include both tracks and the shoring wall.

38. No open excavation shall be left without visual inspection during long period of time, i.e., holidays, etc.

39. Monitoring reading interval shall be daily from the first day of shoring wall installation, during shoring wall installation, during structure excavation, and at all times when the excavation is in an open condition and the shoring wall is under load during all stages of the work and until all the shoring wall is removed.

40. The monitoring plan of the shoring wall shall include the number of targets and location of the targets at each pile.

41. The most important tool in track monitoring is visual inspection of the track and shoring wall. If the track shifts, or deflects, visual inspection will be the most effective tool to prevent any track safety related incident.

42. Daily visual monitoring of the ground behind the shoring wall shall be performed. If any crack within or up-ward movement of the soil is/are observed, the following shall be immediately be reported to CN, location, with and length of the crack and location, length and height of heave.

43. Daily visual monitoring of the track(s) behind the shoring wall shall be performed. If any upward, downward or side movement of track is/are observed, the following shall be immediately be reported to CN, location, and length of the track movement.

44. Targets shall be placed at least on one third of the piles.

45. It is required that monitoring targets to be placed:
    - 45.1. At top of selected piles
    - 45.2. At the level of all tiebacks on each selected pile(s).
    - 45.3. At a mid point between two consecutive level of tie backs.
    - 45.4. If there is only one row of tieback on the selected pile, it is required to have two targets on the pile, one at the tieback level and the second one at mid point between the dredge line and the tieback.

46. It is required to monitor the track(s) as well as shoring wall piles. The maximum spacing between the targets on each rail of each track shall be 6 meters.

47. For filler caisson monitoring, it is required to install a series of inclinometers, to be placed on at least at one forth of bays between king piles, a minimum of 3 inclinometers for whole length of shoring wall is required.

48. All inclinometers shall be installed such that initial readings could be obtained a minimum of one week prior to first drilling for installation of the shoring wall.

49. Inclinometer reading interval shall be daily from the first day of shoring wall installation, during shoring wall installation, during structure excavation, and at all times when the excavation is in an open condition and the shoring wall is under load during all stages of the work and until all the shoring wall is removed.
    - 49.1. The only acceptable location of inclinometer is in the filler caisson.
    - 49.2. The location of each inclinometer shall be clearly shown, with respect to filler caissons and the king piles.
    - 49.3. the slope inclinometer(s) to be protected by steel casing at least 300 mm above the ground and 1000 mm below the ground.
    - 49.4. the threshold of the lateral displacement, 0.1% of the excavated height, to be shown

on the required graph(s).

50. Regarding the presentation of the data, it is required that monitoring report clearly show:
    - 50.1. The actual collected data (date, target #, pile #, northing, easting, elevation, actual lateral and vertical movements, etc)
    - 50.2. A graphical representation of the lateral displacement of targets placed along the selected piles, the unit shall be in mm.
    - 50.3. It is required to have one graph for each row of tie-backs, along the shoring wall
    - 50.4. Also, it is required that threshold of the lateral displacement, 0.1% of the excavated height, to be shown on the required graph(s).

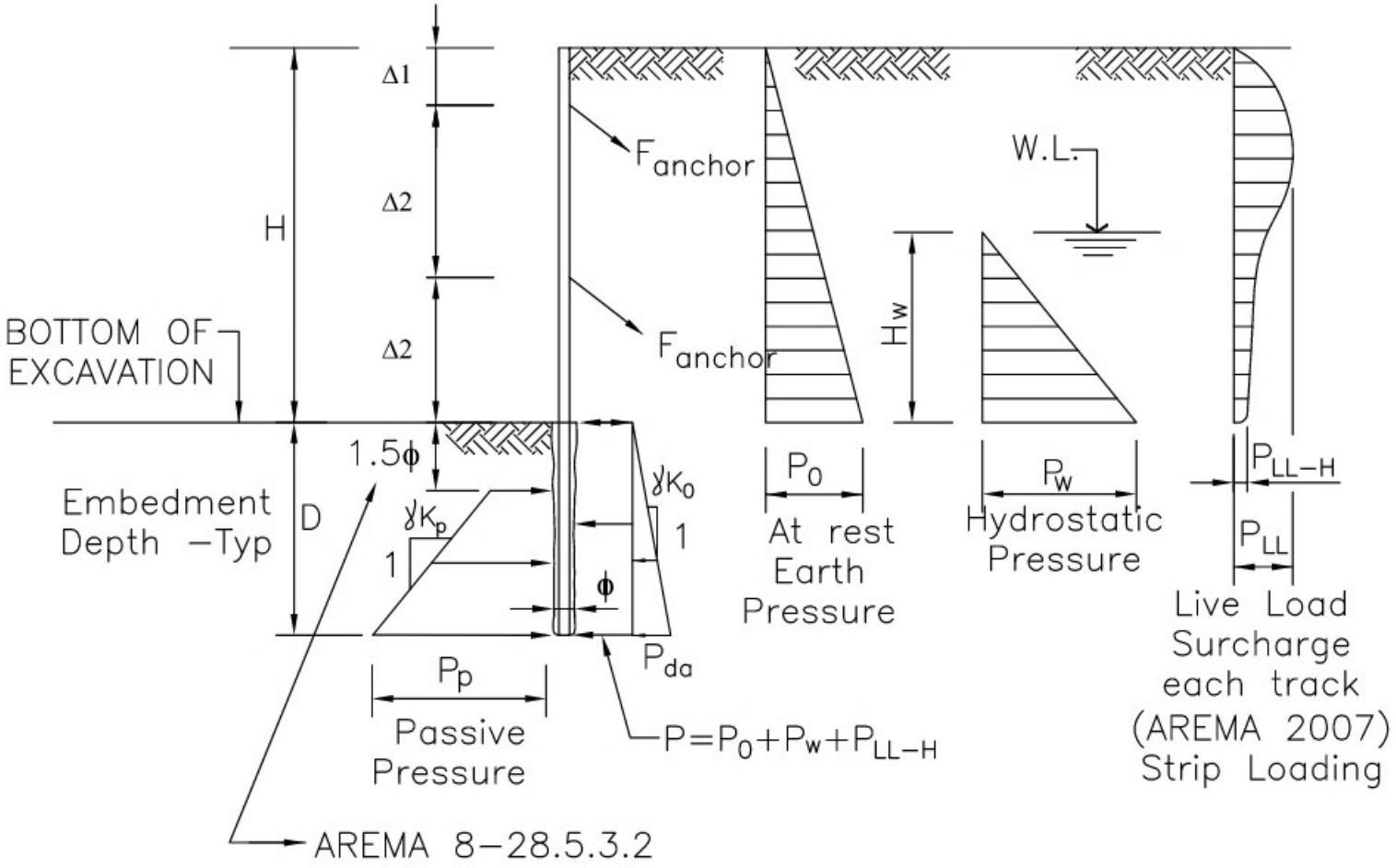
General:

51. Wash-boring (or wet-drilling) method is not allowed to be performed for drilling tie-backs under CN tracks.

52. CN does not accept "pile splicing" on any shoring pile. However, if due to the excessive length of, etc, the pile splicing is absolutely necessary, CN standard S12m(a) for pile splicing shall be used.

53. All tie backs shall be de-stressed during the backfill.

TRACK PROTECTION SYSTEM
DESIGN LOAD DIAGRAMS



LIVE LOAD SURCHARGE

TO BE CALCULATED IN ACCORDANCE WITH AREMA 2007, CHAPTER 8, SECTION 20,3,2,2.

LIVE LOAD = COOPER E90

WHERE:

γ_{soil} = 21 kN/m3
γ_w = 9.806 kN/m3
K_0 = 0.50 Minimum
K_p = 3.0
ϕ = DIAM. OF SHAFT

AT REST EARTH PRESSURE

$P_0 = K_0 \gamma_s H$ (kPa)

$P_{da} = K_0 \gamma_s D$ (kPa)

PASSIVE RESISTANCE

$P_p = K_p \gamma_s D$ (kPa)

HYDROSTATIC PRESSURE

$P_w = \gamma_w H_w$ (kPa)

$\Delta 1$ = Maximum 1.5 m

$\Delta 2$ = Maximum 3.0 m

2011 November 22

CONSTRUCTION PROCEDURE:

- DRILL HOLES TO SIZE AND DEPTH SHOWN. INSTALL PILES, ALIGN AND CAST CONCRETE TOES WHERE SHOWN
- WHEN CONCRETE IN TOES HAS SET (30 MPa), FILL VOID AROUND PILES WITH 0.5MPa STRENGTH CONCRETE.
- EXCAVATE TO FIRST STAGE AND INSTALL LAGGING. EXCAVATE SOIL FACES NEATLY TO ENSURE A TIGHT FIT FOR LAGGING. WEDGE AT PILE AS NECESSARY, PACK ALL VOIDS BEHIND LAGGING WITH GRANULAR MATERIAL RAMMED INTO PLACE.
- WHEN EXCAVATION REACHES 300mm MAX BELOW ANCHOR ELEVATION NOTED, DRILL AND INSTALL ANCHORS.
- FILL ALL VOIDS AROUND TIE BACKS WITH 3000 PSI CONCRETE GROUT.
- DO NOT FURTHER EXCAVATE BELOW ANCHOR ELEVATIONS UNTIL ALL ANCHORS ARE STRESSED AND LOAD LOCKED IN. ALL ANCHORS SHALL BE PROOF TESTED TO 1.33 TIMES DESIGN LOAD. THE LOAD SHALL BE REDUCED TO 1.1 TIMES DESIGN LOADS AND LOCKED IN. A NOMINAL LOAD SHALL BE USED TO STRESS ALL HORIZONTAL ANCHORS IN ORDER TO DRAW OUT ANY SLACK IN THESE ANCHORS.
- CONTINUE EXCAVATION TO INDICATED DEPTHS.
- TIMBER LAGGING SHALL BE SPECIES (S–P–F), BEAMS AND STRINGERS, GRADE No.1 OR BETTER, IN ACCORDANCE WITH AREMA CHAPTER 7. FOR ALLOWABLE BENDING STRESSES USE 6.6 MPa (INCLUDING ALL MODIFICATION FACTORS). THICKNESS SHALL BE 150 mm MIN. FOR UPPER 2000mm AND 200mm MIN. FOR BELOW 2000 mm.
- TIE–BACK ANCHORS SHALL BE DYWIDAG MULTISTRAND, 0.6" dia. 7–WIRE, GREASED AND COATED, LOW–RELAXATION, GRADE 270 ksi STRAND CONFORMING TO CSA G279–82 (ASTM A 416).

- DESIGN LOAD: # –0.6" TENDONS ### KN/ANCHOR
- LOCK–OFF LOAD = 1.10 x DESIGN LOAD.
- PROOF LOAD = 1.33 x DESIGN LOAD.
- PERFORMANCE LOAD = 2.0 x DESIGN LOAD.

SPECIAL PROVISION
SECTION 524
TEMPORARY STRUCTURAL SUPPORTS
(Protective Shield)

524.01 Description The following paragraph is added:

This work shall also consist of furnishing all labor, equipment, and materials required to design, detail, install, maintain, and remove protective shielding to protect traffic during demolition and construction of this project.

524.03 Design The following paragraphs are added:

The Contractor shall submit working drawings to the Resident for review and comment and to Canadian National Railroad, and Eastern Maine Railway for approval. The submittal shall be in accordance with Standard Specifications Subsection 105.7, indicating the sizes, dimensions, details, and installation procedures of the proposed protective shielding.

The protective shielding shall be designed for safely supporting all construction and dead loads, but not less than 100 pounds per square foot with a load duration of seven (7) days. Protective shielding shall be stiff enough to limit deflection to 1/2 inch under maximum loads and to be tightly sealed at all joints. The protective shielding shall be placed on the tops of the bottom flanges of the steel girders, floor beams, stringers, or other methods approved by the Resident, with edges and laps made tight to protect traffic from dust, debris and falling objects.

Temporary shielding designs, to be installed over the Canadian National Railroad tracks, shall be sealed by a Professional Engineer registered in the Province of New Brunswick. Temporary shielding designs, to be installed over the Eastern Maine Railway tracks, shall be sealed by a Professional Engineer licensed in the State of Maine.

524.04 Protective Shielding Erection and Removal The following paragraphs are added:

No portion of the protective shielding shall project below a plane connecting the bottoms of the bottom flanges of the steel stringers. During demolition operations, the protective shielding shall be covered with sheet plastic made tight at edges and laps to prevent water used in the saw cutting operation from falling onto the facilities under the bridge.

The protective shielding on existing and new structures shall extend horizontally three feet beyond the fascia lines and vertically to a point one foot minimum above the top of parapet or railing. The shielding shall also extend along the length of the bridge between the center of the northernmost and southernmost railroad tracks within each rail yard and to a distance of 25 feet

beyond the center of each respective railroad track, unless otherwise noted on the Plans or as approved by the Resident.

Shielding beneath the existing bridge shall be approved by Canadian National Railroad and Eastern Maine Railway, as applicable, and installed prior to the start of any demolition work and shall remain in position during all demolition work. Shielding beneath the new bridge shall also be approved by Canadian National Railroad and Eastern Maine Railway, as applicable, and installed prior to the start of any deck forming and shall remain in position during all deck work. The shielding shall be relocated or removed only as approved by the Resident.

Construction sequences may require protective shielding material to be removed, stored and then reinstalled by the Contractor. Any shielding which is damaged during this removal and reinstallation shall be replaced by the Contractor at no additional cost.

524.05 Method of Measurement The following paragraph is added:

Protective Shielding will be measured as one lump sum satisfactorily designed, installed, maintained, removed and disposed or stacked for the entire project.

524.06 Basis of Payment The following paragraphs are added:

Protective Shielding will be paid for at the Contract unit price one lump sum which price shall include all design, materials, transportation and stacking, labor (to install, maintain, remove and stack as needed), tools and equipment necessary to perform the work as described above or as approved by the Resident.

Payment will be made under:

Pay Item		Pay Unit
524.40	Protective Shield	Lump Sum

SPECIAL PROVISION
SECTION 524
TEMPORARY STRUCTURAL SUPPORTS
(Roadway Support during Staged Construction)

524.01 Description The following paragraph is added:

This work shall consist of the designing, fabricating, erecting, maintaining, and dismantling of temporary structural support wall(s) for the purpose of supporting the partially excavated roadway between the existing Canadian Port Facility roadway and proposed abutments during staged construction.

524.03 Design Replace the last sentence of the first paragraph with:

Temporary support(s) shall be designed by a Professional Engineer registered in the Province of New Brunswick and all plans, computations, and working drawings shall be signed by that Engineer, and shall be submitted to the Resident for review and comment. The computations and working drawings will also require approval from Canadian National Railroad if any portions of the Temporary Structural Support is located within, or any installation efforts occur within, Canadian National Railroad Property.

Add the following two paragraphs:

The temporary structural support(s) and approaches shall achieve acceptable minimum factors of safety. Minimum factors of safety for slope stability are 1.3 for approach embankment slopes and 1.5 for embankment slopes that contain or support structures. The minimum factor of safety for sliding and overturning is 1.3.

The design for the Temporary Structural Support shall be submitted to the Resident at least 3 weeks prior to construction.

524.05 Method of Measurement Add the following paragraph:

Temporary structural supports, as identified herein, will be measured as one lump sum satisfactorily designed, erected, maintained, and dismantled for the entire project. The work associated with removal and reinstallation of existing highway appurtenances (e.g. guardrails, sign supports, etc.) to facilitate the erection of temporary supports will not be measured for payment, but will be considered incidental to the Temporary Structural Support Pay Item.

524.06 Basis of Payment Add the following paragraph:

Temporary structural supports, as identified herein, will be paid for at the Contract unit price one lump sum which price shall be full compensation for all materials, equipment, labor and incidentals necessary for the design, erection, maintenance, and dismantling of such supports in accordance with these specifications.

Pay Item		Pay Unit
524.301	Temporary Structural Support (Earth)	Lump Sum

SPECIAL PROVISION
SECTION 524
TEMPORARY STRUCTURAL SUPPORTS
(Temporary Structural Support - Girder)

524.01 Description The following paragraph is added:

This work shall also include the construction of a temporary structural support of the proposed downstream fascia girder (Girder 4) adjacent to Abutment No. 2 to aid in phased construction staging. This work shall also include designing, fabricating, erecting, operating, maintaining, and dismantling the temporary structural support and associated crash protection required to perform the work.

524.02 Materials The following paragraphs are added:

Materials used as a temporary structural support shall be structural steel, reinforced concrete, or a combination of both, at the Contractor's option. All temporary structural support materials, whether new or used, shall be sound and of adequate strength and cross section for the intended loads.

If jacks are used for any portion of the completion of this item, each jack shall have the rated capacity clearly shown on the manufacturer’s name plate attached to each jack. The Resident may require that any lifting equipment deemed to be inadequate or faulty be removed from the project site. Jacks or other lifting equipment shall be equipped with pressure gages or other load measuring devices that will enable the applied lifting force to be monitored at all times.

524.03 Design The following paragraphs are added:

The temporary structural supports shall be designed to support all applicable loads including, but not limited to, all vertical loading including live load and impact, transverse and longitudinal horizontal loads, differential settlement induced loads, and shall account for any temporary unbalanced loading during load transfer. The temporary structural supports shall be designed with sufficient redundancy such that failure of one member will not cause the collapse of the entire system or the supported structure.

The Contractor may support and/or brace the jacking systems and temporary structural support systems on the top of, or against, the existing and proposed abutment seats and footings or Contractor-furnished blocking systems. Any proposed anchorage system along the front face of the abutment shall not be used to support vertical loads from the temporary support structure. Any attachment to the abutment shall occur through the use of embedded inserts; post-installed anchors will not be allowed. Any such insert shall be stainless steel, recessed a minimum of 1-inch from the surface of the abutment, approved by the Resident, and grouted in accordance with Subsection

502.12 after removal of the temporary structural support. Lateral loads imposed upon the proposed Abutment No. 2, by the Contractor's temporary structural support, shall be limited to 50-kips.

Temporary structural supports which are adjacent to traveled ways, rail traffic, or which support structures carrying traffic, shall additionally be designed to resist any vibration or impact forces due to traffic and shall incorporate sufficient protection against impact by errant vehicles or trains. Temporary structural supports which are founded on, or are in close proximity to, existing structures to be rehabilitated or removed shall be designed to resist any vibration induced by other work to be completed on the project.

The Contractor's design shall also include and/or provide the following:

A. Bracing or other means of restraint to prevent longitudinal and transverse movement of the superstructure and twisting of the girders or deck while the superstructure is temporarily supported.

B. Temporary bearing device sufficient to resist all vertical and lateral loads and accommodate thermal movements and girder bending rotations.

C. Methods to remove the temporary structural support after completion of staged construction, such as a temporary jacking system.

D. Crash protection in accordance with Canadian National Railway's requirements, included in the Appendix A of this Special Provision. For design purposes, the train speed may be taken as 10-mph.

The temporary structural support, including ancillary bracing, temporary bearing, and temporary jacking systems, shall be designed and sealed by a Professional Engineer registered in the Province of New Brunswick. Design computations, plans, details, working drawings, and other documentation necessary to complete the work and certify conformance with these provisions shall be reviewed by the Resident and approved by Canadian National Railroad prior to beginning this work.

All design, detail, and load requirements shall conform to the most current edition of the AASHTO LRFD Bridge Design Specifications with applicable Interim Specifications, the Contract Plans, the Standard Specifications, and as specified herein. The design computations shall verify the proposed jacking scheme does not introduce unacceptable stresses in the existing bridge components including steel girders, diaphragms, connections, and substructures. All design computations submitted for approval shall be reviewed, checked, and initialed accordingly. Any support systems requiring attachment to existing or proposed concrete shall be approved by the Engineer. Systems requiring extensive drilling and anchoring into existing concrete will not be accepted.

Girder reaction design loading and movements, for all components of the temporary support structure, shall be equal to the values found on the "Disc Bearing" sheet within the plan set for an Abutment No. 2, Girder 4 Bearing. Jacking Systems used by the Contractor, to unload and remove the temporary support, shall be capable of withstanding vertical forces at least 150% greater than the identified loads.

The jacking force applied to unload the temporary structural support shall not exceed 125% of the loads identified to avoid overstressing, or otherwise damaging, the proposed permanent structure. If loads in excess of these limits are required, the jacking operations shall cease, and the Resident shall be notified. Jacking operations shall not resume until guidance is provided by the Engineer. If jacking occurs while the bridge is closed, live load and impact may be excluded from the design.

524.04 Erection and Removal The following paragraphs are added:

Prior to commencing construction, the Contractor shall accurately identify the horizontal and vertical location of the existing sewer main between the proposed abutment and adjacent railroad tracks. This effort shall include manual, mechanical, or nondestructive methods (e.g.: vacuum excavation) to physically expose the utility for survey measurement. Exposure of the utility shall occur at each side of the proposed abutment and a minimum of three additional points in between. Any necessary adjustments to the Contractor's designed structural support system shall be resubmitted to the Resident for review.

The temporary structural supports shall securely maintain the displacements at the bearing area, without measurable or noticeable changes under all dead load, live load with impact, and construction loads, until the superstructure loads are transferred to the proposed permanent bearings. The Contractor shall be responsible to prevent any damage to the permanent structure from the support system. Should any damage occur as a result of this work throughout the duration of the Project, the Contractor shall make repairs at no cost to the Department. Any such repair work is subject to the approval of the Resident.

Bracing shall be provided to maintain the superstructure in a stable condition during the jacking operations and while the permanent structure is temporarily supported. As directed by the Resident, bridge elements that may be damaged during jacking operations including, but not limited to, bridge rail, barrier, joints, and joint seals, shall be modified or removed prior to the start of jacking operations and reinstalled at the completion of this work as required. Repair of any damage to these items shall be completed by the Contractor with no additional compensation.

All structural steel fabrication and all concrete construction shall be in accordance with the Standard Specifications. The Contractor should use bond breakers, roofing felt, polyethylene sheeting, or other materials between contact surfaces of the proposed and temporary structures. Any material used to construct the temporary support structure, and placed or cast directly against the permanent structure, shall be capable of being completely removed without damage, staining, or leaving remnants upon removal of the temporary support structure.

During removal of the temporary structural support, the superstructure may be raised through the use of a temporary jacking system. Jacking the superstructure shall be limited to a magnitude necessary to remove the temporary structural support; at no time shall the vertical distance (gap) between the bottom of girder and the temporary structural support (or its bearing) be greater than ¼-inch. The temporary structural support shall be removed after casting and curing the Stage II deck and prior to constructing the Stage II sidewalk or curbing.

524.05 Method of Measurement The following paragraph is added:

Temporary Structural Support, as identified herein, will be measured by the lump sum.

524.06 Basis of Payment The following paragraph is added:

Temporary Structural Support, as identified herein, will be paid for at the Contract lump sum price and will include the design, fabrication, erection, operation, maintenance, and removal of all required temporary jacking and structural support systems to the extent specified herein, including temporary bearings, bracing, crash protection, construction falsework, and any other incidentals necessary to complete the work. Temporary works used by the Contractor for their convenience will not be measured separately for payment. The work associated with removal and reinstallation of existing highway appurtenances (e.g. guardrails, sign supports, etc.) to facilitate the erection of temporary structural supports, as well as accurate identification of the adjacent sewer main, will not be measured for payment but will be considered incidental to the Temporary Structural Support Pay Item.

Payment will be made under:

Pay Item		Pay Unit
524.301	Temporary Structural Support (Girder 4)	Lump Sum

PIER PROTECTION ADJACENT TO RAILROAD TRACKS

Submission Guidelines for Crash Walls – CN RAIL

Crash walls may be required for the protection of overhead structures, and in some cases the Railway may consider a crash wall as an alternative to an earthen berm for the protection of structures or facilities adjacent to the track. When proposing or designing such a structure, the following components should be in the submission. Where there is a discrepancy between the requirements here and those provided by the client Railway or AREMA, the more stringent shall govern.

1. Covering Letter

- Summary of items enclosed,
- Location and date of previous, approved, similar designs by this designer, if any,
- Where the crash wall is proposed as an alternative to an earthen berm: alternative materials / configurations considered and benefits of this design,
- A Location or Key Plan. This will be used to identify the mileage and subdivision, the classification of the rail line, and the maximum speed for freight and passenger rail traffic, all obtained from AECOM Canada for CP and CN-owned corridors or from GO Transit for GO-owned corridors.
- Name, phone, fax and e-mail address of your contact.

2. Geotechnical Report - (2 copies)

- Soil properties used in design, and how determined,
- Borehole logs including location plan, if required to support these properties,
- Narrative report describing soil and ground water conditions, if required as above.

3. Design of Crash Walls

- One of the following methods may be chosen, or an alternative design load may be selected and if it can be justified by the engineer responsible for the design. The simplified approach of Method 1 may be used in most cases. Method 2 may be used to optimize the design, or where factors such as distance from the track to the wall, track speeds, side slopes along the track, consequences of collision or others may justify a different load.
- **Method 1**: The wall may be designed for a minimum point load of 600 kip (2700 kN) applied horizontally and normal to the face at any point along the wall
    - The point load shall be applied at a height of 6 feet (1.8 m) *above the top of rail* for walls up to 25 feet (7.6 m) from the centerline of track, or a height of 6 feet (1.8 m) *above the groundline* for walls farther than 25 feet (7.6 m) from the centerline of track.

- This method may be applied where track speeds do not exceed 50 mph (80 km/hr) for freight or 70 mph (112 km/hr) for passenger trains; where speeds exceed these limits, Method 2 shall be used.

- **Method 2**: an energy balance approach considering collision by glancing blow and single car rotation may be used to determine the design load. The following four cases must be considered:

  - Freight Train Load Case 1 - Glancing Blow: nine cars weighing 143 tons (129 700 kg) each, impacting the wall at an angle, θ_G. The angle of impact will be a function of track curvature, and for tangent track may be taken as 3.5 degrees.

  - Freight Train Load Case 2 - Single Car Impact: single car weighing 143 tons (129 700 kg) impacting the wall as it undergoes rotation about its center. The angle of rotation at impact is:

    $$\theta_f = \text{asin}\left(\frac{d_{CL}}{8.5}\right) \quad [1]$$

    where d_{CL} is the distance from the crash wall to the centerline of track in m. The closest existing or future track is to be used. Where d_{CL} is greater than 8.5 m, this load case need not be considered.

  - Passenger Train Load Case 3 - Glancing Blow: eight cars weighing 74 tons (67120 kg) each impacting the wall at an angle, θ_G. The angle of impact will be a function of track curvature, and for tangent track may be taken as 3.5 degrees.

  - Passenger Train Load Case 4 - Single Car Impact: single car weighing 74 tons (67120 kg) impacting the wall as it undergoes rotation about its center. The angle of rotation at impact is:

    $$\theta_f = asin\left(\frac{d_{CL}}{13}\right) \quad [2]$$

    Where d_{CL} is greater than 13 m, this load case need not be considered.

  - The analysis should reflect the specified track speeds for passenger and/or freight trains applicable within the subject corridor.

  - To assist in designing the structure for the above load cases, use:

    - For the glancing blow load cases, the speed of derailed equipment impacting the wall is reduced from the track speed, v_o, to

      $$v_G = \sqrt{v_o^2 + 2a\left(\frac{d_{CL}-1.625}{\sin\theta_G}\right)} \text{ [m/s]} \quad [3]$$

      Where d_{CL} is the distance from the crash wall to the centerline of track in m.

      v_o is the track speed in m/s

      θ_G is the angle of impact

a is the acceleration in m/s, calculated as $-9.8(.25 + \mathrm{G})$

G is the grade in decimal unit of the groundline in the direction of travel defined by the angle of impact relative to the centerline of track; calculated as $\frac{Groundline\ at\ wall - Base\ of\ Rail}{d_{CL}/_{sin\theta_G}}$.

- For the single car load cases, the speed of derailed equipment impacting the wall is

$$v_A = \frac{2.3\theta_f}{\sqrt{1-cos\,\theta_f}}\left[\frac{m}{s}\right] for\ freight\ cars \quad [4]$$

$$v_A = \frac{2.9\theta_f}{\sqrt{1-cos\,\theta_f}}\left[\frac{m}{s}\right] for\ passenger\ cars \quad [5]$$

Where θ_f is the angle of impact, in radians, defined in [1] and [2].

- For energy dissipation, assume:
  - Contact with the wall stops all movement in the direction perpendicular to the wall, but not along its length
  - Plastic deformation of individual car due to direct impact is 1 foot (.3048 m) maximum,
  - Total compression of linkages and equipment of the 8 or 9 car consist is 10 feet (3.048 m) maximum,
  - Deflection of wall is considered negligible in equations [6] to [9]. Where the designer wishes to include it, those equations may be modified.
  - In lieu of more rigorous analysis, these energy balance equations may be used to determine the design load perpendicular to the wall. The design load acts along the given length of wall.
    - For the glancing blow load cases

$$F_G = \frac{\frac{1}{2}m(v_G \sin\theta_G)^2}{d_G} \quad [6]$$

And the load is considered to act along the length l_G in m:

$$l_G = \frac{3.048}{\cos\theta_G} \quad [7]$$

Where m is the mass of the derailed cars in kg.

v_G is the impact speed in m/s, defined in [3]

$\theta_G$is the angle of impact

d_G is the deformation of the consist in the direction of the applied force, and $d_G = 3.048 \sin \theta_G$, in m

- For the single car impact

$$F_A = \frac{\frac{1}{2} m (v_A \cos \theta_f)^2}{d_A} \quad [8]$$

And the load is considered to act along the length l_A in m:

$$l_A = \frac{.3048}{\sin \theta_f} \quad [9]$$

Where m is the mass of the derailed cars in kg.

v_A is the impact speed in m/s, defined in [4] or [5]

θ_f is the angle of rotation at impact defined in [1] or [2]

d_A is the deformation of the consist in the direction of the applied force, and $d_A = .3048 \cos \theta_f$, in m

Where the influence areas of two sequential cars in an accordion style of derailment overlap, the wall must be designed for the simultaneous impact of both cars.

- Regardless of the method selected, the following guidelines must be followed:
    - The minimum thickness for walls up to 25 feet (7.6 m) from the centerline of track shall be 2'-6" (.760 m); minimum thickness for walls farther than 25 feet (7.6 m) from the centerline of track shall be 18 inches (.45 m).
    - Crash walls less than 12 feet (3.6 m) from the centerline of track shall be a minimum of 12 feet (3.6 m) above the top of rail. Crash walls between 12 feet (3.6 m) and 25 feet (7.6 m) from the centerline of track shall be a minimum of 7 feet (2.135 m) *above the top of rail*. Crash walls greater than 25 feet (7.6 m) from the centerline of track shall be a minimum of 7 feet (2.135 m) *above the adjacent groundline*.
    - The face of the crash wall shall be smooth and continuous, and shall extend a minimum of 6 inches (0.15 m) beyond the face of the structure (such as a building column or bridge pier) parallel to the track. Crash walls shall be at least 12 feet (3.60 m) long.
    - The design must incorporate horizontal and vertical continuity to distribute the loads from the derailed train.
    - The wall must be of solid, heavy construction, and separate precast blocks or stones will not be permitted.

4. Drawings - (2 hard copies as well as .pdf format)

- Site plan clearly showing property line, location of wall structure, centerline and elevation of nearest rail track,
- Layout and structural details of proposed structure, including all material notes and specs and construction procedures/phasing. All drawings signed and sealed by a professional engineer registered in the province having jurisdiction at the project location.
- Extent and treatment of any temporary excavations on railway property.

5. Cheque

- A cheque payable to AECOM will be required for the cost of this review. Please contact AECOM for current pricing. Cost will take into consideration number of submissions, site visits, meetings, and alternative or unusually complex designs.

6. Post-Construction Certificate - (1 copy)

- Engineer's certificate of completion describing actual construction, and certifying that the structure was built as per approved drawings,
- Copy of as-built drawings, as part of the engineer's certification of completion.

Access to Railway Operating Rights-of-Way

Permits **MUST** be obtained before entering into any Railway Operating right-of-way.

Some or all of the following may also be required: - proper railway flagging protection, cable locates, liability insurance, release of liability, safety training.

AECOM Canada Ltd. will provide guidance as to the proper process to be followed in this regard. Fees will be established based on the nature and extent of the work being proposed.

Communication for Submissions

All correspondence during the review process should be directed to AECOM Canada Ltd.

Upon completion of our review, a confidential report on our findings will be made to the railway company, who will subsequently contact the applicant.

The applicant will be notified when the report has been submitted to the railway.

Liability and Responsibility

The review will be undertaken with the understanding that neither the railway nor AECOM Canada Ltd. shall have any responsibility nor liability whatsoever for the design or adequacy of the crash wall, notwithstanding that any plans or specifications may have been reviewed by the railway nor AECOM Canada Ltd. No such review shall be deemed to limit the applicant's full responsibility for the design and construction adequacy of the works.

AECOM Canada Ltd.

Mississauga, Ont.

July 2005 Revised July 29, 2014

PIER PROTECTION ADJACENT TO RAILROAD TRACKS

Submission Guidelines for Crash Walls – CN RAIL

Crash walls may be required for the protection of overhead structures, and in some cases the Railway may consider a crash wall as an alternative to an earthen berm for the protection of structures or facilities adjacent to the track. When proposing or designing such a structure, the following components should be in the submission. Where there is a discrepancy between the requirements here and those provided by the client Railway or AREMA, the more stringent shall govern.

1. Covering Letter

- Summary of items enclosed,
- Location and date of previous, approved, similar designs by this designer, if any,
- Where the crash wall is proposed as an alternative to an earthen berm: alternative materials / configurations considered and benefits of this design,
- A Location or Key Plan. This will be used to identify the mileage and subdivision, the classification of the rail line, and the maximum speed for freight and passenger rail traffic, all obtained from AECOM Canada for CP and CN-owned corridors or from GO Transit for GO-owned corridors.
- Name, phone, fax and e-mail address of your contact.

2. Geotechnical Report - (2 copies)

- Soil properties used in design, and how determined,
- Borehole logs including location plan, if required to support these properties,
- Narrative report describing soil and ground water conditions, if required as above.

3. Design of Crash Walls

- One of the following methods may be chosen, or an alternative design load may be selected and if it can be justified by the engineer responsible for the design. The simplified approach of Method 1 may be used in most cases. Method 2 may be used to optimize the design, or where factors such as distance from the track to the wall, track speeds, side slopes along the track, consequences of collision or others may justify a different load.
- **Method 1**: The wall may be designed for a minimum point load of 600 kip (2700 kN) applied horizontally and normal to the face at any point along the wall
    - The point load shall be applied at a height of 6 feet (1.8 m) *above the top of rail* for walls up to 25 feet (7.6 m) from the centerline of track, or a height of 6 feet (1.8 m) *above the groundline* for walls farther than 25 feet (7.6 m) from the centerline of track.

- This method may be applied where track speeds do not exceed 50 mph (80 km/hr) for freight or 70 mph (112 km/hr) for passenger trains; where speeds exceed these limits, Method 2 shall be used.

- **Method 2**: an energy balance approach considering collision by glancing blow and single car rotation may be used to determine the design load. The following four cases must be considered:

  - Freight Train Load Case 1 - Glancing Blow: nine cars weighing 143 tons (129 700 kg) each, impacting the wall at an angle, θ_G. The angle of impact will be a function of track curvature, and for tangent track may be taken as 3.5 degrees.

  - Freight Train Load Case 2 - Single Car Impact: single car weighing 143 tons (129 700 kg) impacting the wall as it undergoes rotation about its center. The angle of rotation at impact is:

    $$\theta_f = \text{asin}\left(\frac{d_{CL}}{8.5}\right) \quad [1]$$

    where d_{CL} is the distance from the crash wall to the centerline of track in m. The closest existing or future track is to be used. Where d_{CL} is greater than 8.5 m, this load case need not be considered.

  - Passenger Train Load Case 3 - Glancing Blow: eight cars weighing 74 tons (67120 kg) each impacting the wall at an angle, θ_G. The angle of impact will be a function of track curvature, and for tangent track may be taken as 3.5 degrees.

  - Passenger Train Load Case 4 - Single Car Impact: single car weighing 74 tons (67120 kg) impacting the wall as it undergoes rotation about its center. The angle of rotation at impact is:

    $$\theta_f = asin\left(\frac{d_{CL}}{13}\right) \quad [2]$$

    Where d_{CL} is greater than 13 m, this load case need not be considered.

  - The analysis should reflect the specified track speeds for passenger and/or freight trains applicable within the subject corridor.

  - To assist in designing the structure for the above load cases, use:

    - For the glancing blow load cases, the speed of derailed equipment impacting the wall is reduced from the track speed, v_o, to

      $$v_G = \sqrt{v_o^2 + 2a\left(\frac{d_{CL}-1.625}{\sin\theta_G}\right)} \text{ [m/s]} \quad [3]$$

      Where d_{CL} is the distance from the crash wall to the centerline of track in m.

      v_o is the track speed in m/s

      θ_G is the angle of impact

a is the acceleration in m/s, calculated as $-9.8(.25 + \mathrm{G})$

G is the grade in decimal unit of the groundline in the direction of travel defined by the angle of impact relative to the centerline of track; calculated as $\frac{Groundline\ at\ wall - Base\ of\ Rail}{d_{CL}/_{sin\theta_G}}$.

- For the single car load cases, the speed of derailed equipment impacting the wall is

$$v_A = \frac{2.3\theta_f}{\sqrt{1-cos\,\theta_f}}\left[\frac{m}{s}\right] for\ freight\ cars \quad [4]$$

$$v_A = \frac{2.9\theta_f}{\sqrt{1-cos\,\theta_f}}\left[\frac{m}{s}\right] for\ passenger\ cars \quad [5]$$

Where θ_f is the angle of impact, in radians, defined in [1] and [2].

- For energy dissipation, assume:
  - Contact with the wall stops all movement in the direction perpendicular to the wall, but not along its length
  - Plastic deformation of individual car due to direct impact is 1 foot (.3048 m) maximum,
  - Total compression of linkages and equipment of the 8 or 9 car consist is 10 feet (3.048 m) maximum,
  - Deflection of wall is considered negligible in equations [6] to [9]. Where the designer wishes to include it, those equations may be modified.
  - In lieu of more rigorous analysis, these energy balance equations may be used to determine the design load perpendicular to the wall. The design load acts along the given length of wall.
    - For the glancing blow load cases

$$F_G = \frac{\frac{1}{2}m(v_G \sin\theta_G)^2}{d_G} \quad [6]$$

And the load is considered to act along the length l_G in m:

$$l_G = \frac{3.048}{\cos\theta_G} \quad [7]$$

Where m is the mass of the derailed cars in kg.

v_G is the impact speed in m/s, defined in [3]

$\theta_G$is the angle of impact

d_G is the deformation of the consist in the direction of the applied force, and $d_G = 3.048 \sin \theta_G$, in m

- For the single car impact

$$F_A = \frac{\frac{1}{2} m (v_A \cos \theta_f)^2}{d_A} \quad [8]$$

And the load is considered to act along the length l_A in m:

$$l_A = \frac{.3048}{\sin \theta_f} \quad [9]$$

Where m is the mass of the derailed cars in kg.

v_A is the impact speed in m/s, defined in [4] or [5]

θ_f is the angle of rotation at impact defined in [1] or [2]

d_A is the deformation of the consist in the direction of the applied force, and $d_A = .3048 \cos \theta_f$, in m

Where the influence areas of two sequential cars in an accordion style of derailment overlap, the wall must be designed for the simultaneous impact of both cars.

- Regardless of the method selected, the following guidelines must be followed:
    - The minimum thickness for walls up to 25 feet (7.6 m) from the centerline of track shall be 2'-6" (.760 m); minimum thickness for walls farther than 25 feet (7.6 m) from the centerline of track shall be 18 inches (.45 m).
    - Crash walls less than 12 feet (3.6 m) from the centerline of track shall be a minimum of 12 feet (3.6 m) above the top of rail. Crash walls between 12 feet (3.6 m) and 25 feet (7.6 m) from the centerline of track shall be a minimum of 7 feet (2.135 m) *above the top of rail*. Crash walls greater than 25 feet (7.6 m) from the centerline of track shall be a minimum of 7 feet (2.135 m) *above the adjacent groundline*.
    - The face of the crash wall shall be smooth and continuous, and shall extend a minimum of 6 inches (0.15 m) beyond the face of the structure (such as a building column or bridge pier) parallel to the track. Crash walls shall be at least 12 feet (3.60 m) long.
    - The design must incorporate horizontal and vertical continuity to distribute the loads from the derailed train.
    - The wall must be of solid, heavy construction, and separate precast blocks or stones will not be permitted.

4. Drawings - (2 hard copies as well as .pdf format)

- Site plan clearly showing property line, location of wall structure, centerline and elevation of nearest rail track,
- Layout and structural details of proposed structure, including all material notes and specs and construction procedures/phasing. All drawings signed and sealed by a professional engineer registered in the province having jurisdiction at the project location.
- Extent and treatment of any temporary excavations on railway property.

5. Cheque

- A cheque payable to AECOM will be required for the cost of this review. Please contact AECOM for current pricing. Cost will take into consideration number of submissions, site visits, meetings, and alternative or unusually complex designs.

6. Post-Construction Certificate - (1 copy)

- Engineer's certificate of completion describing actual construction, and certifying that the structure was built as per approved drawings,
- Copy of as-built drawings, as part of the engineer's certification of completion.

Access to Railway Operating Rights-of-Way

Permits **MUST** be obtained before entering into any Railway Operating right-of-way.

Some or all of the following may also be required: - proper railway flagging protection, cable locates, liability insurance, release of liability, safety training.

AECOM Canada Ltd. will provide guidance as to the proper process to be followed in this regard. Fees will be established based on the nature and extent of the work being proposed.

Communication for Submissions

All correspondence during the review process should be directed to AECOM Canada Ltd.

Upon completion of our review, a confidential report on our findings will be made to the railway company, who will subsequently contact the applicant.

The applicant will be notified when the report has been submitted to the railway.

Liability and Responsibility

The review will be undertaken with the understanding that neither the railway nor AECOM Canada Ltd. shall have any responsibility nor liability whatsoever for the design or adequacy of the crash wall, notwithstanding that any plans or specifications may have been reviewed by the railway nor AECOM Canada Ltd. No such review shall be deemed to limit the applicant's full responsibility for the design and construction adequacy of the works.

AECOM Canada Ltd.

Mississauga, Ont.

July 2005 Revised July 29, 2014

November 7, 2019

SPECIAL PROVISION
SECTION 534
PRECAST STRUCTURAL CONCRETE

Revise Paragraph 2 of 534.07 Quality Control to say:

Provide a copy of the Quality System Manual (QSM) to the Fabrication Engineer for review and approval.

Add the following Paragraph to 534.07 Quality Control:

QC staff shall be separate from production and shall not perform any production work.

Revise Sentence 1 in 534.17 Finishing Concrete to say:

Concrete Products shall be finished to meet the Standard Grade finish as described in the MNL-116.

SPECIAL PROVISION
SECTION 607
FENCES
(Chain Link Snow Fence)

607.01 Description The following paragraph is added:

This work consists of furnishing all materials for, and the construction of a chain link snow fence. The chain link snow fence shall be 33-inches tall and made from chain link materials as shown in the Plans and as specified herein.

607.02 Materials The following paragraphs are added:

Posts, rails, and braces shall be manufactured by one of the following methods with the steel conforming to ASTM A1011 or ASTM A1008 and A1011/A1011M with minimum yield strength 50 ksi:

- Furnace butt welded, continuous welded
- Cold rolled and electric resistance welded
- Seamless

The Piping shall conform to the following dimensions:

Nominal Diameter (Inches)	**Outside Diameter (Inches)**	**Minimum Wall Thickness (Inches)**	**Mass (Lb/ft)**
1 ½	1.900	0.145	2.72
2 ½	2.875	0.203	5.79

Hardware shall be hot dipped galvanized in accordance with AASHTO M 232 (ASTM A 153) or AASHTO M 298 Class 50 (ASTM B 695 Class 50).

The chain link fabric shall be 9-gauge steel, zinc coated conforming to AASHTO M 181 Type 1 Class D (ASTM A 392), aluminum-coated conforming to AASHTO M181 Type II (ASTM A 491), or 6-gauge aluminum alloy conforming to AASHTO M 181 Type III (ASTM F1183). Chain-link fabric shall be knuckled on top and bottom. The size of the wire mesh shall be 1 inch. Wire ties shall be standard round 9-gauge zinc or aluminum coated steel or 6-gauge aluminum alloy conforming to ASTM F 626. All ties shall be wrapped around chain-link fabric twice (double-pigtailed) at both ends. Space ties at 6″ on center to bottom rail and at 12″ on center at all posts and other rails. Mechanical or power fastened ties are acceptable.

607.06 Method of Measurement The following paragraph is added:

Chain link snow fence will be measured by the lump sum for the entire project, accepted in place and in conformity with the details shown on the Plans or as directed by the Resident.

607.07 Basis of Payment The following paragraph is added:

This work will be paid for at the contract unit price per lump sum, complete and accepted in place. Such price will be compensation for furnishing all materials, labor, equipment, coatings, and incidentals to complete the work.

Payment will be made under:

Pay Item		Pay Unit
607.183	Chain Link Snow Fence 33 Inch	Lump Sum

SPECIAL PROVISION
SECTION 607
FENCES
(Temporary Chain Link Fence – 8-FT)

607.01 Description The following paragraph is added:

This work shall also consist of furnishing all labor, equipment, and materials required to install, maintain, relocate, and remove temporary fencing throughout construction of the proposed bridge and demolition of the existing bridge. This work shall also include furnishing and maintaining temporary lighting at temporary fencing locations.

607.02 Materials The following paragraph is added:

Chain Link Fabric for temporary fencing and corresponding gates shall meet the requirements of Subsection 710.03.

607.03 General The following paragraphs are added:

Temporary fencing shall be 8-ft tall with a maximum post spacing of 12-ft. Installation of the fencing, including tension bars, clamps, and supports shall be in accordance with manufacturer recommendations and as directed by the Resident. Temporary chain link fence shall not require foundations for support posts. Support bases, used to maintain the fence in a vertical position, must have an adequate base to support the fence in windy conditions and be large enough to hold sand bags or other supplemental dead weight if necessary for additional support. Securely attach fence sections to the posts.

Gates shall be provided as deemed necessary by the Contractor to conduct their construction operations. Gates shall be composed of chain link fabric braced with rods, bars, or angles of a type similar in construction to the fencing installed. Gates shall be no less than 8-ft tall. All gates shall be securely locked during periods of inactivity. All locks shall be keyed the same. The Contractor shall provide the Resident with ten sets of keys and a lock box to be mounted in the Resident's field office. All keys shall be stamped to indicate "Do Not Duplicate". Keys will be dispersed by the Resident to the Contractor, Customs Border Patrol (CBP), US Border Patrol, and Canada Border Services Agency (CBSA) as necessary.

The Contractor shall provide temporary chain link fencing and gates at the following locations and for the noted construction durations:

- Proposed bridge abutments: Installation shall occur before the proposed girders are erected continuously from one abutment to the other. Installation shall extend between wingwall tips and along the exposed face of wingwalls until the height between ground and the top of wingwall is greater than 10-ft. Fencing at this location shall be relocated to

accommodate construction by Others at the port facilities and shall be completely removed only when directed by the Resident.

- Existing bridge abutments: Installation shall occur once traffic is maintained on the new bridge. Installation shall generally extend between wingwall tips and along the exposed face of wingwalls until the height between ground and the top of wingwall is greater than 10-ft. Fencing at this location may be completely removed once sufficient bridge removal has occurred that prohibits physical crossing, and as approved by the Resident.

- Temporary work trestles: For work trestles that extend entirely across the river and provide a passable connection between the US and Canada, installation shall occur prior to the placement of the final trestle span. Installation shall occur on the landside of each end of the trestle(s) and extend laterally along the outside edges of the trestle until the height between ground (or streambed) and the bottom of the trestle decking is greater than 10-ft.

- Along the proposed bridge deck between Stage I and Stage II construction as shown on the Plans.

- Other locations as directed by the Resident.

Installation of fencing at the above-noted locations shall occur prior to the need for the security fence or as directed by the Resident, and shall not be removed until approval is given by the Resident. Alternate installation locations and procedures may be submitted to the Resident for approval.

The temporary chain link fence shall be continuous to discourage pedestrian access into or through the work area. The fencing shall be erected vertically, set plumb, and generally straight following the contour of the ground, with the bottom of the fence structure no more than three inches above the ground surface. The Contractor shall provide sandbags or other approved removable ballast to support the portable chain link fence under wind, ice, and snow loads.

Fencing shall be maintained in good working condition throughout construction. If sections of fencing are determined to be unserviceable by the Resident, the Contractor shall replace the applicable fencing at no additional cost.

Temporary lighting shall be provided by the Contractor at the location of each temporary chain link fence installation. The Contractor shall design, and submit for approval, a lighting system that provides a minimum 2-foot-candle illumination with an average-to-minimum uniformity ratio of 10 to 1 over a 25-ft width, measured perpendicular to the fence and along the entire length of fence. The system shall minimize shadows, glare, and be adjusted as directed by the Resident.

607.06 Method of Measurement The following paragraph is added:

Temporary Chain Link Fence will be measured by the lump sum, accepted in place. Relocation of the temporary fence will not be measured for payment.

607.07 Basis of Payment The following paragraphs are added:

The accepted quantity of Temporary Chain Link Fence will be paid at the Contract unit price per lump sum. Payment shall be full compensation for furnishing, assembling, installing, relocating as necessary, maintenance, and removal of fencing, gates, barways, bracing assemblies, locks, and temporary lighting and all other incidentals, tools, material, and labor necessary to complete the work.

Payment will be made under:

Pay Item		Pay Unit
607.1706	Temporary Chain Link Fence – 8 Foot	Lump Sum

Madawaska-Edmundston
International Bridge
WIN: 021736.00
November 4, 2020

SPECIAL PROVISION
SECTION 610
STONE FILL, RIPRAP, STONE BLANKET, AND STONE DITCH PROTECTION
(Sulfide Bearing Rock)

610.02 Materials The following shall be added at the end of the section:

Sulfide-bearing rock (SBR) shall not be used to armor the river banks. SBR is defined as any rock with a sulfur content greater than 0.3% by weight and with a neutralization potential ratio (NPR) less than 3.0.

The Contractor shall sample their identified riprap quarry (or quarries) for SBR using a two-step process. Samples should first be screened for total sulfur content. Those with a total sulfur content greater than 0.3% by weight shall be subject to a modified Sobec acid-base accounting procedure, based on total sulfur content. This approach involves the chemical analyses that determines the acid-neutralization capacity (neutralization potential, NP) of minerals within the sample and the acid-generating capacity (acid potential, AP) from sulfide minerals contained within the sample. The neutralization potential ratio (NPR) is the ratio of NP to AP.

The number of samples and frequency of sampling, throughout the riprap sourcing, may be dependent on the geologic nature of the material and initial test results; however, no less than 3 samples per 100-cy of stone material shall be provided by the Contractor. The Contractor's riprap source/quarry and aforementioned test results shall be provided to the Resident a minimum of 30-days prior to the intended riprap placement date.

SPECIAL PROVISION
SECTION 627
PAVEMENT MARKINGS
(Temporary Pavement Marking Lines)

Section 627 of the Standard Specifications is amended by the addition of the following:

627.01 Description Preformed pavement tape and masking tape shall be applied at locations shown on the plans by mechanical or manual methods. Mechanical applications shall be suitable for all markings. Manual applications shall normally be used for transverse lines, symbols, and legends. Follow manufacturer's recommendations for equipment operation and maintenance, and product applications.

Black line masking tape shall be wider than the colored line it is intended to mask.

Preformed pavement tape and masking tape shall be stored and applied as directed by the manufacturer. The Contractor shall provide a copy of the manufacturer's storage and application recommendations and the manufacturer's certificate of compliance to the Resident upon delivery of the material to the project. The certificate shall include the process, batch, or lot number(s) and corresponding date(s) of manufacture.

627.02 Materials

A. Temporary Pavement Tape – Temporary pavement tape shall consist of polymeric backing materials with a retroreflective surface. The Contractor shall ensure that the underside of the tape is pre-coated with a pressure-sensitive adhesive to bond the tape to the roadway surface and is capable of withstanding traffic immediately after installation and for the duration of the intended service. The Contractor shall use a primer only if recommended by the manufacturer.

   Tape shall have a minimum skid resistance of 35 British petroleum number (BPN) when tested according to ASTM E 303. The Contractor shall not use lead-based pigment in traffic tape. Temporary Pavement Tape shall conform to the requirements specified in the table below:

Requirements for Temporary Pavement Tape		
Property	White	Yellow
Minimum Specific Luminance (mcd/sq fc candelas) ASTM 4581[1]	500	300
Minimum Tensile Stress (psi)[2] ASTM D 538	4D	4D
FED-STD-595B Color Chip No.	3777B	3353B

1. Use an entrance angle of 88.76' and an observation angle of 1.05"

2. Perform tensile stress testing with a testing speed of 6 inches per minute

Tape shall be capable of being removed manually, intact or in large pieces, without the use of solvents, burning, grinding, or blasting and without damage to the underlying surface.

B. Removable Black Line Masking Tape - Black line masking tape shall be black in color, non-retroreflective, and a plant polymer material. The color shall conform to FED-STD-595B color chip No. 37030. Masking tape shall not produce a sheen under day, night, or wet conditions. Masking tape shall be capable of masking the underlying stripes so that they do not reflect through. Masking tape shall have a minimum skid resistance of 30 BPN when tested according to ASTM E 303. The underside of the tape shall be pre-coated with a pressure-sensitive adhesive to bond the tape to the roadway surface and shall be capable of withstanding traffic immediately after installation and for the duration of the intended service.

   The masking tape shall be capable of being removed manually, intact or in large pieces, at temperatures above 40°F, without the use of solvents, burning, grinding, or blasting and without damage to the underlying surface.

Material shall be delivered to the project in original containers. Each container shall be clearly marked to indicate the color of the material, a specific description of the contents, and the process batch or lot numbers.

Material found to be discolored or damaged in any way or material manufactured more than one year prior to installation shall not be used.

627.09 Method of Measurement Temporary pavement marking lines, painted and/or tape, will be measured as one lump sum for work accepted.

627.10 Basis of Payment The accepted quantity of temporary pavement marking lines will be paid for at the contract lump sum price and will include as many applications as required and removal when required. Separate payment will not be made for the removal of temporary pavement marking lines.

Temporary pavement marking tape that loses reflectivity, becomes broken, dislodged or missing during the life of the Contract shall be replaced by the Contractor at no additional cost to the Department.

Payment will be made under:

Pay Item		Pay Unit
627.76	Temporary Pavement Marking Line, White or Yellow	Lump Sum

SPECIAL PROVISION
SECTION 634
HIGHWAY LIGHTING
(Meter and Control Cabinet)
(Light Standard)

634.01 Description The following paragraph is added:

This work shall also consist of furnishing and installing a meter, control cabinet and meter/control cabinet pedestal. This work shall also include the furnishing and installation of roadway lighting and power cables.

634.025 Conventional Light Standards The following paragraph is added to the end of the section:

Each municipal lighting standard (poles P4 through P13, as identified on the Plans) shall be provided with outdoor rated receptacle facing away from the bridge. Each receptacle shall be 120V,20A, GFCI duplex receptacle as manufactured by Hubbel or approved equal. This work shall also include the installation of weatherproof receptacle box, neoprene gasket cover, cover plate and wiring of receptacles to the meter cabinet in Madawaska and proposed Canadian POE power source.

The following Subsection is added:
634.028 Meter, Control Cabinet and Meter/Control Cabinet Pedestal

The pedestal with meter and control cabinet installation shall be in accordance with the details provided on the Plans.

The pedestal shall be installed in compacted soil with the end not less than four feet below finish grade at point of installation. The length of the pedestal shall be as per the details provided on the Plans and shall meet the material requirements of Section 720.12.

The cabinet shall be in accordance with Section 715.11 Service Equipment and include a single photocell (715.10).

One (1) 2P-15A, 240V breaker shall be provided in the control cabinet for Lighting circuit with #6AWG wires to power the light fixtures. The maximum size for main breaker in the meter/ disconnect enclosure shall be a 2-pole, 60-ampere, 240 Volt, 1 phase, 3 wire service wired with #4 AWG.

634.08 Service Replace the second paragraph with the following:

The lighting system will be supplied with electrical power by the local power company. The

type of service will be single phase, three wire, 120/240 Volt, 60 hertz, alternating current. The Contractor shall bring the service wires from the proposed utility pole to the proposed pedestal mounted meter cabinet. A combination meter enclosure/disconnect is recommended on the pedestal to disconnect power to the control cabinet. The Contractor shall request and notify the power company in a timely fashion for the availability of the power, and at least two weeks in advance of the time they intend to turn on and test the lighting system and shall make all necessary arrangements with the power company for the required installation.

The meter and the control cabinet shall be installed so that they will be upright (plumb).
Meter shall be installed with the bottom of the meter is not less than 48 inches or more than 60 inches from the floor to the final grade. Control Cabinet shall be installed such that the bottom of the cabinet is not less than 36 inches from the floor to the final grade.

634.093 Basis of Payment
The second sentence of the first paragraph shall be removed and replaced with the following:

Payment shall be full compensation for the Light Standard and breakaway transformer base or breakaway device, bracket arm and all incidentals necessary to complete the work, including pole-mounted receptacles and design of the Light Standards.

The fourth paragraph shall be removed and replaced with the following:

Lump sum payment for highway lighting system shall be full compensation for furnishing, installing and erecting: ballast, lamps, wiring in underground conduit, pole wiring, pole-mounted receptacle wiring, and all other wiring (except prewired conduit), transformer enclosures, luminaires (except luminaires for high mast lighting), break-away devices when applicable, all identification tags, and all materials, labor, equipment, tools, miscellaneous hardware and incidentals necessary to complete the work. Payment shall also include removing and resetting light standards, installing breakaway devices on existing poles, disposing of unused light standards, as noted on the plans, and for furnishing portable electric power units. Payment shall also include furnishing and installing the pedestal with control cabinet and meter/disconnect, identified on the Plans, including the complete system, operational, tested, and accepted in place. This payment includes full compensation for all electrical components, mounting brackets, ground rods, ground wire and ground wire connections, enclosure, power cables and connections, conduit between meter/ disconnect and control cabinet, circuit breakers, meter socket, control wiring, device boxes, contactors, pull wire, photo cell and control, locks, delivery of keys to the Resident, and all labor, materials, equipment, and incidental costs required to complete the work, including all service coordination.

SPECIAL PROVISION
SECTION 634
HIGHWAY LIGHTING
(Luminaires - LED)

Standard Specification Section 634 is revised as follows:

634.093 Basis of Payment Add the following to the list of pay items:

Pay Item		Pay Unit
634.2042	LED Luminaires	Each

SPECIAL PROVISION
SECTION 634
HIGHWAY LIGHTING
(Aesthetic Lighting)

634.01 Description The following paragraph is added:

This work shall also consist of furnishing and installing lighting fixtures and associated conduit, junction boxes, wiring, and incidentals require to provide an aesthetic lighting system to illuminate the bridge fasciae.

The following Subsection is added:

634.062 Aesthetic Lighting The Contractor shall provide a complete Aesthetic Lighting system, as shown on the Plans, including light fixtures, junction boxes, cables, buried and bridge-mounted conduits, and light fixture mounting equipment. Aesthetic lighting fixtures shall be manufactured by Cooper Lighting or approved equal. The Contractor shall provide a Fiberglass Junction Box with three (3) feet of liquid tight flexible metal conduit (LFMC) at each location where an aesthetic lighting fixture is being installed. The corresponding junction boxes shall be manufactured by Hubbel, or approved equal. All bridge mounting hardware embedded or post-installed into the bridge deck shall be stainless steel. All conduit buried within the bridge approach shall be concrete encased conduit n accordance with Standard Specification 626.

634.092 Method of Measurement The following paragraph is added to the end of the section:

Aesthetic Lighting system will be measured by the lump sum.

634.093 Basis of Payment The following is added to the third and fourth paragraphs:

The accepted Aesthetic Lighting system will be paid for at the contract lump sum price for the complete aesthetic lighting system, installed and operational, as shown on the Plans. Payment shall be full compensation for light fixtures, buried and bridge-mounted conduit, cables, fiberglass junction boxes, testing and flex conduit between the junction boxes and aesthetic lighting fixtures, as well as all labor, materials, equipment, and incidental costs required to complete the work

The following is added to the list of Pay Items:

Pay Item		Pay Unit
634.803	Aesthetic Lighting	Lump Sum

SPECIAL PROVISION
SECTION 639
ENGINEERING FACILITIES
(Field Office – Type A, Modified)

Standard Specification Section 639 is revised as follows:

639.04 Field Offices The following paragraphs are added:

Field Offices are also designated Type A - Modified which shall meet or exceed the requirements of a Type A Field Office, and the requirements identified in this Special Provision.

Field Office, Type A - Modified shall have a minimum floor area (outside dimension) of 720-ft^2 and include:

- Two private offices;
- Indoor toilet facilities with running water;
- Four desks with office chairs;
- A separate lockable closet with minimum floor dimensions of 3-ft by 5-ft or an antitheft floor anchoring system.

The Contractor shall provide full office cleaning supplies, including disinfectants and hand sanitizer, for the duration of the project.

The Contractor shall provide a fully functional wireless desktop copier/scanner/printer, capable of copying 11”x17” paper, for the Resident’s use during the project. All maintenance and supplies, except paper, shall be the responsibility of the Contractor.

The Contractor shall provide a fully functional 50” minimum wall-mounted monitor with two HDMI ports, a USB port, 12-ft HDMI cable, remote video conference camera, and computer speakers.

639.091 Broadband Connection Replace the fifth sentence with the following:

The selected service will have a minimum download connection of 25.0 Mbps and 5Mbps upload.

639.11 Basis of Payment Modify the Pay Item Description within the list of pay items, as follows:

Pay Item		Pay Unit
639.18	Field Office, Type A - Modified	Each

SPECIAL PROVISION
SECTION 641
REST AREA FACILITIES
(Flagpole)

641.01 Description:

The work shall consist of furnishing and installing an aluminum flagpole, pole mounted flood light as shown on the Plans, and all equipment necessary for a complete flagpole installation at the locations shown on the Plans. All the work shall be in accordance with the Plans, these Special Provisions, Standard Specifications Sections 626 and 634, as applicable, and as directed by the Resident.

The Contractor shall be fully responsible for the installation of a complete flagpole and associated hardware and fittings that have been fabricated by a single manufacturer. The Contractor shall test the flagpole for full functionality and integrity by unfurling the flags provided by the communities for a period of one-week or longer as required. The Contractor shall repair any components of the flagpole and associated items resulting this one-week test at no cost to the Department.

Ancillary items provided with the aluminum flagpole shall include (but not be limited to):

- Sleeve tube assembly,
- Swivel snaps
- Collar,
- Truck,
- Ball,
- Aluminum cleat,
- Cleat cover box,
- Grounding,
- All (other) necessary hardware and fittings
- Foundation,
- Shoe-base
- Anchor Bolts
- Halyard
- Flood Light Fixture

Flags to be mounted to the flagpoles will be supplied and installed by others.

641.02 Materials:
The following sections of the standard specifications shall apply:

Aluminum Supports	720.01
Anchor Bolts	720.07

641.021 Equipment List and Drawings:
Unless otherwise permitted in writing, the Contractor shall submit for review a list of equipment and materials which is proposed to be furnished. The list shall include the name of manufacturer, size, and identifying number of each item and other necessary data, including detailed scale drawings, wiring diagrams of special equipment and any proposed minor deviations from the Plans. If requested, the Contractor shall submit sample articles of the material proposed for use. All of the above data except sample articles, shall be submitted in duplicate. Following checking, correction, and approval, not less than two complete sets of approved drawings shall be submitted. The Department will not be liable for material purchased, labor performed, or work delayed before such review. Where electrical equipment is to be constructed as shown on the Plans, the submission of detailed drawings and diagrams will not be required.

641.03 Pole:
The pole construction shall be seamless throughout and comprised of one section. The flagpole shall have a butt diameter of 6 inches, top diameter of 3.5 inches and minimum wall thickness of 0.188 inches. Refer to the Plans for the height of the flagpole.

The flagpole shall be as manufactured by American Flag Express or approved equal:

American Flags Express
12577 W. Custer Ave.
Butler, WI 53007
(262) 783-4800
https://flagsexpress.com/

The pole and pole foundation design shall comply with the National Association of Architectural Metal Manufacturers' (NAAMM) Guide Specifications For Design Of Metal Flagpoles (ANSI/NAAMM FP 1001-07) and shall be designed to meet or exceed the AASHTO Standard Specifications, for Structural Supports for Highway Signs, Luminaries and Traffic Signals.

The design wind loading shall be chosen to be consistent with the location of the structure and the height factor.

641.031 Flagpole Fittings:

Shall be as noted on the Plans or as recommended by the manufacturer.

641.032 Finish:

Flagpole finish shall be similar to lighting standard finish.

641.04 Flagpole Flood Light:

The Contractor shall provide a complete floodlight system including LED floodlight, floodlight mounting straps, lighting cables and rubber grommets as shown on the Plans. Light fixture shall be manufactured by Cooper Lighting or approved equal. Refer to the Plans for floodlight model number. Floodlights shall be connected to the highway lighting circuits as shown on the Plans.

641.05 Method of Measurement:

Flagpoles will be measured by each single unit, complete in place and accepted.

641.06 Basis of Payment:

The accepted quantity of flagpoles will be paid for at the contract unit price each, complete and accepted in place for which the price shall be full compensation for furnishing all materials, labor and other incidentals necessary to satisfactorily complete the work.

The pole-mounted flood light, floodlight wiring, and miscellaneous hardware will not be paid for separately but shall be considered included in the unit bid price for the flagpole.

Pay Item		Pay Unit
641.35	Flagpole	Each

SPECIAL PROVISION
SECTION 652
MAINTENANCE OF TRAFFIC

Subsection 652.3.6 is amended by adding the following requirements:

Long term lane closures will not be permitted. Short-term, daily lane closures with one lane, alternating traffic, will be allowed during working hours only. The Resident must approve all lane closures.

Madawaska-Edmundston
International Bridge
WIN: 021736.00
November 23, 2020

SPECIAL PROVISION
SECTION 652
MAINTENANCE OF TRAFFIC

652.2.2 Signs Replace the section with the following:

Within the State of Maine, only signs with symbol messages conforming to the design of the Manual of Uniform Traffic Control Devices shall be used unless the Resident approves the substitution of word messages. Within the Province of New Brunswick, only signs with symbol messages conforming to the NBDTI Work Area Traffic Control Manual (WATCM) shall be used unless the Resident approves the substitution of word messages.

652.3.4 General The following is added to the end of the first paragraph:

Within the Province of New Brunswick, the Contractor shall instead install the appropriate traffic control devices in accordance with the plans, specifications and the latest edition of WATCM.

652.3.4 General The fourth paragraph is replaced by the following:

Channelization devices shall include Vertical Panel Markers, Barricades, Cones, and Drums. These devices shall be installed and maintained at the spacing determined by the MUTCD through the work area in the State of Maine and at the spacing determined by the WATCM in the province of New Brunswick.

SPECIAL PROVISION
SECTION 652
MAINTENANCE OF TRAFFIC

Approaches. Approach signing shall include the following signs at a minimum. Field conditions may warrant the use of additional signs as determined by the Resident.

Road Work Next X* Miles
Road Work 500 Feet (Ahead)
End Road Work

Work Areas. At each work site, signs and channelizing devices shall be used as directed by the Resident.

Signs include:

Road Work xxxx[1].
One Lane Road Ahead
Flagger Sign

Other typical signs include:

Be Prepared to Stop
Low Shoulder
Bump
Pavement Ends

The above lists of Approach signs and Work Area signs are representative of the contract requirements. Other sign legends may be required.

Unless otherwise defined in Special Provision 105/107 or submitted and approved in the Traffic Control Plan, the following shall apply:

- The Contractor shall conduct their operations in such a manner that the roadway will not be restricted to one lane for more than 2,500 feet at each work area and no more than 4,000 feet for paving and milling work areas.
- Where more than one work area restricts traffic to one lane operation, these work areas shall be separated by at least 1 mile of two-way operation.

Temporary Centerline A temporary centerline shall be placed each day on all new pavement to be used by traffic. The temporary centerline, when specified of reflectorized traffic paint, shall conform to the standard marking patterns used for permanent markings. Failure to apply a temporary centerline daily will result in a Traffic Control Violation and suspension of paving operations until temporary markers are applied to all previously placed pavement.

[1] "Road Work Ahead" to be used in short duration operations and "Road Work xx feet" to be used in stationary operations as directed by the Resident.

SPECIAL PROVISION
SECTION 653
POLYSTYRENE PLASTIC INSULATION
(4-Inch Polystyrene Plastic Insulation)

Section 653 of the Standard Specifications is amended as follows:

653.02 General: Section 653.02 of the Standard Specifications shall be replaced with the following:

Insulating material shall be expanded polystyrene (EPS) insulating board conforming to the requirements of ASTM C578 Type IX and ASTM D6817 Type EPS29 with a minimum compressive resistance at 1% strain of 10.9 psi. EPS shall have a thickness of 4 inches.

Pegs shall be hardwood, approximately 8 inches long by 1/4 inch round, pointed on one end.

653.04 Placing Insulating Boards: Section 653.04 of the Standard Specifications shall be amended with the following:

EPS shall be placed after micropile installation and shall be cut and fit to provide a maximum offset of 4 inches between the insulating board and the nearest side of the micropiles.

653.05 Placing Backfill: Section 653.05 of the Standard Specifications shall be replaced with the following:

After the insulating boards have been placed, concrete fill shall be placed over the insulation boards, and within the annular space between micropiles and EPS, using care to avoid pushing or puncturing the boards. Construction equipment shall not be operated directly on the insulating boards. The type and thickness of concrete fill will be shown on the plans.

653.06 Compaction: Section 653.06 of the Standard Specifications shall be deleted.

653.09 Basis of Payment Add the following to the list of pay items:

Pay Item		Pay Unit
653.24	4 inch Polystyrene Plastic Insulation	Square Yard

SPECIAL PROVISION
SECTION 660
ON-THE-JOB TRAINING

660.01 Description: On-The-Job Training programs (OJT) are required as part of the Contractor's equal employment opportunity affirmative action program. The primary objective of on the job training shall be to train and upgrade women, minorities, and disadvantaged workers toward journey worker status in the type of trade or job classification involved.

660.02 Requirements: Contractors shall begin training in accordance with OJT Special Provision 660 as follows for all projects with assigned trainee slots.

Total number of trainee slots required will be the amount listed in the Schedule of Items. All On-The-Job Training will be performed in accordance with 23 CFR 230, Subpart A, Appendix B and MaineDOT On-The-Job Training Program Manual. Training classifications shall be distributed among work classifications needed by the Contractor in the skilled and semi-skilled craft levels identified on the Letter of Intent. These classifications must be needed on that specific project and have sufficient work hours available to meet the training plan activities and duration.

The Contractor shall receive credit for training hours only after, the Department, or its representative, has approved the program. For this reason, Contractors are reminded to register candidates at the onset of project work in order to guarantee the maximum training time for the enrollee to complete the OJT program. Contractors will be reimbursed for such approved trainee slots upon successful completion of the training.

The Contractor shall make every effort to enroll minority and women trainees (e.g., by conducting systematic and direct recruitment through public and private sources likely to yield women, minorities, and disadvantaged trainees) to the extent that such persons are available within a reasonable area of recruitment. The contractor shall be responsible for demonstrating to the Department the steps taken in pursuance thereof, before determination as to whether the Contractor is in compliance with this program. These semi-skilled and skilled craft employment goals set by this office of Federal Contractor Compliance Programs are as follows: 6.9 percent women and 0.05 percent minorities, and 10 percent for women, and 0.05 percent for minorities in un-skilled classes respectively statewide. For this reason, whether a Contractor meets these goals or not, the Department will require all Contractors to participate in the program until such time that the goals are met as a whole. If any Contractor falls below these standards, it shall immediately implement an Affirmative Action Program to increase the employment and retention of women, minorities and the disadvantaged.

Trainees shall not be enrolled in a classification in which they have successfully completed a training course leading to journey-level status, or for which they have held employment as a journey level worker. No Contractor shall enroll trainees who possess post-secondary degrees, certification, or diploma without first securing written approval from the Civil Rights Office.

Only individuals with non-construction oriented credentials, except those who are upgraded will be considered. Upgrades from semi-skilled to skilled crafts is acceptable but must be approved by the Department or its representative.

The minimum length and type of training for each classification will be as established in the training program selected by the Contractor and approved by the Department. Nothing in this section limits a Contractor to only the curriculum found in the OJT Manual. The Department will consider a training curriculum if it meets the equal employment opportunity obligations that bring women, minorities, and the disadvantaged into the industry and to retain them in the industry at the journey level of the classification of the training. Contractors are encouraged to examine training opportunities, which fit their needs for the project and for the company.

The Contractor shall begin training at the onset of employment for the trade classification. Trainees are expected to remain in status as long as training opportunities exist in the work classification, or until the training program is completed.

Section 660 shall be included directly in all contracts to subcontractors. Subcontractors are expected to comply with craft goals. As with other Sections applied to a Subcontractor, the Contractor retains obligations accordingly.

At enrollment, trainees shall be paid at least 60 percent of the average wage paid for craftspeople in the stated classification on the project. Provided a trainee achieves the objectives of the program, the Contractor must provide incremental wage increases to each enrollee as they progress in the program. By completion, a trainee is expected to earn a comparable wage to that of other journeyed workers, employed by the Contractor in this classification.

Submittals: The Contractor shall complete and forward to the MaineDOT, Civil Rights Office the Letter of Intent, the OJT Registration Form, and the Workforce Breakdown Form. The Contractor shall maintain records of trainee activities and performance and furnish the department or its representative with documentation of each trainee's progress using the Weekly Evaluation Form. Requests for changes in the number of trainee's shall be handled as other bid items. The Contractor must submit a change order with justification to the resident. The Resident will then forward that request to the Civil Rights Office for consideration. Provided the Contractor has Departmental approval prior to relocating an OJT, training may be conducted off-site. The Contractor must

forward a completed Off-Site OJT Request/Approval Form with a cover letter explaining the intent of the transfer to the Civil Rights Office.

Verification of training hours shall be determined for credit on off-site work by either: 1) the weekly training report, or 2) the Contractors usual/daily/weekly time card.

660.03 Method of Measurement: The OJT item will be measured by the number of OJT trainees who successfully complete an approved training program. A trainee will be considered successfully complete for purposes of payment when the trainee receives a certificate of completion from the Department.

660.04 Basis of Payment: The OJT shall be paid for once successfully completed at the contract unit price per each. Payment will be made even though the Contractor may have received additional training program funds from other sources, provided such other source does not prohibit the Contractor from receiving other payment. No payment will be made for training not completed in accordance with this specification, the OJT Manual, and the Code of Federal Regulations. NO payment will be made to the Contractor if the Department determines the Contractor failed to provide the required training, or if the Contractor did not hire the trainee as a tradesperson when the program was completed. When the Department determines the Contractor has not complied with this section, the resulting figures shall be deducted from any monies due the Contractor, as determined by the Resident. The Department shall work with any Contractor whose efforts have been deemed not consistent with the spirit or intent of the Program.

The Civil Rights Office shall move within ten days of the ruling to advise the Contractor, in writing, so a corrective action plan may be developed. If efforts fail, sanctions may be imposed. Contractors may be entitled to mediate the penalty by requesting so in writing to the Department's Civil Rights Office. If mediation is warranted it shall be for extenuating circumstances beyond the control of the Contractor.

Payment will be made under:

Pay Item	**Pay Unit**
660.21 On-The-Job Training	Hourly

SPECIAL PROVISION
SECTION 910
SPECIAL WORK
(Utility Conduit – General Services Administration – Approach Only)

910.01 Description This item shall consist of all work shown on the Plans and described in this Special Provision. This Special Provision is limited to the work from the tie-in points identified on the Plans to 10 feet beyond the end of each approach slab. Utility conduit work related to the bridge-supported conduit, outside these limits, is addressed in separate special provisions.

910.02 Materials The Contractor is responsible for the furnishing and fabrication of all material and associated hardware as shown on the Plans and described in this specification.

The conduits shall be concrete-encased, non-metallic conduit conforming to Standard Specification 626.

Granular Borrow shall conform to Standard Specification 703.20.

Pull string provided within the conduit shall be mule tape rated at 5,000 pounds and shall extend continuously through the entire run of each conduit as located on the Plans. Installation of conduit cables will be performed by Others. The Contractor shall coordinate with the Land Port of Entry (LPOE) contractor and reasonably accommodate access for the installation of cabling.

910.03 General Utility conduit installation shall consist of furnishing and installing all materials and labor for the installation of the conduits noted on the Plans. This generally includes the installation of:

- Four (4), 2” I.D. conduits from Sta 102+15 (±) to Abutment 1 (two conduits for power and two conduits for fiberoptic cable);
- Four (4), 3” I.D. conduits from Sta 102+15 (±) to Abutment 1 (two conduits for power and two conduits for fiberoptic cable); and
- Four (4), 3” I.D. conduits from Sta 102+15 (±) to the overhead sign structure at Sta 103+15(±) (two conduits for power and two conduits for fiberoptic cable).

Included with this work is the installation of unwired conduit, connection to bridge-supported conduit, conduit caps, and all of their components and incidentals related to these items necessary to complete the work.

All work shall be in accordance with Standard Specification 626, Sections 6.5.3.3 and 6.5.7.6 of the General Services P100 Facilities Standards for the Public Buildings Services, July 2018 (available online), and the provisions identified herein.

910.04 Submittals The Contractor shall, within 60 days following execution of the contract, submit a list of materials which are to be installed. The list shall include the manufacturer, size, components, dimensions, and identifying number of each item. The list shall be supplemented by such data as may be required, including detailed scale drawings of proposed minor deviations from the plans. The Contractor shall submit for review, design data and sample articles of the material proposed for use.

910.05 Construction: A minimum of two weeks prior to beginning conduit installation work, a meeting shall be held with members of Customs and Border Protection (CBP), General Services Administration (GSA), the MaineDOT Resident, and the Contractor to discuss and coordinate the work progression.

Conduits shall be installed in accordance with Standard Specification 626 and the requirements identified herein.

Workmanship shall conform to the requirements of: NEC, NESC, ASTM Standards, and the ANSI, the local Utility Companies, the State of Maine, Manufactures Specifications and any local ordinances that may apply except when otherwise noted on the Plans or in the Special Provisions.

Conduits shall be of the sizes noted on the Plans, which are indicated as the nominal inside diameter. All conduit bends shall be made with a minimum 12-inch minimum radius.

The Contractor shall be responsible for and shall repair all damage caused to underground drainage structures, utilities, or lighting conduit, which are encountered during construction.

Where conduit runs are placed parallel to other conduits, they shall be separated by a minimum of 2” of sand or soil cushion.

The Contractor shall install pull-string in all conduits. The ends of the lines shall be secured in such manner as to prevent accidental withdrawal of the wire. All conduit ends shall be capped with watertight conduit caps.

The Contractor shall provide a metal tracer wire and a 2” wide “buried cable” plastic warning tape located 12” below grade at all underground conduits.

910.06 Method of Measurement Special Work – Utility Conduit (Approach Only) shall be measured by the lump sum, complete and accepted.

910.07 Basis of Payment All work for Special Work – Utility Conduit (Approach Only) will be paid at the contract lump sum price. Payment shall be full compensation for all materials, equipment, labor, and hardware necessary to install the utility conduits. Payment for work shall include furnishing and installing concrete encased, non-metallic conduit, associated conduit

fittings (including pull-lines and watertight caps), junction boxes, and any required excavation and backfill with Granular Borrow. Installation of conduit cables will be performed by Others.

Payment will be made under:

Pay Item		Pay Unit
910.301	Special Work – Utility Conduit (Approach Only)	Lump Sum

SPECIAL PROVISION
SECTION 910
SPECIAL WORK
(Utility Conduit – General Services Administration – Bridge Only)

910.01 Description This item shall consist of all work shown on the Plans and described in this Special Provision. This Special Provision is limited to the work on the bridge and up to 10 feet beyond the end of each approach slab. Utility conduit work related to the bridge approaches, outside these limits, is addressed in separate special provisions.

910.02 Materials The Contractor is responsible for the furnishing and fabrication of all material and associated hardware as shown on the Plans and described in this specification.

Structural Steel support members, brackets, and associated hardware shall conform to Standard Specification 504.

The conduits and associated materials furnished by the Contractor shall be new. All materials shall conform to NEMA or UL standards, as applicable. Non-metallic conduit shall be IP/XW Champion Fiberglass telecommunication conduits, or an approved equivalent, and all expansion fittings, junction boxes, and other associated components shall be provided by the same vendor and be compatible with the noted conduit type. Any galvanized rigid conduit (GRC) used to sleeve the conduits through Abutment 1 shall be rated for direct burial or encased in concrete per Article 344 of NEC.

Pull string provided within the conduit shall be mule tape rated at 5,000 pounds and shall extend continuously through the entire run of each conduit as located on the Plans. Installation of conduit cables will be performed by Others. The Contractor shall coordinate with the Land Port of Entry (LPOE) contractor and reasonably accommodate access for the installation of cabling.

910.03 General Utility conduit installation, supported by the Bridge shall consist of furnishing and installing all materials and labor for the installation of the conduits noted on the Plans. This generally includes the installation of:

- Four (4), 2” I.D. conduits from Abutment 1 to Pier 1 (two conduits for power and two conduits for fiberoptic cable); and
- Four (4), 3” I.D. conduits from Abutment 1 to Pier 3 (two conduits for power and two conduits for fiberoptic cable).

Included with this work is the installation of unwired conduit, expansion fittings, conduit support hangers, structural steel utility supports, and all of their components and incidentals related to these items necessary to complete the work. The steel bridge support members identified on the Plans will be predrilled with appropriately sized support bolt hole and hanger spacing. The

utility owners' name ("CBP") shall be clearly labeled and visible at the end of the bridge on their respective conduit to differentiate it from conduits intended for other utility owners.

The Bridge work extending through the concrete abutment to ten (10) feet beyond the approach slab shall consist of furnishing and installing all materials and labor for the installation of four (4) 2-inch conduits and four (4) 3-inch conduits sleeved within four (4) 3-inch galvanized rigid steel conduit and four (4) 4-inch galvanized rigid steel conduit sleeves on each side, respectively. Installation shall include all trenching and backfilling (if necessary), sand bed, pull, tracer wire, warning tape, and all associated hardware and incidentals related to these items necessary to complete the work.

All work shall be in accordance with Standard Specification 626, Sections 6.5.3.3 and 6.5.7.6 of the General Services P100 Facilities Standards for the Public Buildings Services, July 2018 (available online), and the provisions identified herein.

910.04 Submittals The Contractor shall, within 60 days following execution of the contract, submit a list of materials which are to be installed. The list shall include the manufacturer, size, components, dimensions, and identifying number of each item. The list shall be supplemented by such data as may be required, including detailed scale drawings of proposed minor deviations from the plans. The Contractor shall submit for review, design data and sample articles of the material proposed for use.

910.05 Construction: A minimum of two weeks prior to beginning conduit installation work, a meeting shall be held with members of Customs and Border Protection (CBP), General Services Administration (GSA), the MaineDOT Resident, and the Contractor to discuss and coordinate the work progression.

Workmanship shall conform to the requirements of: NEC, NESC, ASTM Standards, and the ANSI, the local Utility Companies, the State of Maine, Manufactures Specifications and any local ordinances that may apply except when otherwise noted on the Plans or in the Special Provisions.

Conduits shall be of the sizes noted on the Plans, which are indicated as the nominal inside diameter. All conduit bends shall be made with a minimum 12-inch minimum radius.

The Contractor shall be responsible for and shall repair all damage caused to underground drainage structures, utilities, or lighting conduit, which are encountered during construction. Conduits placed beneath the bridge superstructure shall be securely supported and fastened as shown on the Plans to maintain the conduits position. The support rods, intermediate rods, and all metallic hardware shall be hot dipped galvanized steel and shall meet or exceed requirements of ASTM A507 with ASTM 153 for galvanizing. Metal components that are custom fabricated shall have hot dipped galvanizing applied in accordance with ASTM A153 with a minimum coating of 2.0 oz./sq. ft. using high grade zinc conforming to ASTM B6-00 with less than .03% lead used in the process. Each vertical portion of the support hanger in contact with the conduit

shall be sleeved with a FRP tube and all horizontal members such as flat bars or square tubing shall be constructed of FRP. FRP conduit and FRP support hangers shall be manufactured by Champion Fiberglass, Inc. or approved equal.

Expansion fittings in the superstructure shall be double "O"-ring type expansion couplings with a movement capacity as indicated on the Plans. During the installation of long runs of conduit, one end shall be left unconnected or a double "O"-ring expansion coupling inserted near one end of the run until the final covering of the conduit is in progress to allow for expansion and contraction. FRP expansion is about 1/3rd that of PVC or comparable to stainless steel and should be accounted for in accordance with NEC 2011 Article 355.44.

Junction boxes shall be provided at 100-ft maximum spaces along the length of the bridge and shall accommodate two (2) conduits (two entering and two exiting) at each junction box location. Provide separate junction boxes for power and fiberoptic cable. Junction boxes shall be supported by the structural steel utility support members. Junction boxes shall be sized as shown in the table below and shall include a watertight cover:

Conduit Dia.	Size of Junction Boxes
2.0-in.	18"L x 18"W x 14"H
3.0-in.	26"L x 26"W x 20"H

All conduits, fittings, junction boxes, and other components necessary to complete the construction of the conduit system shall be supported by structural steel utility supports identified on the Plans. Suspension of the conduit system from, or within, the concrete deck is prohibited.

910.06 Method of Measurement Special Work – Utility Conduit (Bridge Only) shall be measured by the lump sum, complete and accepted.

910.07 Basis of Payment All work for Special Work – Utility Conduit (Bridge Only) will be paid at the contract lump sum price. Payment shall be full compensation for all materials, equipment, labor, and hardware necessary to install the utility conduits. Payment for work shall include furnishing and installing bridge utility support system including structural steel support members, brackets, spacers, and threaded anchor rods, furnishing and installing conduits (including pull-lines and conduit sleeves for each conduit) and sleeves, expansion fittings/devices, junction boxes, and any required excavation and backfill with granular borrow. Installation of conduit cables will be performed by Others.

Payment will be made under:

Pay Item		Pay Unit
910.301	Special Work – Utility Conduit (Bridge Only)	Lump Sum

SPECIAL PROVISION
SECTION 910
SPECIAL WORK
(Relocation of Municipal Services)

910.01 Description This work consists of the removal, supply, installation, and construction of all Work and incidentals as shown on the "Detail Plans for the Construction of Relocation of Municipal Services" (Detail Plans) and as described in this Special Provision.

910.02 Materials The Contractor is responsible for the supply of all materials in accordance with the specifications on the Detail Plans, NBDTI Standard Specifications for Highway Construction, 2019, and described in this Special Provision.

910.03 Submittals Submittals are required in accordance with the Detail Plans.

910.04 Construction Construction of all temporary and permanent works, identified on the Detail Plans, shall be in accordance with NBDTI Standard Specifications for Highway Construction, 2019.

All Work for Special Work – Relocation of Municipal Services shall be carried out under the administration and authority of the Resident acting as the agent for the NBDTI, City of Edmundston and Canada Border Services Agency.

910.05 Method of Measurement Special Work – Relocation of Municipal Services shall be measured by the lump sum, complete and accepted.

Category A Work (Station 0+000 and Station 0+065) is all Work related to the replacement of the 600mmØ trunk sewer, including SAMH-1 and SAMH-2.

Category B Work (Station 0+065 to CBSA Building) is the remainder of the Work shown on the Detail Plans relating to storm sewer, connection of 150mmØ SA lateral from CBSA building directly to the existing 600mmØ trunk sewer using a Kor-N-Seal product (penetration for trunk sewer to be made above the spring line of the pipe), and abandonment of the existing SA lateral. Shoring and temporary by-pass pumping to be utilized as required.

910.06 Basis of Payment All work for Special Work – Relocation of Municipal Services will be paid at the contract lump sum prices. Payment for each sub item shall be full compensation for all materials, equipment, labor, coordination, and incidentals necessary to install the municipal services identified on the Detail Plans. Payment for the work shall include, but not necessarily be limited to, furnishing, installing, and removing (as applicable): sanitary sewer system, storm sewer system, bypass pumping, temporary shoring wall, subbase, and pavement, and for providing all traffic control, erosion control, mobilization, and other incidentals necessary to complete the work identified on the Detail Plans.

Payment will be made under:

Pay Item		Pay Unit
910.301	Special Work – Relocation of Municipal Services (Category A)	Lump Sum
910.301	Special Work – Relocation of Municipal Services (Category B)	Lump Sum

SECTION 01 20 25

MEASUREMENT AND PAYMENT

PART 1 – GENERAL

1.01 DESCRIPTION

A. This Section describes the measurement and payment for the Work to be completed under each item which may also be referred to as "pay item".

B. Payment procedures are in accordance with the Agreement and the General Requirements.

C. Measurement: as determined, verified, or approved by Engineer or Owner in accordance with the General Requirements, except as otherwise specified.

D. The Work described in each pay item shall be as described in the Specifications and shown on the Drawings and not included in other pay items.

1. Pay item descriptions are general and may not specifically describe all associated Work or elements thereof, do not constitute Specifications, and do not supersede the content of the Specifications and Drawings.

2. Review the Specifications and Drawings for Work associated with each pay item. Claims for being unfamiliar with the content of the Specifications and Drawings will not be considered.

E. The following Work is not specifically described or designated as a pay item, is considered incidental to all pay items, and shall not be measured separately for payment.

1. General Requirements including the following items.

a. Mobilization and demobilization

b. Traffic control

c. Erosion & Sediment Controls

2. Materials, equipment, and services necessary to verify existing field conditions and the location, size, type, material, and orientation of existing pipes and utilities shown on the Drawings including test pits. Test pits which are specifically indicated on the Drawings or otherwise directed by the Engineer will be paid for as indicated.

3. Restoration of all areas disturbed by the Contractor within the limits of Work, including planting.

4. Field and laboratory testing and reporting by independent laboratory, including but not limited to compaction of backfill materials; aggregate gradation; and concrete testing

F. Payment will not be made for restoration of areas disturbed by the Contractor outside the limits of Work.

G. Payment will only be made for those utility services specifically identified for replacement on the Drawings. Relocation or replacement for the Contractor's convenience or due to breakage by the Contractor of any utility services shown on the Drawings, or at locations which could reasonably be assumed, shall be at no cost to Owner.

H. Design, installation and removal of excavation support systems, temporary and permanent utility/structure support systems associated with a pay item shall be considered incidental to that pay item.

I. Additional dewatering and erosion control (including installation, operation, maintenance, removal and off-site disposal of erosion control devices) associated with a pay item shall be considered incidental to that pay item.

1.02 BASE BID MEASUREMENT AND PAYMENT BASIS

ITEM #659.10: ADMINISTRATION (Mobilization/Demobilization)	
Measurement	Not Used
Payment	Percent of Lump Sum (LS) price based on Schedule of Values
Schedule of Payment	Payment shall be 50% in the first pay application and the remainder will be released upon Substantial Completion. Installation of project signs shall be completed prior to receipt of initial payment at the first pay application.
Includes all materials, equipment , services, necessary for delivery and removal of equipment from the Project Site, temporary utilities, facilities and controls, obtaining necessary permits including associated fees, insurance and bond costs, signage, development of pre-construction schedules and plans required by the General Conditions, Supplementary Conditions and General Requirements; necessary pre-construction investigations, verifying existing field conditions, coordination, and Site clean-up, restoration and closeout.	

ITEM #801.011: BYPASS PUMPING SYSTEM	
Measurement	Progress of Work
Payment	Lump Sum (LS)
Schedule of Payment	Monthly – based on progress of Work.
All materials, equipment, services, and construction inherent to the Work of bypass pumping the existing sewers to complete the sewer relocation Work. Includes but is not limited to selective demolition of existing manholes required for access, pumps, piping, fuel, power, controls, testing and startup, site/manhole repair and all other components for a complete and reliable bypass pumping system for a duration as required.	

ITEM #801.183: 12" PVC SANITARY SEWER (DR-18)	
Measurement	Along the horizontal projection of the centerline of the pipe; measure from and to inside face of manholes.
Payment	Unit price per Linear Foot (LF)
Schedule of Payment	Monthly – based on progress of Work. For the purpose of partial payment the following schedule shall apply: Installation & Backfill: 75% Successful Testing & Cleaning: 25%
All materials, equipment, services, and construction inherent to the Work. Includes pipe, earthwork, bedding, backfill, shoring & bracing, site stabilization, removal and disposal of existing pipe, fittings, adapters, couplings, end caps, geotextile, magnetic marking tape, crossing and maintenance of existing utilities, repair of existing utilities damaged during work, testing, bypass pumping, sidewalk repair, curb repair, and surface/site restoration. Also includes removal and replacement of existing objects that are within the path of the proposed project, including but not limited to mailboxes, signs, fences, stonewalls, lights, and landscaping.	

ITEM #803.173: SEWER MANHOLE - 4-FOOT DIAMETER	
Measurement	Number of units installed
Payment	Unit price per Each (EA)
Schedule of Payment	Monthly – based on progress of Work. For the purpose of partial payment the following schedule shall apply: Installation & Backfill: 75% Successful Testing & Cleaning: 25%
All materials, equipment, services, and construction inherent to the Work. Includes bedding, backfill, shoring & bracing, compaction, removal and disposal of existing structures, pre-cast concrete structures, sealants, inverts, anti-flotation slabs, frost barriers, boots, frames, covers, rungs, inverts, waterproof exterior coatings, piping, fittings, supports, risers, grade rings leveling courses, compaction, testing, curb repair, bypass pumping and site restoration (including loam and seed).	

ITEM #805.293: ADDITIONAL SELECT BACKFILL MATERIAL	
Measurement	As encountered and as directed by the Engineer
Payment	Unit price per Cubic Yard (CY)
Schedule of Payment	Monthly – based on progress of work
Includes all materials, equipment, services and construction inherent to the Work. Includes suitable backfill material, compaction and testing associated to replace unsuitable materials.	

ITEM #827.302: UNSUITABLE SOIL EXCAVATION – BELOW GRADE	
Measurement	As encountered and as directed by the Engineer
Payment	Unit price per Cubic Yard (CY)
Schedule of Payment	Monthly – based on progress of work
All materials, equipment, services and construction inherent to the Work and as specified in Division 31. Item includes over-excavation and removal of unsuitable materials outside the limits specified or indicated on the Drawings.	

ITEM #827.304: TRENCH ROCK EXCAVATION	
Measurement	As encountered in place prior to excavation within the pay limits as specified and as indicated on the Drawings
Payment	Unit price per Cubic Yard (CY)
Schedule of Payment	Monthly – based on progress of Work
Includes all materials, equipment, services and construction inherent to the Work. Includes transport and disposal of rock and boulders greater than 2 cubic yards each and replacement as necessary with suitable material.	

ITEM #827.33: TRENH INSULATION – 2 INCH	
Measurement	In place along the pipe or as directed by the Engineer
Payment	Unit price per Linear Foot (LF)
Schedule of Payment	Monthly - based on progress of Work
All materials, equipment, services, and construction inherent to the Work.	

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

State of Maine Department of Transportation

Madawaska – Edmundston International Bridge Over Saint John River Sewer Relocation

ISSUE FOR BID SPECIFICATIONS

80 Exchange Street, Suite 400
Bangor, ME 04401
800-564-2333

woodardcurran.com
COMMITMENT & INTEGRITY DRIVE RESULTS

0229641.01
Town of Madawaska, ME
November 2020

SECTION 00 01 07

SEALS PAGE

The engineering material and data contained in these Contract Documents were prepared under the supervision and direction of the undersigned, whose seal as a registered professional engineer is affixed below.



_____

Brent M. Bridges, P.E.
Senior Principal
Woodard and Curran, Inc. (Engineer)

11/06/2020
Date of Issue

This page intentionally left blank

SECTION 00 01 10

TABLE OF CONTENTS

INTRODUCTORY INFORMATION
00 01 07 Seals Page
00 01 10 Table of Contents
00 01 15 List of Drawing Sheets

SPECIFICATIONS
DIVISION 01 GENERAL REQUIREMENTS
01 11 00 Summary of Work
01 50 00 Temporary Facilities and Controls
01 51 40 Temporary Sewage Bypass
01 60 00 Product Requirements
01 70 00 Execution and Closeout Requirements

DIVISION 31 – EARTHWORK
31 20 00 Earthwork
31 40 00 Shoring and Bracing
DIVISION 33 – UTILITIES
33 31 00 Sanitary Utility Sewerage Piping
33 39 13 Sanitary Utility Sewerage Manholes and Structures

DIVISION 40 – PROCESS INTERCONNECTIONS
40 05 14 Process Pipe Couplings and Connectors

END OF SECTION

This page intentionally left blank

SECTION 00 01 15

LIST OF DRAWING SHEETS

DRAWING NUMBER	DRAWING TITLE
G-000	COVER SHEET
G-001	GENERAL NOTES, LEGEND, ABBREVIATIONS, AND SHEET INDEX
C-001	I-30 TO I-29 SEWER RELOCATION
C-101	CIVIL DETAILS 1
C-102	CIVIL DETAILS 2
C-103	CIVIL DETAILS 3
C-104	CIVIL DETAILS 4

END OF SECTION

This page intentionally left blank

SECTION 01 11 00

SUMMARY OF WORK

PART 1 – GENERAL

1.01 SECTION INCLUDES

A. Project Description

B. Description of the Work

C. Work Sequence and Coordination

D. Special Requirements

E. Attachments

1.02 PROJECT DESCRIPTION

A. The project generally consists of the installation of 380 feet of new gravity sewer, and three manholes to reroute a section of existing sewer getting displaced by the new international bridge.

1.03 DESCRIPTION OF THE WORK

A. The Work includes labor, material and equipment, services required for construction, testing, and commissioning of the Project in accordance with the Contract Documents and as more specifically described in the Specifications and Drawings and includes, but is not limited to, the following principal features:

1. Selective Demolition: Demolition or abandonment of existing sewer infrastructure required for the installation of new pipes and manholes as indicated on the Drawings.

2. Temporary Facilities: Bypass pumping as required to perform work.

3. Site Work: As required to restore the site around new sewer pipes and manholes to be installed vie “open cut” methods.

4. Concrete Work: None anticipated.

5. Masonry: None anticipated.

6. Metals: None anticipated.

7. Building Construction: None anticipated.

8. Process Equipment: None anticipated.

9. HVAC Work: None anticipated.

10. Plumbing Work: None anticipated

11. Electrical Work: None anticipated.

12. Controls Work: None anticipated.

13. Installation, Startup and Testing

B. Work Site locations: New sewer installation located adjacent to future international bridge abutment as shown on the Drawings. outside of the DOT abutments as shown on the Drawings. Pipe runs are generally described as off-street/cross county runs with a portion in areas of existing steep grading. Access will be limited and restricted to easements secured by the Town and included in in the Project Documents.

C. Existing conditions and Site data: Per the Drawings.

1.04 WORK SEQUENCE AND COORDINATION

A. The Work shall be sequenced to limit impacts to the Town, business areas and neighboring abutters from construction.

B. Access to businesses and residences must be maintained during the Work.

C. Active sewer service must be maintained for all the Town's users throughout the duration of Work. Bypass pumping may be required and is to be determined by the contractor.

1.05 SPECIAL PROJECT REQUIREMENTS

A. All project work shall be in compliance with the requirements of the Maine DEP Stormwater Management Permit by Rule and the Maine Construction General Permit.

PART 2 – PRODUCTS - NOT USED

PART 3 – EXECUTION - NOT USED

END OF SECTION

SECTION 01 50 00

TEMPORARY FACILITIES AND CONTROLS

PART 1 – GENERAL

1.01 SUMMARY

A. This Section specifies temporary facilities and controls for execution of the Work put into place for use only during the period of construction, that will be removed when no longer required for construction operations. This Section applies to all Specifications and Drawings and provisions of this Section may be supplemented in other sections of Division 01.

B. Certain provisions required by Laws and Regulations may be referenced. Contractor is responsible to determine and obtain applicable Laws and Regulations and to review and interpret the full text of such Laws and Regulations.

C. Section Includes

1.02 TEMPORARY CONSTRUCTION FACILITIES
Barriers
Protection of Work
Security
Safety Facilities
Access Roads
Parking
Field Offices
Staging Area
Project Identification
Progress Cleaning and Waste Removal

1.03 TEMPORARY UTILITIES

1.04 TEMPORARY CONTROLS
Dust Control
Water Control and Dewatering
Erosion and Sediment Control
Noise Control
Pollution Control
Traffic Regulation

1.05 REMOVAL OF TEMPORARY UTILITIES, FACILITIES, AND CONTROLS

1.02 TEMPORARY CONSTRUCTION FACILITIES

A. Barriers

1. Furnish barriers to prevent unauthorized entry to and clear delineation of construction areas, to allow for Owner's use of Site, and to protect existing facilities and adjacent properties from damage from construction operations as recommended by OSHA and as otherwise required for the protection of life and property during construction.

2. Construct barricades and protective facilities in accordance with local and state regulations. Furnish and install signs, lights, reflectors, and such protection facilities as may be required.

3. Furnish barricades required by governing authorities for public rights of way.

4. Provide protection for plant life designated to remain. Replace damaged plant life.

5. Protect non owned vehicular traffic, stored materials, Site and structures from damage.

6. If required, furnish commercial grade, minimum 8 foot high chain link fence around construction Site. Equip with vehicular gates with locks.

B. Protection of Work

1. Protect Work during working and non-working hours.

2. Provide special protection where specified in Specifications or Drawings and in accordance with manufacturer recommendations.

3. Furnish temporary and removable protection for installed equipment and material. Control activity in immediate Work area to minimize damage.

4. Protect exterior areas of Work from damage. Prohibit traffic from landscaped areas.

5. Buildings and Enclosures

a. Furnish protective coverings at walls, projections, jambs, sills, and soffits of openings and protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.

b. Prohibit traffic or storage upon waterproofed or roofed surfaces. If traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer.

6. Whenever gale or high winds are forecast, take measures to secure loose material, equipment or other items that could be blown and be damaged or cause damage. Do not leave such loose items unsecured at end of a working day. Particular attention shall be taken with scaffolding and items placed or stored on roofs or within a structure prior to being enclosed.

7. Provide for removal of snow and ice which may impede Work, damage the finishes or materials, be detrimental to workers, or impede trucking, delivery, or moving of materials at the Site, or prevent adequate drainage of the Site or adjoining areas.

C. Security

1. Provide protection to stored items, the Work and Owner's operations from unauthorized entry, vandalism, or theft, and against fire, storms and other losses during working and non-working hours.

D. Safety Facilities

1. Provide first aid and other safety facilities required by Laws and Regulations during working and non-working hours.

E. Access Roads

1. Construct and maintain temporary roads accessing public thoroughfares to serve construction area. Control dust and water.

2. Extend and relocate as Work progress requires. Provide detours necessary for unimpeded traffic flow.

3. Provide for emergency access and maintain throughout the Work Site.

F. Parking: at the Project Site.

G. Field Offices: As required for the overall Project.

H. Staging Area: The Town of Madawaska is not providing a location for staging area. Determine and secure a location for staging area.

I. Progress Cleaning and Waste Removal

1. Maintain areas free of waste materials, debris, and rubbish and maintain the Site in a clean and orderly condition.

2. Remove debris and rubbish from spaces and other closed or remote spaces before enclosing the space.

3. Collect and remove waste materials, debris, and rubbish from Site at least weekly and legally dispose off-Site.

1.03 TEMPORARY UTILITIES

A. Arrange for and pay for required power service from local electric utility for duration of Project. Exercise measures to conserve energy. Furnish and install required equipment including pole of sufficient height to provide proper clearance and install weatherproof box of such size to house service disconnect, overcurrent protection, electric meter, and other required equipment.

B. Internet access to field offices: As required for the overall Project.

C. Water service: As specified below.

1. Arrange for, pay for and maintain suitable quality water service as required for duration of Project.

D. Furnish and maintain required sanitary facilities and enclosures.

E. Furnish lighting for construction operations. Furnish lighting for exterior staging and storage areas and for security purposes. Maintain lighting and provide routine repairs.

F. Furnish heat devices and heat and cooling devices as required to maintain specified conditions for construction operations.

G. Fire Protection

1. Provide temporary fire protection equipment and services during construction per NFPA and local fire code and regulations, and fire marshal's requirements.

2. Use Work procedures that minimize fire hazards to the extent practicable and materials that are fire resistant where possible. Collect and remove combustible debris and waste materials from the Site each day. Store fuels, solvents, and other volatile or flammable materials away from the construction and storage areas in well-marked, safe containers in accordance with Laws and Regulations.

1.04 TEMPORARY CONTROLS

A. Dust Control: Execute Work by methods to minimize raising dust from construction operations. Provide positive means to prevent air-borne dust from dispersing into atmosphere. Utilize the application of sprinkled water to reduce the emission of air-borne soil particulates from the Project Site.

B. Water Control and Dewatering: Provide in accordance with the following.

1. Grade Site to drain away from excavations to approved drainage collection facilities. Ensure collected surface drainage water meets permitted criteria for sediment content prior to discharge.

2. Maintain excavations free of water. Furnish, operate and maintain pumping equipment.

3. Dewater excavations and legally dispose of water in a manner that will not cause injury to public and private property.

4. Protect Site from puddling, ponding or running water.

5. Obtain necessary regulatory approvals for the disposal of dewatering flows, including, among others, approval by the Environmental Protection Agency under the National Pollutant Discharge Elimination System (NPDES) program for construction dewatering activities. Submit the completed and approved construction dewatering permit to the Engineer immediately upon receipt.

6. Design, furnish, install, maintain, operate and remove temporary dewatering systems as required to lower and control water levels and hydrostatic pressures in excavations during construction; legally dispose of pumped water; construct, maintain, observe and, except where indicated or required to remain in place, remove dewatering equipment and system at the completion of construction.

    a. Dewatering may include: lowering the water table, intercepting and collecting seepage which may penetrate the support of excavation, slopes or bottom of the excavation; increasing the stability of excavated slopes; preventing loss of material from beneath the slopes or bottom of the excavation; reducing lateral loads on sheeting and bracing; limiting horizontal displacements and stresses in support of excavation to tolerable and allowable levels; preventing displacements of existing structures, utilities, pavements, and sidewalks; improving the excavation and hauling characteristics of sandy soil; preventing rupture or heaving of the bottom of any excavation; and disposing of pumped water.

C. Erosion and Sediment Control: Provide in accordance with the following.

- ME DEP requirements
- ME DOT requirements within State rights of way

1. Plan and execute construction using methods to control surface drainage from cuts and fills, from borrow and waste disposal areas and prevent erosion and sedimentation.

2. Submit erosion and sediment control plan to Engineer prior to the start of construction.

3. Install erosion and sediment controls as shown on the Drawings and as required by Laws and Regulations. Install additional erosion and sedimentation control measures as necessary to stabilize the Site. Coordinate temporary erosion controls with permanent erosion controls to the extent practical. Provide and maintain devices to control erosion, siltation, and sedimentation that occur during construction operations. Undertake reasonable precautions and measures to avoid erosion of soil and to prevent silting of drainage ditches, storm sewers, rivers, streams, and lakes.

4. Employ pollution prevention measures, erosion and sedimentation control before, during, and after soils are exposed. Implement measures prior to soil disturbance or soil storage to the extent possible to ensure that such measures are in place before activity occurs and employ additional measures as the Work progresses. Implement and maintain as necessary until the Site is permanently stabilized.

5. Perform inspections of disturbed soil areas, material storage areas exposed to precipitation, and erosion control measures with Engineer a minimum of once every 14 days and also within 24 hours after any storm event greater than 0.5 inches of rainfall. Immediately correct deficiencies in the erosion control measures identified or indicated by failures or erosion by implementing additional measures or different techniques to correct and prevent subsequent erosion at no additional cost to Owner.

6. In the event that silt or debris breaches erosion control, immediately remove and clean silt or debris from drainage ditches and storm sewers and revise erosion control measures as required by the Conservation Commission or the Engineer. Should silt or debris breach erosion controls and reach rivers, streams or lakes, immediately notify local, state or Federal representatives as required and implement required remediation methods at no additional cost to Owner.

7. Limit duration of the exposure of soils on embankments, excavations, and graded areas to a minimum.

8. Provide temporary measures such as berms, dikes and drains to prevent water flow. Install erosion control measures in any ditch, swale or channel before water is allowed to flow in the waterway. Handle water pumped from trenches to minimize discharge of silty water to the maximum extent practicable.

9. Stabilize storm drain outfalls before the discharge points become operational. Install inlet protection immediately upon construction of culverts.

10. Stabilize disturbed areas with temporary and permanent erosion control practices as soon as practicable, but no more than 14 days after construction activity on a particular portion of the Site has temporarily or permanently ceased. Exceptions to this time requirement include: a) where construction activities will resume on the particular portion of the Site within 21 days; and b) where snow cover delays initiation of stabilization measures.

11. Place stockpiled topsoil on the Site away from natural drainages, in piles with side slopes of 50 percent to 70 percent. Install siltation fence around the base of the pile to prevent eroding soil from washing into drainages. Cover topsoil piles which are to remain for a period of 21 days or more with temporary seed and mulch immediately following stockpiling.

12. Conduct pavement sweeping to remove sediment and soil debris accumulation on pavement resulting from construction activity.

D. Noise Control

1. Provide methods, means, and facilities to minimize noise from construction operations.

2. Control noise as required by Town code.

3. Provide noise attenuation systems capable of meeting the Department of Environmental Protection Division of Air Quality Control regulations governed by the following policy:

"A source of sound will be considered to be violating the Department's noise regulation (310 CMR 7.10) if the source:

- *Increases the broadband sound level by more than 10 dB(A) above ambient, or*
- *Produces a "pure tone" condition when any octave band center frequency sound pressure level exceeds the two adjacent center frequency sound pressure levels by 3 decibels or more.*

"These criteria are measured both at the property line and at the nearest inhabited residence. Ambient is defined as the background A-weighted sound level that is exceeded 90% of the time measured during equipment operating hours. The ambient may also be established by other means with the consent of the Department."

4. Construct sound enclosures or utilize other noise reduction techniques if the equipment does not meet the noise level requirements.

E. Pollution Control: as specified below.

1. Provide methods, means, and facilities to prevent contamination of soil, water, and atmosphere from discharge of noxious, toxic substances, and pollutants produced by construction operations.

    a. Water Pollution Control

        1) Ensure that sediment, debris, petroleums, chemicals, or other contaminants will not enter existing drainage facilities and channels. Use construction methods that will prevent entrance of pollutants and wastes into existing streams, rivers, lakes, and flowing and dry watercourses.

        2) Obtain legal disposal sites and dispose of pollutants and wastes in a legal manner.

        3) Respond immediately to emergencies as directed when water quality of existing streams, rivers, lakes and flowing and dry watercourses is threatened. Take corrective action to remove or contain pollutants until a permanent solution is determined.

    b. Air Pollution Control

        1) Equipment and vehicles that exhibit excessive exhausts emissions due to poor engine adjustments or inefficient operation will not be permitted to operate until corrective repairs or adjustments are made.

        2) Burning of materials from clearing or grubbing operations, combustible construction materials, and rubbish will not be allowed.

F. Traffic Regulation: As specified below.

1. A traffic control plan is not required for the Project.

2. Provide and maintain traffic control and maintenance devices in accordance with Part 6, Temporary Traffic Control, of the "Manual on Uniform Traffic Control Devices for Streets and Highways", published by the U.S. Department of Transportation, Federal Highway Administration and other applicable codes and standards as specified. Operate devices 24 hours per day as required.

3. Provide for access by emergency vehicles, such as police, fire, and disaster units at all times. Contractor shall be liable for damages resulting from failure to provide such access.

4. During construction hours, traffic flow must be controlled by uniformed traffic police officers or other traffic controllers allowed by Laws and

Regulations. The services of traffic controllers shall in no way relieve the Contractor of its responsibilities under the Contract.

5. Maintain minimum of one moving lane on roadways at all times.

   a. Where detours are permitted, provide necessary barricades, flashers, flashing arrows and signs in accordance with referenced Manuals and Laws and Regulations.

   b. Provide gravel borrow and bituminous concrete to maintain temporary passable travel lane ramps, temporary bridging, steel plates, temporary pavement, wood-framed walkways, caution, safety and other necessary signs directing the pedestrian and vehicular traffic towards unblocked and safe areas.

6. Provide safe access/egress to businesses and abutting property owners within the Project area. In areas where the construction activity is in progress, install directional signs in front of businesses indicating "OPEN FOR BUSINESS" or similar for guidance of customers.

   a. Certain construction operations such as utility work and roadway/sidewalk reconstruction may restrict access/egress on some roads and to businesses and abutting property owners. Under these circumstances, schedule operations during off-peak hours or late evenings with Owner approval so that a particular work activity can be completed in the shortest possible time.

   b. Provide 48 hours notice to businesses and abutting property owners when access/egress will not be available or restrictions will exist.

7. Exercise particular care to establish and maintain such methods and procedures that will not create hazards.

   a. Remove or properly cover traffic control, safety devices and/or signs having messages that are irrelevant to normal traffic conditions at the end of each Work period. Keep signs clean at all times and provide that legends are distinctive and unmarred.

   b. Place excavated material and construction equipment so that vehicular and pedestrian traffic is maintained at all times unless road closure permit is obtained. If the Contractor's operations cause traffic hazards, implement appropriate safety measures immediately.

   c. In areas of high pedestrian and vehicular traffic volume, the remove waste materials and construction equipment from the Work Site on a daily basis. Do not park construction equipment overnight on the Site or the adjacent roads unless permitted by Owner.

   d. Provide night watchmen where special hazards exist.

8. Post signage clearly stating that any vehicle impeding the progress of construction will be towed at the vehicle owner's expense. Towing charges incurred by Owner for Contractor's failure to post such signs will be borne by the Contractor.

1.05 REMOVAL OF TEMPORARY UTILITIES, FACILITIES, AND CONTROLS

A. Remove temporary utilities, equipment, and facilities before Final Application for Payment inspection.

B. Remove temporary underground installations and grade Site as indicated. Clean and repair damage caused by installation or use of temporary utilities, facilities, and controls.

C. Restore existing facilities and areas used during construction to original condition. Restore permanent facilities used during construction to specified condition.

PART 2 – PRODUCTS (NOT USED)

PART 3 – GENERAL (NOT USED)

END OF SECTION

SECTION 01 51 40

TEMPORARY SEWAGE BYPASS

PART 1 – GENERAL

1.01 SUMMARY

A. Provide, operate, and maintain a functional bypass pumping system capable of bypassing each area of Work without leakage or spillage of sewage upon the ground or streets or back up of sewage into any building or onto any property for the duration of the Project.

B. Design Requirements:

1. Provide a bypass pumping plan for each area of the project that requires bypass pumping. Plan shall be designed by a Professional Engineer registered in the state in which the Project is located.

2. Provide temporary facilities and pumping setups to divert flow around Work areas.

3. Provide a manhole to manhole bypass pumping setup or a manhole/wet well to force main setup as required.

4. Provide temporary bypass pumping adequate to handle dry weather and wet weather flows and to protect against surcharging of the existing system upstream of the Work area. Design bypass pumping system to be robust and permanent enough for duration of work.

1.02 PRICE AND PAYMENT PROCEDURES

A. Measurement and payment requirements: per General Requirements.

1.03 ADMINISTRATIVE REQUIREMENTS

A. Coordination, Sequencing, and Scheduling: in accordance with General Requirements.

B. A sample sequence of bypass pumping is provided below for consideration by the Contractor. Contractor is ultimately responsible execution of final plan selected and approved by the Engineer.

1.04 SAMPLE BYPASS PUMPING SEQUENCE PLAN

A. Sample Sequence Plan #1

1. Run by-pass pumping system from I-31 to I-28 and a second separate by-pass pumping system from K-1 to I-28.

B. Sample Sequence Plan #2

1. Install a plug on the downstream side of I-31 and allow flow to back up in the sewer lines upstream. Install a plug upstream of I-29 towards I-30 to ensure flow does not travel upstream during construction efforts. Replace existing I-30 manhole and stub lines in and out. Connect new I-30 to existing line from I-31.

   a. Monitor back-up volume of sewer in manholes upstream of I-31.

   b. Keep a secondary containment system (vac. tanker truck or bypass pump setup) available if sewer needs to be drawn down.

2. Install a plug on the downstream side of I-30 manhole. Remove plug from I-31. Bypass pump from I-30 to K-1. Install new I-29A manhole. Run new line from I-29A towards existing I-29 and I-30 making connection to I-30.

3. Install plug on the downstream side of I-29A. Remove plug from I-30. Bypass pump I-29A to I-28.

   a. Remove a portion of gravel ballast in order to slide a bypass pump discharge pipe under two rail lines near Twin Rivers loading dock.

4. Install plug on the downstream side of K-1. Bypass pump from K-1 to I-28. Install new I-29 manhole and tie in lines from I-29A, I-28, and K-1.

   a. Remove a portion of gravel ballast in order to slide a bypass pump discharge pipe under two rail lines near Twin Rivers loading dock.

5. Remove plugs at I-29A and K-1. Remove bypass pumping.

1.05 SUBMITTALS

A. Submit in accordance with General Requirements.

1. Bypass pumping plan for each project area and shall be approved by the Owner and Engineer prior to implementation and prior to the start of bypass pumping on site.

2. Minimum contents of sewage bypass pumping plan:

   a. Standard Operating Procedure: Describe the normal sequence of events to be followed while pumping and setting up and breaking down pumping equipment. Plan must address strategies and safeguards to ensure that public safety and environmental health is maintained at all times, the possibility of property damage and wetlands impacts, and overall level of inconvenience is minimized.

b. Plan shall include a bypass routing diagram for each Work zone, estimates of anticipated bypass flows, an emergency response plan, and a list of the equipment that will be used.

c. Layout drawing showing locations of equipment on Site and how access to the Site is maintained

d. Equipment lists

e. Pump curves and motor and engine data demonstrating equipment is sufficiently sized to meet all specified and anticipated operating conditions

f. Notification form

g. Emergency Response Plan: Describe the intended means of handling the following situations, including response and clean-up measures, and emergency backup power or backup fuel storage. List equipment to be used and where it will be stored.

- Break or failure of bypass line (pipe)
- Failure of bypass pump
- Overflow
- Back up into dwelling or onto private property
- Failure of bypass pumping system to accommodate flow

3. Shop Drawings for equipment and materials including, but not limited to:

- Pumps
- Engines and/or Motors
- Sound Enclosures
- Pipe or hose
- Joints/couplings
- Plugs and/or bladders

4. Statement of Qualifications demonstrating experience of the firm in accordance with Article 1.04 and listing a minimum of 5 successful bypass pumping projects conducted in the last 10 years. Provide contact information for no fewer than 5 of these projects which:

- Have been completed in the last 5 years,
- Involved similar equipment to that proposed for this Project, and
- Had duty capacities of not less than those specified below.

1.06 QUALITY ASSURANCE

A. Provide in accordance with Division 01 General Requirements.

B. Qualifications: per Division 01 General Requirements and as follows.

1. Bypass pumping system shall be provided, operated, and maintained by a firm which has been regularly engaged in providing bypass pumping for a minimum of 5 years.

1.07 SITE CONDITIONS

A. Existing Conditions: per General Requirements and as shown on the Drawings.

B. The fluid to be pumped is raw sanitary wastewater which contains typical grit, solids, rags, and debris. Flows are subject to typical diurnal variations and also increase significantly during wet weather and high groundwater. Provide that the bypass pumping system is capable of handling all of these conditions. Visit the Work locations prior to start of Work to visually inspect flow conditions as necessary.

C. Portions of the Project are subjected to infiltration and inflow. Account for infiltration and inflow volume in the planning and conduct of the Work.

D. The portion of the Town's sewer to be bypassed is not metered and exact wastewater flows are not known in the work area. All flow in the work area drains to the Town's Twin Rivers Pump Station with a capacity of 200-1,100 GPM. All bypass pump setups should be able to accommodate these flows at a minimum.

PART 2 – PRODUCTS

2.01 BYPASS PUMPING SYSTEM

A. Godwin Pumps (a Xylem brand)

B. Griffin Dewatering

C. Rain for Rent

D. Engineer Approved Equal

2.02 PUMPS, PIPES & FITTINGS

A. Provide pumps suitable for use with raw, unscreened sewage capable of conveying the volume of flow anticipated with a sufficient margin of safety.

B. Redundancy: At each bypass location where continuous flow must be maintained, provide a minimum of one standby pump of the largest size. Standby pump is not required only at locations with intermittent flow and either 1) sufficient upstream storage capacity, or 2) where flow can be diverted on a temporary basis.

A. Pumps: Self-Priming Suction Lift. Provide critically silenced sound attenuation enclosure for engines and pumps in accordance with state and local noise requirements.

B. Provide electrically-driven primary pump. Provide engine-driven gasoline standby pump.

C. Pump Connections: quick connect couplings to facilitate change out of pumps

D. Pipe: carbon steel, fused high-density polyethylene pipe, or Engineer Approved Equal.

E. Joints and Fittings: Quick Connect. Grooved (Victaulic), Flanged or Engineer Approved Equal.

F. Lay-flat hose: extra heavy duty, highly abrasion resistant, fitted with gasketed couplings, and rated for 150 percent of working pressure.

G. Control: Automatic level control for pumps. Redundant pump shall start automatically if one duty pump fails.

H. Auto-Dialers: Provide Auto-dialers with capacity to call up to 3 different phone numbers upon, at a minimum: low fuel, failure of any pump, standby pump start, and high-high water level. The dialers shall be configured to dial the Contractor's personnel. They shall also be configured to call the Owner's personnel if so requested by the Owner. If any part of the auto-dialer system fails, provide a continuous attendant until the auto-dialer system is returned to service.

PART 3 – EXECUTION

3.01 GENERAL

A. Maintain flows under all flow conditions. Adequately handle flows, even instantaneous peak flows, without damage or overflow, providing for potential large instantaneous flow contributors connected to the sewer under repair.

B. Allow for passage of traffic and protect bypass piping at driveway and street crossings.

C. Coordinate bypassing with low-flow times to the extent possible. Prevent overflows or backups.

D. If Contractor determines bypass pumping is not required at a location due to lack of flow or determines that a Work item does not require bypass pumping to be performed, and Engineer agrees, protect flows from construction debris and ensure no debris enters the collection system or treatment plant unit processes.

E. Repair damage to existing pipes and structures to the satisfaction of the Engineer.

F. Prevent sanitary flow from discharging into salt or fresh water body by means of overflow, bypass pumping, or other methods.

G. Restore normal service to entire system at end of normal working hours each day.

3.02 SHUTDOWN

A. All sewer service shutdowns must be approved by the Town in writing, two weeks prior to proposed shutdown.

B. Deliver approved notification form by hand to each residence and business whose service will be disrupted a minimum of 48 hours in advance of the intended shutdown (e.g. prior to disconnecting a service on Tuesday, provide notification on the previous Friday.)

1. Notification less than 48 hours is unacceptable. Costs associated with delays caused by the Contractor's failure to meet this requirement shall be considered delays within the Contractor's control and at Contractor's expense.

C. Leave a notice at the primary entrances to each housing unit and business unit in the Project area (e.g. provide 2 notices at duplexes). Leave notices in a conspicuous location reasonably free from damage. Do not use mailboxes.

3.03 TEMPORARY POWER

A. Provide fuel and power to run bypass pumps at no additional cost to Owner.

3.04 PIPING

A. Provide that piping system has adequate water tightness (no leakage). Perform a leakage test with clean water at Engineer's direction, at no additional cost to Owner.

B. Lay temporary piping along the general lines of streets, roadways and other traffic paths in a manner that causes the minimum amount of disruption and is least likely to be damaged. Use temporary bituminous pavement, cold patch, or other approved material to form a ramp on each side of the pipe or depress the pipe at driveways/traffic crossings to allow for property owners to drive over the temporary pipe as directed by the Engineer.

C. Piping may be laid between existing railroad ties to pass under railroad tracks. Piping may not interfere with railroad operations.

3.05 OPERATION AND MAINTENANCE

A. Continuously monitor bypassing operations regardless of duration or timing of bypassing. Unattended bypass pumping is prohibited.

B. Arrange for bypass pumping past working hours with Engineer and provide adequate sound attenuation and an attendant.

C. Do not allow leaks in bypass pumping systems. Clean and disinfect leaks at no additional cost to Owner.

D. The Contractor shall respond immediately to any auto dialer alarms or other emergency conditions.

END OF SECTION

This Page Intentionally Left Blank

SECTION 01 60 00

PRODUCT REQUIREMENTS

PART 1 – GENERAL

1.01 SUMMARY

A. This Section specifies general requirements for products, materials and equipment. This Section applies to all Specifications and Drawings and provisions of this Section may be supplemented in other sections.

B. Certain provisions required by Laws and Regulations may be referenced. Contractor is responsible to determine and obtain applicable Laws and Regulations and to review and interpret the full text of such Laws and Regulations.

C. Section Includes

1.02 SOURCE QUALITY CONTROL
General
Independent Testing Agency Certification
Factory Testing

1.03 PRODUCT REQUIREMENTS
General
Transportation and Handling
Storage and Protection

1.04 WARRANTIES

1.02 SOURCE QUALITY CONTROL

A. General

1. Subject material and equipment furnished under the Contract Documents to a complete factory testing program as specified.

2. Shop Drawings and submittals: reviewed by Engineer before initiating testing program.

3. Perform checks and tests in accordance with manufacturer's recommendations and referenced standards.

4. Evaluate test results and advise Owner immediately of any discrepancy between test results and test limits or the failure of any device or system under test. Include test limits for acceptability applicable to each test on the certified test records.

5. Record test information, including the evaluation of testing results, on forms approved by Owner and Engineer.

B. Independent Testing Agency Certification

1. If specified, furnish certificates from an independent testing agency.

2. Independent testing agency to certify that material and equipment components have been examined and tested and are in conformance with the requirements specified in the Contract Documents.

3. Take Samples in accordance with the requirements specified in the Contract Documents, as selected by Owner or independent testing agency. Furnish and ship at no additional cost to Owner.

C. Factory Testing

1. Provide 14 days prior written notice of factory inspections and tests to Owner and Engineer.

2. If failure to give proper written notice results in material and equipment being assembled or covered before a factory inspection or test, make material and equipment ready for inspection or test and reassemble or recover at no additional cost to Owner.

3. Owner may inspect any portion of material and equipment furnished at any reasonable time during manufacture and may witness testing of any portion of material and equipment wherever located. Owner and Engineer to witness tests only.

4. Furnish, set up and operate test equipment and facilities.

5. If facilities for conducting required tests are unavailable to the manufacturer, conduct tests elsewhere or have them performed by an independent agency approved by Engineer.

6. Protect material and equipment after testing and checking to provide that subsequent testing of other equipment or systems does not disturb, damage or otherwise interfere with functional capability of material and equipment.

7. Assume responsibility for protection of material and equipment and safety of all personnel during factory testing program.

8. Grounds for rejection: failure to withstand tests; failure to meet ratings; failure to meet applicable standards.

9. In the event of failure

   a. Submit revisions of documents requiring approval for changes required for rectification.

   b. Obtain Owner's and Engineer's approval before making such changes.

   c. Provide written details of any changes to be made not requiring approval.

   d. Notify Owner and Engineer in writing before retesting.

   e. Furnish new material and equipment which meets requirements of the Specifications if rejected material and equipment cannot be rectified to satisfaction of Owner and Engineer.

   f. Retest after rectification in presence of Owner or Engineer.

10. Assume responsibility for all costs, including, but not limited to: loss or damage to materials and equipment resulting from testing; retesting; rectification; new material and equipment to replace damaged or non-rectifiable material and equipment; removal, furnishing, transportation, unloading, and installation of replacement material and equipment.

11. Submit certified test reports which define tests, list results, and are signed by Contractor's representative, and copies of raw data collected during tests. Submission of certified test reports does not relieve Contractor of responsibility for material and equipment meeting requirements of the Contract Documents after installation.

1.03 PRODUCT REQUIREMENTS

A. General

1. Products include new material and equipment incorporated into the Work and may also include existing material and equipment required for reuse. This does not include machinery and equipment used for preparation, fabrication, conveying, installation and erection of the Work.

2. Do not use materials and equipment removed from existing Work Site, except as specifically permitted.

3. Provide complete with accessories, trim, finished, safety guards, and other devices and details need for a complete installation and for the intended use or effect.

4. Provide standard products which have been produced and used successfully on other similar projects for similar applications. Provide products which are likely to be available to Owner in the future for items required for maintenance and repair or replacement Work.

5. Furnish interchangeable components of the same manufacturer, for similar components.

B. Transportation and Handling

1. Transport and handle material and equipment in accordance with manufacturer's instructions.

2. Notify Engineer and Owner in writing upon acceptance of a shipment.

3. Promptly inspect shipments to assure that material and equipment comply with requirements, quantities are correct, and material and equipment are undamaged.

4. Furnish equipment and personnel to handle material and equipment by methods to prevent soiling, disfigurement, or damage.

5. Uncrate equipment and dispose of packing material properly.

C. Storage and Protection

1. Store and protect material and equipment in accordance with manufacturer's instructions, with seals and labels intact and legible. Store sensitive material and equipment in weather tight, climate controlled enclosures.

2. For exterior storage of fabricated material and equipment, place on sloped supports, above ground.

3. Provide for bonded off Site storage and protection when Site does not permit on Site storage or protection.

4. Cover material and equipment subject to deterioration with impervious sheet covering. Furnish ventilation to avoid condensation or potential degradation of material and equipment.

5. Store loose granular materials on solid flat surfaces in a well-drained area. Avoid mixing with foreign matter.

6. Furnish equipment and personnel to store material and equipment by methods to prevent soiling, disfigurement, or damage.

7. Arrange storage of material and equipment to permit access for inspection. Periodically inspect to assure material and equipment are undamaged and are maintained in acceptable conditions.

8. After receipt of material and equipment, assume responsibility for loss and damage including but not limited to breakage, corrosion, weather damage, and distortion.

1.04 WARRANTIES

D. Provide extended or special warranties as indicated in individual Specification sections.

PART 2 – NOT USED

PART 3 – NOT USED

END OF SECTION

This page intentionally left blank

SECTION 01 70 00

EXECUTION AND CLOSEOUT REQUIREMENTS

PART 1 – GENERAL

1.01 SUMMARY

A. This Section specifies general execution requirements and startup/commissioning and performance testing for closeout of the Work. This Section applies to all Specifications and Drawings and provisions of this Section may be supplemented in other sections.

B. Certain provisions required by Laws and Regulations may be referenced. Contractor is responsible to determine and obtain applicable Laws and Regulations and to review and interpret the full text of such Laws and Regulations.

C. Section Includes

1.02 OVERALL EXECUTION REQUIREMENTS
Coordination
Existing Conditions
Field Engineering
Record Documents
Cutting and Patching
Quality Assurance and Control of Installation
Manufacturers' Field Services
Independent Testing

1.03 STARTUP, TESTING, AND COMMISSIONING
Spare Parts
Consumables
Checkout and Starting Systems
Starting, Adjusting, and Balancing
Startup and Commissioning/Performance Testing

1.04 CLOSEOUT REQUIREMENTS

1.02 OVERALL EXECUTION REQUIREMENTS

A. Coordination

1. Conduct preconstruction and pre-installation meetings before commencing certain Work that requires coordination or has special requirements or approvals.

2. Comply with the required Work sequence and coordination as may be specified in Summary of Work and reflect in the Project scheduling.

3. Coordinate Work such that Work is completed with minimum disruption to residents and businesses.

4. Coordinate space requirements and installation of Work. Utilize spaces efficiently to maximize accessibility for other installations, maintenance, and repairs.

5. Coordinate Work of the various Specifications with interdependent responsibilities for installing, connecting to, and placing in service, operating equipment.

6. Coordinate related Work at the Site in accordance with Article 8 of the Standard General and Supplementary Conditions, if any.

7. Coordinate completion and cleanup of Work of separate sections in preparation for Substantial Completion and for portions of Work designated for Owner's partial occupancy.

8. After Owner occupancy of premises, coordinate access to Site for correction of defective Work and/or incomplete Work to minimize disruption of Owner's activities.

B. Existing Conditions

1. If any, existence and location of Underground Facilities and other utilities and construction indicated as existing are not guaranteed. Before beginning Work investigate and verify the existence and location of Underground Facilities and other utilities and construction.

   a. Conduct test pits and other utility research and properly restore utilities interfered with or damaged during construction at no cost to the Owner.

   b. Contact DIGSAFE (www.digsafe.com) by dialing 811.

   c. Before starting Work in existing manholes, test for gas and blow out the manholes.

C. Field Engineering: ( ) as specified below.

1. Verify layout information shown on the Drawings in relation to existing benchmarks before lay out of the Work. Locate and protect existing benchmarks and control points. Preserve permanent reference points during construction.

2. Promptly report lost or destroyed reference points, benchmarks, or control points. Promptly report requirements relocate reference and control points due to changes in grades. Promptly replace lost or destroyed bounds or markers and control points based on the original survey control points utilizing the services of a professional land surveyor registered in the state where the Project is located. The cost of replacing markers disturbed by the Contractor's operations shall be at the Contractor's expense.

D. Record Documents

1. Provide record documents of work completed.

2. Store record documents separate from documents used for construction. Record information concurrent with construction progress.

3. Legibly mark each item to record description of actual equipment and material installed and actual construction on the Drawings and approved submittals, including the following.

a. Manufacturer's name and equipment and material model and number

b. Material and equipment substitutions or alternates utilized

c. Approved changes

d. Measured depths of foundations

e. Measured horizontal and vertical locations of Underground Facilities and appurtenances, referenced to permanent surface improvements

f. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work

g. Field changes of dimension and detail

h. Details not on original Contract Documents or Shop Drawings

E. Cutting and Patching

1. Employ skilled and experienced personnel to perform cutting and patching.

2. Submit written request in advance of cutting or alteration which affects:

a. structural integrity of any element of Project;

b. integrity of weather exposed or moisture resistant elements;

c. efficiency, maintenance, or safety element;

d. safety, traffic, or hazard barriers;

e. visual qualities of sight exposed elements; and

f. work of Owner or separate contractor.

3. Execute cutting, fitting, and patching including excavation and fill to complete Work and to:

a. fit materials together, to integrate with other work;

b. uncover Work to install ill-timed Work;

c. remove and replace defective or non-conforming Work;

d. remove Samples of installed Work for testing when requested; and

e. provide openings in element of Work for penetration of mechanical and electrical work.

4. Execute Work by methods to avoid damage to other work and which will provide appropriate surfaces to receive patching and finishing.

5. Provide adequate temporary support for Work to be cut.

6. Restore Work with new materials in accordance with requirements of Contract Documents. Use materials identical with original materials where recognized that satisfactory results can be produced.

7. Provide protection from elements for areas which may be exposed by uncovering work.

8. Refinish surfaces to match adjacent finishes. For continuous surfaces, refinish to nearest intersection or natural break. For an assembly, refinish entire unit. Restore exposed finishes of patched areas; and, where necessary extend finish restoration onto retained adjoining Work in a manner, which will eliminate evidence of patching.

9. Identify any Hazardous Waste, Hazardous Environmental Condition, or hazardous substance exposed during the Work to Owner for decision or remedy in accordance with Paragraph 5.06 of the Standard General and Supplementary Conditions, if any.

10. Cut work by methods least likely to damage Work to be retained and work adjoining. Cut Work with sawing and grinding tools, not with hammering, chopping, or burning tools. Cut masonry and concrete materials with masonry saw or core drill. Do not use pneumatic tools without prior

approval. Core drill openings through concrete Work. Adhere to mandatory cutback requirements when saw cutting concrete and roadway openings.

11. Do not cut and patch structural Work in a manner resulting in reduction of load-carrying capacity or load/ deflection ratio.

12. Fit Work tight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces. Maintain supports to ensure structural integrity of the Work. Provide devices and methods to protect other portions of Project from damage and seal voids. For interior work at penetrations of fire rated walls, partitions, ceiling, or floor construction, completely seal voids with fire resistant material, to full thickness of the penetrated element.

13. Do not cut and patch operational or safety-related components that reduce capacities to perform in manner intended. Do not cut and patch Work that reduces visual qualities. Remove and replace unsatisfactory cutting patching as directed by Engineer or Owner.

F. Electrolytic Corrosion Prevention

1. Prevent galvanic action, bimetallic corrosion, anodic or cathodic action, and electrolysis at all electrical grounds and for all galvanic scale (electromotive series or table of oxidation potentials). Do not allow contact of dissimilar metals further apart than 0.35 on the galvanic scale (electromotive series or table of oxidation potentials). The electrode potential of common metals is listed below.

	Electrode Potential Volts (Relative to Hydrogen)
Magnesium	+2.37
Aluminum	+1.70
Zinc+	+0.76
Chromium	+0.56
Iron and Steel	+0.44
Cadmium	+0.40
Nickel	+0.25
Tin	+0.14
Lead	+0.13
Copper	-0.34

2. Unless otherwise indicated, provide dielectric insulators between ferrous and nonferrous pipe and equipment.

G. Quality Assurance and Control of Installation

1. Monitor quality control of Subcontractors, Suppliers, manufacturers, material, equipment, services, Site conditions, and workmanship, to

produce Work of specified quality. Conduct field quality control and testing specified.

2. Comply fully with manufacturers' installation instructions, including each step in sequence. If manufacturers' instructions conflict with Contract Documents, request clarification from Engineer before proceeding.

3. Comply with specified standards as a minimum quality for the Work except when more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.

4. Perform Work using persons qualified to produce workmanship of specified quality.

5. Install field Samples and mockups at the Site as required in Specifications for review. Acceptable Samples and mockups represent a quality level for the Work. Where field Sample or mockup is specified to be removed, clear area after field Sample or mockup has been accepted by Engineer or after Work is complete when mockup is to serve as a control reference.

H. Manufacturers' Field Services

1. If required in the Specifications, arrange and pay for material or equipment Suppliers or manufacturers to provide qualified staff personnel (field representative) to perform the following services and services specified. Submit reports of activities, actions taken and test results to Engineer within 10 days of completion.

   a. Observe Site conditions, conditions of surfaces and installation, quality of workmanship.

   b. Report observations and Site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.

   c. Assist with field assembly as required.

   d. Furnish, setup, and operate required test equipment and facilities.

   e. Perform and record results of manufacturer recommended inspections and tests, and tests specified for material and equipment.

   f. Be responsible for protection of material and equipment and safety of all personnel during testing.

   g. Perform any other services normally provided by field representative's company.

   h. Instruct operating personnel in proper use of material and equipment.

   i. Instruct and supervise field repairs before acceptance by Owner.

I. Independent Testing

1. Employ and pay for specified services of an independent firm to perform inspection and testing as may be specified except where responsibility for a specific inspection or test is expressly allocated to Owner in the Specifications or by Laws and Regulations.

2. Reports will be submitted by the independent firm to Owner, in duplicate indicating observations and results of tests and indicating compliance or noncompliance with Contract Documents.

3. Inspection, testing, and source quality control may occur on or off the Project Site.

4. Cooperate with independent firm. Furnish samples of materials, design mix, equipment, tools, storage and assistance as requested.

5. Notify Owner and independent firm 24 hours before expected time for operations requiring services.

6. Make arrangements with independent firm and pay for additional Samples and tests required for Contractor's use.

7. Retesting required because of nonconformance to specified requirements will be performed by the same independent firm if instructed by Owner. Payment for retesting will be charged to Contractor by deducting inspection or testing charges from the Contract Price.

8. Testing or inspecting does not relieve Contractor from performing Work in accordance with requirements of the Contract Documents.

1.03 STARTUP, TESTING, AND COMMISSIONING

A. Spare Parts

1. Provide spare parts required for construction, startup, testing and commissioning of the Work prior to achievement of Substantial Completion, including spare parts for flushing and consumable supplies such as bolts, nuts, gaskets, filters, insulating tape, etc., normally consumed in the startup, commissioning and testing.

2. If spare parts are to be purchased by Owner as specified, Contractor shall have the right to use the spare parts purchased by Owner provided that such spare parts are replaced prior to Substantial Completion at Contractor’s expense. Replacement spare parts, replaced by Contractor, shall be new, unused and identical as the original spare part used.

B. Consumables

1. Provide initial fills of consumables including equipment lubricants, oils, grease, resins, chemicals, desiccants, and fuels. Provide subsequent fills if required during Warranty Period if acts or omissions of Contractor cause such consumables to require replacement.

2. Coordinate with Owner for consumables required.

C. Checkout and Starting Systems

1. Coordinate schedule for startup and operation of various equipment and systems with Owner.

2. Notify Owner 7 days before startup of each major piece of equipment or system, including a staffing request for Owner's operations and maintenance personnel required to adequately and safely support each specific start-up and operation activity.

3. Verify that each system or piece of equipment item has been assembled, constructed, or completed in accordance with the Contract and capable of functioning as intended.

4. Verify that each piece of equipment or system has been checked for proper lubrication, drive rotation, magnetic center alignment, belt tension, control sequence, or other conditions which may cause damage.

5. Verify that each piece of equipment or system has successfully completed construction testing and cold commissioning, including hydrostatic testing, loop checks, relay checks, calibration, and continuity checks and that all tests, meter readings, and specified electrical characteristics agree with those required by the equipment or system manufacturer.

6. Verify wiring and support components for equipment are complete and tested.

7. Execute start up under supervision of responsible manufacturers' representative or Contractor's personnel in accordance with manufacturers' instructions utilizing Owner's qualified operations and maintenance staff trained by Contractor.

8. When specified in individual Specification Sections, require manufacturer to provide field representative to be present at Site to inspect, check and approve equipment or system installation before start up, and to supervise placing equipment or system in operation.

D. Adjusting and Balancing

1. Supply necessary equipment, material, construction power, and consumables (except for those provided by Owner) needed to startup and fully test the Work and replenish the same until Substantial Completion is achieved. Contractor may utilize Owner's operating spare parts, such use requiring timely replacement at Contractor's expense.

2. Coordinate as required for conduct of independent testing.

3. Perform specified and required adjusting and balancing concurrently to the maximum extent possible on individual equipment and systems and prior to startup and commissioning/performance testing.

E. Startup and Commissioning/Performance Testing

1. Conduct startup and commissioning/performance tests to demonstrate the Work meets the requirements of the Contract Documents and satisfies the Owner's requirements. Conduct testing in accordance with individual Specification sections.

2. Prepare and submit a written startup and commissioning/performance testing procedures no later than 60 days prior to start of testing for review and final test procedures no later than 30 days prior to start of testing. Submit a staffing request for Owner's operations and maintenance personnel.

3. Calibrate test equipment and instrumentation on Site or provide acceptable certificate of calibration conducted within 30 days of testing.

4. Complete functional testing prior to initiating the startup and commissioning/performance testing as specified.

5. Complete specified startup and commissioning/performance tests prior to Substantial Completion. Owner and Engineer will witness Performance Testing. Notify Owner and Engineer in writing at least 7 days prior to starting any startup and commissioning/performance testing. Coordinate for witnessing of tests by required regulatory representatives.

6. Submit written test reports.

F. Demonstration and Training

1. Provide formal demonstration and training of Owner's personnel as specified in individual Specifications.

1.04 CLOSEOUT REQUIREMENTS

A. Substantial Completion shall have been achieved when the following has been completed.

1. Work is complete, systems are successfully operating, and final testing has been successfully completed.

2. A full inventory of the spare parts and special tools purchased by the Owner are replenished and in the custody of the Owner.

3. The Site has been restored to the satisfaction of the Owner and Engineer.

4. An inspection of the Work has been completed by the Engineer and the Owner.

5. An updated Punch List is provided.

6. The Contractor's written warranty and guarantee has been submitted, if any.

B. The Contractor shall have sole care, custody, and control of the Work until achievement of Substantial Completion. During the period between Substantial Completion and the date for Final Completion, Contractor shall be given access to correct items on the Punch List and achieve Final Completion.

C. Final Completion shall have been achieved when the the following are complete.

1. Substantial Completion has been achieved and liquidated damages for failure to meet Substantial Completion Date have been paid (if applicable).

2. All Work including Punch List Items has been completed.

3. Final cleaning has been conducted and Contractor equipment and supplies including waste materials have been removed from the Site and legally disposed of.

4. A full set of record documents have been submitted as specified above and Contractor's written warranty and guarantee has been resubmitted if adjusted.

5. Inspections required by Laws and Regulations are complete. Certificates and permits to occupy and operate have been issued if required.

6. Spare parts, maintenance and extra materials have been delivered in quantities specified to Project Site and stored as directed.

PART 2 – PRODUCTS (NOT USED)

PART 3 – GENERAL (NOT USED

END OF SECTION

This page intentionally left blank

SECTION 31 20 00

EARTHWORK

PART 1 – GENERAL

1.01 SUMMARY OF WORK

A. Provide all excavation, filling, back filling, removal of materials, surface repair and related appurtenances for the Work as specified and as indicated on the Drawings as well as required to complete the Work. Earthwork for utilities is included in this section.

1.02 REFERENCES

A. National Fire Protection Association (NFPA)

1. NFPA 495 Code for the Manufacturer, Transportation, Storage, and Use of Explosive Materials

1.03 SUBMITTALS

A. Reports

1. Provide test reports for all materials which are used as part of the Work. Include material gradations from a certified testing laboratory for all materials.

2. Provide field compaction testing results for fill areas, paved subgrade areas, utility trenches, etc. as specified and as directed by the Engineer for an independent testing laboratory. Compaction testing shall be paid for by the Contractor.

1.04 REGULATORY REQUIREMENTS

A. Conform to applicable codes and NFPA 495 for explosive disintegration of rock.

B. Obtain permits from authorities having jurisdiction before explosives are brought to the project site or drilling is started.

1.05 PROTECTION

A. Do not operate equipment on paved surfaces which will cause damage.

B. Maintain excavations with approved barricades, lights, and signs to protect life and property until excavation is filled and graded to a condition acceptable to the Engineer.

C. Protect structures, utilities, sidewalks, pavement, and other facilities from damage caused by settlement, lateral movement, undermining, washout and other hazards created by earthwork operations.

1.06 EXISTING SITE CONDITIONS

A. Test borings and other exploratory operations may be made by Contractor at no cost to the Owner.

B. Demolish and completely remove from the site, all existing underground utilities indicated to be demolished or removed. Provide services of utility companies for shut-off of utilities, services and related systems if lines are active.

C. Provide test pits where shown on the Drawings or as directed by the Engineer. Comply with all requirements of this section and the Contract Documents.

PART 2 – PRODUCTS

2.01 GENERAL

A. Suitable Materials: Suitable materials shall be as shown on the Drawings or as specified.

B. Unsuitable Materials: Material containing excessive plastic clay, vegetation, organic matter, debris, pavement, stones or boulders over 6 inches in greatest dimension, frozen material, concrete, pavement, CMU, demolition debris and material which, according to the Engineer, will not provide a suitable foundation or subgrade.

C. On-Site Material: Any suitable material from on-site excavation.

D. Material for embankments and general fills may contain pieces of excavated ledge having a greatest dimension of up to 6 inches if approved by the Engineer.

E. Inspection: The Engineer may inspect off-site sources of materials and order tests of these materials to verify compliance with these Specifications.

2.02 AGGREGATE BASE

A. Hard, durable gravel containing only particles passing the 2-inch sieve. All material shall meet MDOT "Standard Specification" Section 703.06, Type A or Type B aggregate. The material shall have the following sieve analysis by weight:

Sieve Size	% Passing by Weight
2-inch	100
½-inch	45-70
¼-inch	30-55
No. 40	0-20
No. 200	0-5

2.03 AGGREGATE SUBBASE (GRAVEL)

A. Hard, durable stone with coarse to fine sand. All particles shall pass the 6-inch sieve and meet MDOT "Standard Specification" Section 703.06, Type D aggregate. That portion which passes the 3-inch sieve shall have the following sieve analysis by weight:

Sieve Size	% Passing by Weight
3-inch	100
¼-inch	25-70
No. 40	0-30
No. 200	0-7

2.04 SAND

A. All sand shall meet the following sieve analysis by weight:

Sieve Size	% Passing by Weight
3/8-inch	100
No. 4	95-100
No. 16	50-85
No. 200	2-10

2.05 ¾-INCH CRUSHED STONE

A. Durable, clean angular rock fragments obtained by breaking and crushing rock material. Sieve analysis by weight shall be as follows:

Sieve Size	% Passing by Weight
1.5 - inch	100
¾-inch	90-100
½-inch	0-55
3/8-inch	0-25
No. 4	0-10
No. 200	0-2

2.06 2-INCH CRUSHED STONE

A. Durable, clean angular rock fragments obtained by breaking and crushing rock material. Sieve analysis by weight shall be as follows:

Sieve Size	% Passing by Weight
2-inch	100
1-inch	35-70
No. 4	0-5
No. 200	0-1

2.07 REFILL MATERIAL

A. Provide ¾-inch crushed stone for refilling excavation below grade or rock excavation unless otherwise directed by the Engineer.

2.08 COMMON BORROW

A. Earth suitable for embankment construction free from frozen material, perishable rubble, peat and other unsuitable material.

2.09 MOISTURE CONTENT

A. Moisture content shall be sufficient to provide required compaction and stable embankment but not exceeding 4% above optimum as determined using AASHTO T180, method C or D.

2.10 SELECT BACKFILL

A. Use Structural Fill as specified below.

2.11 GRANULAR FILL

A. Soil material free from organics, frozen material and other deleterious substances meeting the following gradation:

Sieve Size	% Passing by Weight
6-inch	100
No. 4	25-90
No. 40	0-50
No. 200	0-20

2.12 STRUCTURAL FILL

A. Soil for placement adjacent to building foundations (interior and exterior) and exterior foundations and structures shall be a clean, free draining, granular material meeting the following gradation:

Sieve Size	% Passing by Weight
4-inch	100
3-inch	100
¼ inch	25-70
No. 40	0-30
No. 200	0-7

2.13 RIP RAP

A. Provide sound, durable rock, which will not disintegrate due to exposure to water or weather; angular in shape such as rough, unhewn quarry stone or fragments obtained by blasting, breaking or crushing natural rock. Rounded boulders or cobbles shall not be permitted.

B. Rip Rap: Stone size shall conform to a grain diameter of D_{50} = 6-inch, with a maximum stone size of 12-inch. That is, 50% of the stone, by weight, shall be larger than 6 inches in diameter and 50% of the stone by weight shall be smaller than 6 inches in diameter.

2.14 WOVEN FILTER FABRIC

A. Provide woven geotextile for applications for subgrade separation and confinement of base materials. Filter fabric shall be composed of high-tenacity polypropylene yarns, which are woven into a stable network such that the yarns retain their relative position. Geotextile shall be inert to biological degradation and resistant to naturally encountered chemicals, alkalis, and acids. Provide materials in accordance with MDOT "Standard Specification," Section 722.

2.15 NON-WOVEN FILTER FABRIC

A. Provide a needle-punched nonwoven geotextile composed of polypropylene fibers, which are formed into a stable network such that the fibers retain their relative position. Geotextile shall be inert to biological degradation and resists naturally encountered chemicals, alkalis, and acids. The geotextile shall meet AASHTO M288-06 Class 2. Provide materials in accordance with MDOT "Standard Specification," Section 722.

PART 3 – EXECUTION

3.01 EXCAVATION – GENERAL

A. Remove all materials encountered to the limits shown on the Drawings or designated in the Specifications.

B. Do not perform rock excavation or excavation of unsuitable materials until material to be excavated has been cross-sectioned and classified by the Engineer. Predrilling and blasting of bedrock through overburden will not be allowed.

3.02 EARTH EXCAVATION

A. Provide removal and disposal of pavements and other obstructions visible on ground surface, underground structures and utilities indicated to be demolished and removed, and other materials encountered that are not classified as rock excavation or unauthorized excavation.

3.03 EXCAVATION FOR STRUCTURES

A. Conform to elevations and dimensions shown within a tolerance of plus or minus 0.10 feet and extending a sufficient distance from footings and foundations to permit placing and removal of concrete formwork, installation of services, other construction, and for inspection. In excavating for footings and foundations, take care not to disturb bottom of excavation. Excavate by hand to final grade just before concrete reinforcement is placed. Trim bottoms to required lines and grades to leave solid base to receive other Work.

3.04 ROCK EXCAVATION

A. Removal and disposal of materials that cannot be excavated without drilling and blasting, or requiring use of special equipment, except such materials that are classified as earth excavation.

1. Typical materials classified as rock are solid rock, rock in ledges, and rock hard cementitious aggregate deposits.

2. Intermittent drilling or ripping performed to increase production and not necessary to permit excavation of material encountered will be classified as earth excavation.

3. Rock excavation shall not include; removal of material which can be removed with a hand pick or power shovel or loose or previously blasted rock or broken stone in rock fills or elsewhere.

B. Rock excavation payment limits shall be in accordance with the following unless otherwise specified or indicated on the Drawings:

1. Two feet outside of concrete Work for which forms are required, except footings and base slabs.

2. Manholes & Precast Concrete Structures: As shown on the Drawings for manholes and precast structures.

3. Pipe & Utility Trenches: As shown on the drawings for piping, utilities including pipe and bedding materials.

4. Concrete Work (No Forms): Neat outside dimensions of concrete Work where no forms are required.

5. Slabs on Grade: 6 inches below bottom of concrete slabs unless otherwise specified or as shown on the Drawings.

3.05 EXCAVATION IN PAVED AREAS

A. Saw cut pavement prior to excavation to provide a clean, uniform edge. Minimize disturbance of remaining pavement. Cut and remove the minimum amount of pavement required to do the Work. Use shoring and bracing where sides of excavation will not stand without undermining pavement.

3.06 EXCAVATION FOR TRENCHES

A. Produce an evenly graded flat trench bottom at the subgrade elevation required for installation of pipe and bedding material. Load excavated material directly into trucks unless otherwise permitted by the Engineer. Place backfill material directly

into trench or excavation. Do not stockpile material to be used as backfill in roadways or along edges of trenches.

3.07 UNAUTHORIZED EXCAVATION

A. Removal of materials beyond indicated subgrade elevations or dimensions without specific direction of the Engineer. Unauthorized excavation, as well as all remedial Work directed by the Engineer including refilling and surface restoration shall be at the Contractor's expense.

3.08 REFILLING UNAUTHORIZED EXCAVATIONS

A. Trenches: Use crushed stone or gravel as directed by Engineer.

B. Elsewhere, backfill and compact unauthorized excavations as specified for authorized excavations of same classification, unless otherwise directed by the Engineer.

3.09 EXCAVATION OF UNSUITABLE MATERIALS

A. When excavation has reached required subgrade elevations, notify the Engineer who will inspect conditions. If unsuitable bearing materials are encountered at required subgrade elevations, carry excavations deeper as directed by the Engineer and replace excavated material with select backfill.

3.10 MATERIAL STORAGE

A. Stockpile and maintain suitable surplus excavated materials for re-use as backfill anywhere within the Project limits as directed by the Engineer. Place, grade and shape stockpiles for proper drainage. Locate and retain soil materials away from edge of excavations.

3.11 STABILITY OF EXCAVATIONS

A. General: Slope sides of excavations to comply with OSHA Regulations and Local Codes. Shore and brace where sloping is not possible due to space restrictions or stability of material excavated. Maintain sides and slopes of excavations in safe condition until completion of backfilling.

B. Refer to Section 31 40 00 Shoring and Bracing for additional shoring and bracing requirements.

3.12 DEWATERING

A. Refer to Section 01 50 00 Temporary Facilities for additional details and requirements.

3.13 RIPRAP PLACEMENT

A. Place required rip-rap to full depth shown on the Drawings in one operation without special handwork. Depth shall be measured perpendicular to the face of the slope to obtain a uniform appearance true to line and grade. Place larger stones at bottom of slope. Place stones in close contact, with interlocking of face stones and backing stones. Fill openings between stones with smaller rocks or coarse gravel.

3.14 BACKFILL AND FILL

A. General: Place acceptable soil material in layers to required elevations as shown on the Drawings and as specified. Fill, backfill, and compact to produce minimum subsequent settlement of the material and provide adequate support for the surface treatment or structure to be placed on the material. Place material in approximately horizontal layers beginning at lowest area to be filled. Do not impair drainage.

B. Ground Surface Preparation: Remove vegetation, debris, unsatisfactory soil materials, obstructions, and deleterious materials from ground surface prior to placement of fills. Scarify surfaces so that fill material will bond with existing surface. When existing ground surface has a density less than that specified under "Compaction" for particular area classification, break up ground surface, pulverize, moisture-condition to optimum moisture content, and compact to required depth and percentage of maximum density.

C. Place backfill and fill materials in layers not more than 12 inches in loose depth for material compacted by heavy compaction equipment, and not more than 6 inches in loose depth for material compacted by hand-operated tampers.

D. Do not place backfill or fill material on surfaces that are muddy, frozen, or contain frost or ice.

E. Place backfill and fill materials evenly adjacent to structures, to required elevations. Take care to prevent wedging action of backfill against structures by carrying material uniformly around structure to approximately same elevation in each lift.

F. Do not allow heavy machinery within 5 feet of structures during backfilling and compacting unless otherwise specified or indicated on the Drawings.

G. Backfill excavations as promptly as Work permits, but not until completion of the following:

1. Acceptance of construction of below grade finishes including but not limited to, damp proofing, waterproofing, perimeter insulation, pipe insulation, insulation jacket, etc.

2. Inspection and recording locations of underground utilities.

3. Removal of concrete formwork.

4. Removal of shoring and bracing, and backfilling of voids with satisfactory materials. Unless otherwise specified or indicated on the Drawings, cut off temporary sheet piling driven below bottom of structures and remove in a manner to prevent settlement of the structure or utilities. Leave sheet piling in place if specified, indicated on the Drawings or approved by the Engineer.

5. Removal of trash and debris.

6. Permanent or temporary horizontal bracing is in place on horizontally supported walls.

7. Backfill cast-in-place concrete structures when the concrete has developed adequate strength.

8. Use care in backfilling to avoid damage or displacement of underground structures and pipe.

9. Backfill under all existing utility pipes crossed by sewer construction with ¾-inch crushed stone. The crushed stone backfill will extend continuously from the bedding of the new sewer to the utility pipe crossed, including a 6-inch thick envelope of crushed stone all around the existing utility pipes.

10. The ¾-inch crushed stone backfill shall stand at its own angle of repose. No "haunching" or "forming" with common fill shall be allowed.

H. Backfilling of Trenches shall be in accordance with the trench details on the Drawings. Bed pipe in accordance with details on the Drawings and as specified for the applicable type of pipe. Limits of bedding and requirements for remaining trench backfill shall be as described in the applicable pipe specification or as indicated on the Drawings.

I. Trenches in cross-country runs shall receive surface restoration to existing conditions prior to construction unless otherwise specified or indicated on the Drawings. Mound trench 6 inches above existing grade if required by the Engineer.

J. Replacement of unsuitable materials shall be as previously specified for below normal grade conditions. In above normal grade conditions, replace unsuitable material with suitable stored onsite material unless otherwise specified or indicated on the Drawings. All excess suitable on-site material shall be used before additional off-site material is used. If additional material is required, provide a material as specified, indicated on the Drawings or as directed by the Engineer.

3.15 COMPACTION

A. Methods: Utilize methods which produce the required degree of compaction throughout the entire depth of material placed without damage to new or existing facilities and which are approved by the Engineer. Adjust moisture content of soil as required. Remove and replace material which is too wet to compact to required density. Compact each horizontal layer of till and slopes as Work progresses.

B. Degree of Compaction: Compact to the following minimum densities unless otherwise specified or indicated on the Drawings:

Fill and Backfill Location	Density (% of maximum; see below)
Under structure foundations	95%
2 feet under pavement and above	95%
2 feet under pavement and below	92%
Trenches through unpaved areas	90%
Embankments (including slopes)	90%
Pipe bedding	92%
Beside structure walls, foundation walls, retaining walls, tank walls	90%
Under pipes through structure fills	90%

1. Maximum Density: ASTM D1557, modified.

2. Field Density Tests: ASTM D1556 (sand cone) or ASTM D2167 (rubber balloon), or ASTM D2922 (nuclear methods).

3.16 DENSITY TESTING

A. Determine actual in place densities using field tests as directed by the Engineer. Tests shall be made by an independent laboratory. Perform additional Work to obtain proper compaction if in-place densities do not meet the specified densities. Retesting may be required by the Engineer and shall be at no additional cost to the Owner.

B. The Minimum Number of Tests shall be in accordance with the following criteria:

1. Paved Areas and Building Subgrade: Provide at least one field density test of subgrade for every 2,000 sq. ft. of paved area or building slab, but in no case less than 3 tests.

2. Other Fill Areas: In each compacted fill layer, make one field density test for every 2,000 sq. ft. of overlaying building slab or paved area, but in no case less than 3 tests per fill area.

3. Pipe Trenches: At least one test per 100 linear feet of trench per fill layer.

3.17 GRADING

A. Grading: Provide uniform grading of areas within limits as specified or as indicated on the Drawings, including adjacent transition areas. Smooth finished surface within specified tolerances, compact with uniform levels or slopes between points where elevations are shown, or between such points and existing grades.

B. Grading Outside Structure Lines: Grade areas adjacent to structure lines to drain away from structures and to prevent ponding.

C. Finish surfaces free from irregular surface changes, and as follows:

1. Lawn or Unpaved Areas: Finish areas to receive topsoil to within not more than 0.10 feet above or below required subgrade elevations.

2. Pavements: Shape surface of areas under pavement to line, grade and cross-section, with finish surface not more than ½ inch above or below required subgrade elevation.

3. Fill Under Slabs: Grade smooth and even, free of voids, compacted as specified, and to required elevation. Provide final grades within a tolerance of ½ inch when tested with a 10-foot straightedge.

D. Compaction: After grading, compact subgrade surfaces to the percentage of maximum density for each area classification.

3.18 MAINTENANCE

A. Protection of Graded Areas: Protect newly graded areas from traffic and erosion. Keep free of trash and debris. Repair and re-establish grades in settled, eroded, and rutted areas to specified tolerances.

B. Reconditioning Compacted Areas: Where completed compacted areas are disturbed by subsequent construction operations or adverse weather, scarify surface, re-shape, and compact to required density prior to further construction.

3.19 DISPOSAL OF EXCESS MATERIALS

A. Remove excess excavated material and dispose of it in approved spoils areas. Provide removal and disposal of all excess material from the project site.

B. Grade material to the satisfaction of the Engineer and Owner of the property on which the material is deposited.

C. Keep roads free of debris. Use suitable watertight vehicles for hauling wet materials over roads and streets. Clean up materials dropped from or spread by vehicles promptly or when directed by the Engineer.

END OF SECTION

This page intentionally left blank

SECTION 31 40 00

SHORING AND BRACING

PART 1 – GENERAL

1.01 DESCRIPTION OF WORK

A. Provide shoring and bracing to protect existing buildings, utilities, structures and other improvements. Provide shoring and bracing to prevent excavations against caving due to unstable soils. Provide shoring and bracing in accordance with OSHA safety requirements of shoring and bracing. Provide measures to dispose of water in excavations accordance with all local, state, and federal regulations. Provide removal and disposal of all shoring and bracing unless otherwise specified or indicated on the Drawings.

B. Shoring and bracing systems include, but are not limited to, movable boxes and sheet piling. Provide movable box systems where a shoring system is required but sheet piling is not called for or necessary for proper stabilization. Provide sheet piling where a shoring system is required but a moveable box is not sufficient.

1.02 SUBMITTALS

A. Certificates

1. Provide design and submit shoring and bracing systems sealed by a registered professional Engineer in the state of the project location.

2. Submit certification indicating trench box application recommendations and applications for each trench box. Certifications shall be either sealed by a Professional Engineer registered in the state of the project location or shall be provided by the trench box manufacturer.

1.03 QUALITY ASSURANCE

A. Design of shoring and bracing systems shall be provided by a registered Professional Engineer in State of the Project location. Design of shoring and bracing systems shall comply with local codes and OSHA requirements.

1.04 SITE CONDITIONS

A. Before starting Work, check and verify governing dimensions and elevations. Survey condition of adjoining properties, structures, utilities, etc. with the Engineer. Take photographs, recording any prior settlement or cracking of structures, pavements, and other improvements. Prepare a list of such damages, verified by dated photographs, and signed by the Contractor, Engineer and others conducting the investigation.

B. Survey adjacent structures and improvements, establishing exact elevations at fixed points to act as benchmarks. Clearly identify benchmarks and record existing elevations. Locate datum level used to establish benchmark elevations sufficiently distant so as not to be affected by excavation operations.

C. During excavation, resurvey benchmarks weekly, employing a licensed Land Surveyor or registered Professional Engineer in the state of the project location. Maintain accurate log of surveyed elevations for comparison with original elevations. Notify Engineer if changes in elevations occur or if cracks, sags or other damage is evident.

PART 2 – PRODUCTS

2.01 MATERIALS

A. General: Provide suitable shoring and bracing materials which will support loads imposed. Materials need not be new but should be in serviceable condition.

B. Steel sheet piling and shapes (corners, etc.) shall be continuous interlocking type. Provide section modules and type of sections as required by design.

C. Bracing members shall be wood timbers or A36 steel members.

D. Bolts shall be in accordance with ASTM A307.

PART 3 – EXECUTION

3.01 GENERAL

A. Provide shoring and bracing systems to resist earth and hydrostatic pressures, including surcharges from surface loads and construction equipment.

B. Locate shoring and bracing to clear permanent construction and to permit forming and finishing of concrete.

C. Maintain shoring and bracing while excavation is open.

D. Remove systems in stages to prevent disturbance of soils and damage to structures and improvements. Fill voids as soon as sheeting is withdrawn.

3.02 STEEL SHEET PILING AND BRACING

A. Drive sheet piling prior to excavation where possible. Fill and compact voids outside sheeting to hold sides of excavation in place.

B. Brace as required to prevent distortion of piling and other bracing members. If necessary to move a brace, install new bracing prior to removal of original brace.

C. Unless otherwise specified, indicated on the Drawings or directed by the Engineer, cut off sheet piling to be left in place at least two feet below finish grade.

END OF SECTION

This page intentionally left blank

SECTION 33 31 00

SANITARY UTILITY SEWERAGE PIPING

PART 1 – GENERAL

1.01 SUMMARY

A. Provide new sanitary sewer, storm drain, and pressure piping systems as specified and as indicated on the Drawings. The Work shall include but is not limited to sanitary sewer piping, wastewater force main pressure piping, sewer services, storm drains, culverts, under drains and drain piping associated with clay dams. Provide all related appurtenances including but not limited to pipe fittings, thrust blocks, restraints, pipe supports, couplings and related items for complete systems.

B. The piping included in this section may or may not all be required for the Work outlined in the Contract Documents. Provide all piping that is indicated on the Drawings, is specified, and/or is required to complete the Work outlined in the Contract Documents.

1.02 PRICE AND PAYMENT PROCEDURES

A. Per General Requirements.

1.03 REFERENCES

A. Reference Standards.

B. American Association of State Highway and Transportation Officials (AASHTO)

1. AASHTO M 252 Standard Specification for Corrugated Polyethylene Drainage Pipe

2. AASHTO M 294 Standard Specification for Corrugated Polyethylene Pipe, 300- to 1500-mm Diameter

C. ASTM International (ASTM)

1. ASTM D 3034 Standard Specification for Type PSM Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings

2. ASTM D 3212 Standard Specification for Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals

3. ASTM D 3350 Polyethylene Plastics Pipe and Fittings Materials

4. ASTM F 405 Corrugated Polyethylene (PE) Tubing and Fittings

5. ASTM F 477 Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe

D. American Water Works Association (AWWA)

1. AWWA C104/A21.4 Cement-Mortar Lining for Ductile-Iron Pipe and Fittings for Water

2. AWWA C110/A21.10 Ductile-Iron and Gray-Iron Fittings for Water

3. AWWA C111/A21.11 Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings

4. AWWA C150/A21.50 Thickness Design of Ductile-Iron Pipe

5. AWWA C151/A21.51 Ductile-Iron Pipe, Centrifugally Cast, for Water

6. AWWA C906 Polyethylene (PE) Pressure Pipe and Fittings, 4 In. through 65 In. (100 mm through 1650 mm), for Waterworks

1.04 SUBMITTALS

A. Product Data

1. Provide manufacturer's descriptive data, technical literature, catalog cuts, and installation instructions. Product data shall also include dimensional data for each type of pipe, tube, and fitting.

2. Prior to shipment of pipe, submit a certified affidavit of compliance from the pipe manufacturer stating that the pipe, fittings, gaskets, linings and exterior coatings for this project have been manufactured and tested in accordance with AWWA and ASTM standards as well as the requirements specified herein.

B. Reports

1. The Contractor shall submit test reports for each section of piping tested for pressure and leakage.

2. Construction Records: Record depth and location of the following:

a. Sewer piping

b. Repairs to existing pipes.

c. Force Main Pressure Piping

d. Record all records neatly in a permanently bound notebook and submit to Engineer at Substantial Completion. Provide access to

records for the Engineer at all times. Submit progress copies to the Engineer on a weekly basis.

1.05 QUALITY ASSURANCE

A. Provide removal and disposal of all damaged pipe from the Project Site.

B. When Work is conducted in State Roads, all piping utility Work shall be in accordance with the State Department of Transportation of the project location.

PART 2 – PRODUCTS

2.01 PIPE AND FITTINGS - GENERAL

A. Unless otherwise indicated, all fittings and appurtenances shall be of the same type and grade of materials as the connecting pipe. All products provided under this section shall conform to current AWWA and ANSI specifications as appropriate to the type of pipe specified.

B. Provide commercially manufactured wyes or tees for service connections. Fittings shall have single piece gasket.

2.02 CULVERTS & STORM DRAINS

A. Provide culverts, culvert replacement and storm drain piping as specified and as indicated on the Drawings. Pipe and fittings shall be corrugated exterior polyethylene drainage pipe, smooth wall interior, highway grade in accordance with AASHTO M294 and ASTM D3350.

B. Pipe shall be joined using a bell & spigot joint meeting AASHTO M252, AASHTO M294, or ASTM F2306. The joint shall be soil-tight and gaskets, when applicable, shall meet requirements of ASTM F477. Gaskets shall be installed by the pipe manufacturer and shall be covered with a removable wrap to ensure the gasket is free from debris. A joint lubricant supplied by the manufacturer shall be used on the gasket and bell during assembly.

C. Fittings shall conform to AASHTO M252, AASHTO M294, or ASTM F2306. Bell and spigot connections shall utilize a spun-on or welded bell and valley or saddle gasket meeting the soil-tight joint performance requirements of AASHTO M252, AASHTO M294 or ASTM F2306.

D. Virgin material for pipe and fitting production shall be high-density polyethylene conforming with the minimum requirements of cell classification 424420C for 4-inch through 10-inch diameters, and 435400C for 12-inch through 60-inch diameters, as defined and described in the latest version of ASTM D3350, except that carbon black content should not exceed 4%. The 12- through 60-inch virgin pipe material shall comply with the notched constant ligament-stress (NCLS) test

as specified in Sections 9.5 and 5.1 of AASHTO M294 and ASTM F2306 respectively.

E. High density polyethylene storm drain and culvert piping shall be a product of the following manufacturer:

1. Hancor, Inc. – Surelock
2. ADS, Inc. - N-12 WT IB
3. Engineer Approved Equal

2.03 GRAVITY SEWER PIPE & FITTINGS – TYPE (PVC/5)

A. All “TYPE (PVC/5)” gravity sewer piping shall be PVC, SDR 35 in accordance with ASTM D3034 for sizes 4 inch to 15 inch and ASTM F679 for sizes 18 inch to 48 inches.

B. Pipe and fittings shall be PVC in accordance with ASTM D1784 Cells Class 12454 or 12364. Gaskets shall be EPDM in accordance with ASTM F477. Joints shall be push-on integral bell and spigot in accordance with ASTM D3212. Pipe stiffness shall be in accordance with ASTM D2412 with $F/\Delta Y = 46$ psi or 115 psi. Provide factory pre-fabricated wyes and fittings which match the properties of the connecting pipe. All gravity sewer piping shall be a product of the following manufacturer:

1. J-M Manufacturing Company – Ring-Tite
2. North American Pipe Corporation
3. Engineer Approved Equal

2.04 DUCTILE IRON PIPE & FITTINGS – TYPE (DI/2)

A. All "TYPE (DI/2)" Ductile Iron Piping shall be Class 350 mechanical joint pipe and fittings for "Buried" gravity or pressure pipe applications as per AWWA C151/A21.51 standards. Refer to Section 40 05 13 Process Pipe and Fittings for additional details and requirements for “TYPE (DI/2)” pipe and fittings.

2.05 DUCTILE IRON PIPE & FITTINGS – TYPE (DI/3)

A. All "TYPE (DI/3)" Ductile Iron Piping shall be Class 350 push on joint pipe and fittings for "Buried" applications as per AWWA C151/A21.51 standards. Pipe shall be supplied in standard lengths whenever possible. The pipe thickness design shall be in accordance with AWWA C150/A21.50 standards, except provide a minimum of Class 350 for all piping 12 inches and smaller. Provide a minimum Class 350 for piping from 14 inches to 24 inches and provide a minimum of Class 250 for piping larger than 24 inches. Refer to Section 40 05 13 for additional details and requirements.

2.06 PERFORATED UNDERDRAIN PIPE & FITTINGS

A. Provide non-pressure perforated HDPE piping for underdrain applications as specified and as indicated on the Drawings. Perforated HDPE piping shall be in accordance with the standards for culverts and storm drains listed above in section 2.02.

2.07 HIGH DENSITY POLYETHYLENE PRESSURE PIPE – TYPE (PE/4)

A. High Density Polyethylene Pressure Pipe - Type (PE/4), shall be High Density Polyethylene (HDPE), DR 11, PE 3408 pipe with Iron Pipe Size (IPS) outside diameter or Ductile Iron Pipe Size (DIPS) as indicated on the Drawings or to match the connecting pipe outside diameter. Pipe and fittings shall conform to the requirements of AWWA C906. Provide transition couplings, mechanical joint adaptors and 304 stainless steel stiffeners as required, as indicated on the Drawings as specified and as recommended by pipe manufacturers. Provide fusion welded connections and molded fittings for all Type (PE/4) piping.

2.08 PVC PRESSURE PIPE & FITTINGS – TYPE (PVC/6)

A. PVC Pressure Pipe - (Type PVC/6): Pipe, couplings and fittings shall be manufactured of materials conforming to ASTM D 1784, Class 12454B. Pipe shall conform to AWWA C900 or AWWA C905-10 standards and shall be plain end or gasket bell end, Pressure Class 235 psi (FM 150 psi), (DR 18), with Ductile Iron Pipe Size (DIPS) or Iron Pipe Size (IPS) equivalent outside diameter as indicated on the Drawings or to match the connecting piping. Fittings shall be PVC with push-on joint ends. Fittings shall be designed with the same pressure rating as the connecting piping. All pipe bells shall incorporate gaskets which meet the requirements of ASTM F477. All gaskets shall be locked into the pipe bell. The assembled joint shall meet the requirements of ASTM D3139 standards. Pipe shall be designed for pressurized wastewater applications. All PVC pressure pipe shall be a product of the following manufacturer:

1. J-M Manufacturing Company
2. North American Pipe Corporation
3. Engineer Approved Equal

2.09 CLAY DAM DRAIN PIPE

A. Provide corrugated polyethylene drainage pipe, highway grade, AASHTO M 252, ASTM F 405-74 as shown on the Drawings or directed by the Engineer.

2.10 COUPLINGS

A. Provide couplings, adapters and fittings for pipe transitions as specified and as indicated on the Drawings. Refer to Section 40 05 14 Process Pipe Couplings and Connectors for additional details and requirements.

2.11 PIPE SUPPORTS

A. Provide pipe supports (within structures) as specified and as indicated on the Drawings. Unless otherwise specified or indicated on the Drawings, all pipe supports shall be 304 stainless steel with 304 stainless steel hardware. Refer to the details on the Drawings for additional details and requirements.

2.12 NON-WOVEN FILTER FABRIC

A. Provide non-woven filter fabric in accordance with Specification 31 00 00 Earthwork.

2.13 DETECTABLE UNDERGROUND MARKING TAPE

A. Provide four (4) inch wide detectable underground metallic marking tape for all buried utilities including but not limited to force main pressure piping and gravity sewer piping systems. Provide detectable marking tape as follows:

1. Gravity Sewer Systems - Detectable tape shall be green and shall read "Caution - Buried Sewer Line Below".

2. Sanitary Pressure Piping Systems - Force Mains - Detectable tape shall be brown and shall read "Caution - Buried Force Main Below".

B. Underground marking tape shall be detectable marking tape, with a minimum 5.0 mil overall thickness. Tape shall be manufactured using a 0.8 mil clear virgin polypropylene film, reverse printed and laminated to a 0.35 mil solid aluminum foil core, and then laminated to a 3.75 mil clear virgin polyethylene film. Tape shall be printed using a diagonally striped design for maximum visibility and meet the APWA Color-Code standard for identification of buried utilities.

2.14 TRENCH DAMS

A. Provide trench dams (trench baffles) only where specified or indicated on the Drawings for utility piping systems. Baffles shall be self-supporting and provide a watertight seal around the pipe by use of an appropriately sized elastomeric PVC flexible coupling. Baffles shall form an impenetrable barrier in the pipe envelope to the flow of water. Baffles shall be constructed of ABS or PVC plastic. Baffles shall be designed and constructed in accordance with the following:

1. Specific Gravity: 1.05, per ASTM D 792

2. Izod Impact: 6.0 ft-lbs/inch at 730F, per ASTM D 256

3. Tensile Strength: 4,800 psi, per ASTM D 638

4. Tensile Modulus: 280,000 psi, per ASTM D 638

5. Flexural Strength: 7,000 psi, per ASTM D 790

6. Flexural Modulus: 300,000 psi, per ASTM D 790

7. Deflection Temperature: 1900F, per ASTM D 648

8. Gardner Gloss: 10-15% at 600 Angle, per ASTM D 523

9. Hardness: 85 Rockwell R, per ASTM D 785

2.15 THRUST BLOCKS

A. Provide concrete thrust blocks at all pressure pipe fittings as specified, as indicated on the Drawings and as directed by the Engineer. Thrust blocks shall be 3,000 psi (minimum) compressive strength concrete. Cast-in-place concrete thrust blocks shall be ready mixed concrete from a concrete truck. Pre-cast concrete thrust blocks shall also be acceptable. Refer to the Drawings for additional details and requirements.

2.16 RIGID INSULATION

A. Provide rigid insulation as specified, as indicated on the Drawings or as directed by the Engineer. Insulation shall be rigid, cellular polystyrene thermal insulation with closed cells and integral high-density skin, formed by the expansion of polystyrene base resin in an extrusion process to comply with ASTM C 578. Insulation shall conform to the following properties:

1. Thermal Resistance: 5.0 ft2-h-0F/Btu, per ASTM C 518 & ASTM C 177

2. Compressive Strength: 25 psi (minimum), per ASTM D 1621

3. Water Absorption: 0.3% by volume, per ASTM C 272

4. Water Vapor Permeance: 0.8 perms, per ASTM E 96

5. Maximum Use Temperature: 165 0F

6. Coefficient of Linear Expansion: 3.5x10-5 in/in-0F, per ASTM C 203

7. Insulation Type: IV or V, per ASTM C 578

8. Thickness: 2-inch, unless otherwise specified or indicated on the Drawings.

B. Provide 4-inch minimum compacted sand layers directly above and below insulation, or as directed by the Engineer.

PART 3 – EXECUTION

3.01 INSTALLATION OF GRAVITY PIPING SYSTEMS

A. Install gravity sewer pipe and fittings in accordance with manufacturer's recommendations and the trench details as indicated on the Drawings. Use a laser beam for line and grade unless otherwise permitted by the Engineer. Secure each length of pipe with bedding before placing next length. Plug open ends of pipe when Work is suspended. Bed pipe as shown on the Drawings. A 30-inch minimum cover over the top of PVC pipe should be provided before the trench is wheel-loaded.

B. Lay pipe to alignment and grade shown on the Drawings. If grade is not shown, determine elevations of start and finish points for each run of pipe. Lay pipe to a uniform grade between these points. Line and grade may be adjusted by the Engineer as required by field conditions. Install a mechanical water stop for every 10 vertical feet of sewer main elevation change.

C. Lay pipe in the dry. Do not use installed pipe to remove water from work area.

D. Flush all piping and remove all debris. Flushing method used shall be approved by the Engineer. Gravity flushing shall not be acceptable. Provide all labor, water, pumps and related appurtenances for pipe flushing.

E. Connections to manholes and catch basins: Provide short length of pipe so that joints are located within 3 feet of inside surface of manholes and catch basins for piping other than PVC pipe.

F. Unless otherwise specified or indicated on the Drawings residential house service fittings and leads shall be six (6) inch. Provide larger service connections as indicated on the Drawings or to match existing service size. Provide pre-fabricated tee/wye or wye fittings on main line pipe to accommodate existing service connections. Provide assistance and labor to Engineer in measurement of pipe installed and in obtaining swing ties to service connections.

G. Provide pre-cast sewer chimneys as specified and as indicated on the Drawings or to match existing conditions. Install chimneys in accordance with the manufacturer's instructions. Provide services of a Manufacturer's representative to provide a one-day site visit to assist and instruct in the proper installation of sewer chimney products.

H. Provide backwater valves as specified and as indicated on the Drawings. Provide adaptors to transition to solvent weld pipe connection to push-on pipe with flexible adapter.

3.02 INSTALLATION OF FORCE MAIN PRESSURE PIPE

A. Install force main pressure piping in accordance with the manufacturer's recommendations and the details as shown on the Drawings. Installation of HDPE pressure pipe "Type (PE/4)" shall conform to the Plastic Pipe Institute (PPI) Handbook of PE Pipe and the manufacturer's recommendations. Thermal butt fusion or electro-fusion methods are acceptable provided the Contractor has submitted evidence of training by a manufacturer's representative.

B. Lay pipe to line and grade shown on the Drawings. Do not allow positive-negative grade discontinuities. Line and grade may be adjusted by the Engineer as required by field conditions.

C. Flush all piping and remove all debris. Flushing method used shall be approved by the Engineer. Gravity flushing shall not be acceptable. Provide all labor, water, pumps and related appurtenances for pipe flushing.

D. Lay pipe in the dry. Do not use installed pipe to remove water from work area.

E. Install warning tape continuously from pumping stations to the end of each force main. At ends of rolls and repairs, splice tape with 3-foot overlap connected with tape. Provide the Owner with one full roll for future repairs. Extend to grade at each access manhole and at pump stations.

F. Provide thrust protection via concrete thrust blocks at all bends in force main pressure piping systems in accordance with the Drawings.

3.03 UTILITIES TO BE ABANDONED

A. Provide closure of abandoned utilities as specified and as indicated on the Drawings. Provide caps, or watertight plugs on open ends of abandoned underground utilities which are not indicated to be removed or demolished. Provide closures to withstand hydro-static or earth pressure which may result after ends of abandoned utilities have been closed.

3.04 INSULATION

A. Provide rigid insulation as shown on the Drawings or directed by the Engineer.

3.05 TESTING OF SANITARY SEWERS

A. Test all sanitary sewer pipes after backfilling. Install all house service leads on main line before testing. Perform tests in the presence of the Engineer. A maximum of 1,000 linear feet of pipe may be installed but not tested at any time. Provide low pressure air testing of all gravity sewer piping systems as follows:

1. Plug all ends of sections to be tested.

2. Supply air slowly to the pipe to be tested until the air pressure inside the pipe is 4.0 psi greater than the average back pressure of any groundwater submerging the pipe.

3. Disconnect air supply and allow a minimum of two minutes for stabilization of pressure.

4. Following stabilization period measure drop in pressure over the test period based on piping size.

Nominal Pipe Size (Inches)	Test Period (Minutes)
4	4
6	4
8	6
10	6
12	7
15	8
18	9
21	11
24	13

5. Acceptable Drop: Pressure drop shall not exceed more than 1.0 psi.

B. Deflection Test for PVC Gravity Sewer Pipe: Provide testing of all pipe with "GO-NO-GO" gauge allowing a 5% maximum deflection.

C. Special Testing for Gravity Sewer Replacing Existing Sewer: For all new sewer replacing existing sewer and requiring an immediate tie-in of existing services, provide sewer TV inspection and joint testing services per NASSCO specifications. Provide two (2) DVD copies of inspections to the Engineer upon completion of testing: Provide TV Work during low flow periods (1:00 a.m.- 4:00 a.m.) unless otherwise directed by the Engineer.

D. Provide repair and retesting of all piping systems which do not pass tests using materials and methods approved by the Engineer.

END OF SECTION

SECTION 33 39 13

SANITARY UTILITY SEWERAGE MANHOLES AND STRUCTURES

PART 1 – GENERAL

1.01 DESCRIPTION OF WORK

A. Provide all materials, tools, equipment, and labor necessary to manufacture install and test precast concrete and precast concrete manhole structures and catch basins complete with steps, frames, covers, and stainless-steel anti-buoyancy hardware as specified herein and as shown on the Drawings. Provide precast concrete manholes and precast concrete items as shown on the Drawings and as specified herein including but not limited to precast manholes, precast catch basins, inverts, risers, frames, covers, grates, hatches and anti-flotation slabs.

1.02 REFERENCES

A. Reference Standards

B. American Association of State Highway and Transportation Officials (AASHTO)

1. AASHTO M 198 Joints for Concrete Pipe, Manholes, and Precast Box Sections Using Preformed Flexible Joint Sealants

2. AASHTO T 111 Standard Method of Test for Mineral Matter or Ash in Asphalt Materials

C. ASTM International (ASTM)

1. ASTM A 1064/A 1064 M Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete

2. ASTM A 36/A 36M Standard Specification for Carbon Structural Steel

3. ASTM A 48/A 48M Standard Specification for Gray Iron Castings

4. ASTM B 26/B 26M Standard Specification for Aluminum-Alloy Sand Castings

5. ASTM C 1244 Standard Test Method for Concrete Sewer Manholes by the Negative Air Pressure (Vacuum) Test Prior to Backfill

6. ASTM C 139 Standard Specification for Concrete Masonry Units for Construction of Catch Basins and Manholes

7. ASTM C 144 Standard Specification for Aggregate for Masonry Mortar

8. ASTM C 150/C 150 M Standard Specification for Portland Cement

9. ASTM C 260/C 260 M Standard Specification for Air-Entraining Admixtures for Concrete

10. ASTM C 270 Standard Specification for Mortar for Unit Masonry

11. ASTM C 32 Standard Specification for Sewer and Manhole Brick (Made from Clay or Shale)

12. ASTM C33 Standard Specification for Concrete Aggregates

13. ASTM C 478 Standard Specification for Precast Reinforced Concrete Manhole Sections

14. ASTM C 494/C 494 M Standard Specification for Chemical Admixtures for Concrete

15. ASTM A 615/A 615 M Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement

16. ASTM C 857 Standard Practice for Minimum Structural Design Loading for Underground Precast Concrete Utility Structures

17. ASTM D 877/D 877 M Standard Test Method for Dielectric Breakdown Voltage of Insulating Liquids Using Disk Electrodes

18. ASTM C 890 Standard Practice for Minimum Structural Design Loading for Monolithic or Sectional Precast Concrete Water and Wastewater Structures

19. ASTM C 913 Standard Specification for Precast Concrete Water and Wastewater Structures

20. ASTM C 923 Standard Specification for Resilient Connectors Between Reinforced Concrete Manhole Structures, Pipe, and Laterals

21. ASTM D 1187/D 1187 M Standard Specification for Asphalt-Based Emulsions for Use as Protective Coatings for Metal

22. ASTM D 1227 Standard Specification for Emulsified Asphalt Used as a Protective Coating for Roofing

23. ASTM D 217 Standard Test Method for Cone Penetration of Lubrication Grease

24. ASTM D4 Standard Test Method for Bitumen Content

25. ASTM D6/D6 M Standard Test Method for Loss on Heating of Oil and Asphaltic Compounds

26. ASTM D71 Standard Test Method for Relative Density of Solid Pitch and Asphalt (Displacement Method)

1.03 SUBMITTALS

A. Shop Drawings

1. Show components to be used, elevations of top of precast sections, base and pipe inverts, rim elevation, location of pipe penetrations, and steps for each manhole. Verify Finish grade elevation at each proposed manhole location.

2. Record as-built structure information neatly in a permanently bound notebook and submit at Substantial Completion. Provide access to records for Engineer at all times. Submit copies to Engineer on a weekly basis. Record information on as-built structure locations. Specifically, provide the following:

a. Location and rim elevations of all precast concrete structures.

b. Locations and invert elevations of all pipe penetrations.

B. Product Data

1. Provide Manufacturer's descriptive data, technical literature, catalog cuts, and installation instructions. Product data shall also include dimensional data for each structure. Provide product data for manholes, joint sealants, catch basins, inverts, risers, frames, covers, grates and frost barriers.

C. Reports

1. Submit leakage test reports for each structure.

D. Certificates

1. Provide design of all precast structures including anti-flotation slabs. Provide the precast structures requiring anti-flotation slabs as one complete unit. Submit a certificate of design signed by a Professional Engineer, registered in the State of the project location with five (5) years minimum experience in the design of similar structures. The design Engineer shall certify that all precast structures including the anti-flotation slabs, whether provided separately or as a monolithic unit, have been designed to withstand all forces including soil, traffic and hydrostatic loads in accordance with all applicable laws, regulations, rules and codes.

1.04 QUALITY ASSURANCE

A. Provide complete manhole and precast concrete structures capable of supports AASHTO H20 loading. All precast concrete shall comply with ASTM C 913.

B. Precast Manhole Components shall comply with ASTM C 478.

PART 2 – PRODUCTS

2.01 MANHOLES & STRUCTURES – GENERAL

A. Base Sections: Precast monolithic construction with steps.

B. Barrel Sections: Precast with steps.

C. Top Sections: Precast eccentric cone top as shown on Drawings. Provide flat top structures only where specified and as indicated on the Drawings.

2.02 PRE-CAST CONCRETE

A. All concrete used for precast concrete structures shall conform to the following design criteria and conditions:

B. Concrete compressive strength shall be 5,000 psi (minimum) after 28 days.

C. Unless otherwise specified or indicated on the Drawings the minimum concrete structure thickness shall be 6 inches. Provide increased thicknesses to accommodate loadings from vehicles or mechanical equipment. Provide increased thicknesses to accommodate H20 load ratings.

D. Portland cement shall be Type II conforming to ASTM C 150/C 150 M standards.

E. Fine aggregate shall consist of natural sand conforming to ASTM C 33/C 33M standards.

F. Coarse aggregate shall consist of well graded crushed stone conforming to ASTM C 33/C 33M.

G. Air entrainment admixture shall conform to ASTM C 260. The air-entrained content shall be not less than 4 percent, nor greater than 7 percent.

H. A superplasticizer shall be used and shall conform to ASTM C 494/C 494 M type F or G. Concrete shall be placed at a slump of between 5 and 8 inches.

I. Minimum cement content shall be 564 pounds per cubic yard.

J. Provide a trowel finish on all floors.

K. Structures shall be designed to resist soil loads, surcharges, and buoyant forces.

L. Concrete Fillet: Minimum 3,000 psi concrete.

2.03 REINFORCEMENT

A. All concrete reinforcement shall conform to the following design conditions and criteria:

1. Minimum reinforcing steel yield stress shall be 40,000 psi.

2. Minimum concrete cover over reinforcing bars shall be 1-1/2 inch.

3. Wire fabric shall conform to the requirements of ASTM A 1064/A 1064 M.

4. Reinforcing bars shall be new billet steel, deformed, conforming to the requirements of ASTM A 615/A 615M, Grade 60.

2.04 BRICK & MORTAR

A. Sewer Brick: ASTM C 32, Grade SS, hard brick.

B. Concrete Masonry Units: Conform to ASTM C 139.

1. Portland cement shall conform to ASTM C 150. Sand shall conform to ASTM C 144. Hydrated lime shall conform to ASTM C 207.

2. Use Type II Portland cement, Type S Lime.

3. Portions for Mortar are 1-part Portland cement, ¼-part hydrated lime, 3 to 3-¾ parts sand.

2.05 STEPS

A. Steps shall be constructed of steel reinforced copolymer polypropylene conforming to ASTM C 478, cast-in-place or installed utilizing inserts approved by the Engineer. All steps shall be 12 inches on center with abrasive step surface and safety edge, drop front design, one (1) inch diameter and 16 inches wide. Metal items embedded in concrete shall be provided with a bituminous coating.

2.06 JOINTS

A. Pre-cast concrete sections shall be provided with bell and spigot or tongue-in-groove ends to ensure proper connection of the joints. Provide flat joints only where specified or indicated on the Drawings.

B. All joints shall be sealed with a minimum of two rows of butyl rubber sealant. A compatible primer shall be applied as recommended by the manufacturer. All seals shall be applied in accordance with the manufacturer's recommendations. Joint seals shall meet the hydrostatic performance requirements set forth in ASTM C 990, Section 10.1. Sealant properties shall meet or exceed the following criteria:

1. Hydrocarbon Blend Content: 50% (Minimum), per ASTM D4
2. Inert Mineral Filler: 30% (Minimum) by weight, per AASHTO T 111
3. Volatile Matter: 2% (Maximum) by weight, per ASTM D6
4. Specific Gravity: 1.15-1.50, per ASTM D71
5. Ductility: 5.0 (Minimum)
6. Penetration Cone: 50-100 mm, per ASTM D 217 at 77 0F, 150 gm. 5 Sec.
7. FED SS-S-210A: No deterioration, no cracking and no swelling after 30 days immersion in 5% solutions of HCl, H_2SO_4, NaOH, KOH, and H_2S

C. Precast structure joint sealants shall be a product of the following manufacturer:

1. Concrete Sealants, Inc. - Conseal CS-102 or CS-202 (Per Temperature)
2. Hamilton Kent – Kent Seal No. 2
3. Press-Seal Gasket Corporation – Pro-Stik
4. Engineer Approved Equal

2.07 PIPE CONNECTIONS

A. Provide seals for all piping penetrations in precast structures as indicated on the Drawings. In cases where the pipe sealing system has not been specifically indicated, provide pre-molded elastomeric (boot type) sealed joints between the pipe and precast sections. Where specified or indicated on the Drawings provide mechanical link type seals for piping penetrations.

B. Pre-molded elastomeric seals shall be manufactured of EPDM with 300 series stainless steel pipe clamps, bands and wedges. Each seal shall also be designed in accordance with the following criteria:

1. Head Pressure: 13 psi for 10 minutes at 00, per ASTM C 923
2. Head Pressure: 10 psi for 10 minutes at 00, per ASTM C 923

3. Deflection: 70, in any direction, per ASTM C 923

4. Load Test: 150 lbs/in pipe diameter, per ASTM C 923

C. All flexible seals shall be a product of the following manufacturer:

1. Trelleborg Pipe Seals, Inc. – Kor-N-Seal

2. A-Lok Products, Inc.

3. Press-Seal Gasket Corporation

4. Engineer Approved Equal

2.08 STAINLESS STEEL CONNECTOR

A. Stainless Steel Connector: Provide 304 stainless steel plate connectors between manhole sections to prevent frost separation. Provide stainless steel connectors for valve manholes.

2.09 DAMPROOFING & WATER SEALING

A. Provide a two-coat bituminous damp-proofing (water sealing) system for all precast structures. All exterior coatings shall conform to ASTM D 1227 and ASTM D 1187 standards. Concrete sealants shall be designed for use both above and below grade. Exterior concrete sealants shall be a product of the following manufacturer:

1. BASF Construction Chemicals, Inc. Hydrocide 600, 700 or 700B

2. Karnak Corporation – 100AF

3. Engineer Approved Equal

2.10 JOINT WRAP

A. Provide exterior joint wrap for all precast structure joints. The joint seal (wrap) shall be manufactured of a self-shrinking EPDM rubber material with a minimum thickness of 30 mils. The back side of the seal shall be coated with a cross-linked reinforced non-hardening butyl adhesive. The sealant shall be a minimum of 30 mils thick. The sealing system shall be designed to stretch entirely around each structure along the joint and then be overlapped to create a fused bond. The width of the joint wrap shall be 6 inches (minimum) and each wrap shall be overlapped by at least two times the width of the wrap.

B. The butyl component of the tape shall consist of 50% (minimum) butyl rubber and it shall contain 2% or less volatile matter. Provide primer and/or adhesive as

recommended by the manufacturer. Joint wrap shall conform to ASTM C 877 (Type III). All joint wrap shall be a product of the following manufacturer:

1. Press-Seal Gasket Corporation – EZ-Wrap

2. Sealing Systems, Inc. – Infi-Shield Gator Wrap

3. Engineer Approved Equal

2.11 RISERS (GRADE RINGS)

A. Grade Rings: Provide precast concrete grade rings (if required) to raise rim elevations of the frame and covers.

B. Grade rings of injection-molded HDPE shall also be acceptable if approved by the Engineer.

2.12 FRAMES, GRATES & COVERS

A. Cast Iron: Conform to ASTM A 48/A 48M Class 30

B. Aluminum: Provide alloy number 713.0. Conform to ASTM B 26/B 26M.

C. Carbon Steel: Conform to ASTM A 36/A 36M.

D. All frames shall include four, pre-drilled holes to allow a bolted connection to pre-cast structures.

E. Manhole Frames & Covers: Labeled with "SEWER" in 3" high raised letters on cover.

1. Standard Frames & Covers: 24 Inch lid: Model R-1670-A frame and type C cover with self-sealing application by Neenah Foundry or Engineer Approved Equal.

2. Waterproof Frames & Covers: Equal to Model R-1755-F2 frame and type C cover by Neenah Foundry or Engineer Approved Equal.

3. Manhole Frames & Hinged Covers: 24-inch opening, PAMREX frame and cover by Certainteed Corporation or Engineer Approved Equal.

F. Catch Basin Frames & Grates: Provide heavy duty, bicycle safe, cascading type frame & grate equal to Model R-3588 LL by Neenah Foundry or Engineer Approved Equal.

2.13 ANTI-FLOTATION DESIGN

A. Certificate of Design: The Contractor shall be responsible for design of all precast structures including anti-flotation slabs and may provide the precast structures requiring anti-flotation slabs as one complete unit. Submit a certificate of design signed by a Professional Engineer, registered in the State the project location and having five (5) years minimum experience in the design of similar structures, certifying that all precast structures including the anti-flotation slabs, whether provided separately or as a monolithic unit, have been designed to withstand all forces including soil, traffic and hydrostatic in accordance with all applicable laws, regulations, rules and codes.

B. Each structure shall be designed with a minimum factor of safety of 1.15 against buoyancy with an assumed flood elevation at the top of the structure. Frictional resistance in this calculation shall not be permitted. Where the structure is composed of successive vertical segments, the weight of the segments shall be such as to provide the same factor of safety for buoyancy, or stainless-steel mechanical connections shall be used to connect the segments together. The design shall include positive anchorage to a reinforced concrete anti-buoyancy slab of the required size.

2.14 DESIGN LOADS

A. Unless otherwise specified or indicated on the Drawings, the design shall meet the requirements of AASHTO HB-17, including a HS-20 vehicle load. A lateral vehicle surcharge load of 125 psf shall be applied. Unless otherwise specified or indicated on the Drawings, water and wastewater structures shall be designed for the loads prescribed in ASTM C 890. Unless otherwise specified or indicated on the Drawings, utility structures shall be designed for the loads prescribed in ASTM C 857.

B. The equivalent lateral fluid pressure shall be 100 psf/lf below flood and/or the design groundwater elevation and 60 psf/lf above such elevation. The specified lateral vehicle surcharge load shall be added to this load.

2.15 MISCELLANEOUS

A. Frost Barrier: U.V.-resistant, high grade polyethylene, minimum thickness, 6 mils

B. Butyl Rubber Caulking: Conform to AASHTO M 198, Type B.

PART 3 – EXECUTION

3.01 INSTALLATION OF MANHOLES

A. Placement: Place precast bases on compacted bedding material so bottom of structure is plumb, and pipe inverts are at proper elevations. Place barrel and top sections in the appropriate height combinations. Plug all lifting holes inside and out with non-shrink grout. Fill below structure with 3,000 psi concrete, if required. Lay pipe to alignment and grade shown on the Drawings. If grade is not shown, determine elevations of start and finish points for each run of pipe. Lay pipe to a uniform grade between these points. Line and grade may be adjusted by the Engineer as required by field conditions. Install a mechanical water stop for every 10 vertical feet of sewer main elevation change.

B. Joints: Follow the manufacturer's instructions for sealing joints between precast sections. Provide two rings of 1-inch diameter butyl rubber sealant and joint wrap.

C. Frames and Covers:

1. Set to final grade as shown on the Drawings. Unless otherwise specified or indicated on the Drawings frames and covers shall be set ½ inch below pavement grade in paved areas, ½ inch below finish grade in unpaved gravel roads, or 24 inches above grade in cross country areas. Provide adequate temporary covers to prevent accidental entry until final placement of frame and cover is made.

2. Provide two rings of 1-inch diameter butyl rubber sealant between frame and chimney joints. Provide downward force to frame so as to compress the joint, provide a watertight seal, and prevent future settlement. Point compressed joint with butyl rubber caulk sealant.

3. Set manhole frames and covers to final grade only after pavement base course has been applied, or after final grading of gravel roads.

D. Frost Barriers: Wrap each structure to the maximum excavation depth or not less than 6 feet below grade, with a minimum of four layers of 6 mils each of the polyethylene.

1. Clean structure exterior of all dirt and remove any protrusions.

2. Apply a 6-inch wide vertical strip of bituminous waterproofing adhesive from the top of manhole to the greatest excavation depth, but not in excess of 10 feet.

3. Start poly wrap at adhesive strip and proceed around manhole continuously, overlapping adhesive strip a minimum of 24 inches on the final layer.

4. Tuck and pleat poly at top in a continuous manner, minimizing size of folds. Extend poly past top of manhole frame and temporarily tuck remainder inside frame, until final backfill and paving.

5. Paved areas: Cut poly flush with manhole rim after pavement is in place.

6. Unpaved areas: Pull loose ends of poly together, remove excess air and tie off end with galvanized wire. Bury with manhole below grade.

E. Inverts: See detail on Drawings.

F. Steps: Replace any steps that are out of plumb and proper horizontal placement.

3.02 LEAKAGE TESTING

A. General: Tests shall be observed and certified by the Engineer. Structures must be complete for final test acceptance except for shelf and invert brickwork. All pipe connections shall be made prior to testing. Plug all pipes and other openings in the structure walls prior to test. The Contractor shall test all precast concrete manholes as soon as they are installed and before they are backfilled to demonstrate that the work confirms to these specifications.

B. Vacuum Tests for Manholes

1. After the manhole has been constructed, the Contractor shall conduct a Manhole Acceptance Test using the vacuum test procedure in ASTM C 1244, except as modified herein.

2. The manhole, regardless of diameter, shall pass if the time for the vacuum to drop from 10 inches of mercury to 9 inches of mercury is greater than:

   a. 2.0 minutes for 0’-10’ deep manholes

   b. 2.5 min for 10’-15’ deep manholes

   c. 3.0 min for 15’+ deep manholes

3. If the vacuum drops in excess of the prescribed rate, the Contractor shall locate the leak, make proper repairs, and retest the structure.

4. If the unit fails the test after repair, the unit shall be water exfiltration tested as directed by the Engineer in accordance with the following.

C. Exfiltration Test

1. Plug pipes into and out of structure and secure plugs.

2. Lower groundwater table (GWT) to below structure. Maintain GWT at this level throughout test. Provide means of determining GWT level at any time throughout test.

3. Fill structure with water to top of structure.

4. Allow a period of time for absorption, to be determined by the Engineer.

5. Refill to top of cone.

6. Determine volume of leakage in an 8-hour minimum test period and calculate rate.

7. Acceptable Leakage Rate: Not more than 1 gallon per vertical foot per 24 hours for manholes and wet wells. Not more than 1/10 of 1 percent of the tank volume in any 24-hour period for storage tanks.

8. The Engineer reserves the right to require an exfiltration test if a vacuum test has failed or cannot be performed.

3.03 REPAIRS

A. Determine the causes of all leaks and repair them. Perform earthwork required for repairs if manhole has already been backfilled.

B. Perform repairs using methods and materials approved by the Engineer.

C. Remove and replace or reconstruct the manhole if necessary.

D. Remove and replace the defective sections if required by the Engineer.

END OF SECTION

SECTION 40 05 14

PROCESS PIPE COUPLINGS AND CONNECTORS

PART 1 – GENERAL

1.01 DESCRIPTION OF WORK

A. Furnish, install, test, and make ready for operation all process pipe couplings and connectors of the type(s) and size(s) as required and as shown on the Drawings. All couplings and connectors shall conform to the requirements of the Contract Documents. The items include but may not be limited to sleeve type couplings, split type couplings, flanged adaptors, expansion joints, harnessing and restraints, quick connect couplings, unions, dielectric connectors, and restrained mechanical joint couplings. The aforementioned items may or may not all be required for the work of the Contract. All items shall be provided for complete and operational systems, as shown on the Drawings, and as specified herein.

1.02 REFERENCES

A. Reference Standards.

B. AMERICAN WATER WORKS ASSOCIATION (AWWA)

1. AWWA C110/A21.10 (2008) Ductile-Iron and Gray-Iron Fittings for Water

2. AWWA C111/A21.11 (2000) Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings

3. AWWA C153/A21.53 (2006) Ductile-Iron Compact Fittings for Water Service

4. AWWA C207 (2007) Standard for Steel Pipe Flanges for Waterworks Service-Sizes 100 mm through 3600 mm 4 in. through 144 in.

5. AWWA C600 (2005) Installation of Ductile-Iron Water Mains and Their Appurtenances

6. AWWA C606 (2006) Grooved and Shouldered Joints

7. AWWA M11 (2004) Manual: Steel Pipe: A Guide for Design and Installation

C. ASTM INTERNATIONAL (ASTM)

1. ASTM A 108 (2007) Standard Specification for Steel Bar, Carbon and Alloy, Cold-Finished

2. ASTM A 126 (2004) Standard Specification for Gray Iron Castings for Valves, Flanges, and Pipe Fittings

3. ASTM A 183 (2003) Standard Specification for Carbon Steel Track Bolts and Nuts

4. ASTM A 197/A 197M (2000; R 2006) Standard Specification for Cupola Malleable Iron

5. ASTM A 307 (2007b) Standard Specification for Carbon Steel Bolts and Studs, 60 000 PSI Tensile Strength

6. ASTM A 325M (2009) Standard Specification for Structural Bolts, Steel, Heat Treated, 830 Mpa Minimum Tensile Strength (Metric)

7. ASTM A 36/A 36M (2008) Standard Specification for Carbon Structural Steel

8. ASTM A 48/A 48M (2003; R 2008) Standard Specification for Gray Iron Castings

9. ASTM A 512 (2006) Standard Specification for Cold-Drawn Buttweld Carbon Steel Mechanical Tubing

10. ASTM A 513 (2008a) Standard Specification for Electric-Resistance-Welded Carbon and Alloy Steel Mechanical Tubing

11. ASTM A 536 (1984; R 2009) Standard Specification for Ductile Iron Castings

12. ASTM A 564/A 564M (2004; R 2009) Standard Specification for Hot-Rolled and Cold-Finished Age-Hardening Stainless Steel Bars and Shapes

13. ASTM A 575 (1996; R 2007) Standard Specification for Steel Bars, Carbon, Merchant Quality, M-Grades

14. ASTM A 632 (2004) Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing (Small-Diameter) for General Service

15. ASTM B 584 (2008a) Standard Specification for Copper Alloy Sand Castings for General Applications

16. ASTM B 62 (2002) Standard Specification for Composition Bronze or Ounce Metal Castings

17. ASTM B 633 (2007) Standard Specification for Electrodeposited Coatings of Zinc on Iron and Steel

18. ASTM B 88 (2003) Standard Specification for Seamless Copper Water Tube

19. ASTM D 2774 (2008) Underground Installation of Thermoplastic Pressure Piping

1.03 SUBMITTALS

A. Shop Drawings

1. Provide drawings of all couplings, connectors, and fittings in the product submittals. The drawings shall be specifically identified with the applicable style or series designation. The submittal drawings shall show layouts and dimensions of the couplings and connectors. Drawings shall also show layout and dimensions of all couplings and connectors, major components, key alignment locations and locations of bolt holes.

B. Product Data

1. All "bellows type" expansion joint Manufacturers shall provide materials of construction, including gauge of corrugated element, maximum test pressure force to compress joint, bellows spring rate, shear force and end moment due to calculated traverse only. The Manufacturer shall also furnish evidence of completing cycle life testing for the maximum diameter coupling to be installed. The Manufacturer shall indicate such assured cycle life test results on the materials and information submitted for approval.

2. Provide catalog cut sheets of joints, couplings, harnesses, expansion joints, gaskets, fasteners and all other process pipe couplings and connectors specified in this section.

3. Provide sufficient product data to verify compliance with the specifications and to illustrate the construction and assembly of the products. Include compliance of materials and components with applicable CEAM, ASTM, AGMA, and other standards. List the manufacture, model and weights of major components. Include catalog cuts, illustrations, schedules, diagrams, performance charts, instructions and brochures illustrating size, physical appearance and other characteristics of materials, systems or equipment.

C. Operation and Maintenance Data

1. All required cuts, drawings, equipment lists, descriptions, etc., which are required to instruct operation and maintenance personnel unfamiliar with such equipment. The O&M manuals shall include instructions for cleaning and maintenance.

1.04 QUALITY ASSURANCE

A. All welding shall be conducted under qualified welding procedures. All welders and operators shall be certified in accordance with the latest applicable AWS and ANSI codes for shop and project site welding of piping work. The Contractor shall furnish written proof of certifications upon request from the Engineer.

B. All piping systems, components, and appurtenances in contact with potable water (including potable water during any stage of treatment or conditioning) shall be certified to meet the requirements of ANSI/NSF 61 for water service.

C. All process piping couplings and connectors shall be new and unused.

D. Provide Manufacturer's certification that the submitted materials meet or exceed the minimum requirements as specified. Coordinate dimensions and drilling of flanges with flanges for valves, pumps and other equipment to be installed in the piping systems. Bolt holes in flanges shall straddle the vertical centerline.

1.05 QUALIFICATIONS OF MANUFACTURER

A. Materials and equipment shall be the standard products of a Manufacturer regularly engaged in the production of such products and shall essentially duplicate items that have been in satisfactory use in identical applications in other wastewater treatment facilities. The Manufacturer shall have a minimum of five (5) years of documented experience in the design and production of couplings and connectors of all types, and not less than five (5) years of experience in the production of equal or larger sized models of the exact equipment as specified herein.

B. The equipment supplier shall provide a list of at least ten (10) similar installations, including contact names and phone numbers. All equipment shall be supported by a service organization that is, in the opinion of the Engineer, reasonably convenient to the site to ensure parts and service can be acquired in a timely fashion.

1.06 WARRANTY

A. The Manufacturer shall provide a full and comprehensive warranty for the equipment specified in this section. The equipment shall be warrantied to be free from defects in workmanship, design, and materials for a period of not less than one (1) year. If any parts of the equipment supplied under this section should fail during the Manufacturer's warranty period, replacement of parts or the unit itself shall be provided. The units shall be restored to active working service at no expense to the Owner of the equipment. The Manufacturer shall incur all costs including but not

limited to parts, labor, service, technicians, shipping, and handling as required for restoration of equipment to active service as required under the Manufacturer's warranty.

B. The Manufacturer's warranty shall commence at the date of substantial completion or partial utilization.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Materials delivered and placed in storage shall be stored with protection from the weather, excessive humidity variation, excessive temperature variation, dirt, dust and/or other contaminants. Proper protection and care of materials before, during and after installation shall be the Contractor's responsibility. Any materials found to be damaged shall be replaced at the Contractor's expense. Materials shall be stored with protection from puncture, dirt, grease, moisture, mechanical abrasions, excessive heat, ultraviolet (UV) radiation, or other damage.

B. Surfaces such as female threads, internal mechanical joint ends or flange faces shall be protected from damage during shipment. Inspect the materials delivered to the site for damage. Store rubber products under cover out of direct sunlight. Do not store materials directly on the ground. Keep the inside of couplings, connectors, and fittings free of dirt and debris.

1.08 SPECIAL TOOLS

A. Furnish one set of all special tools required to completely assemble, disassemble, or maintain the equipment. Special tools shall refer to oversized or specially dimensioned tools, special attachments or fixtures, or any similar items.

PART 2 – PRODUCTS

2.01 GENERAL

A. All couplings and connectors shall be of sizes shown on the Drawings or as specified. Provide couplings which are sized to match the connecting piping outside diameters. Where piping outside diameters differ, provide transition type couplings. All couplings and connectors shall have the Manufacturer, size, flow directional arrows (if applicable), working pressure for which they were designed and all standard referenced specifications cast in raised letters or permanently marked upon some appropriate part of the equipment. Unless otherwise specified or indicated on the Drawings, all couplings and connectors shall have a minimum pressure rating of 150 psi or be of the same working pressure as the pipes they connect, whichever is greater.

B. All couplings and connectors shall be designed for the pressures of the application where they are to be installed. The reference of a Manufacturer's name and/or model number in this specification has been provided for the purpose of establishing the

standard of quality or general configuration desired and shall not be considered as proprietary.

C. Unless otherwise specified or indicated on the Drawings all piping shall be connected using standard flanged, mechanical joint, push-on joint, threaded, welded, or solvent cement welded connections. Couplings and connectors shall be used where specified or indicated on the Drawings. The use of couplings in place of standard piping connections shall not be acceptable unless approved by the Engineer in writing.

2.02 SLEEVE TYPE COUPLINGS - TYPE C01

A. Provide sleeve type couplings to join all plain end pipes and/or exterior below grade transitions in piping materials as shown on the Drawings, as specified and as outlined in AWWA C 201 standards. In cases where the outside diameters of the piping segments to be connected differ, provide "reduction/expansion" sleeve type couplings.

B. Sleeve type couplings shall also be provided for all exterior below grade piping runs prior to entering and exiting buildings or structures. The couplings shall be installed prior to the building or structure wall penetration to allow for differential settlement of the piping and structure. All sleeve type couplings shall conform to the provisions of AWWA C 219 standards. All sleeve type couplings shall be rated for use with the same operational pressure as the connecting pipes.

C. All sleeve type couplings for low pressure air service shall be 304L stainless steel with 316L stainless steel followers.

D. All coupling lugs shall be in accordance with ASTM A 36/A 36M standards. All washers shall be in accordance with ASTM A 325M standards. All couplings shall be fitted with plastic plugs to protect the bolt holes.

E. Provide sleeve couplings on all piping buried directly under a structure at the structure's expansion joints. In applications where the piping is encased in concrete, provide a minimum of 3-inch-thick Styrofoam placed perpendicular to the horizontal centerline of the coupling.

2.03 FASTENERS – TYPE C01

A. All bolts shall be installed such that a minimum of 1/4 inch of the bolt projects beyond the surface of the nut. All hexagonal nuts shall be in accordance with ANSI B18.2 standards. Hexagonal nuts shall have threads in accordance with ANSI B1.1 standards. All bolts shall be in accordance with ASTM A 307 and ANSI B1.1 standards. All bolts shall be square or hexagonal head type. Bolts shall be threaded over the full length. All bolt ends shall be rounded or chamfered. Bolts shall be coarse thread fit type. Provide 304 or 316 stainless steel bolts and hardware for all sleeve type couplings.

2.04 GASKETS – TYPE C01

A. Provide gaskets to match the particular service application. Unless otherwise specified or recommended by the coupling Manufacturer, all gaskets for low pressure air service shall be EPDM and all gaskets for wastewater service shall be Nitrile (Buna-N/NBR), EPDM or SBR. The coupling gasket shall match the gasket material used for the piping system.

2.05 MIDDLE RING – TYPE C01

A. The pipe stop within the inner surface of the middle ring of couplings shall be omitted as required to permit removal of valves, flow meters, equipment, and appurtenances. All other couplings shall be provided with pipe stops.

B. The middle ring of each sleeve type coupling shall have a thickness at least equal to that of the connecting piping on which the coupling is to be used. All sleeve type couplings shall be a minimum of 10 inches long for pipe 30 inches and larger. All sleeve type couplings shall be a minimum of 7 inches long for pipe under 30 inches in diameter.

C. Couplings which are designed to be self-restrained shall not be required to meet the minimum middle ring length requirements specified.

2.06 JOINT HARNESSES – TYPE C01

A. When specified or when shown on the Drawings, anchor sleeve-coupled joints with harness bolts. Weld all harness lugs to steel pipe. All harnesses shall be in accordance with AWWA M11 standards. All harnesses shall be provided with a minimum of two (2) 5/8 inch diameter bolts.

B. All joint harness bolts shall be of sufficient length. Provide harness lugs and install them such that the coupling can be slipped in one direction to clear the joint. Provide harnesses of sufficient number and strength to withstand the test pressure of the piping being connected. Test pressures shall be as indicated by the Engineer or as specified in Section 40 05 13 PROCESS PIPE AND FITTINGS. Provide 304L stainless steel harnesses for stainless steel piping systems.

2.07 FINISHING – TYPE C01

A. All ferrous metallic surfaces of couplings shall be provided with a standard fusion-bonded epoxy coating. All stainless steel, plastic, brass or bronze parts shall not be painted.

2.08 MANUFACTURER – TYPE C01

A. All sleeve type couplings of the same type, style, and duty shall be supplied by a single Manufacturer. All sleeve type couplings shall be a product of the following Manufacturer:

1. Dresser Piping Specialties

2. Romac Industries, Inc.

3. Smith-Blair Inc.

4. Engineer Approved Equal

2.09 FLEXIBLE SLEEVE TYPE COUPLINGS - TYPE C02

A. Provide flexible sleeve type couplings to join all plain end pipes and/or transitions in piping materials as shown on the Drawings and as specified herein. In cases where the outside diameters of the piping segments to be connected differ, provide concentric or eccentric "reduction/expansion" flexible sleeve type couplings.

B. Flexible sleeve type couplings shall also be provided for all exterior below grade piping runs prior to entering and exiting buildings or structures. The couplings shall be installed prior to the building or structure wall penetration to allow for differential settlement of the piping and structure. All sleeve type couplings shall be rated for use with the same operational pressure as the connecting pipes. The couplings shall also conform to applicable portions of ASTM A 564/A 564M, ASTM C 443, ASTM C 425 and ASTM D 1869 standards. Provide couplings with a 300 series stainless steel shear ring for all below grade installation applications.

C. The couplings shall be designed for a maximum operating temperature of 140 degrees F (non-consistent) and a minimum operating temperature: –30 degrees F. Each coupling shall include two (2) 316 stainless steel band clamps. Each clamp shall be an interlocked housing and band design which strengthens under tension to ensure a positive seal. The bands shall include additional slots to accommodate a greater dimensional range.

D. All flexible sleeve type couplings of the same type, style, and duty shall be supplied by a single Manufacturer. All Manufacturers named or otherwise shall comply completely with the Contract Documents. All flexible sleeve type couplings shall be a product of the following Manufacturer:

1. Fernco, Inc.

2. Mission Rubber Company, LLC

3. Engineer Approved Equal

2.10 COUPLING SLEEVE (GASKET) – TYPE C02

A. The coupling sleeve shall be constructed of PVC to allow for flexibility and chemical resistance. The PVC sleeve shall also be resistant to ultraviolet rays, fungus growth and sewer gases. All flexible sleeve type couplings shall also be designed in accordance with ASTM D 5926, ASTM C 1173 and CSA B602

standards. All coupling sleeves shall be designed and constructed in accordance with the following criteria:

1. Hardness (Shore A): 65 (+/-) 5
2. Tensile Strength: 1,000 psi (minimum)
3. Elongation at Rupture: 250% (minimum)
4. Tear Strength: 150 lb/in (minimum)
5. Brittleness Temperature: -40°F

2.11 COUPLING SHEAR RINGS – TYPE C02

A. For "buried" applications provide couplings with shear rings which are designed for resistance to heavy earth loads and shear forces to provide improved pipe alignment. The shear ring shall be a minimum of 0.12 inches thick 300 series stainless steel. The width of the shear ring shall be manufactured according to coupling width and the length shall be manufactured according to coupling diameter. Each shear ring shall have clamps spot welded in place at the factory.

2.12 SPLIT TYPE COUPLINGS

A. Provide "rigid" split type couplings for connection of grooved or shouldered end pipe. All split type couplings shall be cast in two (2) segments for sizes 3/4 inch through 14 inch, four (4) segments for sizes 15 inch through 24 inch pipe, and six (6) segments for pipe sizes over 24 inches, to facilitate ease of handling and installation.

B. The couplings shall be designed to engage grooved or shouldered pipe ends while encasing an elastomeric gasket to create a seal between the connected pipe segments. Split type couplings shall be utilized as directed by the Engineer for piping with thin wall thicknesses. The use of split type couplings shall prevent weakening of the piping due to compression.

2.13 SPLIT COUPLING GASKETS

A. The Manufacturer shall provide gaskets to match the particular service application. Unless otherwise specified or recommended by the coupling Manufacturer, all gaskets for low pressure air service shall be EPDM and all gaskets for waste water service shall be Nitrile (Buna-N/NBR). All EPDM gaskets shall be rated for a temperature range of -30 degrees F to +230 degrees F. All coupling gaskets shall be equal to the gasket used and recommended by the process piping Manufacturer of the pipe segments to be connected.

2.14 SPLIT COUPLING HOUSING

A. The coupling housing shall be constructed of ductile iron conforming to ASTM A 536 standards, grade 65-45-12. The housing shall be provided with two part fusion

bonded epoxy coating for corrosion resistance. The finished coatings shall be in accordance with the Manufacturer's recommendations as well as that specified in Section 09 90 00 PAINTS & COATINGS. Provide 316 stainless steel split coupling housings for use with stainless steel pipe.

2.15 SPLIT COUPLING HARDWARE

A. Only when specified or specifically indicated on the Drawings; provide all couplings with carbon steel bolts and nuts, conforming to ASTM A 183 standards. Unless otherwise specified or indicated on the Drawings, all couplings shall be provided with type 316 stainless steel, Grade B-8M, Class 2, bolts, nuts, and washers.

2.16 PIPING WALL THICKNESS & SPLIT COUPLINGS

A. The standards of AWWA C606 as well as the respective coupling Manufacturers require a minimum thickness of pipe walls for use of various split type couplings. Provide piping with the minimum wall thicknesses required (unless a greater thickness is specified or required in the individual pipe specifications) for use with split type couplings.

B. In the event that the minimum pipe wall thicknesses do not meet the coupling manufacturer or AWWA C606 standards for the minimum requirements for grooving, then a shouldered end treatment with couplings as specified or as shown on the Drawings shall be utilized.

2.17 SPLIT COUPLINGS - DUCTILE IRON PIPING

A. All ductile iron pipe for use with split-type coupling joints shall be designed with radius grooved ends and conform to AWWA C606 standards. All ductile iron pipe shall have grooved ends to provide either a rigid joint or flexible joint as shown on the Drawings or as specified.

B. When not specified or shown on the Drawings, provide "rigid" grooved couplings unless otherwise approved by the Engineer. Flexible joint grooving and couplings shall permit expansion, contraction, and angular deflection of the piping. All rigid joint grooving and couplings shall allow no angular or linear movement/deflection. The minimum pipe wall thickness for grooved pipe shall be as specified by the coupling Manufacturer.

2.18 SPLIT COUPLINGS – STEEL & STAINLESS STEEL PIPING

A. Grooved couplings for steel and stainless steel piping shall have roll grooving, machine-grooving, or ring collars fully welded to the pipe or fitting.

2.19 FLEXIBLE SPLIT RING GROOVED END COUPLINGS - TYPE C03

A. Unless otherwise specified or shown on the Drawings, all flexible split ring grooved end type couplings of the same type, style, and duty shall be supplied by a single

Manufacturer. All Manufacturers named or otherwise shall comply with the Contract Documents. All flexible split ring grooved end type couplings shall be a product of the following Manufacturer:

1. Victaulic Company of America - Style 77

2. Gustin-Bacon Company

3. Engineer Approved Equal

2.20 FLEXIBLE SPLIT RING SHOULDERED END COUPLINGS - TYPE C04

A. Unless otherwise specified or shown on the Drawings, all flexible split ring shouldered end type couplings of the same type, style, and duty shall be supplied by a single Manufacturer. All Manufacturers named or otherwise shall comply with the Contract Documents. All flexible split ring shouldered end type couplings shall be a product of the following Manufacturer:

1. Victaulic Company of America - Style 44

2. Gustin-Bacon Company

3. Engineer Approved Equal

2.21 RIGID SPLIT RING GROOVED END COUPLINGS - TYPE C05

A. Unless otherwise specified or indicated on the Drawings. Provide rigid split ring grooved end couplings on ductile iron pipe less than 36 inches. Provide flexible split ring grooved end couplings as previously specified and where indicated on the Drawings. Pipe wall thickness shall meet all requirements of AWWA C606. If not specifically specified or indicated on the Drawings, the use of rigid split ring grooved end couplings shall only be used with written permission from the Engineer. If approved, all couplings used in place of flanges shall utilize "rigid" grooved pipe connections.

B. Unless otherwise specified or shown on the Drawings, all rigid split ring grooved end type couplings for ductile iron piping, of the same type, style, and duty shall be supplied by a single Manufacturer. All Manufacturers named or otherwise shall comply with the Contract Documents. All rigid split ring grooved end type couplings shall be a product of the following Manufacturer:

1. Victaulic Company of America - Style 31

2. Gustin-Bacon Company

3. Engineer Approved Equal

C. Unless otherwise specified or shown on the Drawings, all rigid split ring grooved end type couplings for manufactured steel and other associated standard groove piping, of

the same type, style, and duty shall be supplied by a single Manufacturer. All Manufacturers named or otherwise shall comply with the Contract Documents. All rigid split ring grooved end type couplings shall be a product of the following Manufacturer:

1. Victaulic Company of America - Style 07

2. Gustin-Bacon Company

3. Engineer Approved Equal

2.22 RIGID SPLIT RING SHOULDERED END COUPLINGS - TYPE C06

A. Provide rigid split ring shouldered end couplings as specified and as shown on the Drawings. Utilize rigid split ring shouldered end couplings on all ductile iron pipe over 16 inches or ductile iron pipe without sufficient wall thickness as outlined in AWWA C606 standards. Also utilize rigid split ring shouldered end couplings on all manufactured steel pipe or thin walled stainless steel pipe. Unless otherwise specified or shown on the Drawings the coupling shall be of the same materials of construction as the piping being connected. Provide stainless steel couplings for use with stainless steel piping.

B. Unless otherwise specified or shown on the Drawings, all rigid split ring shouldered end type couplings for manufactured steel, ductile iron, stainless steel and other associated thin walled piping, of the same type, style, and duty shall be supplied by a single Manufacturer. All Manufacturers named or otherwise shall comply with the Contract Documents. All rigid split ring shouldered end type couplings shall be a product of the following Manufacturer:

1. Victaulic Company of America - Style 44

2. Gustin-Bacon Company

3. Engineer Approved Equal

2.23 EXPOSED SLEEVE TYPE FLANGED ADAPTORS - TYPE C07

A. Provide exposed sleeve type flanged adaptors for joining "Plain end cast iron, ductile iron, and steel piping at fittings, valves, equipment, flow meters, and other appurtenances as required, specified, as shown on the Drawings or as directed by the Engineer. All flanged adapters shall conform in size and bolt hole placement to ANSI standards for steel and/or cast iron flanges 125/150 pound standard unless otherwise required for connections. Flanged adaptors shall be rated for a minimum pressure of 150 psi.

B. The follower shall be in accordance with AISI C1012 or ASME SA36 standards. The body and flange shall be of the same material as the connecting piping and designed in accordance with ASTM A 513, ASTM A 635, or ASME SA675 GR60 standards.

All ductile iron bodies shall be in accordance with ASTM A 536 standards. All bolts, nuts and washers shall be 316 stainless steel in accordance with AWWA C111/A21.11 standards. Gaskets for wastewater service shall be Nitrile (Buna-N/NBR). All flanged adaptors for use in potable water service shall be ANSI/NSF 61 listed. The gasket shall have a nominal temperature range of -20 degrees F to 180 degrees F. All ferrous metal surfaces of flanged adaptors shall be provided with a corrosion resistant epoxy finish. Stainless steel components shall not be painted.

C. Unless otherwise specified or shown on the Drawings, all exposed sleeve type flanged adaptors, of the same type, style, and duty shall be supplied by a single Manufacturer. All Manufacturers named or otherwise shall comply with the Contract Documents. All exposed sleeve type flanged adaptors shall be a product of the following Manufacturer:

1. Dresser Inc. - Style 128

2. Smith-Blair Inc. - Style 912

3. Engineer Approved Equal

2.24 STAINLESS STEEL SLEEVE TYPE FLANGE ADAPTORS - TYPE C08

A. Provide exposed sleeve type flanged adaptors for joining plain end stainless steel piping at fittings, valves, equipment, flow meters, and other appurtenances as required, specified, and as shown on the Drawings. All flanged adapters shall conform in size and bolt hole placement to ANSI standards for steel and/or cast iron flanges 125/150 pound standard unless otherwise required for connections. The flanged adaptors shall be rated for a minimum pressure of 150 psi.

B. All flange adaptors for stainless steel piping shall be type 316L stainless steel and conform to AWWA C207 standards. Gaskets for low pressure air service piping shall be EPDM with a maximum temperature rating of at least 230 degrees F.

C. Unless otherwise specified or shown on the Drawings, all exposed stainless steel sleeve type flanged adaptors, of the same type, style, and duty shall be supplied by a single Manufacturer. All Manufacturers named or otherwise shall comply with the Contract Documents. All exposed stainless steel sleeve type flanged adaptors shall be a product of the following Manufacturer:

1. Dresser Inc.

2. Smith-Blair Inc.

3. Engineer Approved Equal

2.25 SHORT BODY FLANGED ADAPTORS - TYPE C09

A. Provide exposed "short body" flanged adaptors for joining plain end piping at fittings, valves, equipment, flow meters, and other appurtenances as required,

specified, as shown on the Drawings or as directed by the Engineer. All flanged adapters shall conform in size and bolt hole placement to ANSI standards for steel and/or cast iron flanges 125/150 pound standard unless otherwise required for connections. The flanged adaptors shall be rated for a minimum pressure of 150 psi.

B. The restraints shall be manufactured of ductile iron conforming to ASTM A 536 standards. The bolt circles and bolt holes shall conform to AWWA C110/A21.10 standards. The screws shall have a Rockwell hardness of C40-45 converted from Brinnell. The flanged adaptor shall be designed with a minimum safety factor of 2.

C. Flange adaptors shall be UL listed. All flanged adaptors shall be designed for use on water or wastewater pipelines subject to hydrostatic pressure in accordance with AWWA C600 or ASTM D 2774 standards.

D. All flanged adaptor assemblies and related parts shall be processed through a phosphate wash, rinse, and drying operation prior to coating application. The coating shall consist of a minimum of two coats of liquid thermoset epoxy coating with heat cure to follow each coat. All casting bodies shall be surface pretreated with a phosphate wash, rinse, and sealer before drying. The coating shall be electrostatically applied and heat cured. The coating shall be a polyester based powder to provide corrosion, impact, and UV resistance.

E. All short body flanged adaptors of the same type, style, and duty shall be supplied by a single Manufacturer. All Manufacturers named or otherwise shall comply completely with the Contract Documents. All short body flanged adaptors shall be a product of the following Manufacturer:

1. EBAA Iron, Inc. - Series 1000

2. Engineer Approved Equal

2.26 SPLIT TYPE FLANGED ADAPTORS - TYPE C10

A. Provide exposed split type flanged adaptors for joining "Grooved or Shoulder End" piping at fittings, valves, equipment, flow meters, and other appurtenances as required, as specified, and as shown on the Drawings. All flanged adapters shall conform in size and bolt hole placement to ANSI standards for steel and/or cast iron flanges 125/150 pound standard unless otherwise required for connections. The flanged adaptors shall be rated for a minimum pressure of 150 psi. All flanged adaptors shall meet or exceed all applicable AWWA C 219 standards.

B. The flange housing/body shall be ductile iron conforming to ASTM A 536 standards, Grade 65-45-12 or carbon steel conforming to ASTM A 512 and ASTM A 52 standards. The follower flanges shall be ductile iron conforming to ASTM A 536 standards. All ferrous metal surfaces of flanged adaptors shall be provided with a corrosion resistant two part epoxy paint finish. The prime and finish coatings shall be in accordance with Section 09 90 00 PAINTS & COATINGS.

C. Gaskets for wastewater service shall be Nitrile (Buna-N/NBR), Grade S, with an NSF 61 listing. The gasket shall have a nominal temperature range of -20 degrees F to 180 degrees F. Gaskets for low pressure air service piping shall be EPDM with a maximum temperature rating of at least 230 degrees F.

D. Only when specified or indicated on the Drawings; provide all flanged adaptors with carbon steel bolts and nuts, conforming to ASTM A 183 standards. Unless otherwise specified or indicated on the Drawings, all flanged adaptors shall be provided with type 316 stainless steel, Grade B-8M, Class 2, bolts, nuts, and washers.

E. Unless otherwise specified or shown on the Drawings, all exposed split type flanged adaptors, of the same type, style, and duty shall be supplied by a single Manufacturer. All Manufacturers named or otherwise shall comply with the Contract Documents. All exposed split type flanged adaptors shall be a product of the following Manufacturer:

1. Victaulic Company of America - Style 341

2. Smith-Blair Inc. - Style 913 or 914

3. Engineer Approved Equal

2.27 EXPANSION JOINTS (LIQUID SERVICE) - TYPE C11

A. Provide single arch flexible connectors of the expansion/vibration type for connection to pumps and equipment as specified and as shown on the Drawings. Expansion joints for liquid waste water service shall be "filled arch" type to prevent sediment build up. Utilize filled arch expansion joints for all sludge, septage, raw wastewater, chemicals and other piping of similar fluid service. Guides shall be provided for each expansion joint.

B. All expansion joints shall be designed for the axial movements required for the specified application along with the maximum axial force required to compress the joint. The joints shall prevent axial, lateral and rotational movement and vibration from being transmitted to the piping and equipment. All expansion joints shall be designed for the test pressure of the connecting piping where installed as outlined in Section 40 05 13 PROCESS PIPE AND FITTINGS or as directed by the Engineer.

C. Unless otherwise specified or shown on the Drawings, all expansion joints for liquid service, of the same type, style, and duty shall be supplied by a single Manufacturer. All Manufacturers named or otherwise shall comply with the Contract Documents. The manufacturer of the expansion joints shall be a member of the Rubber Expansion Joint Division of the Fluid Sealing Association. All liquid service expansion joints shall be a product of the following Manufacturer:

1. General Rubber Corporation - Style 1025

2. Mercer Rubber Company - Series 450

3. Red Valve Company Inc. - Type J-1

4. Engineer Approved Equal

2.28 MATERIALS OF CONSTRUCTION – TYPE C11

A. Expansion joints shall be manufactured of butyl rubber surrounded by high grade woven cotton or suitable synthetic fiber and individual solid steel ring reinforcement. All soft rubber fillers shall be integrally cured into the arches to provide a smooth flow path to prevent settling of material, grit, sludge etc., into the arch. The rubber used shall be specifically designed for service with wastewater and/or sludge. The expansion joints shall include a three-ply abrasion resistant liner.

B. All expansion joints for chemical service shall be constructed of Viton. Provide alternative materials of construction which are compatible with the process fluid if Viton is not compatible.

2.29 JOINTS – TYPE C11

A. Unless otherwise specified or shown on the Drawings, all joints shall match the connecting piping size. The expansion joints shall be designed for the working pressure and fluid service of the connecting piping. All joints shall have full faced fabric reinforced butyl flanges integral with the flexible connector body.

2.30 BACK-UP RINGS – TYPE C11

A. Provide stainless steel back-up rings for each joint. Provide Split steel or ductile iron back-up rings only where specifically indicated on the Drawings to ensure a proper joint fit. Unless otherwise specified or shown on the Drawings, all rings shall be designed for mating with ANSI Standard 125/150 pound flanges. All joints shall be provided with a two part epoxy coating finish. Stainless steel back-up rings shall not be painted.

2.31 CONTROL HARNESSES – TYPE C11

A. All expansion joints used for vibration isolation/expansion service shall be provided with control harness assemblies. All control harness assemblies shall consist of a minimum of two drilled plates, stretcher bolts, and rubber washers backed by metal washers. The stretcher bolts/control rods shall prevent over-elongation of the joint. Extra nuts shall be provided on the stretcher bolts/control rods on the inside of the plate to prevent over compression. All nuts, bolts, fasteners and plates shall be 316 stainless steel.

2.32 SEAL WATER SYSTEMS – TYPE C11

A. Provide flexible connectors for the seal water connection to each pump stuffing box. The flexible connectors shall be designed to isolate vibration from being transmitted from the pump(s) and the seal water piping assemblies. The flexible connectors shall

be hose type constructed of Nitrile (Buna-N/NBR) with fiber type reinforcement. All hose type flexible connectors shall be rated for a pressure of 150 psi. The hose type flexible connectors shall be a minimum of 12 inches long. Provide type 304L stainless steel or bronze NPT end fittings for connection to the pump stuffing box.

2.33 EXPANSION JOINTS (AIR SERVICE) - TYPE C12

A. Provide "bellows style" flexible connectors of the expansion/vibration type for all low pressure air service piping, equipment, and appurtenances as specified and as shown on the Drawings. The flexible connector shall be "non-filled arch" type. All expansion joints shall be designed for a maximum pressure of 20 psig at a temperature of 250 degrees F. The expansion joints shall be designed to prevent rotational movement and vibration from being transmitted to the piping, equipment, or associated appurtenances. All flexible connectors shall be constructed in accordance with the latest revision of Section C of The Standards of the Expansion Joint Manufacturers, Fifth Edition, 1980, including all current addenda.

B. Flange drilling shall match or be suitable for use with the connected equipment or companion flanges. Furnish guides with all bellows style expansion joints. "Hinged" or "Gimbal" expansion joints shall be provided at horizontal and vertical bends in strict accordance with the standards of the Expansion Joint Manufacturer's Association (EJMA). If reinforcement of the expansion joint is necessary for pressure, reinforcing rings shall be formed integrally with bolted-on control devices such as equalizing rings.

C. All bellows style expansion joints shall be hydraulically formed (with dies on the outside only). All seam welding shall be longitudinal only. All seams shall have equal strength, physical properties and thickness as the parent metal. The entire expansion joint, including but not limited to the bellow and internal sleeve shall be constructed entirely of Type 316 stainless steel (minimum). The end flanges shall be constructed of 316 stainless steel. The entire inside length of the expansion joint shall be straight.

D. The expansion joint Manufacturer shall warrant their product to be suitable for the proposed service conditions as specified and as shown on the Drawings. The Manufacturer shall provide lifting lugs at each flange for ease in handling and removal of sheet metal coverage for any expansion joint for maintenance or installation.

E. Unless otherwise specified or shown on the Drawings, all expansion joints for low pressure air service, of the same type, style, and duty shall be supplied by a single Manufacturer. All Manufacturers named or otherwise shall comply with the Contract Documents. The manufacturer of the expansion joints shall be a member of the Expansion Joint Manufacturer's Association (EJMA). All air service expansion joints shall be a product of the following Manufacturer:

1. U.S. Bellows, Inc.

2. Unaflex Inc.

3. Engineer Approved Equal

2.34 HARNESSING AND RESTRAINTS

A. Provide all harnessing as specified, as shown on the Drawings, and as required for couplings and adaptors. Unless otherwise specified or noted, the size and material for tie rods, clamps, plates and hex nuts shall be as shown on the Drawings. When not specifically specified or shown on the Drawings all harnessing and restraints shall be sized per AWWA M11 standards.

B. All restrained joints, such as welded, or locking mechanical joints shall be of the type specified with the individual type of pipe. If not specified, restrained (locking) mechanical joint pipe shall be of the Manufacturer's standard design utilizing a locking device (ring or ears) integrally cast with the pipe. The Contractor shall be responsible for all anchorage and restraint for piping installations.

C. Unless otherwise specified or shown on the Drawings, all harnessing and restraint systems, of the same type, style, and duty shall be supplied by a single Manufacturer. All Manufacturers named or otherwise shall comply with the Contract Documents. All harnessing and restraint systems shall be a product of the following Manufacturer:

1. Dresser Inc. - Style 440

2. Engineer Approved Equal

2.35 QUICK CONNECT COUPLINGS - TYPE C13

A. Provide quick connect couplings as specified and as shown on the Drawings. Quick connect couplings shall be provided at all exterior chemical delivery stations as well as septage delivery stations.

B. Couplings shall match the connecting pipe size shown on the Drawings. The quick connect couplings shall be cam and groove type with a male/female adapter as required. All quick connect couplings shall conform to A-A-59326 and (MIL-C-27487) standards. All couplings for wastewater and septage service which are connected to metallic piping shall have a body constructed of 316 stainless steel with 316 stainless steel handles and pull rings. All seals for wastewater and/or septage service shall be EPDM for maximum UV resistance in outdoor installations. The male adapter shall connect to the pipe via a 125/150 pound flange connection.

C. All couplings connected to PVC (non-metallic piping) as well as all couplings for chemical delivery or chemical service applications shall have a body constructed of polypropylene. The polypropylene shall be acid-resistant and glass-reinforced. Handles and pull rings for polypropylene couplings shall be brass. Gaskets shall be of a material which is compatible with the process fluid to match the gasket of the

piping system, or of a material as specified or as directed by the Engineer. Gaskets for chemical delivery quick connect couplings shall be Viton.

D. The quick connect coupling shall be designed to receive a female/male coupler without requiring threading, bolting, or special tools. The connection shall remain tight and leak-proof under pressures up to 100 psi. Each quick connect coupling shall be furnished with a dust cap complete with a stainless steel security chain. Provide all adaptors and appurtenances as required to provide a complete and working system.

E. Unless otherwise specified or shown on the Drawings, all quick connect couplings, of the same type, style, and duty shall be supplied by a single Manufacturer. All Manufacturers named or otherwise shall comply with the Contract Documents. All quick connect coupling systems shall be a product of the following Manufacturer:

1. OPW Engineered Systems - Kamlock Series

2. Flow Lock Inc. - Snaplock Series

3. Banjo Corporation

4. Engineer Approved Equal

2.36 UNIONS

A. Provide unions as specified and as shown on the Drawings. In addition to that shown on the drawings, provide unions at all locations including but not limited to the following: equipment, pumps, tanks, valves, long piping runs, piping bypasses around equipment, or any other location as directed by the Engineer or Owner. Unions shall be located to allow for ease of piping disassembly, alterations, or repairs.

B. All unions shall be brass or bronze for joining nonferrous metallic pipe. Provide malleable brass, bronze-seated iron, or steel unions for joining ferrous metallic pipe. Provide PVC unions for joining plastic and non-metallic pipe.

2.37 DIELECTRIC CONNECTORS

A. Provide dielectric piping connectors, fittings, and insulators as specified, as shown on the Drawings or as directed by the Engineer. Dielectric pipe connectors and unions shall be used to prevent galvanic action wherever valves or piping of dissimilar metals connect. In addition, provide dielectric connectors whenever copper, brass, or bronze piping is required to be connected to cast iron or steel piping.

B. Provide dielectric flange unions for all connections 2-1/2 inches and larger. All cast iron flanges shall meet ASTM A 126 standards. The copper solder end shall meet ASTM B 62 standards and the pipe thread shall meet ASME B2.1 standards. Dielectric flange unions shall be rated for at least 175 psi at 210 degrees F.

C. Dielectric unions used for piping connections two (2) inches and smaller shall be designed to accommodate the end connections of the two connecting pipe segments. Steel union nuts shall be in accordance with ASTM A 575 standards. Steel or ductile iron connection ends shall have accurately machined taper tapped pipe threads in accordance with ASME B2.1 standards. Copper connection ends shall be solder joint which meets the requirements of ASTM B 88 standards. All dielectric unions for piping connections two (2) inches and smaller shall be rated for at least 250 psi at 210 degrees F.

D. Dielectric fittings and unions shall be manufactured of one or more of the following materials. The materials shall be in accordance with the associated reference standards and criteria:

1. Gray iron - ASTM A 48/A 48M

2. Malleable iron parts - ASTM A 197/A 197M

3. Steel parts - ASTM A 108

4. Brass parts - ASTM B 16

5. Bronze parts - ASTM B 584

6. Zinc parts - ASTM B 633

7. Stainless steel - ASTM A 632

E. All gaskets for water or wastewater service shall be Nitrile (Buna-N/NBR) or EPDM. Gaskets for low pressure air service or other high temperature applications shall be EPDM. The Contractor shall ensure that all gaskets are of a material which is compatible with the process fluid. The use of gasket materials shall be as approved by the Engineer and Manufacturer.

F. Unless otherwise specified or shown on the Drawings, all dielectric unions, of the same type, style, and duty shall be supplied by a single Manufacturer. All Manufacturers named or otherwise shall comply with the Contract Documents. All dielectric union systems shall be a product of the following Manufacturer:

1. Watts Inc. - Series 3000

2. Wilkins, a Zurn Company

3. G&L Fittings Inc.

4. Engineer Approved Equal

G. Provide all flange insulating kits for dielectric connections. One insulator shall be provided for each bolt of the flange connection. Insulated sleeve couplings and flange adaptors shall be similar to those units as previously specified.

H. Unless otherwise specified or shown on the Drawings, all flange insulating kits, of the same type, style, and duty shall be supplied by a single Manufacturer. All Manufacturers named or otherwise shall comply with the Contract Documents. All flange insulating systems shall be a product of the following Manufacturer:

1. Watts Inc.

2. Wilkins a Zurn Company

3. Engineer Approved Equal

2.38 RESTRAINED MECHANICAL JOINT COUPLINGS - TYPE C14

A. Provide restrained mechanical joint couplings where indicated on the Drawings or as specified. Restrained mechanical joint couplings shall only be utilized with written permission of the Engineer when not specified or indicated on the Drawings. Restrained mechanical joint couplings shall not be considered as equivalent to concrete thrust blocks.

B. All restrained mechanical joint couplings shall be listed by Underwriters Laboratories, Inc., as meeting their standard (UL 6M46), latest revision. Restrained mechanical joint couplings shall also comply with Factory Mutual Research Corporation's approvals.

2.39 RETAINER AND FOLLOWER GLANDS – TYPE C14

A. Mechanical joint retainer glands shall be incorporated in the design of the follower gland and shall include a restraining ring that, when actuated by a wedging action of the gland, imparts a restraining force against the pipe that increases as the pressure increases. The restraining ring shall grip the full pipe circumference.

B. Coupling devices that restrain by a method of "Point-Loading" on the pipe shall not be acceptable.

2.40 MATERIALS OF CONSTRUCTION – TYPE C14

A. Glands and restraining rings shall be manufactured of Ductile Iron meeting ASTM A 536 standards, Grade 65-45-12. Restraining rings shall also be heat treated to a minimum hardness of Rockwell 40. The restrained mechanical joint couplings shall meet the latest revisions of ANSI A21.10, AWWA C111/A21.11, and AWWA C153/A21.53 standards. The restraint ring shall be actuated solely by the tee-head bolts. Provide a two part epoxy coating on all ferrous metallic surfaces of couplings.

B. The restrained mechanical joint couplings shall have a working pressure of at least 350 psi with a minimum safety factor of 2:1.

2.41 DUCTILE IRON EXPANSION JOINTS – TYPE C15

A. Expansion joints shall be installed in the locations indicated on the drawings and shall be manufactured of ductile iron conforming to the material properties of ANSI/AWWA C153/A21.53. All expansion joints shall be capable of expanding or contracting to the amounts shown on the drawings or as indicated in the specifications. At a minimum, each expansion joint shall allow for a minimum of four (4) inches of total axial movement.

B. Separation beyond the maximum extension of the expansion joint shall be prevented without the use of external tie rods. Each expansion joint shall be pressure tested against its own restraint to a minimum of 350 psi for joint which are less than 24 inch and 250 psi for joints which are larger than 24 inches. Joint restraint shall be provided with each mechanical joint connection to the expansion joint.

C. All internal surfaces (wetted parts) shall be lined with a minimum of 15 mils of fusion bonded epoxy conforming to the applicable requirements of ANSI/AWWA C213. Exterior surfaces shall be coated with a minimum of 6 mils of fusion bonded epoxy conforming to the applicable requirements of ANSI/AWWA C116/A21.16. Sealing gaskets shall be constructed of EPDM. The coating and gaskets shall meet ANSI/NSF-61. Each ductile iron expansion joint shall be designed in accordance with the following criteria:

1. Size: 3 inch through 36 inch – Match to piping size shown on Drawings

2. Body: Ductile Iron, per ASTM A 536

3. End Connections: Flanged, Mechanical Joint or combination Flanged/Mechanical Joint as required for piping connections or as indicated on the Drawings.

4. Linear Expansion: 4 inches (Minimum)

D. All coupling seals shall conform to the applicable requirements of ANSI/AWWA C111/A21.11. Flange outlets shall conform to the dimensional requirements of ANSI/AWWA C110/A21.10 (class 150) with the addition of an O-ring gasket to ensure a watertight seal. Mechanical Joint end connections conform to the dimensional requirements of either ANSI/AWWA C111/A21.11 or ANSI/AWWA C153/A21.53 depending on size.

PART 3 – EXECUTION

3.01 INSTALLATION OF SLEEVE TYPE COUPLINGS

A. All sleeve type couplings shall be installed in strict accordance with the recommendations of the coupling Manufacturer. The Contractor shall thoroughly clean all pipe connecting ends prior to installation of sleeve couplings. The pipe ends

shall be cleaned a minimum of 8 to 12 inches from the ends of the piping prior to installation. Provide clean soapy water for use as a gasket lubricant.

B. Install the follower ring then the gasket over each pipe end to a distance of approximately 6 inches from the end of the pipe. Place the middle ring over the center of the joint. Insert the pipe length into the middle ring the full and proper distance. The gaskets and followers shall then be pressed evenly into the middle ring flares.

C. Insert all bolts. All bolts shall be finger tightened prior to the use of tools. Progressively tighten diametrically opposite nuts uniformly around the adapter. Once the nuts can no longer be finger tightened use a torque wrench of the appropriate size and torque for the bolts. Utilize the wrench to progressively and uniformly tighten all bolts.

D. The torque applied shall be in accordance with the recommendations of the coupling Manufacturer. The correct torque as indicated by a torque wrench shall not exceed 75 foot-pounds for 5/8 inch bolts and 90 foot-pounds for 3/4 inch bolts.

E. Insert and tighten all tapered threaded lock pins. All bolts shall be finger tightened prior to use of tools. Progressively tighten diametrically opposite nuts uniformly around the adapter. Once the nuts can no longer be finger tightened use a torque wrench of the appropriate size and torque for the bolts. Utilize the wrench to progressively and uniformly tighten all bolts.

F. Provide and install harnessing or flange clamp assemblies where shown on the Drawings, as specified or as directed by the Engineer. Harnessing or flange clamp assemblies shall be provided to prevent sleeve couplings from being pulled apart under pressure. It shall be the Contractor's responsibility for locating, providing and installing all restraints. Harnessing, flange clamp assemblies, or tie rods shall be provided on all pressurized lines.

3.02 INSTALLATION OF SPLIT TYPE COUPLINGS

A. Install all split type couplings in strict accordance with the recommendations of the coupling Manufacturer. Where applicable the Contractor shall refer to specified procedures for the installation of sleeve type couplings. The shoulders of the connecting pipes as well as all other associated portions of the assembly shall be thoroughly cleaned prior to assembly. Slip the gasket over the pipe end. The ends of the pipes and outside of the gaskets shall be moderately coated with petroleum jelly, cup grease, soft soap, or graphite paste to provide lubrication for installation. Once the other pipe has been brought to the correct position, the gasket shall be centered properly over the pipe ends with the lips against the pipes. Then install the housing sections of the coupling.

B. Ensure that the joints are fully extended after the rings are in place. Do not tighten the bolts prior to assuring that the joints are fully extended. Insert all bolts and tighten nuts progressively and uniformly until the housing sections are in tight contact. Do

not overtighten such that excessive bolt tension or strain is applied on the connecting piping. Tighten all fasteners to the torque rating as recommended by the coupling Manufacturer.

3.03 INSTALLATION OF EXPANSION JOINTS

A. Align all piping systems prior to installation of expansion fittings. The alignment shall be provided by fitting a rigid pipe spool in place of the expansion joint. Prior to testing of the piping system, the pipe spool shall be replaced with the specified expansion or flexible fitting.

B. In addition to the locations noted on the Drawings, expansion fittings and anchors shall be located and spaced as specified by the Expansion Joint Manufacturer's Association (EJMA). The Contractor shall not install any expansion joints or flexible connectors during times of temperature extremes or in a fully compressed or fully expanded condition. Install all expansion joints in strict accordance with the Manufacturer's recommendations.

3.04 TESTING

A. All couplings and connectors specified in this section shall be hydrostatically pressure tested with the associated piping as specified or as directed by the Engineer.

END OF SECTION



woodardcurran.com

COMMITMENT & INTEGRITY DRIVE RESULTS

APPENDIX B
CODE OF FAIR PRACTICES AND AFFIRMATIVE ACTION

During the performance of this contract, the contractor, for itself, its assignees and successors in interest (hereinafter referred to as the "Railroad") agrees as follows:

1. **Compliance with Regulations:** The Railroad shall comply with the Regulation relative to nondiscrimination in federally-assisted programs of the Department of Transportation (hereinafter, "DOT") Title 49, Code of Federal Regulations, Part 21, as they may be amended from time to time, (hereinafter referred to as the Regulations), which are herein incorporated by reference and made a part of this contract.
2. **Nondiscrimination:** The Railroad, with regard to the work performed by it during the contract, shall not discriminate on the grounds of race, color, or national origin in the selection and retention of subcontractors, including procurements of materials and leases of equipment. The Railroad shall not participate either directly or indirectly in the discrimination prohibited by section 21.5 of the Regulations, including employment practices when the contract covers a program set forth in Appendix B of the Regulations.
3. **Solicitations for Subcontractors, Including Procurements of Materials and Equipment:** In all solicitations either by competitive bidding or negotiation made by the Railroad for work to be performed under a subcontract, including procurements of materials or leases of equipment, each potential subcontractor or supplier shall be notified by the Railroad of the Railroad's obligations under this contract and the Regulations relative to nondiscrimination on the grounds of race, color, or national origin.
4. **Information and Reports:** The Railroad shall provide all information and reports required by the Regulations or directives issued pursuant thereto, and shall permit access to its books, records, accounts, other sources of information, and its facilities as may be determined by the MaineDOT or its designee to be pertinent to ascertain compliance with such Regulations, orders and instructions. Where any information required of the Railroad is in the exclusive possession of another who fails or refuses to furnish this information the Railroad shall so certify to MaineDOT or its designee as appropriate and shall set forth what efforts it has made to obtain the information.
5. **Sanctions for Noncompliance:** In the event of the Railroad's noncompliance with the nondiscrimination provisions of this contract, MaineDOT shall impose such contract sanctions as it or its federal partner may determine to be appropriate, including, but not limited to:
   (a.) withholding of payments to the Railroad under the contract until the Railroad complies, and/or
   (b.) cancellation, termination or suspension of the contract, in whole or in part.
6. **Incorporation of Provisions:** The Railroad shall include the provisions of paragraphs (1) through (6) in every subcontract, including procurements of materials and leases of equipment, unless exempt by the Regulations, or directives issued pursuant thereto.

The Railroad shall take such action with respect to any subcontract or procurement as MaineDOT or its federal partner may direct as a means of enforcing such provisions including sanctions for non-compliance; Provided, however, that, in the event a Railroad becomes involved in, or is threatened with, litigation with a subcontractor or supplier as a result of such direction, the Railroad may request that MaineDOT to enter into such litigation to protect MaineDOT’s interests, and, in addition, the Railroad may request the United States to enter into such litigation to protect the interests of the United States.

APPENDIX D
PREVENTION OF HARASSMENT AMONG EMPLOYEES

It is the policy of the Maine Department of Transportation (MaineDOT) to enforce the provisions contained in all MaineDOT construction project contracts which provide that all parties have a right to work in an environment free from harassment, including sexual harassment. The MaineDOT prohibits all forms of sexual harassment in the workplace, on the job site or that which may have an effect on the work environment.

THEREFORE:

The Contractor hereby agrees to the following requirements in order to provide and promote a nondiscriminatory workplace free of sexual harassment:

1. No Contractor, supervisor or employee shall allow repeated, objectionable or unwanted verbal or physical advances, sexually explicit derogatory statements, or sexually discriminatory remarks that cause discomfort, humiliation or are in any way offensive to the recipient or which interfere with the quality of any employee's work environment in any way. Furthermore, no one on any job shall threaten or insinuate either explicitly or implicitly that any employee's submission to or rejection of sexual advances will have any effect on that person's employment, job assignment, training, evaluation, promotion, wages or any other term or condition of employment or future job opportunity. Contractors are responsible for ensuring and maintaining a work environment which is free from sexual harassment.

2. Any Contractor whose employee sexually harasses another employee shall be subject to disciplinary action. Contractors who fail to adequately and expeditiously investigate sexual harassment claims at the request of the MaineDOT or other authorized Federal or State agency may be subject to enforcement proceedings and such sanctions as are authorized by law. Contractors are required to provide detailed written reports to MaineDOT when so requested which shall describe the investigation and corrective actions taken by Contractors in all instances of sexual harassment allegations.

3. Contractors shall also be responsible for ensuring that no retaliation, reprisal or intimidation be directed against any complainant or other employee who provides information to any person or agency investigating an allegation or complaint of sexual harassment.

AUTHORITIES:

1. Executive Order 11246
2. Title VII of the Civil Rights Act of 1964
3. EEOC Guidelines on Sexual Harassment
4. PL 94-369 Title I, Section 110
5. 42 U.S.C. Chapter 80, Section 6709
6. 42 U.S.C. Chapter 21, Sections 2000e-2, 2000e-3(a) and 2000e-5(b)
7. 23 U.S.C. Chapter 1, Section 140(a) and Chapter 3, Section 324

Town: **Madawaska**
WIN: **21736.00**
Date: **May 26, 2020**

APPENDIX E

PROTECTION OF RAILROAD TRAFFIC AND STRUCTURES SPECIAL PROVISIONS

1. GENERAL REQUIREMENTS

Part of the work required by the Contract will be performed within a railroad right of way and/or adjacent to the tracks, telephone, telegraph, signal and electric supply lines of a railroad or railroads. The Contractor agrees to perform all such work in compliance with all of the terms of this Special Provision and all safety rules, regulations, or standards applicable to the Railroad. The Contractor shall be fully responsible for all damages arising from his failure to comply with the requirements of this Special Provision. The Contractor shall be deemed to have included all costs in the unit prices of the Schedule of Prices and the Proposal.

2. AMOUNT OF RAILROAD WORK

The estimated amount of work to be done within (**25** feet) of the track of **Maine Northern Railway** is **1%**of the contract.

3. NUMBER OF TRAINS AND TRAIN SPEED

The Contractor is notified that a maximum speed of (**25** mph) will be considered as prevailing for the operation of trains of the Railroad at this project and that the approximate number of trains per day at this project is **Varies**.

4. PRIORITY OF RAILROAD OPERATIONS

The train movements of the Railroad, and its lessees, and licensees shall have absolute priority over the performance of the Construction Project within the railroad right of way. The Contractor hereby agrees that the hours and times of work within the Railroad right of way must be coordinated through the Railroad and that such hours and times are subject to change without prior notice to the Contractor, unless other prior arrangements have been made through the Railroad.

5. AUTHORITY OF RAILROAD TO STOP WORK

If the Contractor fails to comply with the safety terms of this Special Provision, or if the Chief Engineer of the Railroad determines that the Contractor is using unsafe practices that threaten the safety of rail traffic, rail workers, or the general public, the Railroad shall have the right to immediately order the Contractor to cease work and vacate the Railroad's property. The Railroad agrees to confirm any cessation of work in writing by

delivering to the Department's Construction Manager a completed Stop Work Order form attached as Exhibit A within 24 hours of giving any such order.

6. ENTRY UPON RAILROAD PROPERTY

The Railroad hereby agrees to permit the Contractor, together with their subcontractors, suppliers, consultants and engineers (the "Contractor"), to enter upon the Railroad property for the purpose of performing the Construction Project, PROVIDED THAT the Contractor complies with all of the terms of this Special Provision and all safety requirements and directions of the Chief Engineer of the Railroad, or his authorized representative (the "Railroad's Chief Engineer").

7. NOTICE REQUIRED BEFORE ENTRY

The Contractor shall give written notice to the Railroad's Chief Engineer at least **14** calendar day(s) in advance of the time it proposes to do work within the limits of the Railroad right-of-way or perform operations that may create a Hazard as specified by this Special Provision. The Contractor shall give such notice regardless of whether the work may also be within the limits of a public highway.

8. HAZARDS

The Contractor shall assess to its own satisfaction hazards which may be caused by its operations. At a minimum, the Contractor agrees that the following shall constitute Hazards.

An operating track shall be considered fouled and subject to hazard when any object is brought nearer than (**20** feet) to the gauge line of the near rail of the track.

A signal line or communication line shall be considered fouled and subject to hazard when any object is brought nearer than (**15** feet) to any wire or cable.

An electric supply line shall be considered fouled and subject to hazard when any object is brought nearer than (**15** feet) to any wire of the line.

Cranes, trucks, power shovels or any other equipment shall be considered as fouling and subjecting to hazard a track, signal line, communication or electric supply line when working in such position that failure of equipment, with or without load, could foul the track, signal line, communication or electric supply line. The railroad has agreed that if the tracks are not in jeopardy of being fouled a manmade barrier can be erected and flagger protection will not be required so long as all work can be performed out of the restricted area.

Railroad operation will be considered subject to hazard when explosives are used in the vicinity of railroad premises, or during the driving or pulling of sheeting for any footing

adjacent to a track, or when erecting structural steel adjacent to a track, or when performing work under, across or adjacent to a track, or when operations involve swinging booms or chutes that could in any way come nearer then (**15** feet) to the gauge line of the near rail of the track, or when erection or removal of staging, false work or forms fouls a track or wire line.

None of the operations specified as a Hazard above shall be carried on during the approach or passing of a train or without permission from the Railroad's Chief Engineer and the presence of a railroad inspector/flagman, unless other prior arrangements have been made through the Railroad.

9. MINIMUM CLEARANCES

During the construction of staging, false work or forms, the Contractor shall at all times maintain a minimum vertical clearance of (**26** feet) above the top of high rail and a minimum side clearance of (**15** feet) from the gauge line of the near rail where track is tangent. Additional side clearance must be maintained where track is on a curve.

10. WORK PLAN SUBMITTAL AND APPROVAL

The Contractor shall submit in writing to the Railroad's Chief Engineer or duly authorized representative, and the Department's Railroad Property Manager or his appointed representative, at least **14** calendar day(s) in advance of the start of the project, an outline of his plan for work within the Railroad right of way including contemplated method(s) of construction. This plan must meet with the approval of the Railroad's Chief Engineer and the Department's Railroad Property Manager in every respect. If the Contractor contemplates the use of "on the track equipment", it should so state and obtain from the Railroad the conditions pertaining to such operations. All Railroad costs included in this operation will be borne by the Contractor. In a like manner, any of the Contractor's equipment or material on cars for this project shall be handled in conformance with existing traffic rules with all costs borne by the Contractor.

Prior to submitting their Proposal, the Contractor shall have ascertained from the Railroad and from the Department's Railroad Property Manager or his appointed representative, all information relating to its requirements and regulations and all costs in connection with compliance thereto.

11. EXCAVATIONS

Before excavation for footings adjacent to tracks and/or within the Railroad's right-of-way may commence, whether or not also within the limits of a public highway, plans and calculations for such excavations, prepared by a Professional Engineer authorized to practice in Maine, shall be submitted to the Railroad's Chief Engineer for review and approval. Unless other prior arrangements have been made, the Railroad's Chief Engineer shall have **3** week(s) to perform such review and approval and issue a written

permission to proceed with the excavation. No excavation shall proceed without such permission.

At a minimum, excavations must utilize proper bracing, shoring, sheeting or other support as determined by the Railroad's Chief Engineer, to support the tracks with railroad traffic. Open excavation shall be suitably planked over when construction operations are not in progress. No excavation work shall be performed by the Contractor within the limits of the Railroad right of way, whether or not also within the limits of a public highway, until the Contractor has ascertained from the Chief Engineer of the Railroad the location of any wires, conduits, pipes, cables or other railroad facilities below the surface of the ground. Damage to any such facilities caused by the failure of the Contractor to ascertain the location of such facilities or by failure to use due care to avoid injury to such facilities shall be at the expense of the Contractor.

12. EQUIPMENT

Equipment of the Contractor shall be in such condition so as to prevent failure that would cause delay in the operation of trains or damage to railroad facilities. Equipment shall not be placed or put in operation adjacent to a track without first obtaining permission of the Railroad. The Railroad agrees that such permission shall not be unreasonably withheld.

13. RAILROAD SERVICES - GENERALLY

When work is to be performed within the Railroad's right-of-way, the Railroad shall provide the services, equipment and materials provided in this Special Provision including, but not limited to, engineering, flagging, inspection, signal protection and/or relocation, and restoration or replacement of the Railroad's track structure or ballast. Further, if the Railroad's Chief Engineer determines that the Contractor's operations do not comply with all of the safety requirements of this Special Provision and all safety requirements and directions of said Chief Engineer, the Railroad will employ the necessary qualified employees to protect its trains and other facilities. The Contractor shall pay to the Railroad the cost for performing all Railroad Services unless said costs are to be paid by the Department as specified in this Special Provision.

14. INSPECTION / FLAGGING

The Railroad shall furnish and assign all inspectors / flaggers for general inspection purposes of general protection of railroad property and operations during construction as the Railroad's Chief Engineer determines are necessary to preserve safety.

(a) Responsibility for Cost. The Department will bear the cost of all flagging or inspection (including travel time) or any combination thereof for the duration of the project.

(b) Terms. The minimum hours per day for the Railroad employees engaged in inspection flagging services shall be eight (8) hours. Time at rates for straight time, overtime or for deadheading starts in accordance with established practices in effect in the territory in which the project is located. Information as to these practices should be obtained from the Railroad's Chief Engineer.

The Contractor shall notify the Railroad's Chief Engineer and the Chief Engineer of the Department in writing **14** calendar day(s) before beginning, resuming or suspending work within (**25** feet) of the track, so that an inspector may be provided or removed in accordance with the requirements of this Special Provision. An inspector may be removed upon **3** calendar day(s) notice. Failure to give notice of intent to suspend work shall be cause of charge to the Contractor the cost of inspection during the period when work is suspended.

(c) Estimated Cost. The following is an estimate of the cost per day of inspection/flagging necessary for this project. The rates shown include all overhead charges, travel time, deadheading and personal expenses.

Date of estimate **9/16/2020**

Estimated daily rate for four (4) consecutive hours Monday-Friday (straight time):
$**376.76**

Estimated daily rate for four (4) consecutive hours Saturday, Sunday, Holiday (overtime):
$565.20

Estimated rate for hours worked in excess of eight (8) hours in any one day:
$**141.30/hour**

Rates charged will be those in effect at the time of the performing the inspection/ flagging which may be different than the rates used at the date of the Estimate. The Railroad agrees to notify the Department if rates used to calculate the above estimates change before the date of bids are received for this Contract.

(d) Definitions.

Man day (M.D.) - eight (8) consecutive hours or any portion thereof.

Overtime - Each additional hour or fraction thereof consecutive to and beyond the standard man day will count as 3/16 of a man day.

Standard Man day - Eight (8) consecutive hour, Monday - Friday between the hours of **7:00** a.m. to **3:30** p.m. unless otherwise noted and agreed to by all parties.

Travel Time - Time required by flagger and/or inspector to commute between his or her point of headquarters to the project site. This time shall not be charged in determining available man days.

15. OTHER CONTRACTOR RESPONSIBILITIES

The restoring and resurfacing of tracks, if disturbed due to Contractor's operations, shall be at the expense of the Contractor.

Any other changes made, or services furnished by the Railroad as a result of the Contractor will be at the Contractor's expense.

16. EXTRA-CONTRACT SERVICES

Temporary and permanent changes of tracks and telephone, signal and electric supply lines made necessary by or to clear the permanent work of the Contractor as shown on the construction plans and included in the Railroad force account as recollect able from the State will be made or caused to be made by the Railroad without expense to the Contractor.

17. INDEMNIFICATION

Where work is being performed over, under, across or adjacent to Railroad premises, the Contractor shall defend, indemnify and save harmless Maine Northern Railway Company, Eastern Maine Railway Company and the Maine Department of Transportation from and against any and all loss, cost, damage, claims, suits, demands, or liability for damages for personal injury including death and for damage to property, which may arise from or out of the operations conducted under his contract, occurring by reason of any act or omission of the Contractor, his agents, servants or employees, or by reason of any act or omission of any subcontractor, his agents, servants or employees.

18. INSURANCE

In addition to any other forms of insurance or bonds required under the terms of the Contract, the Contractor will be required to procure and maintain, at its sole cost and expense, the following insurance coverages:

(a) Railroad Protective Liability Insurance with limits not less than **$2M** per single occurrence and **$5M** per aggregate total occurrences naming Eastern Maine Railway Company and Maine Northern Railway Company as additional insureds.

(b) Comprehensive General Liability Insurance protecting against liability from bodily injury or property damage arising out of the Construction Project with limits of not less than **$2M** per single occurrence and **$5M** per aggregate total occurrences naming Eastern Maine Railway Company and Maine Northern Railway Company as additional insureds.

(c) Workers Compensation and Occupational Disease Insurance, as required by law.

(d) Automobile Liability Insurance covering all motor vehicles used about or in connection with the Construction Project naming Eastern Maine Railway Company and Maine Northern Railway Company as additional insureds.

If any part of the work is sublet, these insurance coverages shall be provided by or on behalf of the subcontractors to cover their operations

Each policy shall carry an endorsement covering the "save harmless" clause in favor of Eastern Maine Railway Company and Maine Northern Railway Company and the Maine Department of Transportation, as set forth in the paragraph, "Responsibility for Damage Claims". Each policy (other than Workers Compensation) shall include a cross liability and severability of interest clause and a waiver of subrogation in favour or each of Eastern Maine Railway Company, Maine Northern Railway Company.

If blasting is to be done in the vicinity of the Railroad, the insurance policies shall include such coverage.

The policies shall be in force before any work is done on the project and shall remain in effect until all work required to be performed under the terms of the contract is satisfactorily completed as evidenced by the formal acceptance by the State and the Railroad.

Before any work is done on the project, the Department of Transportation and the Railroad's Chief Engineer shall be furnished certificates of each policy. Further, the original policy of the Comprehensive General Liability Insurance and the Railroad Protective Liability Insurance shall be furnished to the Railroad's Chief Engineer and a duplicate shall be furnished to the Department of Transportation.

The policy or policies of the Railroad's protective public liability and property damage liability shall be written by a Company authorized to do business in the State of Maine and shall be signed by the President and Secretary of the Insurance Company and shall be countersigned by an authorized representative of the Company.

19. **ROADWAY WORKER SAFETY REGULATION**

Notice to all Contractors/Subcontractors and individuals must be aware of the Federal Roadway Worker Safety Regulation, CFR 49, Part 214(c). They may be required to comply with this regulation. Any requirements for them to comply will be discussed at the pre-construction utility meeting.

Town: **Madawaska**
WIN: **21736.00**
Date: **May 26, 2020**

EXHIBIT A
ORIGINAL TO CONTRACTOR

MDOT/RAILROAD STOP WORK ORDER

Section A - Contractor	Town
	DOT Railroad Project #
Railroad Name	Location
	Notice #
DESCRIPTION OF SAFETY HAZARD/REASON FOR ORDER	
Standard Violated	RAC (Risk Assessment Code) **N/R**
Railroad Official (Flagger/Inspector) Name Signature	Date
SECTION B - ACTION TAKEN:	

cc: MDOT - R.E. or Inspector
MDOT - Utility Section
MDOT - Construction Division
Railroad - Chief Engineer

1. Risk Assessment. Each identified/validated hazard shall be assigned a Risk Assessment Code (RAC) by the Safety Office. The RAC represents the degree of risk associated with the deficiency and combines the elements of hazard severity and mishap probability. The RAC is derived as follows:

a. Hazard Severity. The hazard severity is an assessment of the worst potential consequence: Defined by degree of injury, occupational illness, or property damage, which is likely to occur as a result of a deficiency. Hazard severity categories shall be assigned by roman numeral according to the following criteria.

(1) Category I - Catastrophic: The hazard may cause death or loss of a facility.

(2) Category II - Critical: May cause severe injury, severe occupational illness, or major property damage.

(3) Category III - Marginal: May cause minor injury, minor occupational illness, or minor property damage.

(4) Category IV - Negligible: Probably would not affect personnel safety or health but is nevertheless in violation of a NAVOSH standard.

b. Mishap Probability. The mishap probability is the probability that a hazard will result in a mishap, based on an assessment of such factors as location, exposure in terms of cycles or hours of operation, and affected population. Mishap probability shall be assigned an Arabic letter according to the following criteria:

(1) Sub-category A - Likely to occur immediately or within a short period of time.

(2) Sub-category B - Probably will occur in time.

(3) Sub-category C - May occur in time.

(4) Sub-category D - Unlikely to occur.

c. Risk Assessment Code. The RAC is an expression of risk which combines the elements of hazard severity and mishap probability. Using the matrix shown below, the RAC is expressed as a single Arabic number that can be used to help determine hazard abatement priorities.

	Mishap Probability					RAC
		A	B	C	D	1 - Critical
Hazard Severity	I	1	1	2	3	2 - Serious
	II	1	2	3	4	3 - Moderate
	III	2	3	4	5	4 - Minor
	IV	3	4	5	5	5 - Negligible

December 15, 2020
Supersedes August 27, 2020

2020 STANDARD DETAIL UPDATES

Standard Details and Standard Detail updates are available at:
http://maine.gov/mdot/contractors/publications/standarddetail/

Detail #	Description	Revision Date
802(05)	Roadway Culvert End Slope Treatment	1/03/2017
643(11)	ATCC Cabinet	12/14/2020

ATCC CABINET

643(II)

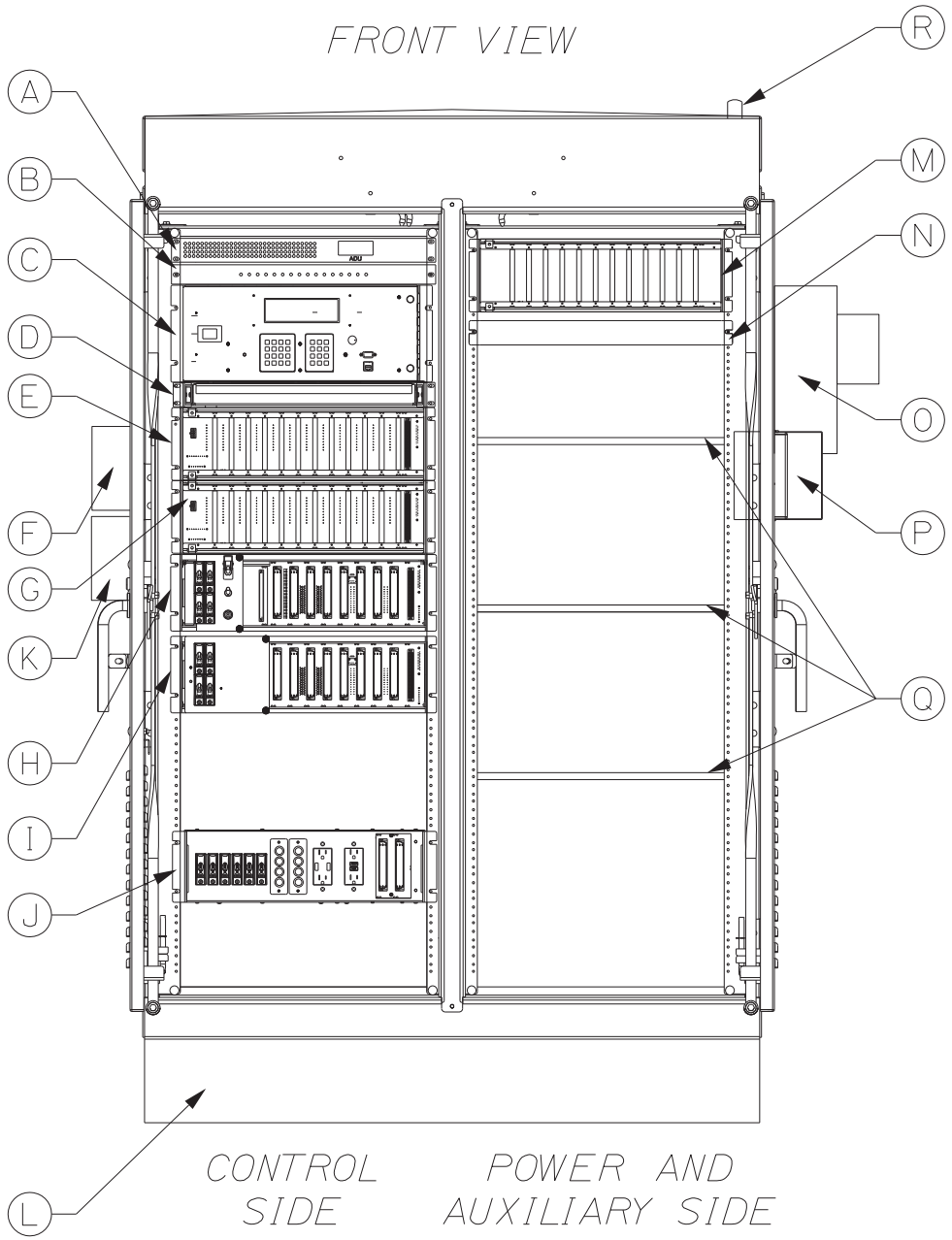
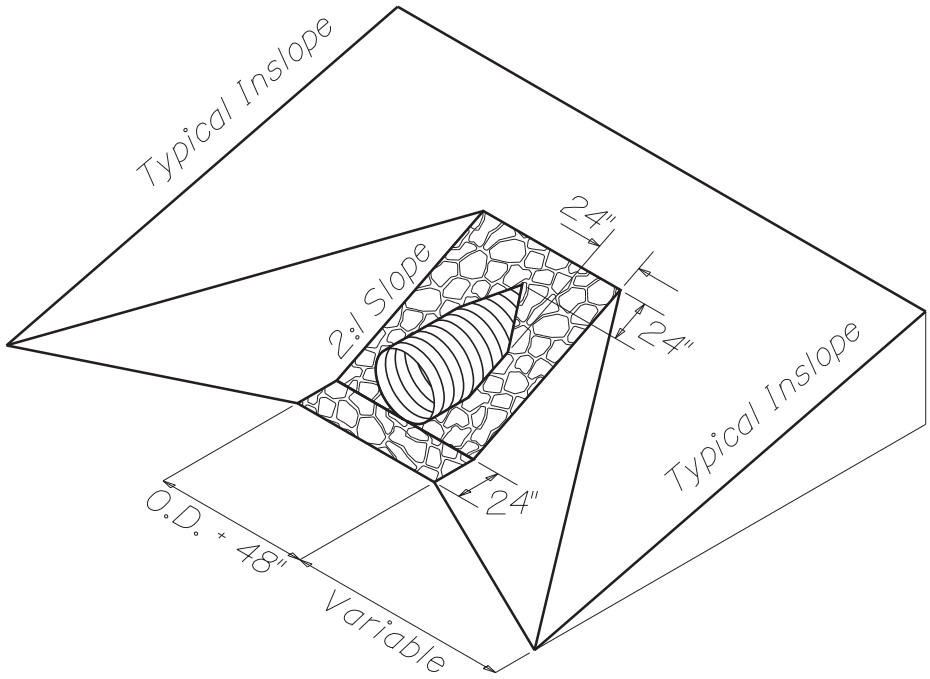
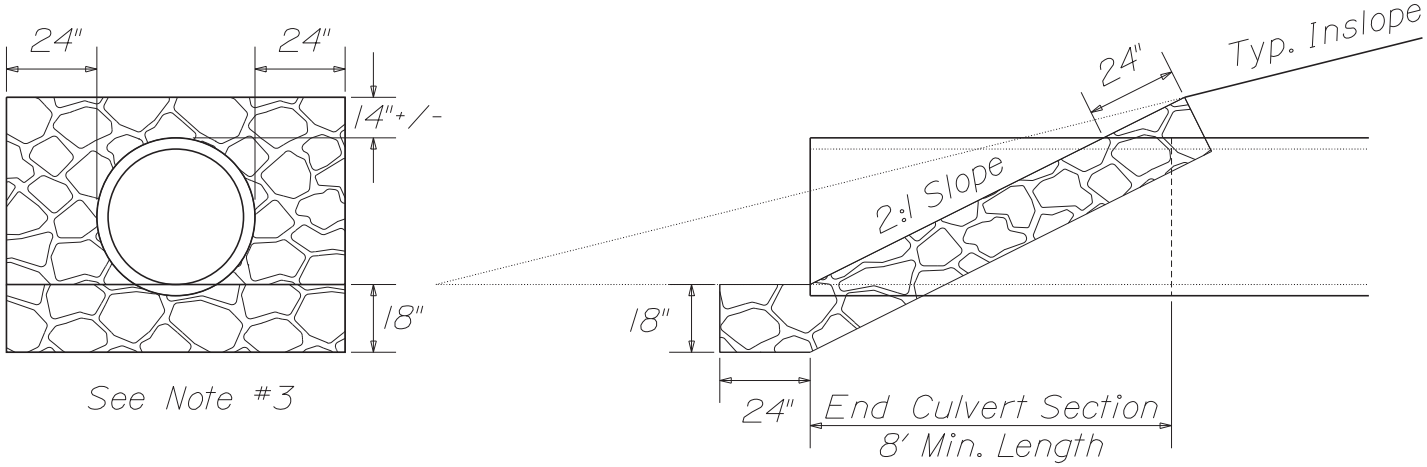


TABLE OF COMPONENTS	
CONTROL SIDE	
A	Auxiliary Display Unit
B	Detector Test Switch Panel
C	ATC Controller
D	Pull-out Drawer
E	24 Channel Input Assembly
F	GFI Outlet Access Box
G	24 Channel Input Assembly
H	Output Assembly Channels 1-16
I	Output Assembly Channels 17-32
J	Service Assembly
K	Generator Access Panel MTD to Cabinet Wall 36" Above Grade
L	6" Extender Base
POWER & AUX. SIDE	
M	Empty 19" Card Cage
N	Field Monitoring Unit
O	Electric Service Meter Socket/ Electrical Service Disconnect
P	Police Door MTD to Front Door
Q	Shelves
R	Cellular Antennna





NOTES:

1. The dimensions shown are approximate and may be modified in the field by the Resident.
2. Riprap will be required on portions of the culvert end treatment that lie on a 2:1 slope. The remaining portions shall be loamed, seeded and mulched as directed.
3. Install riprap 24" around the outside diameter of the culvert pipe.

REFERENCE: Best Managment Practices for Erosion and Sediment Control - Culvert Inlet / Outlet Protection.

ROADWAY CULVERT END SLOPE TREATMENT

802(05) Revised January 1,2017

SUPPLEMENTAL SPECIFICATIONS
(Corrections, Additions, & Revisions to Standard Specifications – March 2020)

SECTION 104
GENERAL RIGHTS AND RESPONSIBILITIES

104.2.1 Furnishing of Right-of-Way Revise the last sentence in the first paragraph by removing "105.4.5 – Special Detours" and replacing it with "**105.4.5 – Maintenance of Existing Structures**.".

SECTION 401
HOT MIX ASPHALT PAVEMENT

401.19 Contractor Quality Control Amend this Section by adding the following to the end:
"Failure to comply with the approved QCP will result in work suspension and pay reductions as outlined in Section 106.4.6. The Quality Control Plan Value shall be the total bid value for all items covered by the QCP as identified in Special Provision 403."

SECTION 502
STRUCTURAL CONCRETE

502.09 Forms and Falsework Amend this subsection by adding the subsection title "**502.10 Placing Concrete**" after section "D" Removal of Forms and False work" and after the paragraph beginning with "2. Forms and False work, including blocking…". So that a new subsection starts and reads:

"**502.10 Placing Concrete**

A. **General Concrete shall not be placed until forms** …."

502.1701 Quality Control, Method A and B Revise this Section so that the first paragraph and the first sentence of the second paragraph read:

"**502.17 Quality Control The Contractor shall control the quality of the concrete through testing, inspection, and practices which shall be described in the QCP, sufficient to assure a product meeting the Contract requirements. The QCP shall meet the requirements of Section 106, Quality, and this specification. No work under this item shall proceed until the QCP is submitted to and approved by the Department. Failure to comply with the approved QCP will result in work suspension and pay reductions as outlined in Section 106.4.6. The Quality Control Plan Value shall be the total bid value for all cast-in-place items covered by the QCP, using the P value listed in Special Provision 502. If no P value is listed, a value of $350, or bid value per cubic yard, whichever is less, shall be used.**

502.1701 Quality Control, Method A and B The QCP shall address all elements that affect the quality of the structural concrete including, but not limited to, the following: "

502.18, Method of Measurement, Revise Subsection 'F' by removing the word 'transverse' so that it reads: "**Saw cut grooving of concrete wearing surfaces, complete and accepted, will be measured for payment as one lump sum**."

502.19, Basis of Payment, Revise the third paragraph by removing the word 'transverse' so that it reads: "**Saw cut grooving of concrete wearing surfaces will be paid for at the Contract Lump Sum Price, which shall be payment for furnishing all materials, labor, and equipment, including depth gauges and all incidentals, to satisfactorily complete the work."**

535.24, Installation of Slabs, Beams, and Girders Revise the 5th paragraph by replacing "6.0 and 9.0" to "5.0 and 8.0" so it reads: **"Ready mixed grout shall achieve a design compressive strength of 6,000 psi at 28 days, have an entrained air content of between 5.0 and 8.0 percent, be non-shrink, flowable, and contain a non-shrink additive listed on the Department QPL for expansive cements."**

535.25, Installation of Precast/Prestressed Deck Panels Revise the 2nd paragraph by replacing "6.0 and 9.0" to "5.0 and 8.0" so it reads: **"Ready mixed grout shall achieve a design compressive strength of 6,000 psi at 28 days, have an entrained air content of between 5.0 and 8.0 percent, be non-shrink, flowable, and contain a non-shrink additive listed on the Department QPL for expansive cements."**

SECTION 506
SHOP APPLIED PROTECTIVE COATING – STEEL

506.13 Surface Preparation Amend this section by adding this paragraph to the end:

"**Steel shall meet the requirements of SSPC SP8 Pickling prior to being immersed in the zinc tanks. Verification of the surface preparation shall be included in the QC documentation**."

SECTION 523
BEARINGS

523.22 Fabrication Amend this subsection by adding the following: "**Elastomeric Bearings shall be fabricated in accordance with AASHTO M251."**

SECTION 606
GUARDRAIL

Amend this section by replacing it with the following:

606.01 Description This work shall consist of furnishing and installing guardrail components in accordance with these specifications and in reasonably close conformity with the lines and grades shown on the plans or as established. Guardrail is designated as:

31” W-Beam Guardrail - Mid-Way Splice
Galvanized steel w-beam, 8” wood or composite offset blocks, galvanized steel posts

Thrie Beam
Galvanized steel thrie beam, 8” wood or composite offset blocks, galvanized steel posts

Median guardrail shall consist of two beams of the above types, mounted on single posts.

Bridge mounted guardrail shall consist of furnishing all labor, materials, and equipment necessary to install guardrail as shown on the plans. This work shall also include drilling for and installation of offset blocks if specified, and incidental hardware necessary for satisfactory completion of the work.

Remove and Reset and Remove, Modify, and Reset guardrail shall consist of removing the existing designated guardrail and resetting in a new location as shown on the plans or directed by the Resident. Remove, Modify, and Reset guardrail and Modify guardrail include the following guardrail modifications: Removing plate washers at all posts, except at anchorage assemblies as noted on the Standard Details, adding offset blocks, and other modifications as listed in the Construction Notes or General Notes. Modifications shall conform to the guardrail Standard Details.

Bridge Connection shall consist of the installation and attachment of beam guardrail to the existing bridge. This work shall consist of constructing a concrete end post or modifying an existing end post as required, furnishing, and installing a terminal connector, necessary hardware, and incidentals required to complete the work as shown on the plans. Bridge Transition shall consist of a bridge connection and furnishing and installing guardrail components as shown in the Standard Details.

606.02 Materials Materials shall meet the requirements specified in the following Sections of Division 700 - Materials:

Timber Preservative	708.05
Metal Beam Rail	710.04
Guardrail Posts	710.07
Guardrail Hardware	710.08

Guardrail components shall meet the applicable standards of "A Guide to Standardized Highway Barrier Hardware" prepared and approved by the AASHTO-AGC-ARTBA Joint Cooperative Committee, Task Force 13 Report.

Posts for underdrain delineators shall be “U” channel steel, 8 ft long, 2 ½ lb/ft minimum and have 3/8-inch round holes, 1-inch center to center for a minimum distance of 2 ft from the top of the post.

Reflectorized Flexible Guardrail Markers shall be mounted on all guardrails. A marker shall be mounted onto guardrail posts at the flared guardrail terminal end point and tangent point, both at the leading and trailing ends of each run of guardrail. The marker’s flexible posts shall be gray with either silver-white or yellow reflectors (to match the edge line striping) at the tangents, red at leading ends, and green at trailing ends. Whenever the guardrail terminal is not flared, markers will only be required at the terminal end point. These shall be red or green as appropriate. Markers shall be

installed on the protected side of guardrail posts unless otherwise approved by the Resident. Reflectorized flexible guardrail markers shall be from the Department's Qualified Products List of Delineators. The marker shall be gray, flexible, durable, and of a non-discoloring material to which 3-inch by 9-inch reflectors shall be applied, and capable of recovering from repeated impacts and meeting MASH 16 requirements. Reflective material shall meet the requirements of Section 719.01 for ASTM D 4956 Type III reflective sheeting. The marker shall be secured to the guardrail post with two fasteners, as shown in the Standard Details.

Reflectorized beam guardrail ("butterfly"-type) delineators shall be mounted on all "w"-beam guardrail. The delineators shall be mounted within the guardrail beam at guardrail posts. Delineators shall be fabricated from high-impact, ultraviolet & weather resistant thermoplastic. Reflectorized beam guardrail delineators shall be placed at approximately 62.5 ft intervals or every tenth post on tangents and at approximately 31.25 ft intervals or every fifth post on curves. Exact locations of the delineators shall be as directed by the Resident. On divided highways, the left-hand delineators shall be yellow, and the right-hand delineators shall be silver/white. On two directional highways, the right-hand side shall be silver/white, and no reflectorized delineator used on the left. All reflectors shall have reflective sheeting applied to only one side of the delineator facing the direction of traffic as shown in the Standard Details. Reflectorized sheeting for guardrail delineators shall meet the requirements of Section 719.01.

Single wood post shall be of cedar, white oak, or tamarack, well-seasoned, straight, and sound and have been cut from live trees. The outer and inner bark shall be removed, and all knots trimmed flush with the surface of the post. Posts shall be uniform taper and free of kinks and bends.

Single steel post shall conform to the requirements of Section 710.07 b.

Single steel pipe post shall be galvanized, seamless steel pipe conforming to the requirements of ASTM A120, Schedule No. 40, Standard Weight.

Acceptable multiple mailbox assemblies shall be listed on the Department's Qualified Products List and shall be MASH 16 tested and approved.

Flared and Tangent w-beam guardrail terminals and guardrail offset blocks shall be from the Department's Qualified Products List. Flared terminals shall be installed with a 4 ft offset as shown in the Manufacturer's installation instructions.

Anchorage assemblies used to anchor trailing ends, radius guardrail, or other ends not exposed to traffic shall meet the applicable standards of "A Guide to Standardized Highway Barrier Hardware" prepared and approved by the AASHTO-AGC-ARTBA Joint Cooperative Committee, Task Force 13 Report, Drawing SEW02a.

Existing materials damaged or lost during adjusting, removing and resetting, or removing, modifying, and resetting, shall be replaced by the Contractor without additional compensation. Existing guardrail posts and guardrail beams found to be unfit for reuse shall be replaced when directed by the Resident.

606.03 Posts Posts for guardrail shall be set plumb in holes or they may be driven if suitable driving equipment is used to prevent battering and distorting the post. When posts are driven through pavement, the damaged area around the post shall be repaired with approved bituminous patching. Damage to lighting and signal conduit and conductors shall be repaired by the Contractor.

When set in holes, posts shall be on a stable foundation and the space around the posts, backfilled in layers with suitable material, thoroughly tamped.

The reflectorized flexible guardrail markers shall be set plumb with the reflective surface facing the oncoming traffic. Markers shall be installed on the protected side of guardrail posts. Markers, which become bent or otherwise damaged, shall be removed and replaced with new markers.

Single wood posts shall be set plumb in holes and backfilled in layers with suitable material, thoroughly tamped. The Resident will designate the elevation and shape of the top. The posts, that are not pressure treated, shall be painted two coats of good quality oil base exterior house paint.

Single steel posts shall be set plumb in holes as specified for single wood posts or they may be driven if suitable driving equipment is used to prevent battering and distorting the post.

Additional bolt holes required in existing posts shall be drilled or punched, but the size of the holes shall not exceed the dimensions given in the Standard Details. Metal around the holes shall be thoroughly cleaned and painted with two coats of approved aluminum rust resistant paint. Holes shall not be burned.

606.04 Rails Brackets and fittings shall be placed and fastened as shown on the plans. Rail beams shall be erected and aligned to provide a smooth, continuous barrier. Beams shall be lapped with the exposed end away from approaching traffic.

End assemblies shall be installed as shown on the plans and shall be securely attached to the rail section and end post.

All bolts shall be of sufficient length to extend beyond the nuts but not more than ½ inch. Nuts shall be drawn tight.

Additional bolt holes required in existing beams shall be drilled or punched, but the size of the holes shall not exceed the dimensions given in the Standard Details. Metal around the holes shall be thoroughly cleaned and painted with two coats of approved aluminum rust resistant paint. Holes shall not be burned.

606.045 Offset Blocks The same offset block material is to be provided for the entire project unless otherwise specified.

606.05 Shoulder Widening At designated locations the existing shoulder of the roadway shall be widened as shown on the plans. All grading, paving, seeding, and other necessary work shall be in accordance with the Specifications for the type work being done.

606.06 Mail Box Post Single wood post shall be installed at the designated location for the support of the mailbox. The multiple mailbox assemblies shall be installed at the designated location in accordance with the Standard Details and as recommended by the Manufacturer. Attachment of the mailbox to the post will be the responsibility of the home or business owner.

606.07 Abraded Surfaces All galvanized surfaces of new guardrail and posts, which have been abraded so that the base metal is exposed, and the threaded portions of all fittings and fasteners and cut ends of bolts shall be cleaned and painted with two coats of approved rust resistant paint.

606.08 Method of Measurement Guardrail will be measured by the linear foot from center to center of end posts along the gradient of the rail except where end connections are made to masonry or steel structures, in which case measurement will be as shown on the plans. When connected to radius rail, measurement will be to the end of the last tangent beam.

Guardrail terminal, reflectorized flexible guardrail marker, terminal end, anchorage assembly, bridge transition, bridge connection, multiple mailbox post, and single post will be measured by each unit of the kind specified and installed.

Widened shoulder will be measured as a unit of grading within the limits shown on the plans.

Excavation in solid rock for placement of posts will be paid under force account unless otherwise indicated in the Bid Documents.

606.09 Basis of Payment The accepted quantities of guardrail will be paid for at the contract unit price per linear foot for the type specified, complete in place. Reflectorized beam guardrail (“butterfly”-type) delineators will not be paid for directly but will be considered incidental to guardrail items. Reflectorized flexible guardrail marker, terminal end, anchorage assembly, bridge transition, bridge connection, multiple mailbox post, and single post will be paid for at the contract unit price each for the kind specified complete in place.

Guardrail terminals will be paid for at the contract price each, complete in place which price shall be full payment for furnishing and installing all components including the terminal section, posts, offset blocks, "w" beam, cable foundation posts, plates and for all incidentals necessary to complete the installation within the limits as shown on the Standard Details or the Manufacturer’s installation instructions. Pay limits for a flared terminal will be 37.5 feet. Pay limits for a tangent terminal will be 50 feet. Each guardrail terminal will be clearly marked with the Manufacturer’s name and model number to facilitate any future needed repair. Such payment shall also be full compensation for furnishing all material, excavating, backfilling holes, assembling, and all incidentals necessary to complete the work, except that for excavation for posts or anchorages in solid ledge rock, payment will be made under 109.7.5 – Force Account. Type III Retroreflective Adhesive Sheeting shall be applied to the approach buffer end sections and sized to substantially cover the end section. On all roadways, the ends shall be marked with alternating black and retroreflective yellow stripes. The stripes shall be 3 in wide and sloped down at an angle of 45 degrees toward the side on which traffic is to pass the end section. Guardrail terminals shall also include a set of installation drawings supplied to the Resident.

Anchorages to bridge end posts will be part of the bridge work. Connections thereto will be considered included in the unit bid price for guardrail.

Guardrail to be placed on a radius of curvature of 150 ft or less will be paid for under the designated radius pay item for the type guardrail being placed.

Widened shoulder will be paid for at the contract unit price each complete in place and will be full compensation for furnishing and placing, grading and compaction of aggregate subbase and any required fill material.

Adjust guardrail will be paid for at the contract unit price per linear foot and will be full compensation for adjusting to grade. Payment shall also include adjusting guardrail terminals where required.

Modify guardrail will be paid for at the contract unit price per linear foot and will be full compensation for furnishing and installing offset blocks, additional posts, and other specified modifications; removing, modifying, installing, and adjusting to grade existing posts and beams; removing plate washers and backup plates, and all incidentals necessary to complete the work. Payment shall also include removing and resetting guardrail terminals where required.

Remove and Reset guardrail will be paid for at the contract unit price per linear foot and will be full compensation for removing, transporting, storing, reassembling all parts, necessary cutting, furnishing new parts when necessary, reinstalling at the new location, and all other incidentals necessary to complete the work. Payment shall also include removing and resetting guardrail terminals when required.

Remove, Modify, and Reset guardrail will be paid for at the contract unit price per foot and will be full compensation for the requirements listed in Modify guardrail and Remove and Reset guardrail.

Bridge Connections will be paid for at the contract unit price each. Payment shall include, attaching the connection to the endpost including furnishing and placing concrete and reinforcing steel necessary to construct new endposts if required, furnishing and installing the terminal connector, and all miscellaneous hardware, labor, equipment, and incidentals necessary to complete the work.

Bridge Transitions will be paid for at the contract unit price each. Payment shall include furnishing and installing the thrie beam or “w”-beam terminal connector, doubled beam section, and transition section, where called for, posts, hardware, precast concrete transition curb, and any other necessary materials and labor, including the bridge connection as stated in the previous paragraph.

No payment will be made for guardrail removed, but not reset and all costs for such removal shall be considered incidental to the various contract pay items.

Payment will be made under:

Pay Item	Pay Unit

606.1301	31” W-Beam Guardrail - Mid-Way Splice – Single Faced	Linear Foot
606.1302	31” W-Beam Guardrail - Mid-Way Splice – Double Faced	Linear Foot
606.1303	31” W-Beam Guardrail - Mid-Way Splice, 15’ Radius and Less	Linear Foot
606.1304	31” W-Beam Guardrail - Mid-Way Splice, Over 15’ Radius	Linear Foot
606.1305	31” W-Beam Guardrail - Mid-Way Splice Flared Terminal	Each
606.1306	31” W-Beam Guardrail - Mid-Way Splice Tangent Terminal	Each
606.1307	Bridge Transition (Asymmetrical) – Type IA	Each
606.1721	Bridge Transition - Type I	Each
606.1722	Bridge Transition - Type II	Each
606.1731	Bridge Connection - Type I	Each
606.1732	Bridge Connection - Type II	Each
606.178	Guardrail Beam	Linear Foot
606.25	Terminal Connector	Each
606.257	Terminal Connector - Thrie Beam	Each
606.259	Anchorage Assembly	Each
606.265	Terminal End-Single Rail - Galvanized Steel	Each
606.266	Terminal End-Single Rail - Corrosion Resistant Steel	Each
606.275	Terminal End-Double Rail - Galvanized Steel	Each
606.276	Terminal End-Double Rail - Corrosion Resistant Steel	Each
606.353	Reflectorized Flexible Guardrail Marker	Each
606.354	Remove and Reset Reflectorized Flexible Guardrail Marker	Each
606.356	Underdrain Delineator Post	Each
606.358	Guardrail, Modify	Linear Foot
606.362	Guardrail, Adjust	Linear Foot
606.365	Guardrail, Remove, Modify, and Reset	Linear Foot
606.366	Guardrail, Remove and Reset	Linear Foot
606.367	Replace Unusable Existing Guardrail Posts	Each
606.47	Single Wood Post	Each
606.48	Single Galvanized Steel Post	Each
606.50	Single Steel Pipe Post	Each
606.51	Multiple Mailbox Support	Each
606.568	Guardrail, Modify - Double Rail	Linear Foot
606.63	Thrie Beam Rail Beam	Linear Foot
606.64	Guardrail Thrie Beam - Double Rail	Linear Foot
606.65	Guardrail Thrie Beam - Single Rail	Linear Foot
606.66	Terminal End Thrie Beam	Each
606.70	Transition Section - Thrie Beam	Each
606.71	Guardrail Thrie Beam - 15 ft radius and less	Linear Foot
606.72	Guardrail Thrie Beam - over 15 ft radius	Linear Foot
606.73	Guardrail Thrie Beam - Single Rail Bridge Mounted	Linear Foot
606.74	Guardrail - Single Rail Bridge Mounted	Linear Foot
606.753	Widen Shoulder for Low Volume Guardrail End	Each
606.754	Widen Shoulder for Flared Guardrail Terminal	Each
606.78	Low Volume Guardrail End	Each
606.80	Buried-in-Slope Guardrail End	Each

SECTION 609
CURB

609.02 Materials Revise the paragraph beginning "The Contractor shall submit a concrete mix…" so that it reads:

"**The Contractor shall submit a concrete mix design for the Portland Cement Concrete to the Resident, with a minimum designed compressive strength of 3000 psi concrete fill**."

609.03 Vertical Stone Curb, Terminal Section and Transition Sections and Portland Cement Concrete Curb, Terminal Sections and Transition Sections Revise this section by underlining the section number and title so that it reads in the spec book as:

"**609.03 Vertical Stone Curb, Terminal Section and Transition Sections and Portland Cement Concrete Curb, Terminal Sections and Transition Sections**"

Revise the last paragraph beginning with "The Contractor may elect…" so that it reads:

"The Contractor may elect to substitute concrete to backfill Stone Curbing or Stone Edging at their option. If the concrete backfill option is elected, the Concrete Fill shall **meet the requirements of 609.02."**

SECTION 610
STONE FILL, RIPRAP, STONE BLANKET, AND STONE DITCH PROTECTION

610.02 Materials Amend this subsection by adding the following to the end of the material list:
"**Stone Ditch Protection 703.29"**

SECTION 618
SEEDING

618.08 Mulching Revise this Section so that the third sentence reads: "Mulch for Seeding Method Number 1 shall only be cellulous fiber mulch Section 619.04 **(b)** or straw mulch Section 619.04 (**a**)."

SECTION 626
FOUNDATIONS, CONDUIT, AND JUNCTION BOXES FOR HIGHWAY SIGNING, LIGHTING, AND SIGNALS

626.034 Concrete Foundations Revise this Section by changing '626.037' to '**626.036**' in the Second Paragraph which begins with "Foundations shall consist of cast-in-place…".

Revise the 10th paragraph beginning with "Before placing concrete, the required elbows…" by removing "…**in accordance with Standard Specification 633**."

SECTION 627
PAVEMENT MARKINGS

627.06 Application Revise this subsection by replacing the paragraph beginning with " On other final pavement markings…" with the following:
"On other final pavement markings and on curb, where the paint is applied by hand painting or spraying, application shall be one uniform covering coat at least 16 mils thick. Before the paint has dried, the glass beads shall be applied by a pressure system that will force the glass beads onto the undried paint as uniformly as possible.

Painted lines and markings shall be applied in accordance with the manufacturer's published recommendations. These recommendations will be supplied to the Resident prior to installation."

SECTION 643
TRAFFIC SIGNALS

643.09 Service Connection Revise this subsection by removing the paragraph that begins with "Traffic signal services shall have…".

And by removing the paragraphs beginning with " A service ground rod shall be installed…" and "A total of 4, 10' service…" and replace them with "**A total of 4, 10' service ground rods shall be installed and properly connected together on the outside of the cabinet foundation. One ground rod shall be located at each corner and shall be either flush or slightly below finished grade. The connection between the ground rod and the ground wire shall be an exothermic connection such as a Cadweld. The ground wire from the interconnected ground rods shall be routed through a conduit in the foundation and into the base of the cabinet**".

SECTION 645
HIGHWAY SIGNING

Section 645.023 Sign Support Structures. Under letter "c.", revise the fifth paragraph beginning with "In addition to the required details…" by removing the words "**and foundation**" from the 5th sentence.

Section 645.08 Method of Measurement. Revise the second paragraph beginning with "Bridge-type, cantilever and…" by removing the words "**including the foundation**" .

Section 645.09 Basis of Payment. Revise the third paragraph beginning with "The accepted bridge-type, cantilever and…" by removing the word "**foundation**" from the second sentence. Add the following sentence to the end of the paragraph "**Conduits, Junction Boxes, and Foundations will be paid for under Section 626.**"

SECTION 652
MAINTENANCE OF TRAFFIC

652.4 Flaggers Revise the first paragraph of this section so that it reads:

"The Contractor shall furnish flaggers as required by the TCP or as otherwise specified by the Resident. All flaggers must have successfully completed a flagger test approved by the Department and administered by a Department-approved Flagger-Certifier who is employing that flagger. All flaggers must carry an official certification card with them while flagging that has been issued by their employer."

SECTION 681
PRECAST AGGREGATE-FILLED, CONCRETE BLOCK GRAVITY WALL

681.08 Basis of Payment Amend this section by adding the Item Number "**681.10**' in front of the item "Precast Aggregate-Filled Concrete Block Gravity Wall" at the end of the section.

SECTION 703
AGGREGATES

Add the following to Section 703 - Aggregates

703.01 Fine Aggregate for Concrete Fine aggregate for concrete shall consist of natural sand or, when approved by the Resident, other inert materials with similar characteristics or combinations thereof, having strong, durable particles. Fine aggregate from different sources of supply shall not be mixed or stored in the same pile nor used alternately in the same class of construction or mix without permission of the Resident.

All fine aggregate shall be free from injurious amounts of organic impurities. Should the fine aggregate, when subjected to the colorimetric test for organic impurities, AASHTO T 21, produce a color darker than the reference standard color solution (laboratory designation Plate III), the fine aggregate shall be rejected.

Fine aggregate shall have a sand equivalent value of not less than 75 when tested in accordance with AASHTO T 176.
Fine aggregate sources shall meet the Alkali Silica Reactivity (ASR) requirements of Section 703.0201.

The fineness modulus shall not be less than 2.26 or more than 3.14. If this value is exceeded, the fine aggregate will be rejected unless suitable adjustments are made in proportions of coarse and fine aggregate. The fineness modulus of fine aggregate shall be determined by adding the cumulative percentages of material by weight retained on the following sieves: Nos. 4, 8, 16, 30, 50, 100 and dividing by 100.

Fine aggregate, from an individual source when tested for absorption as specified in AASHTO T 84, shall show an absorption of not more than 2.3 percent.

Sieve Designation	Percentage by Weight Passing Square Mesh Sieves
⅜ inch	100
No. 4	95-100
No. 8	80-100
No. 16	50-85
No. 30	25-60
No. 50	10-30
No. 100	2-10
No. 200	0-5.0

703.02 Coarse Aggregate for Concrete Coarse aggregate for concrete shall consist of crushed stone or gravel having hard, strong, durable pieces, free from adherent coatings and of which the composite blend retained on the ⅜ inch sieve shall contain no more than 15 percent, by weight of flat and elongated particles when performed in accordance with test method ASTM D 4791, Flat Particles, Elongated Particles, or Flat and Elongated Particles in Coarse Aggregate, using a dimensional ratio of 1:5.

The coarse aggregate from an individual source shall have an absorption no greater than 2.0 percent by weight determined in accordance with AASHTO T 85 modified for weight of sample.

The composite blend shall have a Micro-Deval value of 18.0 percent or less as determined by AASHTO T 327 or not exceed 40 percent loss as determined by AASHTO T 96.

Coarse aggregate sources shall meet the Alkali Silica Reactivity (ASR) requirements of Section 703.0201.

Coarse aggregate shall conform to the requirements of the following table for the size or sizes designated and shall be well graded between the limits specified.

Sieve Designation	Percentage by Weight Passing Square Mesh Sieves			
Grading	A	AA	S	LATEX
Aggregate Size	1 inch	¾ inch	1½ inch	½ inch
2 inch			100	
1½ inch	100		95-100	
1 inch	95-100	100	-	
¾ inch	-	90-100	35-70	100
½ inch	25-60	-	-	90-100
⅜ inch	-	20-55	10-30	40-70
No. 4	0-10	0-10	0-5	0-15
No. 8	0-5	0-5	-	0-5
No. 16	-	-	-	-
No. 50	-	-	-	-
No. 200	0 - 1.5	0 - 1.5	0 - 1.5	0 - 1.5

703.0201 Alkali Silica Reactive Aggregates All coarse and fine aggregates proposed for use in concrete shall be tested for Alkali Silica Reactivity (ASR) potential under AASHTO T 303 (ASTM C 1260), Accelerated Detection of Potentially Deleterious Expansion of Mortar Bars Due to Alkali-Silica Reaction, prior to being accepted for use. Acceptance will be based on testing performed by an accredited independent lab submitted to the Department. Aggregate submittals will be required on a 5-year cycle, unless the source or character of the aggregate in question has changed within 5 years from the last test date.

As per AASHTO T 303 (ASTM C 1260): Use of a particular coarse or fine aggregate will be allowed with no restrictions when the mortar bars made with this aggregate expand less than or equal to 0.10 percent at 30 days from casting. Use of a particular coarse or fine aggregate will be classified as potentially reactive when the mortar bars made with this aggregate expand greater than 0.10 percent at 30 days from casting. Use of this aggregate will only be allowed with the use of cement-pozzolan blends and/or chemical admixtures that result in mortar bar expansion of less than 0.10 percent at 30 days from casting as tested under ASTM C 1567.

Acceptable pozzolans and chemical admixtures that may be used when an aggregate is classified as potentially reactive include, but are not limited to the following:

a. Class F Coal Fly Ash meeting the requirements of AASHTO M 295
b. Ground Granulated Blast Furnace Slag (Grade 100 or 120) meeting the requirements of AASHTO M 302
c. Densified Silica Fume meeting the requirements of AASHTO M 307
d. Lithium-based admixtures
e. Metakaolin

Pozzolans or chemical admixtures required to offset the effects of potentially reactive aggregates will be incorporated into the concrete at no additional cost to the Department.

703.05 Aggregate for Sand Leveling Aggregate for sand leveling shall be sand of hard durable particles free from vegetable matter, lumps or balls of clay and other deleterious substances. The aggregate shall meet the grading requirements of the following table.

Sieve Designation	Percentage by Weight Passing Square Mesh Sieves
⅜ inch	85-100
No. 200	0-5.0

703.06 Aggregate for Base and Subbase The following shall apply to Sections (a.) and (c.) below. The material shall have a Micro-Deval…" and replace with "The material shall have a minimum degradation value of 25.0 or less15 as determined by AASHTO T 327. If the Micro-Deval value exceeds 25.0, the Washington State Degradation DOT Test Method T 113T113, Method of Test for Determination of Degradation Value (January 2009 version) shall be performed), except that the test shall be performed on the reported degradation value will be the result of testing a single specimen from that portion of the sample that passes the ½ in sieve and is retained on the No. 10 sieve. If the material has a Washington Degradation value of less than 15, the material shall be rejected.

The material, minus any reclaimed asphalt pavement used in Section (b.) below shall have a Micro-Deval value of 25.0 or less as determined by AASHTO T 327. If the Micro-Deval value exceeds 25.0 the material may be used if it does not exceed 25 percent loss on AASHTO T 96, Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine. If AASHTO T 96 is used for acceptance of the material, the material shall be retested at intervals of 25%, 50% and 75% completion of the course.

Recycled Asphalt Pavement (RAP) shall not be used for or blended with aggregate base or subbase.

a. Aggregate for base, Type A and B shall be crushed ledge or crushed gravel of hard durable particles free from vegetable matter, lumps or balls of clay and other deleterious substances. The gradation of the part that passes a 3 inch sieve shall meet the grading requirements of the following table:

Sieve Designation	Percentage by Weight Passing Square Mesh Sieves	
	Type A	Type B
½ inch	45-70	35-75
¼ inch	30-55	25-60
No. 40	0-20	0-25

No. 200	0-6.0	0-6.0

At least 50 percent by weight of the material retained on the No. 4 sieve shall have at least one fractured face as tested by AASHTO T 335.

Type A aggregate for base shall only contain particles of rock that will pass the 2 inch square mesh sieve.

Type B aggregate for base shall only contain particles of rock that will pass the 4 inch square mesh sieve.

b. Aggregate for base, Type C shall be crushed ledge or crushed gravel of hard durable particles free from vegetable matter, lumps or balls of clay and other deleterious substances. The material shall meet the grading requirements of the following table:

Sieve Designation	Percentage by Weight Passing Square Mesh Sieves
	Type C
4 inches	100
3 inches	90-100
2 inches	75-100
1 inch	50-80
½ inch	30-60
No. 4	15-40
No. 200	0-6.0

At least 50 percent by weight of the material coarser than the No. 4 sieve shall have at least one fractured face as tested by AASHTO T 335.

c. Aggregate for subbase shall be sand or gravel of hard durable particles free from vegetable matter, lumps or balls of clay and other deleterious substances. The gradation of the part that passes a 3 inch sieve shall meet the grading requirements of the following table:

Sieve Designation	Percentage by Weight Passing Square Mesh Sieves

	Type D	Type E
½ in	35-80	
¼ inch	25-65	25-100
No. 40	0-30	0-50
No. 200	0-7.0	0-7.0

Type D aggregate for subbase gravel may contain up to 50 percent by weight Recycled Concrete Aggregate (RCA). When RCA is used, the portion of the resulting blend of gravel and RCA retained on a ½" square mesh sieve shall contain a total of no more than 5 percent by weight of other recycled materials such as brick, concrete masonry block, or asphalt pavement as determined by visual inspection.

RCA shall be substantially free of wood, metal, plaster, and gypsum board as defined in Note 9 in Section 7.4 of AASHTO M 319. RCA shall also be free of all substances that fall under the category of solid waste or hazardous materials.

Aggregate for subbase shall not contain particles of rock which will not pass the 6 inch square mesh sieve.

703.08 Recycled Asphalt Pavement Recycled asphalt pavement shall consist of salvaged asphalt materials from milled pavements or production waste that has been processed before use to meet the requirements of the job mix formula. It shall be free of winter sand, granular fill, construction debris, or other materials not generally considered asphalt pavement.

703.081 RAP for Asphalt Pavement Recycled Asphalt Pavement (RAP) may be introduced into hot-mix asphalt pavement at percentages approved by the Department according to the MaineDOT Policies and Procedures for HMA Sampling and Testing.

If approved by the Department, the Contractor shall provide documentation stating the source, test results for average residual asphalt content, and stockpile gradations showing RAP materials have been sized to meet the maximum aggregate size requirements of each mix designation. The Department will obtain samples for verification and approval prior to its use.

The maximum allowable percent of RAP shall be determined by the asphalt content, the percent passing the 0.075 mm sieve, the ratio between the percent passing the 0.075 mm sieve and the asphalt content, and Coarse Micro-Deval loss values as tested by the Department.

The maximum percentage of RAP allowable shall be the lowest percentage as determined according to Table 4 below:

Classification	Maximum RAP Percentage Allowed	Asphalt content standard deviation	Percent passing 0.075 mm sieve standard deviation	Percent passing 0.075 mm sieve / asphalt content ratio	Residual aggregate M-D loss value
Class III	**10%**	**≤ 1.0**	**N/A**	**≤ 4.0**	**≤ 18**
Class II	**20%**	**≤ 0.5**	**≤ 1.0**	**≤ 2.8**	
Class I	**30%**	**≤ 0.3**	**≤ 0.5**	**≤ 1.8**	

Table 4: Maximum Percent RAP According to Test Results

The Department will monitor RAP asphalt content and gradation during production by testing samples from the stockpile at approximately 15,000 T intervals (in terms of mix production). The allowable variance limits (from the numerical average values used for mix designs) for this testing are determined based upon the maximum allowable RAP percentage and are shown below in Table 5.

Table 5: RAP Verification Limits

Classification	Asphalt content (compared to aim)	Percent passing 0.075 mm sieve (compared to aim)
Class III	± 1.5	± 2.0
Class II	± 1.0	± 1.5
Class I	± 0.5	± 0.7

For specification purposes, RAP will be categorized as follows:

Class III – A maximum of 10.0 percent of Class III RAP may be used in any base, intermediate base, surface, or shim mixture. A maximum of 20.0 percent of Class III RAP may be used in hand-placed mixes for item 403.209.

Class II – A maximum of 20.0 percent Class II RAP in any base, binder, surface, or shim course.

Class I – A maximum of 20.0 percent Class I RAP may be used in any base, intermediate base, surface, or shim mixture without requiring a change to the specified asphalt binder. A maximum

of 30.0 percent Class I RAP may be used in in any base or intermediate base mixture provided that a PG 58-28 or PG 58-34 asphalt binder is used. A maximum of 30.0 percent Class I RAP may be used in any surface or shim mixture provided that PG 58-34 asphalt binder is used. Mixtures exceeding 20.0 percent Class I RAP must be evaluated and approved by the Department.

The Contractor may use up to two different RAP sources in any one mix design. The total RAP percentage of the mix shall not exceed the maximum allowed for the highest classification RAP source used (i.e. if a Class I & Class III used, total RAP must not exceed 30.0%). The blended RAP material must meet all the requirements of the classification for which the RAP is entered (i.e. 10% Class III with 20% Class I, blend must meet Class I criteria). The Department may take belt cuts of the blended RAP to verify the material meets these requirements. If the Contractor elects to use more than one RAP source in a design, the Contractor shall provide an acceptable point of sampling blended RAP material from the feed belt.

In the event that RAP source or properties change, the Contractor shall notify the Department of the change and submit new documentation stating the new source or properties a minimum of 72 hours prior to the change to allow for obtaining new samples and approval.

SECTION 710
FENCE AND GUARDRAIL

710.06 Fence Posts and Braces Revise the first Paragraph so that it reads:

"Wood posts shall be of cedar, white oak, or tamarack or other AWPA approved species, of the diameter or section and length shown on the plans."

Remove the fourth paragraph which starts " That portion of wood posts…".

Revise the paragraph beginning with "Braces shall be of spruce, eastern hemlock … so that it now reads:

"Braces shall be of spruce, eastern hemlock, Norway pine, pitch pine, or tamarack timbers or other AWPA approved species, or spruce, cedar, tamarack or other AWPA approved species round posts of sufficient length to make a diagonal brace between adjacent posts. All wood posts and braces shall be pressure-treated in accordance with AASHTO M 133 and AWPA U1, UC4A Commodity Specification B: Posts. "

710.07 Guardrail Posts Revise this section so that the first sentence of section a. reads:

"a. Wood posts shall be of Norway pine, southern yellow pine, pitch pine, Douglas fir, red pine, white pine, or eastern hemlock or other AWPA approved species."

Revise the next paragraph so that it reads:

Wood posts and offset brackets shall be preservative treated in accordance with the requirements of AASHTO M 133 and AWPA U1, UC4A Commodity Specification B: Posts.

SECTION 712
MISCELLANEOUS HIGHWAY MATERIAL

712.061 Structural Precast Units Amend this section by adding the following sentence to the end of the first paragraph of the Construction subsection:

"Facilities certified by NPCA or PCI shall provide to the Fabrication Engineer a copy of their annual audit to include deficiency reports and corrective actions."

Revise this section by changing the letter "b" of ASTM C1611 of the Concrete Testing subsection so that it reads:

"**b. Air content shall be 5.0% to 8.0%**."

SECTION 718
TRAFFIC SIGNALS MATERIAL

718.03 Signal Mounting Amend the paragraph beginning with "All trunions, brackets and…" by adding "**For polycarbonate signal heads with more than 3 sections or requiring mounting extensions greater than 12 inches in length, reinforcing plates shall be used to reinforce the housings at the point of attachment.**" to the end of the paragraph.

718.08 Controller Cabinet Revise this subsection by replacing the paragraph beginning with "The cabinet shall be supplied with LED light panels…" on or about page 7-66 with "**The cabinet shall be supplied with white LED light panels which shall automatically illuminate via a door open switch whenever one of the four main cabinet doors are opened for the ground mount cabinet or two main doors for the side of pole cabinet. The ground mounted cabinet shall contain four LED light panels per side totaling eight panels for the cabinet; one panel each at the top and bottom portion of the front side and back side on the Control side and Power/Auxiliary side of the cabinet. Each light panel shall produce a minimum of 250 lumens for a total minimum lumen output of 2000 lumens with all eight panels illuminated. The minimum output per side would be 1000 lumens. The LED panels shall be protected by a clear shatterproof shield. The side of pole mounted cabinet shall contain four light panels; one at the top of the rack assembly and one at the bottom rack assembly on each side of the cabinet. A second door open status switch per door shall activate a controller input to log a report event that one of the doors was opened. All door open status switches shall be connected to the same controller input. For the ground mount cabinet, there shall be two switches on each of the four main doors. For the side-of-pole mount cabinet, there shall be two switches on each of the two main doors**."

Revise this subsection by replacing the paragraph beginning with "The cabinet shall be supplied with a generator panel …" on or about page 7-68 with:

"The cabinet shall be supplied with a generator panel. The generator panel shall consist of a manual transfer switch and a twist-lock connector for generator hookup. The transfer switch knob and twist-lock connector shall be located inside a stainless steel enclosure with a separate lockable door accessed with a Corbin #2 key. The unit shall be mounted on the left, exterior of the control side wall of the ground mount cabinet a minimum of 36" above the surrounding grade and on the lower left side of the pole mounted cabinet. The generator transfer switch shall be a Reliance C30A1 Signa Series or approved equal. "

Revise this subsection by removing the following from the paragraph beginning with "The ground mounted cabinet shall be supplied and installed with an electric service meter socket trim and electrical service disconnect switch …" on or about page 7-69: **"(removed: thus preventing that space from being used either by equipment supplied as part of the project, or future equipment that would be installed in the rack system. Joe indicated that he would add this language to the detail so it is covered.)".**

Revise this subsection by replacing the following in the paragraph beginning with "The Contractor shall reconfigure the default user name…" on or around page 7-70; "MaineDOT IT" with "**MaineDOT Traffic Division**".

In the paragraph beginning with "Tests shall be conducted by the contractor…" on or around page 7-73, amend this subsection by removing **"in the state of Maine and"** after "The facility shall be".

Amend this Section by adding the following subsection:

718.13 Field Monitoring Unit (FMU) This item of work shall conform to this specification. This item shall consist of furnishing and installing a Field Monitoring Unit (FMU) and software, as well as all needed accessories required for a full and complete installation, including but not limited to power adapters, Ethernet cables, and interface cables, as described herein.

Where applicable, communications from MaineDOT's cloud-based Central Management System (CMS) to the on-street traffic signal controllers shall be made through fiber optic interconnect cable connected back to existing internet connections and/or the Field Monitoring Unit (FMU). The Contractor shall furnish and install all materials necessary for a complete and operational fiber optic interconnection to all project intersections as shown on the plans. All connections to the CMS cloud-based system shall be via a secure VPN network.

The FMU shall be the only remote connection device used by isolated intersections to connect to the cloud-based system. All connections shall be encrypted VPN tunnels. The Contractor shall coordinate all configuration settings with MaineDOT IT and the Engineer.

The FMU central web based interface shall be a separate element from the CMS.

MATERIALS: The materials for this work shall conform to the following requirements:

1. The work under this item specifies the requirements for the FMU. The FMU shall operate independent of the brand/type of intersection controller deployed in the ATC traffic cabinet.

2. The FMU shall conform to the following requirements:

   2.1 The FMU shall function correctly between -34 degrees C and +74 degrees C.

   2.2 The FMU shall be provided with appropriately rated connectors that allows the FMU to be exchanged by unplugging connectors, without tools.

   2.3 The FMU shall monitor and log all ATC Controller and ATC cabinet faults and or alarms.

   2.4 The FMU shall be wired directly to the ATC cabinet.

   2.5 The FMU shall have an internal cellular modem running at 4G LTE.

      2.5.1 The Cellular modem shall be designed to be replaced / upgraded to 5G service when available.

   2.6 The FMU shall incorporate an integrated GPS and cell modem.

   2.7 The configuration of the FMU shall be accomplished by accessing the internal web server with a browser. It shall be possible to configure the FMU without any special software.

   2.8 The FMU shall be powered via a standard 120V input power.

   2.9 The FMU shall allow for the routing of the controller configuration packets to and from the controller (either by Ethernet or serial communications) for any type of controller utilized by the MaineDOT. In this way it shall be possible to configure the controller and utilize the controller specific software to interrogate the controller, and the FMU shall provide the communications pipe which allows this to be accomplished.

   2.10 The FMU shall, within the size limitations above, include a battery and battery charging/monitoring circuit, to allow the FMU to function correctly even when all power to the intersection has failed. The battery shall continue to power the FMU for a minimum of 5 hours after all power has failed to the intersection.

   2.11 The FMU shall incorporate an integrated GPS which will allow the FMU to geo-locate itself on the FMU management software map, without configuration.

   2.12 The FMU shall operate without requiring a static IP address. The only configuration required at the FMU is to enter the URL of where the FMU management software is hosted.

   2.13 In the event that the cell service is interrupted or is not available, the FMU shall store any events that occur in internal memory and forward these events automatically to the FMU management software when the cell service is restored. In this way, a complete

record of events at the device can be maintained even if cell service is interrupted for a period. The system will store 5000 events.

2.14 The FMU shall utilize HTTP and HTTPS protocols, and XML data structures, for communication with the FMU management software. In this way the data will be open for future expansion and competition. The use of secret proprietary protocols is not permitted.

2.15 The FMU shall include Ethernet communications via an Ethernet Port with RJ45 connector.

2.16 The FMU shall include weather proof antennas.

3. **Map Display FMU Management Software**

3.1 The FMU shall include a scrollable, zoomable map display, with the intersections and other monitored devices shown as representative icons on the map. The map shall include the ability to see the intersections using Google Streetview.

3.2 The alarm status of the intersection shall be clearly indicated on the icon on the map, so that the user can see at a glance which intersections are in alarm.

3.3 The map display shall also include a list of intersections, with the number and priority of alarms indicated on the list. Intersections in high priority alarm shall be moved to the top of the list, followed by medium priority, low priority and then finally by intersections not in alarm.

3.4 The icons shall change to be able to clearly indicate if an intersection is offline.

3.5 Clicking on the icon on the map shall expose a box with the current parameters of the intersection shown.

3.6 The default map display position and zoom shall be configurable by user, so that the user's view will default to show the intersections that the user is responsible for managing.

3.7 The map view shall have the ability to show Google traffic overlays on the map.

4. **Intersection Detail Display FMU Management Software**

4.1 It shall be possible to drill down, either from the map icon or from the list, to a device level detail for the intersection, which as a minimum shall display the following parameters:

4.1.1 The alarm status, with priority indicated, and a text description of the alarm (if an alarm is present for this device).

4.1.2 The time since the last communication with the device

4.1.3 The following parameters (real time now values, minimum for the day values, maximum for the day values, and average for the day values)

4.1.3.1 The AC mains voltage (value)

4.1.3.2 The battery back-up voltage (value)

4.1.3.3 The cabinet temperature (value)

4.1.3.4 The cabinet humidity (value)

4.1.3.5 The presence of AC power (OK or Fail)

4.1.3.6 The flashing status of the intersection (OK or Flashing)

4.1.3.7 Stop Time status (OK or Stop Time Active)

4.1.3.8 The cabinet door status (Open or Closed)

4.1.3.9 The intersection fan status (Fan On or Fan off)

4.1.4 It shall be possible to view graphs of each of the value parameters in graphical form, over the recent two-week period. This includes real time graphs of:

4.1.4.1 The AC mains voltage

4.1.4.2 The battery back-up voltage

4.1.4.3 The cabinet temperature

4.1.4.4 The cabinet humidity

5. **Diagnostics and Log Display FMU Management Software**

5.1 From the device level detail within the FMU management software, it shall be possible to drill down to get the raw data; the error logs; and the communications logs to allow a technician to fault-find problems.

5.2 It shall be possible to filter the logs by Device; by Device Type and/or by Group as well as between dates.

5.3 It shall be possible to print these selected logs to a local printer or a PDF file.

5.4 It shall be possible to export these logs to Excel on the local computer for further analysis.

6. **Alarms FMU Management Software**

6.1 The FMU management software shall have a comprehensive alarm generation capability

6.2 It shall be possible to configure alarms to be generated on any parameter becoming out of tolerance, including analog values, digital values and enumerated values.

6.3 Alarms shall be configurable to be of Low, High or Critical Priority.

6.4 The alarm priority shall be displayed throughout the FMU management software, on all displays, using color codes such as red-critical; yellow – high; and amber-low to indicate the priority of the alarm.

6.5 The current active alarms shall be accessible for view via an expandable window, to see which alarms are active and when the alarm occurred. The highest priority alarms shall rise to the top of the list.

7. **Alerts FMU Management Software**

7.1 The FMU management software shall have comprehensive alerting capability, to enable the response personnel to be notified when an abnormal situation has occurred.

7.2 It shall be possible to configure alerts to one or more personnel for each alarm. This will cause, as selected, an SMS and/or an email to be sent to the person when an alarm occurs.

7.3 The alert shall be configurable to optionally send via email and/or via SMS a message when an alarm clears.

7.4 The intention is that the FMU management software provides the alerts to the user in near real time. The SMS and email shall be issued within 30 seconds of the occurrence of event which results in an alert being issued.

8. **Hosting and Connectivity and Service FMU / FMU Management Software**

8.1 The contractor shall supply the FMU with the FMU manufacturers 10 year options for Connectivity and Service, as part of the purchase price. The Connectivity and Service agreement shall include at a minimum:

8.1.1 Cellular Connectivity

8.1.2 No cellular overage charges

8.1.3 Extended warranty on the hardware for the period of the Connectivity and Service Agreement

8.1.4 Over-the-air software updates

8.1.5 Over-the-air security updates

8.1.6 Future Connected Vehicles Service

720.12 Wood Sign Posts Revise the first sentence so that it reads:

Wood sign posts shall be rectangular, straight and sound timber, cut from live growing native spruce, red pine, hemlock, cedar trees or other AWPA approved species, free from loose knots or other structurally weakening defects of importance, such as shake or holes or heart rot.

Revise the third paragraph that starts with “When pressure treated…” so that it reads:

All sign posts shall be pressure-treated in accordance with AASHTO M 133 and AWPA Standard U1, UC4A, Commodity Specification A: Sawn Products.

APPENDIX A TO DIVISION 100

SECTION 1 - BIDDING PROVISIONS

A. Federally Required Certifications By signing and delivering a Bid, the Bidder certifies as provided in all certifications set forth in this Appendix A - Federal Contract Provisions Supplement including:

- Certification Regarding No Kickbacks to Procure Contract as provided on this page 1 below.
- Certification Regarding Non-collusion as provided on page 1 below.
- Certification Regarding Non-segregated Facilities as provided by FHWA Form 1273, section III set forth on page 21 below.
- "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion" as provided by FHWA Form 1273, section XI set forth on page 32 below.
- "Certification Regarding Use of Contract Funds for Lobbying" as provided by FHWA Form 1273, section XII set forth on page 35 below.

Unless otherwise provided below, the term "Bidder", for the purposes of these certifications, includes the Bidder, its principals, and the person(s) signing the Bid. Upon execution of the Contract, the Bidder (then called the Contractor) will again make all the certifications indicated in this paragraph above.

CERTIFICATION REGARDING NO KICKBACKS TO PROCURE CONTRACT Except expressly stated by the Bidder on sheets submitted with the Bid (if any), the Bidder hereby certifies, to the best of its knowledge and belief, that it has not:

(A) employed or retained for a commission, percentage, brokerage, contingent fee, or other consideration, any firm or person (other then a bona fide employee working solely for me) to solicit or secure this contract;

(B) agreed, as an express or implied condition for obtaining this contract, to employ or retain the services of any firm or person in connection with carrying out the contract, or;

C) paid, or agreed to pay, to any firm, organization, or person (other than a bona fide employee working solely for me) any fee, contribution, donation, or consideration of any kind for, or in connection with, procuring or carrying out the contract;

By signing and submitting a Bid, the Bidder acknowledges that this certification is to be furnished to the Maine Department of Transportation and the Federal Highway Administration, U.S. Department of Transportation in connection with this contract in anticipation of federal aid highway funds and is subject to applicable state and federal laws, both criminal and civil.

CERTIFICATION REGARDING NONCOLLUSION Under penalty of perjury as provided by federal law (28 U.S.C. §1746), the Bidder hereby certifies, to the best of its knowledge and belief, that:

> the Bidder has not, either directly or indirectly, entered into any agreement, participated in any collusion, or otherwise taken any action in restraint of competitive bidding in connection with the Contract.

For a related provisions, see Section 102.7.2 (C) of the Standard Specifications - "Effects of Signing and Delivery of Bids" - "Certifications", Section 3 of this Appendix A entitled "Other Federal Requirements" including section XI - "Certification Regarding Debarment, Suspension, Ineligibility, and Voluntary Exclusion" and section XII. - "Certification Regarding Use of Contract Funds for Lobbying."

****

B. Bid Rigging Hotline To report bid rigging activities call: **1-800-424-9071**

The U.S. Department of Transportation (DOT) operates the above toll-free "hotline" Monday through Friday, 8:00 a.m. to 5:00 p.m., eastern time. Anyone with knowledge of possible bid rigging, bidder collusion, or other fraudulent activities should use the "hotline" to report such activities.

The "hotline" is part of the DOT's continuing effort to identify and investigate highway construction contract fraud and abuse and is operated under the direction of the DOT Inspector General. All information will be treated confidentially and caller anonymity will be respected.

****

SECTION 2 - FEDERAL EEO AND CIVIL RIGHTS REQUIREMENTS

Unless expressly otherwise provided in the Bid Documents, the provisions contained in this Section 2 of this "Federal Contract Provisions Supplement" are hereby incorporated into the Bid Documents and Contract.

A. Nondiscrimination & Civil Rights - Title VI The Contractor and its subcontractors shall not discriminate on the basis of race, color, national origin, or sex in the performance of this Contract. The Contractor shall carry out applicable requirements of 49 CFR Part 26 in the award and administration of DOT assisted contracts. Failure by the Contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy as the Department deems appropriate. The Contractor and subcontractors shall comply with Title VI of the Civil Rights Act of 1964, as amended, and with all State of Maine and other Federal Civil Rights laws.

For related provisions, see Subsection B - "Nondiscrimination and Affirmative Action - Executive Order 11246" of this Section 2 and Section 3 - Other Federal Requirements of this "Federal Contract Provisions Supplement" including section II - "Nondiscrimination" of the "Required Contract Provisions, Federal Aid Construction Contracts", FHWA-1273.

B. Nondiscrimination and Affirmative Action - Executive Order 11246 Pursuant to Executive Order 11246, which was issued by President Johnson in 1965 and amended in 1967 and 1978, this Contract provides as follows.

The Contractor shall take specific affirmative actions to ensure equal employment opportunity. The evaluation of the Contractor's compliance with these specifications shall be based upon its efforts to achieve maximum results from its actions. The Contractor shall document these efforts fully, and shall implement affirmative action steps at least as extensive as the following:

Ensure and maintain a working environment free of harassment, intimidations, and coercion at all sites, and in all facilities at which the Contractor's employees are assigned to work. The Contractor, where possible, will assign two or more women to each construction project. The Contractor shall specifically ensure that all forepersons, superintendents, and other on-site supervisory personnel are aware of and carry out the Contractor's obligation to maintain such a working environment, with specific attention to minority or female individuals working at such sites or in such facilities.

Establish and maintain a current list of minority and female recruitment sources, provide written notification to minority and female recruitment sources and to community organizations when the Contractor or its union have employment opportunities available, and to maintain a record of the organization's responses.

Maintain a current file of the names, addresses and telephone numbers of each minority and female off-the-street applicant and minority or female referral from a union, a recruitment source or community organization and of what action was taken with respect to each such individual. If such individual was sent to the union hiring hall for referral and was not referred back to the Contractor by the union or, if referred, not employed by the Contractor, this shall be documented in the file with the reason therefore, along with whatever additional actions the Contractor may have taken.

Provide immediate written notification to the Department's Civil Rights Office when the union or unions with which the Contractor has a collective bargaining agreement has not referred to the Contractor a minority person or woman sent by the Contractor, or when the Contractor has other information that the union referral process has impeded the Design-Builder's efforts to meet its obligations.

Develop on-the-job training opportunities and/or participate in training programs for the area which expressly include minorities and women, including upgrading programs and apprenticeship and trainee programs relevant to the Contractor's employment needs, especially those programs funded or approved by the Department of Labor. The Contractor shall provide notice of these programs to the sources compiled under B above.

Disseminate the Contractor's EEO policy by providing notice of the policy to unions and training programs and requesting their cooperation in assisting the Contractor in meeting its EEO obligation; by including it in any policy manual and collective bargaining agreement; by publicizing it in the company newspaper, annual report, etc.; by specific review of the policy with all management personnel and with all minority and female employees at least once a year; and by posting the company EEO policy on bulletin boards accessible to all employees at each location where construction work is performed.

Review, at least annually, the company's EEO policy and affirmative action obligations under these specifications with all employees having any responsibility for hiring, assignment, layoff, termination, or other employment decisions including specific review of these items with on-site supervisory personnel such as Superintendents, General Forepersons, etc., prior to the initiation of construction work at any job site. A written record shall be made and maintained identifying the time and place of these meetings, persons attending, subject matter discussed, and disposition of the subject matter.

Disseminate the Contractor's EEO policy externally by including it in any advertising in the news media, specifically including minority and female news media, and providing written notification to and discussing the Contractor's EEO policy with other Contractor's and Subcontractors with whom the Contractor does or anticipates doing business.

Direct its recruitment efforts, both orally and written to minority, female and community organizations, to schools with minority and female students and to minority and female recruitment and training organizations serving the Contractor's recruitment area and employment needs. Not later that one month prior to the date for the acceptance of applications for apprenticeship or other training by any recruitment source, the Contractor shall send written notification to organizations such as the above describing the openings, screenings, procedures, and test to be used in the selection process.

Encourage present minority and female employees to recruit other minority persons and women and, where reasonable, provide after school, summer and vacation employment to minority and female youth, both on the site and in other areas of a Contractor's workforce.

Validate all tests and other selection requirements.

Conduct, at least annually, an inventory and evaluation at least of all minority and female personnel for promotional opportunities and encourage these employees to seek or to prepare for, through appropriate training, etc., such opportunities.

Ensure that seniority practices, job classifications, work assignments and other personnel practices, do not have a discriminatory effect by continually monitoring all personnel and employment related activities to ensure that the EEO policy and the Contractor's obligations under these specifications are being carried out.

Ensure that all facilities and company activities are non segregated except that separate or single-user toilet and necessary changing facilities shall be provided to assure privacy between the sexes.

Document and maintain a record of all solicitations of offers for subcontracts from minority and female construction Contractor's and suppliers, including circulation of solicitations to minority and female Contractor associations and other business associations.

Conduct a review, at least annually, of all supervisors' adherence to and performance under the Contractor's EEO policies and affirmative action obligations.

C. Goals for Employment of Women and Minorities Per Executive Order 11246, craft tradesperson goals are 6.9% women and .5% minorities employed. However, goals may be adjusted upward at the mutual agreement of the Contractor and the Department. Calculation of these percentages shall not include On-the-Job Training Program trainees, and shall not include clerical or field clerk position employees.

For a more complete presentation of requirements for such Goals, see the federally required document "Goals for Employment of Females and Minorities" set forth in the next 6 pages below.

****

Start of GOALS FOR EMPLOYMENT OF FEMALES AND MINORITIES
Federally Required Contract Document

§60-4.2 Solicitations

(d) The following notice shall be included in, and shall be part of, all solicitations for offers and bids on all Federal and federally assisted construction contracts or subcontracts in excess of $10,000 to be performed in geographical areas designated by the Director pursuant to §60-4.6 of this part (see 41 CFR 60-4.2(a)):

Notice of Requirement for Affirmative Action to Ensure Equal Opportunity (Executive Order 11246)

1. The Offeror's or bidder's attention is called to the "Equal Opportunity Clause" and the "Standard Federal Equal Employment Specifications" set forth herein.

2. The goals and timetables for minority and female participation, expressed in percentage terms for the Contractor's aggregate work force in each trade on all construction work in the covered area, are as follows:

Goals for female participation in each trade	6.9%

Goals for minority participation for each trade

Maine

001 Bangor, ME	0.8%
Non-SMSA Counties (Aroostook, Hancock, Penobscot, Piscataquis, Waldo, Washington)	
002 Portland-Lewiston, ME	
SMSA Counties: 4243 Lewiston-Auburn, ME (Androscoggin)	0.5%
6403 Portland, ME (Cumberland, Sagadahoc)	0.6%

Non-SMSA Counties: 0.5%
(Franklin, Kennebec, Knox, Lincoln, Oxford, Somerset, York)

These goals are applicable to all the Contractor's construction work (whether or not it is Federal or federally assisted) performed in the covered area. If the contractor performs construction work in a geographical area located outside of the covered area, it shall apply the goals established for such geographical area where the work is actually performed. With regard to this second area, the contractor also is subject to the goals for both its federally involved and non federally involved construction.

The contractor's compliance with the Executive Order and the regulations in 41 CFR Part 60-4 shall be based on its implementation of the Equal Opportunity Clause, specific affirmative action obligations required by the specifications set forth in 41 CFR 60-4.3(a), and its efforts to meet the goals. The hours of minority and female employment and training must be substantially uniform throughout the length of the contract, and in each trade, and the contractor shall make a good faith effort to employ minorities and women evenly on each of its projects. The transfer of minority or female employees or trainees from Contractor to Contractor or from project to project for the sole purpose of meeting the Contractor's goals shall be in violation of the contract, the Executive Order and the regulations in 41 CFR Part 60-4. Compliance with the goals will be measured against the total work hours performed.

3. The Contractor shall provide written notification to the Director of the Office of Federal Contract Compliance Programs within 10 working days of award of any construction subcontract in excess of $10,000 at any tier for construction work under the contract resulting from this solicitation. The notification shall list the name, address and telephone number of the subcontractor, employer identification number of the subcontractor, estimated dollar amount of the subcontract; estimated started and completion dates of the subcontract; and the geographical area in which the subcontract is to be performed.

4. As used in this Notice, and in the Contract resulting from this solicitation, the "covered area" is (insert description of the geographical areas where the contract is to be performed giving the state, county and city, if any).

STANDARD FEDERAL EQUAL EMPLOYMENT OPPORTUNITY CONSTRUCTION CONTRACT SPECIFICATIONS (EXECUTIVE ORDER 11246)

1. As used in these specifications:

   a. "Covered area" means the geographical area described in the solicitation from which this contract resulted;

   b. "Director" means Director, Office of Federal Contract Compliance Programs, United States Department of Labor, or any person to whom the Director delegates authority;

   c. "Employer identification number" means the Federal Social Security number used on the Employer's Quarterly Federal Tax Return, U.S. Treasury Department form 941;

   d. "Minority" includes:

(i) Black (all persons having origins in any of the Black African racial groups not of Hispanic origin);
(ii) Hispanic (all persons of Mexican, Puerto Rican, Cuban, Central or South American or other Spanish Culture or origin, regardless of race);
(iii) Asian and Pacific Islander (all persons having origins in any of the original peoples of the Far East, Southeast Asia, the Indian Subcontinent, or the Pacific Islands); and
(iv) American Indian or Alaskan Native (all persons having origins in any of the original peoples of the North America and maintaining identifiable tribal affiliations through membership and participation or community identification).

2. Whenever the Contractor, or any subcontractor at any tier, subcontracts a portion of the work involving any construction trade, it shall physically include in each subcontract in excess of $10,000 the provisions of these specifications and the Notice which contains the applicable goals for minority and female participation and which is set forth in the solicitations from which this contract resulted.

3. If the contractor, is participating (pursuant to 41 CFR 60-4.5) in a Hometown Plan approved by the U.S. Department of Labor in the covered area either individually or through an association, its affirmative action obligations on all work in the Plan area (including goals and timetables) shall be in accordance with that Plan for those trades which have unions participating in the Plan. Contractors must be able to demonstrate their participation in and compliance with the provisions of any such Hometown Plan. Each Contractor or Subcontractor participating in an approved Plan is individually required to comply with its obligations under the EEO clause, and to make a good faith effort to achieve each goal under the Plan in each trade in which it has employees. The overall good faith performance by other Contractors for Subcontractors toward a goal in an approved Plan does not excuse any covered Contractor's or Subcontractor's failure to take good faith efforts to achieve the Plan goals and timetables.

4. The Contractor shall implement the specific affirmative action standards provided in paragraphs 7 a. through p. of these specifications. The goals set forth in the solicitation from which this contract resulted are expressed as percentages of the total hours of employment and training of minority and female utilization the Contractor should reasonably be able to achieve in each construction trade in which it has employees in contractors performing construction work in geographical areas where they do not have a Federal or federally assisted construction contract shall apply the minority and female goals established for the geographical areas where the work is being performed. Goals are published periodically in the Federal Register in notice form and such notices may be obtained from any Office of Federal Contract Compliance Programs office or from Federal procurement contracting officers. The Contractor is expected to make substantially uniform progress in meeting its goals in each craft during the period specific.

5. Neither the provisions of any collective bargaining agreement, nor the failure by a union with whom the Contractor has a collective bargaining agreement, to refer either minorities or women shall excuse the Contractor's obligations under these specifications, Executive Order 11246, or the regulations promulgated pursuant, thereto.

6. In order for the non working training hours of apprentices and trainees to be counted in meeting the goals, such apprentices and trainees must be employed by the Contractor during the training period, and the Contractor must have made a commitment to employ the apprentices and trainees at the completion of their training, subject to the availability of employment opportunities. Trainees must be trained pursuant to training programs approved by the U.S. Department of Labor.

7. The Contractor shall take specific affirmative actions to ensure equal employment opportunity. The evaluation of the Contractor's compliance with these specifications shall be based upon its effort to achieve maximum results from its actions. The Contractor shall document these efforts fully, and shall implement affirmative action steps at least as expensive as the following:

   a. Ensure and maintain a working environment free of harassment, intimidation, coercion at all sites, and in all facilities at which the Contractor's employees are assigned to work. The Contractor, when possible, will assign two or more women to each construction project. The Contractor shall specifically ensure that all foremen, superintendents, and other on-site supervisory personnel are aware of and carry out the Contractor's obligation to maintain such a working environment, with specific attention to minority or female individuals working at such sites or in such facilities.

   b. Establish and maintain a current list of minority and female recruitment sources provide written notification to minority and female recruitment sources and to community organizations when the Contractor or its unions have employment opportunities available, and maintain a record of the organization's responses.

   c. Maintain a current file of the names, addresses and telephone numbers of each minority and female off-the-street applicant and minority or female referral from a union, a recruitment sources or community organization and of what action was taken with respect to each such individual. If such individual was sent to the union hiring hall for referral and was not referred back to the Contractor by the union or, if referred, not employed by the Contractor, this shall be documented in the file with the reason therefore, along with whatever additional actions the Contractor may have taken.

   d. Provide immediate written notification to the Director when the union or unions with which the Contractor has a collective bargaining agreement has not referred to the Contractor a minority person or woman sent by the Contractor, or when the Contractor has other information that the union referral process has impeded the Contractor's efforts to meet its obligations.

   e. Develop on-the-job training opportunities and/or participate in training programs for the area which expressly include minorities and women, including upgrading programs and apprenticeship and trainee programs relevant to the Contractor's employment needs, especially those programs funded or approved by the Department of Labor. The Contractor shall provide notice of these programs to the sources complied under 7b above.

f. Disseminate the Contractor's EEO policy by providing notice of the policy to unions and training programs and requesting their cooperation in assisting the Contractor in meeting its EEO obligations; by including in any policy manual and collective bargaining agreement; by publicizing it in the company newspaper, annual report, etc.; by specific review of the policy with all management personnel and with all minority and female employees at least once a year; and by posting the company EEO policy on bulletin boards accessible to all employees at each location where construction work is performed.

g. Review, at least annually, the company's EEO policy and affirmative action obligations under these specifications with all employees having any responsibility for hiring, assignment, layoff, termination or other employment decisions including specific review of these items with on-site supervisory personnel such as Superintendents, General Foremen, etc., prior to the initiation of construction work at any job site. A written record shall be made and maintained identifying the time and place of these meetings, persons attending, subject matter discussed, and disposition of the subject matter.

h. Disseminate the Contractor's EEO policy externally by including it in any advertising in the news media, specifically including minority and female news media, and providing written notification to and discussing the Contractor's EEO policy with other Contractors and Subcontractors with whom the Contractor does or anticipates doing business.

i. Direct its recruitment, efforts, both oral and written, to minority, female and community organizations, to schools with minority and female students and to minority and female recruitment and training organizations serving the Contractor's recruitment area and employment needs. Not later than one month other training by any recruitment source, the Contractor shall send written notification to organizations such as the above, describing prior to the date for the acceptance of applications for apprenticeship or the openings, screening procedures, and tests to be used in the selection process.

j. Encourage present minority and female employees to recruit other minority persons and women and, where reasonable, provide after school, summer and vacation employment to minority and female youth both on site and in other areas of a Contractor's work force.

k. Validate all tests and other selection requirements where there is an obligation to do so under 41 CFR Part 60-3.

l. Conduct, at least annually, an inventory and evaluation at least of all minority and female personnel for promotional opportunities and encourage these employees to seek or to prepare for, through appropriate training, etc., such opportunities.

m. Ensure that seniority practices, job classifications, work assignments and other personnel practices, do not have a discriminatory effect by continually monitoring all personnel and employment related activities to ensure that the EEO policy and the Contractor's obligations under these specifications are being carried out.

n. Ensure that all facilities and company activities are non segregated except that separate or single-user toilet and necessary changing facilities shall be provided to assure privacy between the sexes.

o. Document and maintain a record of all solicitations of offers for subcontracts from minority and female construction contractors and suppliers, including circulation of solicitation to minority and female contractor associations and other business associations.

p. Conduct a review, at least annually, of all supervisor's adherence to and performance under the Contractor's EEO policies and affirmative action obligations.

8. Contractors are encouraged to participate in voluntary associations which assist in fulfilling one or more of their affirmative action obligations (7 a through p.). The efforts of a contractor association, joint contractor-union, contractor-community, or other similar group of which the contractor is a member and participant, may be asserted as fulfilling any one or more of its obligations under 7 a through p. of these specifications provided that the contractor actively participates in the group, makes every effort to assure that the group has a positive impact on the employment of minorities and women in the industry, ensures that the concrete benefits of the program and reflected in the Contractor's minority and female work force participation, makes a good faith effort to meet its individual goals and timetables, and can provide access to documentation which demonstrates the effectiveness of actions take on behalf of the Contractor. The obligation to comply, however, is the Contractor's and failure of such a group to fulfill an obligation shall not be a defense for the Contractor's noncompliance.

9. A single goal for minorities and a separate single goal for women have been established. The Contractor, however, is required to provide equal employment opportunity and to take affirmative action for all minority groups, both make and female, and all women, both minority and non-minority. Consequently, the Contractor may be in violation of the Executive Order if a particular group is employed in a substantially disparate manner (for example, specific minority group of women is underutilized.)

10. The Contractor shall not use the goals and timetables or affirmative action even through the Contractor has achieved its goals for women generally, the Contractor may be in violation of the Executive Order if standards to discriminate against any person because of race, color, religion, sex, or national origin.

11. The Contractor shall not enter into any Subcontract with any person or firm debarred from Government contracts pursuant to Executive Order 11246.

12. The Contractor shall carry out such sanctions and penalties for violation of these specifications and of the Equal Opportunity Clause, including suspension, termination and cancellation of existing subcontracts as may be imposed or ordered pursuant to Executive Order 11246, as amended, and its implementation regulations by the Office of Federal Contract Compliance Programs. Any Contractor who fails to carry out such sanctions and penalties shall be in violation of these specifications and Executive Order 11246, as amended.

13. The Contractor, in fulfilling its obligations under these specifications, shall implement specific affirmative action steps, at least as extensive as those standards prescribed in paragraph 7 of these specifications, so as to achieve maximum results from its efforts to ensure equal employment opportunity. If the Contractor fails to comply with the requirements of the Executive Order, the implementing regulations, or these specifications, the Director shall proceed in accordance with 41 CFR 60-4.6.

14. The Contractor shall designate a responsible official to monitor all employment related activity to ensure that the company EEO policy is being carried out, to submit reports relating to the provisions hereof as may be required by the Government and to keep records. Records shall at least include for each employee the name, address, telephone numbers, construction trade, union affiliation if any, employee identification number when assigned, social security number, race, sex, status (e.g. mechanic, apprentice, trainee, helper, or laborer), dates of changes in status, hours worked per week in the indicated trade, rate of pay, and location sat which the work was performed. Records be maintained in an easily understandable and retrievable form; however, to the degree that existing records satisfy this requirement, contractors shall not be required to maintain separate records.

15. Nothing herein provided shall be construed as a limitation upon the application of other laws which establish different standards of compliance or upon the application of requirements for the hiring of local or other area residents (e.g., those under the Public Works Employment Act of 1977 and the Community Development Block Grant Program).

End of GOALS FOR EMPLOYMENT OF FEMALES AND MINORITIES
Federally Required Contract Document

****

D. Section '**D Disadvantaged Business Enterprise (DBE) Requirements**' is removed in its entirety. The DBE material is in:

Section 105.10 EQUAL OPPORTUNITY AND CIVIL RIGHTS.

SECTION 3 - OTHER FEDERAL REQUIREMENTS

Unless expressly otherwise provided in the Bid Documents, the provisions contained in this Section 3 of this "Federal Contract Provisions Supplement" are hereby incorporated into the Bid Documents and Contract.

A. Buy America

If the cost of products purchased for permanent use in this project which are manufactured of steel, iron or the application of any coating to products of these materials exceeds 0.1 percent of the contract amount, or $2,500.00, whichever is greater, the products shall have been manufactured and the coating applied in the United States. The coating materials are not subject to this clause, only the application of the coating. In computing that amount, only the cost of the product and coating application cost will be included.

Ore, for the manufacture of steel or iron, may be from outside the United States; however, all other manufacturing processes of steel or iron must be in the United States to qualify as having been manufactured in the United States.

United States includes the 50 United States and any place subject to the jurisdiction thereof.

Products of steel include, but are not limited to, such products as structural steel, piles, guardrail, steel culverts, reinforcing steel, structural plate and steel supports for signs, luminaries and signals.

Products of iron include, but are not limited to, such products as cast iron grates.

Application of coatings include, but are not limited to, such applications as epoxy, galvanized and paint.

To assure compliance with this section, the Contractor shall submit a certification letter on its letterhead to the Department stating the following:

> "This is to certify that products made of steel, iron or the application of any coating to products of these materials whose costs are in excess of $2,500.00 or 0.1 percent of the original contract amount, whichever is greater, were manufactured and the coating, if one was required, was applied in the United States."

B. Materials

a. Convict Produced Materials References: 23 U.S.C. 114(b)(2), 23 CFR 635.417
Applicability: FHWA's prohibition against the use of convict material only applies to Federal-aid highways. Materials produced after July 1, 1991, by convict labor may only be incorporated in a Federal-aid highway construction project if: 1) such materials have been produced by convicts who are on parole, supervised release, or probation from a prison; or
2) such material has been produced in a qualified prison facility, e.g., prison industry, with the amount produced during any 12-month period, for use in Federal-aid projects, not exceeding the amount produced, for such use, during the 12-month period ending July 1, 1987.

Materials obtained from prison facilities (e.g., prison industries) are subject to the same requirements for Federal-aid participation that are imposed upon materials acquired from other sources. Materials manufactured or produced by convict labor will be given no preferential treatment.

The preferred method of obtaining materials for a project is through normal contracting procedures which require the contractor to furnish all materials to be incorporated in the work. The contractor selects the source, public or private, from which the materials are to be obtained (23 CFR 635.407). Prison industries are prohibited from bidding on projects directly (23 CFR 635.112e), but may act as material supplier to construction contractors.

Prison materials may also be approved as State-furnished material. However, since public agencies may not bid in competition with private firms, direct acquisition of materials from a

prison industry for use as State-furnished material is subject to a public interest finding with the Division Administrator's concurrence (23 CFR 635.407d). Selection of materials produced by convict labor as State-furnished materials for mandatory use should be cleared prior to the submittal of the Plans Specifications & Estimates (PS&E).

b. Patented/Proprietary Products References: 23 U.S.C. 112, 23 CFR 635.411

FHWA will not participate, directly or indirectly, in payment for any premium or royalty on any patented or proprietary material, specification, or process specifically set forth in the plans and specifications for a project, unless:

- the item is purchased or obtained through competitive bidding with equally suitable unpatented items,
- the STA certifies either that the proprietary or patented item is essential for synchronization with the existing highway facilities or that no equally suitable alternative exists, or
- the item is used for research or for a special type of construction on relatively short sections of road for experimental purposes. States should follow FHWA's procedures for "Construction Projects Incorporating Experimental Features" (expermnt.htm) for the submittal of work plans and evaluations.

The primary purpose of the policy is to have competition in selection of materials and allow for development of new materials and products. The policy further permits materials and products that are judged equal may be bid under generic specifications. If only patented or proprietary products are acceptable, they shall be bid as alternatives with all, or at least a reasonable number of, acceptable materials or products listed; and the Division Administrator may approve a single source if it can be found that its utilization is in the public interest.

Trade names are generally the key to identifying patented or proprietary materials. Trade name examples include 3M, Corten, etc. Generally, products identified by their brand or trade name are not to be specified without an "or equal" phrase, and, if trade names are used, all, or at least a reasonable number of acceptable "equal" materials or products should be listed. The licensing of several suppliers to produce a product does not change the fact that it is a single product and should not be specified to the exclusion of other equally suitable products.

c. State Preference References: 23 U.S.C. 112, 23 CFR 635.409

Materials produced within Maine shall not be favored to the exclusion of comparable materials produced outside of Maine. State preference clauses give particular advantage to the designated source and thus restrict competition. Therefore, State preference provisions shall not be used on any Federal-aid construction projects.

This policy also applies to State preference actions against materials of foreign origin, except as otherwise permitted by Federal law. Thus, States cannot give preference to in-State material sources over foreign material sources. Under the Buy America provisions, the States are

permitted to expand the Buy America restrictions provided that the STA is legally authorized under State law to impose more stringent requirements.

d. State Owned/Furnished/Designated Materials References: 23 U.S.C. 112, 23 CFR 635.407

Current FHWA policy requires that the contractor must furnish all materials to be incorporated in the work, and the contractor shall be permitted to select the sources from which the materials are to be obtained. Exceptions to this requirement may be made when there is a definite finding, by MaineDOT and concurred in by Federal Highway Administration's (FHWA) Division Administrator, that it is in the public interest to require the contractor to use materials furnished by the MaineDOT or from sources designated by MaineDOT. The exception policy can best be understood by separating State-furnished materials into the categories of manufactured materials and local natural materials.

Manufactured Materials When the use of State-furnished manufactured materials is approved based on a public interest finding, such use must be made mandatory. The optional use of State-furnished manufactured materials is in violation of our policy prohibiting public agencies from competing with private firms. Manufactured materials to be furnished by MaineDOT must be acquired through competitive bidding, unless there is a public interest finding for another method, and concurred in by FHWA's Division Administrator.

Local Natural Materials When MaineDOT owns or controls a local natural materials source such as a borrow pit or a stockpile of salvaged pavement material, etc., the materials may be designated for either optional or mandatory use; however, mandatory use will require a public interest finding (PIF) and FHWA's Division Administrator's concurrence.

In order to permit prospective bidders to properly prepare their bids, the location, cost, and any conditions to be met for obtaining materials that are made available to the contractor shall be stated in the bidding documents.

Mandatory Disposal Sites Normally, the disposal site for surplus excavated materials is to be of the contractor's choosing; although, an optional site(s) may be shown in the contract provisions. A mandatory site shall be specified when there is a finding by MaineDOT, with the concurrence of the Division Administrator, that such placement is the most economical or that the environment would be substantially enhanced without excessive cost. Discussion of the mandatory use of a disposal site in the environmental document may serve as the basis for the public interest finding.

Summarizing FHWA policy for the mandatory use of borrow or disposal sites:

- mandatory use of either requires a public interest finding and FHWA's Division Administrator's concurrence,
- mandatory use of either may be based on environmental consideration where the environment will be substantially enhanced without excessive additional cost, and
- where the use is based on environmental considerations, the discussion in the environmental document may be used as the basis for the public interest finding.

Factors to justify a public interest finding should include such items as cost effectiveness, system integrity, and local shortages of material.

C. Standard FHWA Contract Provisions - FHWA 1273

Unless expressly otherwise provided in the Bid Documents, the following "Required Contract Provisions, Federal Aid Construction Contracts", FHWA-1273, are hereby incorporated into the Bid Documents and Contract.

****

Cargo Preference Act : Contractor and Subcontractor Clauses. "Use of United States-flag vessels: The contractor agrees—"(1) To utilize privately owned United States-flag commercial vessels to ship at least 50 percent of the gross tonnage (computed separately for dry bulk carriers, dry cargo liners, and tankers) involved, whenever shipping any equipment, material, or commodities pursuant to this contract, to the extent such vessels are available at fair and reasonable rates for United States-flag commercial vessels."(2) To furnish within 20 days following the date of loading for shipments originating within the United States or within 30 working days following the date of loading for shipments originating outside the United States, a legible copy of a rated, 'on-board' commercial ocean bill-of-lading in English for each shipment of cargo described in paragraph (1) of this section to both the Contracting Officer (through the prime contractor in the case of subcontractor bills-of-lading) and to the Division of National Cargo, Office of Market Development, Maritime Administration, Washington, DC 20590."(3) To insert the substance of the provisions of this clause in all subcontracts issued pursuant to this contract."(Reorganization Plans No. 21 of 1950 (64 Stat. 1273) and No. 7 of 1961 (75 Stat. 840) as amended by Pub. L. 91-469 (84 Stat. 1036) and Department of Commerce Organization Order 10-8 (38 FR 19707, July 23, 1973)) [42 FR 57126, Nov. 1, 1977]

The Cargo Preference Act requirements apply to materials or equipment that are acquired for a specific Federal-aid highway project. In general, the requirements are not applicable to goods or materials that come into inventories independent of an FHWA funded-contract. For example, the requirements would not apply to shipments of Portland cement, asphalt cement, or aggregates, as industry suppliers and contractors use these materials to replenish existing inventories. In general, most of the materials used for highway construction originate from existing inventories and are not acquired solely for a specific Federal-aid project. However, if materials or equipment are acquired solely for a Federal-aid project, then the Cargo Preference Act requirements apply."

****

Start of FHWA 1273 REQUIRED CONTRACT PROVISIONS
FEDERAL-AID CONSTRUCTION CONTRACTS (As revised through May 1, 2012)

FHWA-1273 -- Revised May 1, 2012

REQUIRED CONTRACT PROVISIONS
FEDERAL-AID CONSTRUCTION CONTRACTS

I. General
II. Nondiscrimination
III. Nonsegregated Facilities
IV. Davis-Bacon and Related Act Provisions
V. Contract Work Hours and Safety Standards Act Provisions
VI. Subletting or Assigning the Contract
VII. Safety: Accident Prevention
VIII. False Statements Concerning Highway Projects
IX. Implementation of Clean Air Act and Federal Water Pollution Control Act
X. Compliance with Governmentwide Suspension and Debarment Requirements
XI. Certification Regarding Use of Contract Funds for Lobbying

ATTACHMENTS

A. Employment and Materials Preference for Appalachian Development Highway System or Appalachian Local Access Road Contracts (included in Appalachian contracts only)

I. GENERAL

1. Form FHWA-1273 must be physically incorporated in each construction contract funded under Title 23 (excluding emergency contracts solely intended for debris removal). The contractor (or subcontractor) must insert this form in each subcontract and further require its inclusion in all lower tier subcontracts (excluding purchase orders, rental agreements and other agreements for supplies or services).

The applicable requirements of Form FHWA-1273 are incorporated by reference for work done under any purchase order, rental agreement or agreement for other services. The prime contractor shall be responsible for compliance by any subcontractor, lower-tier subcontractor or service provider.

Form FHWA-1273 must be included in all Federal-aid design-build contracts, in all subcontracts and in lower tier subcontracts (excluding subcontracts for design services, purchase orders, rental agreements and other agreements for supplies or services). The design-builder shall be responsible for compliance by any subcontractor, lower-tier subcontractor or service provider.

Contracting agencies may reference Form FHWA-1273 in bid proposal or request for proposal documents, however, the Form FHWA-1273 must be physically incorporated (not referenced) in all contracts, subcontracts and lower-tier subcontracts (excluding purchase orders, rental agreements and other agreements for supplies or services related to a construction contract).

2. Subject to the applicability criteria noted in the following sections, these contract provisions shall apply to all work performed on the contract by the contractor's own organization and with the assistance of workers under the contractor's immediate superintendence and to all work performed on the contract by piecework, station work, or by subcontract.

3. A breach of any of the stipulations contained in these Required Contract Provisions may be sufficient grounds for withholding of progress payments, withholding of final payment,

termination of the contract, suspension / debarment or any other action determined to be appropriate by the contracting agency and FHWA.

4. Selection of Labor: During the performance of this contract, the contractor shall not use convict labor for any purpose within the limits of a construction project on a Federal-aid highway unless it is labor performed by convicts who are on parole, supervised release, or probation. The term Federal-aid highway does not include roadways functionally classified as local roads or rural minor collectors.

II. NONDISCRIMINATION

The provisions of this section related to 23 CFR Part 230 are applicable to all Federal-aid construction contracts and to all related construction subcontracts of $10,000 or more. The provisions of 23 CFR Part 230 are not applicable to material supply, engineering, or architectural service contracts.

In addition, the contractor and all subcontractors must comply with the following policies: Executive Order 11246, 41 CFR 60, 29 CFR 1625-1627, Title 23 USC Section 140, the Rehabilitation Act of 1973, as amended (29 USC 794), Title VI of the Civil Rights Act of 1964, as amended, and related regulations including 49 CFR Parts 21, 26 and 27; and 23 CFR Parts 200, 230, and 633.

The contractor and all subcontractors must comply with: the requirements of the Equal Opportunity Clause in 41 CFR 60-1.4(b) and, for all construction contracts exceeding $10,000, the Standard Federal Equal Employment Opportunity Construction Contract Specifications in 41 CFR 60-4.3.

Note: The U.S. Department of Labor has exclusive authority to determine compliance with Executive Order 11246 and the policies of the Secretary of Labor including 41 CFR 60, and 29 CFR 1625-1627. The contracting agency and the FHWA have the authority and the responsibility to ensure compliance with Title 23 USC Section 140, the Rehabilitation Act of 1973, as amended (29 USC 794), and Title VI of the Civil Rights Act of 1964, as amended, and related regulations including 49 CFR Parts 21, 26 and 27; and 23 CFR Parts 200, 230, and 633.

The following provision is adopted from 23 CFR 230, Appendix A, with appropriate revisions to conform to the U.S. Department of Labor (US DOL) and FHWA requirements.

1. Equal Employment Opportunity: Equal employment opportunity (EEO) requirements not to discriminate and to take affirmative action to assure equal opportunity as set forth under laws, executive orders, rules, regulations (28 CFR 35, 29 CFR 1630, 29 CFR 1625-1627, 41 CFR 60 and 49 CFR 27) and orders of the Secretary of Labor as modified by the provisions prescribed herein, and imposed pursuant to 23 U.S.C. 140 shall constitute the EEO and specific affirmative action standards for the contractor's project activities under this contract. The provisions of the Americans with Disabilities Act of 1990 (42 U.S.C. 12101 et seq.) set forth under 28 CFR 35 and 29 CFR 1630 are incorporated by reference in this contract. In the execution of this contract, the contractor agrees to comply with the following minimum specific requirement activities of EEO:

a. The contractor will work with the contracting agency and the Federal Government to ensure that it has made every good faith effort to provide equal opportunity with respect to all of its terms and conditions of employment and in their review of activities under the contract.

b. The contractor will accept as its operating policy the following statement:

"It is the policy of this Company to assure that applicants are employed, and that employees are treated during employment, without regard to their race, religion, sex, color, national origin, age or disability. Such action shall include: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship, pre-apprenticeship, and/or on-the-job training."

2. EEO Officer: The contractor will designate and make known to the contracting officers an EEO Officer who will have the responsibility for and must be capable of effectively administering and promoting an active EEO program and who must be assigned adequate authority and responsibility to do so.

3. Dissemination of Policy: All members of the contractor's staff who are authorized to hire, supervise, promote, and discharge employees, or who recommend such action, or who are substantially involved in such action, will be made fully cognizant of, and will implement, the contractor's EEO policy and contractual responsibilities to provide EEO in each grade and classification of employment. To ensure that the above agreement will be met, the following actions will be taken as a minimum:

a. Periodic meetings of supervisory and personnel office employees will be conducted before the start of work and then not less often than once every six months, at which time the contractor's EEO policy and its implementation will be reviewed and explained. The meetings will be conducted by the EEO Officer.

b. All new supervisory or personnel office employees will be given a thorough indoctrination by the EEO Officer, covering all major aspects of the contractor's EEO obligations within thirty days following their reporting for duty with the contractor.

c. All personnel who are engaged in direct recruitment for the project will be instructed by the EEO Officer in the contractor's procedures for locating and hiring minorities and women.

d. Notices and posters setting forth the contractor's EEO policy will be placed in areas readily accessible to employees, applicants for employment and potential employees.

e. The contractor's EEO policy and the procedures to implement such policy will be brought to the attention of employees by means of meetings, employee handbooks, or other appropriate means.

4. Recruitment: When advertising for employees, the contractor will include in all advertisements for employees the notation: "An Equal Opportunity Employer." All such advertisements will be placed in publications having a large circulation among minorities and women in the area from which the project work force would normally be derived.

a. The contractor will, unless precluded by a valid bargaining agreement, conduct systematic and direct recruitment through public and private employee referral sources likely to yield qualified minorities and women. To meet this requirement, the contractor will identify sources of potential minority group employees, and establish with such identified sources procedures whereby minority and women applicants may be referred to the contractor for employment consideration.

b. In the event the contractor has a valid bargaining agreement providing for exclusive hiring hall referrals, the contractor is expected to observe the provisions of that agreement to the extent that the system meets the contractor's compliance with EEO contract provisions. Where implementation of such an agreement has the effect of discriminating against minorities or women, or obligates the contractor to do the same, such implementation violates Federal nondiscrimination provisions.

c. The contractor will encourage its present employees to refer minorities and women as applicants for employment. Information and procedures with regard to referring such applicants will be discussed with employees.

5. Personnel Actions: Wages, working conditions, and employee benefits shall be established and administered, and personnel actions of every type, including hiring, upgrading, promotion, transfer, demotion, layoff, and termination, shall be taken without regard to race, color, religion, sex, national origin, age or disability.

The following procedures shall be followed:

a. The contractor will conduct periodic inspections of project sites to insure that working conditions and employee facilities do not indicate discriminatory treatment of project site personnel.

b. The contractor will periodically evaluate the spread of wages paid within each classification to determine any evidence of discriminatory wage practices.

c. The contractor will periodically review selected personnel actions in depth to determine whether there is evidence of discrimination. Where evidence is found, the contractor will promptly take corrective action. If the review indicates that the discrimination may extend beyond the actions reviewed, such corrective action shall include all affected persons.

d. The contractor will promptly investigate all complaints of alleged discrimination made to the contractor in connection with its obligations under this contract, will attempt to resolve such complaints, and will take appropriate corrective action within a reasonable time. If the investigation indicates that the discrimination may affect persons other than the complainant, such corrective action shall include such other persons. Upon completion of each investigation, the contractor will inform every complainant of all of their avenues of appeal.

6. Training and Promotion:

a. The contractor will assist in locating, qualifying, and increasing the skills of minorities and women who are applicants for employment or current employees. Such efforts should be aimed at developing full journey level status employees in the type of trade or job classification involved.

b. Consistent with the contractor's work force requirements and as permissible under Federal and State regulations, the contractor shall make full use of training programs, i.e., apprenticeship, and on-the-job training programs for the geographical area of contract performance. In the event a special provision for training is provided under this contract, this subparagraph will be superseded as indicated in the special provision. The contracting agency may reserve training positions for persons who receive welfare assistance in accordance with 23 U.S.C. 140(a).

c. The contractor will advise employees and applicants for employment of available training programs and entrance requirements for each.

d. The contractor will periodically review the training and promotion potential of employees who are minorities and women and will encourage eligible employees to apply for such training and promotion.

7. Unions: If the contractor relies in whole or in part upon unions as a source of employees, the contractor will use good faith efforts to obtain the cooperation of such unions to increase opportunities for minorities and women.

Actions by the contractor, either directly or through a contractor's association acting as agent, will include the procedures set forth below:

a. The contractor will use good faith efforts to develop, in cooperation with the unions, joint training programs aimed toward qualifying more minorities and women for membership in the unions and increasing the skills of minorities and women so that they may qualify for higher paying employment.

b. The contractor will use good faith efforts to incorporate an EEO clause into each union agreement to the end that such union will be contractually bound to refer applicants without regard to their race, color, religion, sex, national origin, age or disability.

c. The contractor is to obtain information as to the referral practices and policies of the labor union except that to the extent such information is within the exclusive possession of the labor union and such labor union refuses to furnish such information to the contractor, the contractor shall so certify to the contracting agency and shall set forth what efforts have been made to obtain such information.

d. In the event the union is unable to provide the contractor with a reasonable flow of referrals within the time limit set forth in the collective bargaining agreement, the contractor will, through independent recruitment efforts, fill the employment vacancies without regard to race, color, religion, sex, national origin, age or disability; making full efforts to obtain qualified and/or qualifiable minorities and women. The failure of a union to provide sufficient referrals (even

though it is obligated to provide exclusive referrals under the terms of a collective bargaining agreement) does not relieve the contractor from the requirements of this paragraph. In the event the union referral practice prevents the contractor from meeting the obligations pursuant to Executive Order 11246, as amended, and these special provisions, such contractor shall immediately notify the contracting agency.

8. Reasonable Accommodation for Applicants / Employees with Disabilities: The contractor must be familiar with the requirements for and comply with the Americans with Disabilities Act and all rules and regulations established there under. Employers must provide reasonable accommodation in all employment activities unless to do so would cause an undue hardship.

9. Selection of Subcontractors, Procurement of Materials and Leasing of Equipment: The contractor shall not discriminate on the grounds of race, color, religion, sex, national origin, age or disability in the selection and retention of subcontractors, including procurement of materials and leases of equipment. The contractor shall take all necessary and reasonable steps to ensure nondiscrimination in the administration of this contract.

a. The contractor shall notify all potential subcontractors and suppliers and lessors of their EEO obligations under this contract.

b. The contractor will use good faith efforts to ensure subcontractor compliance with their EEO obligations.

10. Assurance Required by 49 CFR 26.13(b):

a. The requirements of 49 CFR Part 26 and the State DOT's U.S. DOT-approved DBE program are incorporated by reference.

b. The contractor or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The contractor shall carry out applicable requirements of 49 CFR Part 26 in the award and administration of DOT-assisted contracts. Failure by the contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy as the contracting agency deems appropriate.

11. Records and Reports: The contractor shall keep such records as necessary to document compliance with the EEO requirements. Such records shall be retained for a period of three years following the date of the final payment to the contractor for all contract work and shall be available at reasonable times and places for inspection by authorized representatives of the contracting agency and the FHWA.

a. The records kept by the contractor shall document the following:

(1) The number and work hours of minority and non-minority group members and women employed in each work classification on the project;

(2) The progress and efforts being made in cooperation with unions, when applicable, to increase employment opportunities for minorities and women; and

(3) The progress and efforts being made in locating, hiring, training, qualifying, and upgrading minorities and women;

b. The contractors and subcontractors will submit an annual report to the contracting agency each July for the duration of the project, indicating the number of minority, women, and non-minority group employees currently engaged in each work classification required by the contract work. This information is to be reported on Form FHWA-1391. The staffing data should represent the project work force on board in all or any part of the last payroll period preceding the end of July. If on-the-job training is being required by special provision, the contractor will be required to collect and report training data. The employment data should reflect the work force on board during all or any part of the last payroll period preceding the end of July.

III. NONSEGREGATED FACILITIES

This provision is applicable to all Federal-aid construction contracts and to all related construction subcontracts of $10,000 or more.

The contractor must ensure that facilities provided for employees are provided in such a manner that segregation on the basis of race, color, religion, sex, or national origin cannot result. The contractor may neither require such segregated use by written or oral policies nor tolerate such use by employee custom. The contractor's obligation extends further to ensure that its employees are not assigned to perform their services at any location, under the contractor's control, where the facilities are segregated. The term "facilities" includes waiting rooms, work areas, restaurants and other eating areas, time clocks, restrooms, washrooms, locker rooms, and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing provided for employees. The contractor shall provide separate or single-user restrooms and necessary dressing or sleeping areas to assure privacy between sexes.

IV. DAVIS-BACON AND RELATED ACT PROVISIONS

This section is applicable to all Federal-aid construction projects exceeding $2,000 and to all related subcontracts and lower-tier subcontracts (regardless of subcontract size). The requirements apply to all projects located within the right-of-way of a roadway that is functionally classified as Federal-aid highway. This excludes roadways functionally classified as local roads or rural minor collectors, which are exempt. Contracting agencies may elect to apply these requirements to other projects.

The following provisions are from the U.S. Department of Labor regulations in 29 CFR 5.5 “Contract provisions and related matters” with minor revisions to conform to the FHWA-1273 format and FHWA program requirements.

1. Minimum wages

a. All laborers and mechanics employed or working upon the site of the work, will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by regulations issued by the Secretary of Labor under the Copeland Act (29 CFR part 3)), the full amount of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the contractor and such laborers and mechanics.

Contributions made or costs reasonably anticipated for bona fide fringe benefits under section 1(b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of paragraph 1.d. of this section; also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in 29 CFR 5.5(a)(4). Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein: Provided, That the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classification and wage rates conformed under paragraph 1.b. of this section) and the Davis-Bacon poster (WH–1321) shall be posted at all times by the contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers.

b. (1) The contracting officer shall require that any class of laborers or mechanics, including helpers, which is not listed in the wage determination and which is to be employed under the contract shall be classified in conformance with the wage determination. The contracting officer shall approve an additional classification and wage rate and fringe benefits therefore only when the following criteria have been met:

(i) The work to be performed by the classification requested is not performed by a classification in the wage determination; and

(ii) The classification is utilized in the area by the construction industry; and

(iii) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.

(2) If the contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and the contracting officer agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken shall be sent by the contracting officer to the Administrator of the Wage and Hour Division, Employment Standards Administration, U.S. Department of Labor, Washington, DC 20210. The Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

(3) In the event the contractor, the laborers or mechanics to be employed in the classification or their representatives, and the contracting officer do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), the contracting officer shall refer the questions, including the views of all interested parties and the recommendation of the contracting officer, to the Wage and Hour Administrator for determination. The Wage and Hour Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

(4) The wage rate (including fringe benefits where appropriate) determined pursuant to paragraphs 1.b.(2) or 1.b.(3) of this section, shall be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.

c. Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the contractor shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.

d. If the contractor does not make payments to a trustee or other third person, the contractor may consider as part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program, Provided, That the Secretary of Labor has found, upon the written request of the contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the contractor to set aside in a separate account assets for the meeting of obligations under the plan or program.

2. Withholding

The contracting agency shall upon its own action or upon written request of an authorized representative of the Department of Labor, withhold or cause to be withheld from the contractor under this contract, or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to Davis-Bacon prevailing wage requirements, which is held by the same prime contractor, so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees, and helpers, employed by the contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee, or helper, employed or working on the site of the work, all or part of the wages required by the contract, the contracting agency may, after written notice to the contractor, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.

3. Payrolls and basic records

a. Payrolls and basic records relating thereto shall be maintained by the contractor during the course of the work and preserved for a period of three years thereafter for all laborers and mechanics working at the site of the work. Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in section 1(b)(2)(B) of the Davis-Bacon Act),

daily and weekly number of hours worked, deductions made and actual wages paid. Whenever the Secretary of Labor has found under 29 CFR 5.5(a)(1)(iv) that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in section 1(b)(2)(B) of the Davis-Bacon Act, the contractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs.

b. (1) The contractor shall submit weekly for each week in which any contract work is performed a copy of all payrolls to the contracting agency. The payrolls submitted shall set out accurately and completely all of the information required to be maintained under 29 CFR 5.5(a)(3)(i), except that full social security numbers and home addresses shall not be included on weekly transmittals. Instead the payrolls shall only need to include an individually identifying number for each employee (e.g. , the last four digits of the employee's social security number). The required weekly payroll information may be submitted in any form desired. Optional Form WH–347 is available for this purpose from the Wage and Hour Division Web site at http://www.dol.gov/esa/whd/forms/wh347instr.htm or its successor site. The prime contractor is responsible for the submission of copies of payrolls by all subcontractors. Contractors and subcontractors shall maintain the full social security number and current address of each covered worker, and shall provide them upon request to the contracting agency for transmission to the State DOT, the FHWA or the Wage and Hour Division of the Department of Labor for purposes of an investigation or audit of compliance with prevailing wage requirements. It is not a violation of this section for a prime contractor to require a subcontractor to provide addresses and social security numbers to the prime contractor for its own records, without weekly submission to the contracting agency..

(2) Each payroll submitted shall be accompanied by a “Statement of Compliance,” signed by the contractor or subcontractor or his or her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:

(i) That the payroll for the payroll period contains the information required to be provided under §5.5 (a)(3)(ii) of Regulations, 29 CFR part 5, the appropriate information is being maintained under §5.5 (a)(3)(i) of Regulations, 29 CFR part 5, and that such information is correct and complete;

(ii) That each laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in Regulations, 29 CFR part 3;

(iii) That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.

(3) The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH–347 shall satisfy the requirement for submission of the "Statement of Compliance" required by paragraph 3.b.(2) of this section.

(4) The falsification of any of the above certifications may subject the contractor or subcontractor to civil or criminal prosecution under section 1001 of title 18 and section 231 of title 31 of the United States Code.

c. The contractor or subcontractor shall make the records required under paragraph 3.a. of this section available for inspection, copying, or transcription by authorized representatives of the contracting agency, the State DOT, the FHWA, or the Department of Labor, and shall permit such representatives to interview employees during working hours on the job. If the contractor or subcontractor fails to submit the required records or to make them available, the FHWA may, after written notice to the contractor, the contracting agency or the State DOT, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.

4. Apprentices and trainees

a. Apprentices (programs of the USDOL).

Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Office of Apprenticeship Training, Employer and Labor Services, or with a State Apprenticeship Agency recognized by the Office, or if a person is employed in his or her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Office of Apprenticeship Training, Employer and Labor Services or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice.

The allowable ratio of apprentices to journeymen on the job site in any craft classification shall not be greater than the ratio permitted to the contractor as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated above, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a contractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman's hourly rate) specified in the contractor's or subcontractor's registered program shall be observed.

Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeymen hourly rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator determines that a

different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination.

In the event the Office of Apprenticeship Training, Employer and Labor Services, or a State Apprenticeship Agency recognized by the Office, withdraws approval of an apprenticeship program, the contractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

b. Trainees (programs of the USDOL).

Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the U.S. Department of Labor, Employment and Training Administration.

The ratio of trainees to journeymen on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration.

Every trainee must be paid at not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman wage rate on the wage determination which provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed.

In the event the Employment and Training Administration withdraws approval of a training program, the contractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

c. Equal employment opportunity. The utilization of apprentices, trainees and journeymen under this part shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR part 30.

d. Apprentices and Trainees (programs of the U.S. DOT).

Apprentices and trainees working under apprenticeship and skill training programs which have been certified by the Secretary of Transportation as promoting EEO in connection with Federal-aid highway construction programs are not subject to the requirements of paragraph 4 of this Section IV. The straight time hourly wage rates for apprentices and trainees under such programs will be established by the particular programs. The ratio of apprentices and trainees to journeymen shall not be greater than permitted by the terms of the particular program.

5. Compliance with Copeland Act requirements. The contractor shall comply with the requirements of 29 CFR part 3, which are incorporated by reference in this contract.

6. Subcontracts. The contractor or subcontractor shall insert Form FHWA-1273 in any subcontracts and also require the subcontractors to include Form FHWA-1273 in any lower tier subcontracts. The prime contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all the contract clauses in 29 CFR 5.5.

7. Contract termination: debarment. A breach of the contract clauses in 29 CFR 5.5 may be grounds for termination of the contract, and for debarment as a contractor and a subcontractor as provided in 29 CFR 5.12.

8. Compliance with Davis-Bacon and Related Act requirements. All rulings and interpretations of the Davis-Bacon and Related Acts contained in 29 CFR parts 1, 3, and 5 are herein incorporated by reference in this contract.

9. Disputes concerning labor standards. Disputes arising out of the labor standards provisions of this contract shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the Department of Labor set forth in 29 CFR parts 5, 6, and 7. Disputes within the meaning of this clause include disputes between the contractor (or any of its subcontractors) and the contracting agency, the U.S. Department of Labor, or the employees or their representatives.

10. Certification of eligibility.

a. By entering into this contract, the contractor certifies that neither it (nor he or she) nor any person or firm who has an interest in the contractor's firm is a person or firm ineligible to be awarded Government contracts by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

b. No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

c. The penalty for making false statements is prescribed in the U.S. Criminal Code, 18 U.S.C. 1001.

V. CONTRACT WORK HOURS AND SAFETY STANDARDS ACT

The following clauses apply to any Federal-aid construction contract in an amount in excess of $100,000 and subject to the overtime provisions of the Contract Work Hours and Safety Standards Act. These clauses shall be inserted in addition to the clauses required by 29 CFR 5.5(a) or 29 CFR 4.6. As used in this paragraph, the terms laborers and mechanics include watchmen and guards.

1. Overtime requirements. No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek.

2. Violation; liability for unpaid wages; liquidated damages. In the event of any violation of the clause set forth in paragraph (1.) of this section, the contractor and any subcontractor responsible therefor shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph (1.) of this section, in the sum of $10 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph (1.) of this section.

3. Withholding for unpaid wages and liquidated damages. The FHWA or the contacting agency shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph (2.) of this section.

4. Subcontracts. The contractor or subcontractor shall insert in any subcontracts the clauses set forth in paragraph (1.) through (4.) of this section and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs (1.) through (4.) of this section.

VI. SUBLETTING OR ASSIGNING THE CONTRACT

This provision is applicable to all Federal-aid construction contracts on the National Highway System.

1. The contractor shall perform with its own organization contract work amounting to not less than 30 percent (or a greater percentage if specified elsewhere in the contract) of the total original contract price, excluding any specialty items designated by the contracting agency. Specialty items may be performed by subcontract and the amount of any such specialty items performed may be deducted from the total original contract price before computing the amount of work required to be performed by the contractor's own organization (23 CFR 635.116).

a. The term “perform work with its own organization” refers to workers employed or leased by the prime contractor, and equipment owned or rented by the prime contractor, with or without operators. Such term does not include employees or equipment of a subcontractor or lower tier subcontractor, agents of the prime contractor, or any other assignees. The term may include payments for the costs of hiring leased employees from an employee leasing firm meeting all relevant Federal and State regulatory requirements. Leased employees may only be included in this term if the prime contractor meets all of the following conditions:

(1) the prime contractor maintains control over the supervision of the day-to-day activities of the leased employees;
(2) the prime contractor remains responsible for the quality of the work of the leased employees;
(3) the prime contractor retains all power to accept or exclude individual employees from work on the project; and
(4) the prime contractor remains ultimately responsible for the payment of predetermined minimum wages, the submission of payrolls, statements of compliance and all other Federal regulatory requirements.

b. "Specialty Items" shall be construed to be limited to work that requires highly specialized knowledge, abilities, or equipment not ordinarily available in the type of contracting organizations qualified and expected to bid or propose on the contract as a whole and in general are to be limited to minor components of the overall contract.

2. The contract amount upon which the requirements set forth in paragraph (1) of Section VI is computed includes the cost of material and manufactured products which are to be purchased or produced by the contractor under the contract provisions.

3. The contractor shall furnish (a) a competent superintendent or supervisor who is employed by the firm, has full authority to direct performance of the work in accordance with the contract requirements, and is in charge of all construction operations (regardless of who performs the work) and (b) such other of its own organizational resources (supervision, management, and engineering services) as the contracting officer determines is necessary to assure the performance of the contract.

4. No portion of the contract shall be sublet, assigned or otherwise disposed of except with the written consent of the contracting officer, or authorized representative, and such consent when given shall not be construed to relieve the contractor of any responsibility for the fulfillment of the contract. Written consent will be given only after the contracting agency has assured that each subcontract is evidenced in writing and that it contains all pertinent provisions and requirements of the prime contract.

5. The 30% self-performance requirement of paragraph (1) is not applicable to design-build contracts; however, contracting agencies may establish their own self-performance requirements.

VII. SAFETY: ACCIDENT PREVENTION

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

1. In the performance of this contract the contractor shall comply with all applicable Federal, State, and local laws governing safety, health, and sanitation (23 CFR 635). The contractor shall provide all safeguards, safety devices and protective equipment and take any other needed actions as it determines, or as the contracting officer may determine, to be reasonably necessary to protect the life and health of employees on the job and the safety of the public and to protect property in connection with the performance of the work covered by the contract.

2. It is a condition of this contract, and shall be made a condition of each subcontract, which the contractor enters into pursuant to this contract, that the contractor and any subcontractor shall not permit any employee, in performance of the contract, to work in surroundings or under conditions which are unsanitary, hazardous or dangerous to his/her health or safety, as determined under construction safety and health standards (29 CFR 1926) promulgated by the Secretary of Labor, in accordance with Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C. 3704).

3. Pursuant to 29 CFR 1926.3, it is a condition of this contract that the Secretary of Labor or authorized representative thereof, shall have right of entry to any site of contract performance to inspect or investigate the matter of compliance with the construction safety and health standards and to carry out the duties of the Secretary under Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C.3704).

VIII. FALSE STATEMENTS CONCERNING HIGHWAY PROJECTS

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

In order to assure high quality and durable construction in conformity with approved plans and specifications and a high degree of reliability on statements and representations made by engineers, contractors, suppliers, and workers on Federal-aid highway projects, it is essential that all persons concerned with the project perform their functions as carefully, thoroughly, and honestly as possible. Willful falsification, distortion, or misrepresentation with respect to any facts related to the project is a violation of Federal law. To prevent any misunderstanding regarding the seriousness of these and similar acts, Form FHWA-1022 shall be posted on each Federal-aid highway project (23 CFR 635) in one or more places where it is readily available to all persons concerned with the project:

18 U.S.C. 1020 reads as follows:

"Whoever, being an officer, agent, or employee of the United States, or of any State or Territory, or whoever, whether a person, association, firm, or corporation, knowingly makes any false statement, false representation, or false report as to the character, quality, quantity, or cost of the material used or to be used, or the quantity or quality of the work performed or to be performed, or the cost thereof in connection with the submission of plans, maps, specifications, contracts, or costs of construction on any highway or related project submitted for approval to the Secretary of Transportation; or

Whoever knowingly makes any false statement, false representation, false report or false claim with respect to the character, quality, quantity, or cost of any work performed or to be performed, or materials furnished or to be furnished, in connection with the construction of any highway or related project approved by the Secretary of Transportation; or

Whoever knowingly makes any false statement or false representation as to material fact in any statement, certificate, or report submitted pursuant to provisions of the Federal-aid Roads Act approved July 1, 1916, (39 Stat. 355), as amended and supplemented;

Shall be fined under this title or imprisoned not more than 5 years or both."

IX. IMPLEMENTATION OF CLEAN AIR ACT AND FEDERAL WATER POLLUTION CONTROL ACT

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

By submission of this bid/proposal or the execution of this contract, or subcontract, as appropriate, the bidder, proposer, Federal-aid construction contractor, or subcontractor, as appropriate, will be deemed to have stipulated as follows:

1. That any person who is or will be utilized in the performance of this contract is not prohibited from receiving an award due to a violation of Section 508 of the Clean Water Act or Section 306 of the Clean Air Act.
2. That the contractor agrees to include or cause to be included the requirements of paragraph (1) of this Section X in every subcontract, and further agrees to take such action as the contracting agency may direct as a means of enforcing such requirements.

X. CERTIFICATION REGARDING DEBARMENT, SUSPENSION, INELIGIBILITY AND VOLUNTARY EXCLUSION

This provision is applicable to all Federal-aid construction contracts, design-build contracts, subcontracts, lower-tier subcontracts, purchase orders, lease agreements, consultant contracts or any other covered transaction requiring FHWA approval or that is estimated to cost $25,000 or more – as defined in 2 CFR Parts 180 and 1200.

1**. Instructions for Certification – First Tier Participants:**

a. By signing and submitting this proposal, the prospective first tier participant is providing the certification set out below.

b. The inability of a person to provide the certification set out below will not necessarily result in denial of participation in this covered transaction. The prospective first tier participant shall submit an explanation of why it cannot provide the certification set out below. The certification or explanation will be considered in connection with the department or agency's determination whether to enter into this transaction. However, failure of the prospective first tier participant to furnish a certification or an explanation shall disqualify such a person from participation in this transaction.

c. The certification in this clause is a material representation of fact upon which reliance was placed when the contracting agency determined to enter into this transaction. If it is later determined that the prospective participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the contracting agency may terminate this transaction for cause of default.

d. The prospective first tier participant shall provide immediate written notice to the contracting agency to whom this proposal is submitted if any time the prospective first tier participant learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.

e. The terms "covered transaction," "debarred," "suspended," "ineligible," "participant," "person," "principal," and "voluntarily excluded," as used in this clause, are defined in 2 CFR Parts 180 and 1200. “First Tier Covered Transactions” refers to any covered transaction between a grantee or subgrantee of Federal funds and a participant (such as the prime or general contract). “Lower Tier Covered Transactions” refers to any covered transaction under a First Tier Covered Transaction (such as subcontracts). “First Tier Participant” refers to the participant who has entered into a covered transaction with a grantee or subgrantee of Federal funds (such as the prime or general contractor). “Lower Tier Participant” refers any participant who has entered into a covered transaction with a First Tier Participant or other Lower Tier Participants (such as subcontractors and suppliers).

f. The prospective first tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency entering into this transaction.

g. The prospective first tier participant further agrees by submitting this proposal that it will include the clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transactions," provided by the department or contracting agency, entering into this covered transaction, without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions exceeding the $25,000 threshold.

h. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant is responsible for ensuring that its principals are not suspended, debarred, or otherwise ineligible to participate in covered transactions. To verify the eligibility of its principals, as well as the eligibility of any lower tier prospective participants, each participant may, but is not required to, check the Excluded Parties List System website (https://www.epls.gov/), which is compiled by the General Services Administration.

i. Nothing contained in the foregoing shall be construed to require the establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of the prospective participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

j. Except for transactions authorized under paragraph (f) of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency may terminate this transaction for cause or default.

* * * * *

2. Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion – First Tier Participants:

a. The prospective first tier participant certifies to the best of its knowledge and belief, that it and its principals:

(1) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participating in covered transactions by any Federal department or agency;

(2) Have not within a three-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;

(3) Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph (a)(2) of this certification; and

(4) Have not within a three-year period preceding this application/proposal had one or more public transactions (Federal, State or local) terminated for cause or default.

b. Where the prospective participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

2. **Instructions for Certification - Lower Tier Participants:**

(Applicable to all subcontracts, purchase orders and other lower tier transactions requiring prior FHWA approval or estimated to cost $25,000 or more - 2 CFR Parts 180 and 1200)

a. By signing and submitting this proposal, the prospective lower tier is providing the certification set out below.

b. The certification in this clause is a material representation of fact upon which reliance was placed when this transaction was entered into. If it is later determined that the prospective lower tier participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the department, or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

c. The prospective lower tier participant shall provide immediate written notice to the person to which this proposal is submitted if at any time the prospective lower tier participant learns that its certification was erroneous by reason of changed circumstances.

d. The terms "covered transaction," "debarred," "suspended," "ineligible," "participant," "person," "principal," and "voluntarily excluded," as used in this clause, are defined in 2 CFR Parts 180 and 1200. You may contact the person to which this proposal is submitted for assistance in obtaining a copy of those regulations. “First Tier Covered Transactions” refers to any covered transaction between a grantee or subgrantee of Federal funds and a participant (such as the prime or general contract). “Lower Tier Covered Transactions” refers to any covered transaction under a First Tier Covered Transaction (such as subcontracts). “First Tier Participant” refers to the participant who has entered into a covered transaction with a grantee or subgrantee of Federal funds (such as the prime or general contractor). “Lower Tier Participant” refers any participant who has entered into a covered transaction with a First Tier Participant or other Lower Tier Participants (such as subcontractors and suppliers).

e. The prospective lower tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency with which this transaction originated.

f. The prospective lower tier participant further agrees by submitting this proposal that it will include this clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transaction," without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions exceeding the $25,000 threshold.

g. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant is responsible for ensuring that its principals are not suspended, debarred, or otherwise ineligible to participate in covered transactions. To verify the eligibility of its principals, as well as the eligibility of any lower tier prospective participants, each participant may, but is not required to, check the Excluded Parties List System website (https://www.epls.gov/), which is compiled by the General Services Administration.

h. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

i. Except for transactions authorized under paragraph e of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

* * * * *

Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion--Lower Tier Participants:

1. The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participating in covered transactions by any Federal department or agency.

2. Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

* * * * *

XI. CERTIFICATION REGARDING USE OF CONTRACT FUNDS FOR LOBBYING

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts which exceed $100,000 (49 CFR 20).

1. The prospective participant certifies, by signing and submitting this bid or proposal, to the best of his or her knowledge and belief, that:

a. No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

b. If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

2. This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by 31 U.S.C. 1352. Any person who fails to file the required certification shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.

3. The prospective participant also agrees by submitting its bid or proposal that the participant shall require that the language of this certification be included in all lower tier subcontracts, which exceed $100,000 and that all such recipients shall certify and disclose accordingly.

ATTACHMENT A - EMPLOYMENT AND MATERIALS PREFERENCE FOR APPALACHIAN DEVELOPMENT HIGHWAY SYSTEM OR APPALACHIAN LOCAL ACCESS ROAD CONTRACTS

This provision is applicable to all Federal-aid projects funded under the Appalachian Regional Development Act of 1965.

1. During the performance of this contract, the contractor undertaking to do work which is, or reasonably may be, done as on-site work, shall give preference to qualified persons who regularly reside in the labor area as designated by the DOL wherein the contract work is situated, or the subregion, or the Appalachian counties of the State wherein the contract work is situated, except:

a. To the extent that qualified persons regularly residing in the area are not available.

b. For the reasonable needs of the contractor to employ supervisory or specially experienced personnel necessary to assure an efficient execution of the contract work.

c. For the obligation of the contractor to offer employment to present or former employees as the result of a lawful collective bargaining contract, provided that the number of nonresident persons employed under this subparagraph (1c) shall not exceed 20 percent of the total number of employees employed by the contractor on the contract work, except as provided in subparagraph (4) below.

2. The contractor shall place a job order with the State Employment Service indicating (a) the classifications of the laborers, mechanics and other employees required to perform the contract work, (b) the number of employees required in each classification, (c) the date on which the participant estimates such employees will be required, and (d) any other pertinent information required by the State Employment Service to complete the job order form. The job order may be placed with the State Employment Service in writing or by telephone. If during the course of the contract work, the information submitted by the contractor in the original job order is substantially modified, the participant shall promptly notify the State Employment Service.

3. The contractor shall give full consideration to all qualified job applicants referred to him by the State Employment Service. The contractor is not required to grant employment to any job applicants who, in his opinion, are not qualified to perform the classification of work required.

4. If, within one week following the placing of a job order by the contractor with the State Employment Service, the State Employment Service is unable to refer any qualified job applicants to the contractor, or less than the number requested, the State Employment Service will forward a certificate to the contractor indicating the unavailability of applicants. Such certificate shall be made a part of the contractor's permanent project records. Upon receipt of this certificate, the contractor may employ persons who do not normally reside in the labor area to fill positions covered by the certificate, notwithstanding the provisions of subparagraph (1c) above.

5. The provisions of 23 CFR 633.207(e) allow the contracting agency to provide a contractual preference for the use of mineral resource materials native to the Appalachian region.

6. The contractor shall include the provisions of Sections 1 through 4 of this Attachment A in every subcontract for work which is, or reasonably may be, done as on-site work.

End of FHWA 1273

The United States Department of Transportation (USDOT) Standard Title VI/Non-Discrimination Assurances

DOT Order No. 1050.2A

The ***Maine Department of Transportation*** (herein referred to as the "Recipient"), **HEREBY AGREES THAT**, as a condition to receiving any Federal financial assistance from the U.S. Department of Transportation (DOT), through the ***Federal Highway Administration (FHWA***), is subject to and will comply with the following:

Statutory/Regulatory Authorities

- Title VI of the Civil Rights Act of 1964 (42 U.S.C. § 2000d et seq., 78 stat. 252), (prohibits discrimination on the basis of race, color, national origin);
- 49 C.F.R. Part 21 (entitled Non-discrimination In Federally-Assisted Programs Of The Department Of Transportation-Effectuation Of Title VI Of The Civil Rights Act Of 1964);
- 28 C.F.R. Section 50.3 (U.S. Department of Justice Guidelines for Enforcement of Title VI of the Civil Rights Act of 1964);

The preceding statutory and regulatory cites hereinafter are referred to as the "Acts" and "Regulations," respectively.

General Assurances

In accordance with the Acts, the Regulations, and other pertinent directives, circulars, policy, memoranda, and/or guidance, the Recipient hereby gives assurance that it will promptly take any measures necessary to ensure that:

> *"No person in the United States shall, on the grounds of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be otherwise subjected to discrimination under any program or activity, "for which the Recipient receives Federal financial assistance from DOT, including the* ***FHWA****.*

The Civil Rights Restoration Act of 1987 clarified the original intent of Congress, with respect to Title VI and other Non-discrimination requirements (The Age Discrimination Act of 1975, and Section 504 of the Rehabilitation Act of 1973), by restoring the broad, institutional-wide scope and coverage of these non-discrimination statutes and requirements to include all programs and activities of the Recipient, so long as any portion of the program is Federally assisted.

Specific Assurances

More specifically, and without limiting the above general Assurance, the Recipient agrees with and gives the following Assurances with respect to its Federally assisted ***Highway Program***:

1. The Recipient agrees that each "activity," "facility," or "program," as defined in §§ 21.23(b) and 21.23(e) of 49 C.F.R. § 21 will be (with regard to an "activity") facilitated, or will be (with regard

E

to a "facility") operated, or will be (with regard to a "program") conducted in compliance with all requirements imposed by, or pursuant to the Acts and the Regulations.

2. The Recipient will insert the following notification in all solicitations for bids, Requests For Proposals for work, or material subject to the Acts and the Regulations made in connection with all ***Federal-Aid Highway Program activities*** and, in adapted form, in all proposals for negotiated agreements regardless of funding source:

> "The ***Maine Department of Transportation***, in accordance with the provisions of Title VI of the Civil Rights Act of 1964 (78 Stat. 252, 42 US.C. §§ 2000d to 2000d-4) and the Regulations, hereby notifies all bidders that it will affirmatively ensure that any contract entered into pursuant to this advertisement, disadvantaged business enterprises will be afforded full and fair opportunity to submit bids in response to this invitation and will not be discriminated against on the grounds of race, color, or national origin in consideration for an award."

3. The Recipient will insert the clauses of Appendix A and E of this Assurance in every contract or agreement subject to the Acts and the Regulations.

4. The Recipient will insert the clauses of Appendix B of this Assurance, as a covenant running with the land, in any deed from the United States effecting or recording a transfer of real property, structures, use, or improvements thereon or interest therein to a Recipient.

5. That where the Recipient receives Federal financial assistance to construct a facility, or part of a facility, the Assurance will extend to the entire facility and facilities operated in connection therewith.

6. That where the Recipient receives Federal financial assistance in the form, or for the acquisition of real property or an interest in real property, the Assurance will extend to rights to space on, over, or under such property.

7. That the Recipient will include the clauses set forth in Appendix C and Appendix D of this Assurance, as a covenant running with the land, in any future deeds, leases, licenses, permits, or similar instruments entered into by the Recipient with other parties:

   a. for the subsequent transfer of real property acquired or improved under the applicable activity, project, or program; and
   b. for the construction or use of, or access to, space on, over, or under real property acquired or improved under the applicable activity, project, or program.

8. That this Assurance obligates the Recipient for the period during which Federal financial assistance is extended to the program, except where the Federal financial assistance is to provide, or is in the form of, personal property, or real property, or interest therein, or structures or improvements thereon, in which case the Assurance obligates the Recipient, or any transferee for the longer of the following periods:

a. the period during which the property is used for a purpose for which the Federal financial assistance is extended, or for another purpose involving the provision of similar services or benefits; or
b. the period during which the Recipient retains ownership or possession of the property.

9. The Recipient will provide for such methods of administration for the program as are found by the Secretary of Transportation or the official to whom he/she delegates specific authority to give reasonable guarantee that it, other recipients, sub-recipients, sub-grantees, contractors, subcontractors, consultants, transferees, successors in interest, and other participants of Federal financial assistance under such program will comply with all requirements imposed or pursuant to the Acts, the Regulations, and this Assurance.

10. The Recipient agrees that the United States has a right to seek judicial enforcement with regard to any matter arising under the Acts, the Regulations, and this Assurance.

By signing this ASSURANCE, the ***Maine Department of Transportation*** also agrees to comply (and require any sub-recipients, sub-grantees, contractors, successors, transferees, and/or assignees to comply) with all applicable provisions governing the ***FHWA and USDOT*** access to records, accounts, documents, information, facilities, and staff. You also recognize that you must comply with any program or compliance reviews, and/or complaint investigations conducted by the ***FHWA and USDOT***. You must keep records, reports, and submit the material for review upon request to ***FHWA and USDOT***, or its designee in a timely, complete, and accurate way. Additionally, you must comply with all other reporting, data collection, and evaluation requirements, as prescribed by law or detailed in program guidance.

The ***Maine Department of Transportation*** gives this ASSURANCE in consideration of and for obtaining any Federal grants, loans, contracts, agreements, property, and/or discounts, or other Federal-aid and Federal financial assistance extended after the date hereof to the recipients by the U.S. Department of Transportation under the ***Federal Aid Highway Program***. This ASSURANCE is binding on [***insert State***], other recipients, sub-recipients, sub-grantees, contractors, subcontractors and their subcontractors', transferees, successors in interest, and any other participants in the ***Federal Aid Highway Program***. The person(s) signing below is authorized to sign this ASSURANCE on behalf of the Recipient.

MAINE DEPARTMENT OF TRANSPORTATION
(*Name of Recipient*)

by _____
Bruce A. Van Note, Commissioner

DATED 2/13/19

APPENDIX A

During the performance of this contract, the contractor, for itself, its assignees, and successors in interest (hereinafter referred to as the "contractor") agrees as follows:

1. **Compliance with Regulations**: The contractor (hereinafter includes consultants) will comply with the Acts and the Regulations relative to Non-discrimination in Federally-assisted programs of the U.S. Department of Transportation, ***Federal Highway Administration (FWHA)***, as they may be amended from time to time, which are herein incorporated by reference and made a part of this contract.

2. **Non-discrimination**: The contractor, with regard to the work performed by it during the contract, will not discriminate on the grounds of race, color, or national origin in the selection and retention of subcontractors, including procurements of materials and leases of equipment. The contractor will not participate directly or indirectly in the discrimination prohibited by the Acts and the Regulations, including employment practices when the contract covers any activity, project, or program set forth in Appendix B of 49 CFR Part 21.

3. **Solicitations for Subcontracts, Including Procurements of Materials and Equipment**: In all solicitations, either by competitive bidding, or negotiation made by the contractor for work to be performed under a subcontract, including procurements of materials, or leases of equipment, each potential subcontractor or supplier will be notified by the contractor of the contractor's obligations under this contract and the Acts and the Regulations relative to Non-discrimination on the grounds of race, color, or national origin.

4. **Information and Reports**: The contractor will provide all information and reports required by the Acts, the Regulations, and directives issued pursuant thereto and will permit access to its books, records, accounts, other sources of information, and its facilities as may be determined by the Recipient or the ***FHWA*** to be pertinent to ascertain compliance with such Acts, Regulations, and instructions. Where any information required of a contractor is in the exclusive possession of another who fails or refuses to furnish the information, the contractor will so certify to the Recipient or the ***FHWA***, as appropriate, and will set forth what efforts it has made to obtain the information.

5. **Sanctions for Noncompliance**: In the event of a contractor's noncompliance with the Non discrimination provisions of this contract, the Recipient will impose such contract sanctions as it or the ***FHWA*** may determine to be appropriate, including, but not limited to:

    a. withholding payments to the contractor under the contract until the contractor complies; and/or
    b. cancelling, terminating, or suspending a contract, in whole or in part.

6. **Incorporation of Provisions**: The contractor will include the provisions of paragraphs one through six in every subcontract, including procurements of materials and leases of equipment, unless exempt by the Acts, the Regulations and directives issued pursuant thereto. The contractor will take action with respect to any subcontract or procurement as the Recipient or the ***FHWA*** may direct as a means of enforcing such provisions including sanctions for

noncompliance. Provided, that if the contractor becomes involved in, or is threatened with litigation by a subcontractor, or supplier because of such direction, the contractor may request the Recipient to enter into any litigation to protect the interests of the Recipient. In addition, the contractor may request the United States to enter into the litigation to protect the interests of the United States.

APPENDIX B

CLAUSES FOR DEEDS TRANSFERRING UNITED STATES PROPERTY

The following clauses will be included in deeds effecting or recording the transfer of real property, structures, or improvements thereon, or granting interest therein from the United States pursuant to the provisions of Assurance 4:

NOW, THEREFORE, the U.S. Department of Transportation as authorized by law and upon the condition that the ***Maine Department of Transportation*** will accept title to the lands and maintain the project constructed thereon in accordance with ***23 U.S. Code § 107***, the Regulations for the Administration of ***the Federal Aid Highway Program***, and the policies and procedures prescribed by the ***FHWA*** of the U.S. Department of Transportation in accordance and in compliance with all requirements imposed by Title 49, Code of Federal Regulations, U.S. Department of Transportation, Subtitle A, Office of the Secretary, Part 21, Non-discrimination in Federally-assisted programs of the U.S Department of Transportation pertaining to and effectuating the provisions of Title VI of the Civil Rights Act of 1964 (78 Stat. 252; 42 U.S.C. § 2000d to 2000d-4), does hereby remise, release, quitclaim and convey unto the ***Maine Department of Transportation*** all the right, title and interest of the U.S. Department of Transportation in and to said lands described in Exhibit A attached hereto and made a part hereof.

(HABENDUM CLAUSE)

TO HAVE AND TO HOLD said lands and interests therein unto ***Maine Department of Transportation*** and its successors forever, subject, however, to the covenants, conditions, restrictions and reservations herein contained as follows, which will remain in effect for the period during which the real property or structures are used for a purpose for which Federal financial assistance is extended or for another purpose involving the provision of similar services or benefits and will be binding on the ***Maine Department of Transportation***, its successors and assigns.

The ***Maine Department of Transportation***, in consideration of the conveyance of said lands and interests in lands, does hereby covenant and agree as a covenant running with the land for itself, its successors and assigns, that (1) no person will on the grounds of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be otherwise subjected to discrimination with regard to any facility located wholly or in part on, over, or under such lands hereby conveyed [,] [and]* (2) that the ***Maine Department of Transportation*** will use the lands and interests in lands and interests in lands so conveyed, in compliance with all requirements imposed by or pursuant to Title 49, Code of Federal Regulations, U.S. Department of Transportation, Subtitle A, Office of the Secretary, Part 21, Nondiscrimination in Federally-assisted programs of the U.S. Department of Transportation, Effectuation of Title VI of the Civil Rights Act of 1964, and as said Regulations and Acts may be amended [, and (3) that in the event of breach of any of the above-mentioned non-discrimination conditions, the Department will have a right to enter or re-enter said lands and facilities on said land, and that above described land and facilities will thereon revert to and vest in and become the absolute property of the U.S. Department of Transportation and its assigns as such interest existed prior to this instruction].*

(*Reverter clause and related language to be used only when it is determined that such a clause is necessary in order to make clear the purpose of Title VI.)

APPENDIX C

CLAUSES FOR TRANSFER OF REAL PROPERTY ACQUIRED OR IMPROVED UNDER THE ACTIVITY, FACILITY, OR PROGRAM

The following clauses will be included in deeds, licenses, leases, permits, or similar instruments entered into by the ***Maine Department of Transportation*** pursuant to the provisions of Assurance 7(a):

A. The (grantee, lessee, permittee, etc. as appropriate) for himself/herself, his/her heirs, personal representatives, successors in interest, and assigns, as a part of the consideration hereof, does hereby covenant and agree [in the case of deeds and leases add "as a covenant running with the land"] that:

   1. In the event facilities are constructed, maintained, or otherwise operated on the property described in this (deed, license, lease, permit, etc.) for a purpose for which a U.S. Department of Transportation activity, facility, or program is extended or for another purpose involving the provision of similar services or benefits, the (grantee, licensee, lessee, permittee, etc.) will maintain and operate such facilities and services in compliance with all requirements imposed by the Acts and Regulations (as may be amended) such that no person on the grounds of race, color, or national origin, will be excluded from participation in, denied the benefits of, or be otherwise subjected to discrimination in the use of said facilities.

B. With respect to licenses, leases, permits, etc., in the event of breach of any of the above Non-discrimination covenants, ***Maine Department of Transportation*** will have the right to terminate the (lease, license, permit, etc.) and to enter, re-enter, and repossess said lands and facilities thereon, and hold the same as if the (lease, license, permit, etc.) had never been made or issued.*

C. With respect to a deed, in the event of breach of any of the above Non-discrimination covenants, the ***Maine Department of Transportation*** will have the right to enter or re-enter the lands and facilities thereon, and the above described lands and facilities will there upon revert to and vest in and become the absolute property of the ***Maine Department of Transportation*** and its assigns.*

(*Reverter clause and related language to be used only when it is determined that such a clause is necessary to make clear the purpose of Title VI.)

APPENDIX D

CLAUSES FOR CONSTRUCTION/USE/ACCESS TO REAL PROPERTY ACQUIRED UNDER THE ACTIVITY, FACILITY OR PROGRAM

The following clauses will be included in deeds, licenses, permits, or similar instruments/agreements entered into by the ***Maine Department of Transportation*** pursuant to the provisions of Assurance 7(b):

A. The (grantee, licensee, permittee, etc., as appropriate) for himself/herself, his/her heirs, personal representatives, successors in interest, and assigns, as a part of the consideration hereof, does hereby covenant and agree (in the case of deeds and leases add, "as a covenant running with the land") that (1) no person on the ground of race, color, or national origin, will be excluded from participation in, denied the benefits of, or be otherwise subjected to discrimination in the use of said facilities, (2) that in the construction of any improvements on, over, or under such land, and the furnishing of services thereon, no person on the ground of race, color, or national origin, will be excluded from participation in, denied the benefits of, or otherwise be subjected to discrimination, (3) that the (grantee, licensee, lessee, permittee, etc.) will use the premises in compliance with all other requirements imposed by or pursuant to the Acts and Regulations, as amended, set forth in this Assurance.

B. With respect to (licenses, leases, permits, etc.), in the event of breach of any of the above Non discrimination covenants, the ***Maine Department of Transportation*** will have the right to terminate the (license, permit, etc., as appropriate) and to enter or re-enter and repossess said land and the facilities thereon, and hold the same as if said (license, permit, etc., as appropriate) had never been made or issued.*

C. With respect to deeds, in the event of breach of any of the above Non-discrimination covenants, the ***Maine Department of Transportation*** will there upon revert to and vest in and become the absolute property of the ***Maine Department of Transportation*** and its assigns.*

(*Reverter clause and related language to be used only when it is determined that such a clause is necessary to make clear the purpose of Title VI.)

APPENDIX E

During the performance of this contract, the contractor, for itself, its assignees, and successors in interest (hereinafter referred to as the "contractor") agrees to comply with the following non-discrimination statutes and authorities; including but not limited to:

Pertinent Non-Discrimination Authorities:

- Title VI of the Civil Rights Act of 1964 (42 U.S.C. § 2000d et seq., 78 stat. 252), (prohibits discrimination on the basis of race, color, national origin); and 49 CFR Part 21.
- The Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, (42 U.S.C. § 4601), (prohibits unfair treatment of persons displaced or whose property has been acquired because of Federal or Federal-aid programs and projects);
- Federal-Aid Highway Act of 1973, (23 U.S.C. § 324 et seq.), (prohibits discrimination on the basis of sex);
- Section 504 of the Rehabilitation Act of 1973, (29 U.S.C. § 794 et seq.), as amended, (prohibits discrimination on the basis of disability); and 49 CFR Part 27;
- The Age Discrimination Act of 1975, as amended, (42 U.S.C. § 6101 et seq.), (prohibits discrimination on the basis of age);
- Airport and Airway Improvement Act of 1982, (49 USC § 471, Section 47123), as amended, (prohibits discrimination based on race, creed, color, national origin, or sex);
- The Civil Rights Restoration Act of 1987, (PL 100-209), (Broadened the scope, coverage and applicability of Title VI of the Civil Rights Act of 1964, The Age Discrimination Act of 1975 and Section 504 of the Rehabilitation Act of 1973, by expanding the definition of the terms "programs or activities" to include all of the programs or activities of the Federal-aid recipients, sub-recipients and contractors, whether such programs or activities are Federally funded or not);
- Titles II and III of the Americans with Disabilities Act, which prohibit discrimination on the basis of disability in the operation of public entities, public and private transportation systems, places of public accommodation, and certain testing entities (42 U.S.C. §§ 12131-12189) as implemented by Department of Transportation regulations at 49 C.F.R. parts 37 and 38;
- The Federal Aviation Administration's Non-discrimination statute (49 U.S.C. § 47123) (prohibits discrimination on the basis of race, color, national origin, and sex);
- Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, which ensures Non-discrimination against minority populations by discouraging programs, policies, and activities with disproportionately high and adverse human health or environmental effects on minority and low-income populations;
- Executive Order 13166, Improving Access to Services for Persons with Limited English Proficiency, and resulting agency guidance, national origin discrimination includes discrimination because of Limited English proficiency (LEP). To ensure compliance with Title VI, you must take reasonable steps to ensure that LEP persons have meaningful access to your programs (70 Fed. Reg. at 74087 to 74100);
- Title IX of the Education Amendments of 1972, as amended, which prohibits you from discriminating because of sex in education programs or activities (20 U.S.C. 1681 et seq).

U. S . Permits

1. Maine Department of Environmental Protection (DEP) Natural Resources Protection Act Individual Permit

2. Army Corps of Engineers Maine Programmatic General Permit

3. U.S. Coast Guard Bridge Permit

STATE OF MAINE
DEPARTMENT OF ENVIRONMENTAL PROTECTION
17 STATE HOUSE STATION AUGUSTA, MAINE 04333-0017

DEPARTMENT ORDER

IN THE MATTER OF

MAINE DOT	) NATURAL RESOURCES PROTECTION ACT
Madawaska, Aroostook County	) FRESHWATER WETLAND ALTERATION
INTERNATIONAL BRIDGE	) STREAM ALTERATION
L-28697-TG-A-N (approval)	) WATER QUALITY CERTIFICATION
L-28697-L5-B-N (approval)	)
L-28967-L6-C-N (approval)	) FINDINGS OF FACT AND ORDER

Pursuant to the provisions of 38 M.R.S. §§ 480-A–480-JJ, Section 401 of the Federal Water Pollution Control Act (33 U.S.C. § 1341), and Chapters 310 and 315 of Department rules, the Department of Environmental Protection has considered the application of MAINE DOT with the supportive data, and other related materials on file and FINDS THE FOLLOWING FACTS:

1. PROJECT DESCRIPTION:

A. Summary: The applicant is proposing to replace the existing International Bridge between Madawaska, Maine and Edmundston, New Brunswick. The proposed bridge will be located upstream of the existing bridge and will connect a new U.S. Land Port of Entry (LPOE) in Madawaska to the existing Canadian Port of Entry (POE) in Edmundston. The existing bridge will be removed. The bridge will be supported by five piers, three of which will be located in the United States. Two of these piers will be located directly within the channel. The proposed piers will impact 2,592 square feet of river habitat.

The existing shoreline is extremely steep, and there are no other access points available. The project proposes 37,186 square feet of temporary impact along the shoreline between the existing bridge and the proposed bridge, to provide access to the new bridge location during construction. Temporary pile supported trestles will also be used for both construction of the new bridge and removal of the existing bridge.

The applicant proposes to install 1,300 linear feet of riprap to a height of up to 35 feet to stabilize the shoreline between the existing bridge and the new bridge. Approximately 30,040 square feet of direct impact to a Palustrine Emergent (PEM) Freshwater Wetland is proposed for the shoreline stabilization. The shoreline stabilization will also impact approximately 28,415 square feet in the Saint John River. The proposed riprap bank stabilization will be constructed at a 2H:1V slope. The slope is designed using heavy riprap, which consists of a thicker layer of larger rocks to allow installation at a steeper slope than regular riprap. As designed, the top section of the slope will be loamed and seeded to allow vegetation to re-establish.

The project is shown on a set of plans included with the application, the first of which is entitled “Bridge Avenue Resource Impact Plans”, prepared by the applicant and submitted

with the application. The project site is located on Bridge Avenue in the Town of Madawaska.

A. Current Use of the Site: The project site contains upland land use that includes industrially developed-storage areas, warehouse buildings, Twin Rivers Paper Facility, and Maine Northern Railroad. The shoreline is developed with a railroad that follows the top of the bank adjacent to steep slopes that have already failed and needed repair with riprap.

2. EXISTING SCENIC, AESTHETIC, RECREATIONAL OR NAVIGATIONAL USES:

The Natural Resources Protection Act (NRPA), in 38 M.R.S. §480-D(1), requires the applicant to demonstrate that the proposed project will not unreasonably interfere with existing scenic, aesthetic, recreational and navigational uses.

In accordance with Chapter 315, *Assessing and Mitigating Impacts to Scenic and Aesthetic Uses* (06-096 C.M.R. ch. 315, effective June 29, 2003), the applicant submitted a copy of the Department's Visual Evaluation Field Survey Checklist as Appendix A to the application along with a description of the property and the proposed project. The applicant also submitted several photographs of the proposed project site and surroundings. Department staff visited the project site on October 2, 2019.

The proposed project is located in the Saint John River, which is a scenic resource visited by the general public, in part, for the use, observation, enjoyment and appreciation of its natural and cultural visual qualities. This area experiences mixed commercial and recreational uses. The new bridge will be similar in design and scale and will be located approximately a quarter mile upstream from its current location.

Stone used for the riprap will be similar in color to the existing beach material. The top section of the slope will be loamed and seeded to allow vegetation to re-establish.

The Department staff utilized the Department’s Visual Impact Assessment Matrix in its evaluation of the proposed project and the Matrix showed an acceptable potential visual impact rating for the proposed project. Based on the information submitted in the application and the visual impact rating and the site visit, the Department determined that the location and scale of the proposed activity is compatible with the existing visual quality and landscape characteristics found within the viewshed of the scenic resource in the project area.

The Department finds that the proposed activity will not unreasonably interfere with existing scenic, aesthetic, recreational or navigational uses of the Saint John River.

3. SOIL EROSION:

The NRPA, in 38 M.R.S. §480-D(2), requires the applicant to demonstrate that the proposed project will not cause unreasonable erosion of soil or sediment nor unreasonably

inhibit the natural transfer of soil from the terrestrial to the marine or freshwater environment.

The length of the new and existing river crossings requires the use of a combination of temporary access roads and trestles for construction and demolition activities, which will require in-water work. Erosion control geotextile will also be used to contain fill fines from washing into the river. Temporary trestles are anticipated to be supported by pipe piles driven through the stream bed to bedrock. Installation and/or removal activities associated with the temporary trestle will occur over the course of six months each year, within a construction season lasting approximately eight or nine months. Construction of the piers located within or immediately adjacent to the river, will require the installation of a cofferdam, excavation to bedrock (contained within the cofferdam), and placement of a concrete seal. Once the piers are constructed to an elevation above flood waters, the cofferdam will be removed.

The applicant and the Department entered into a Memorandum of Agreement in 2007 which outlines procedures for Maine DOT projects in terms of erosion and sediment control. This project will comply with that Memorandum of Agreement.

The Department finds that the activity will not cause unreasonable erosion of soil or sediment nor unreasonably inhibit the natural transfer of soil from the terrestrial to the marine or freshwater environment.

4. HABITAT CONSIDERATIONS:

The NRPA, in 38 M.R.S. §480-D(3), requires the applicant to demonstrate that the proposed project will not unreasonably harm significant wildlife habitat, freshwater wetland plant habitat, threatened or endangered plant habitat, aquatic or adjacent upland habitat, travel corridor, freshwater, estuarine or marine fisheries or other aquatic life.

The Maine Department of Inland Fisheries and Wildlife (MDIFW) reviewed the proposed project and stated that there are no significant wildlife habitats present in the project area. MDIFW and the Department conducted a site visit on October 2, 2019. The complexities of construction were discussed particularly with respect to access for construction, temporary impacts and the need for a flexible work window. MDIFW indicated that an open work window would be acceptable.

The Department finds that the activity will not unreasonably harm any significant wildlife habitat, freshwater wetland plant habitat, threatened or endangered plant habitat, aquatic or adjacent upland habitat, travel corridor, freshwater, estuarine or marine fisheries or other aquatic life.

5. WATER QUALITY CONSIDERATIONS:

As discussed in Finding 3, the applicant proposes to use erosion and sediment control during construction to minimize impacts to water quality from siltation.

The Department does not anticipate that the proposed project will violate any state water quality law, including those governing the classification of the State's waters.

6. WETLANDS AND WATERBODIES PROTECTION RULES:

The applicant proposes to impact 30,040 square feet of freshwater wetlands to stabilize the riverbank. Freshwater wetlands, located within 25 feet of a river are wetlands of special significance. The applicant also proposes to impact 28,415 square feet of the Saint John River for the shoreline stabilization and 2,592 square feet of the Saint John River for two new bridge piers.

The *Wetlands and Waterbodies Protection Rules*, 06-096 C.M.R. ch. 310 (last amended November 11, 2018), interpret and elaborate on the Natural Resources Protection Act (NRPA) criteria for obtaining a permit. The rules guide the Department in its determination of whether a project's impacts would be unreasonable. A proposed project would generally be found to be unreasonable if it would cause a loss in wetland area, functions and values and there is a practicable alternative to the project that would be less damaging to the environment. Each application for a NRPA permit that involves an impact to a resource must provide an analysis of alternatives in order to demonstrate that a practicable alternative does not exist.

A. Avoidance. The applicant must submit an analysis of whether there is a practicable alternative to the project that would be less damaging to the environment and this analysis is considered by the Department in its assessment of the reasonableness of any impacts. Additionally, for activities proposed in, on, or over wetlands of special significance the activity must be among the types listed in Chapter 310, § 5(A) or a practicable alternative less damaging to the environment is considered to exist and the impact is unreasonable. The shoreline stabilization activity will alter wetlands of special significance. This activity is listed among the activities specifically provided for in Chapter 310, § 5(A)(1)(h).

The applicant conducted a project feasibility and planning study in May 2018 that evaluated nearly twenty different combinations of crossing locations and alignments to connect port facilities on each side of the river. The purpose of this project is to provide for the long-term safe and efficient flow of current and projected traffic volumes, including the movement of goods and people, between Edmundston, New Brunswick and Madawaska, Maine. The proposed project is needed because: 1) the existing International Bridge is nearing the end of its useful life, and 2) the size and conditions of the existing building and overall site of the Madawaska LPOE are substandard, preventing the agencies assigned to the LPOE from adequately fulfilling their respective missions.

Rehabilitation of the bridge, in the same location, is not feasible due to limited service life, construction costs, lack of improved roadway geometrics, safety concerns, construction duration, and impacts to the traveling public. The proposed new alignment was determined to meet security (sight distance) requirements at each port facility, accommodate phased

construction, accommodate traffic movements at the port facilities, meet vertical clearance requirements over the railroads, and minimize construction complexity and cost.

The applicant considered various ways to construct the project. The proposed bank stabilization and nearly all the proposed impact are driven by the existing steep slopes and the need for temporary construction access at a sight constrained by the Land Port of Entry construction, Maine Northern Railway, Twin Rivers, steep riverbank slopes, and river flow and spring ice conditions. In addition, the existing bridge is posted for a maximum weight limit of 5 tons and construction vehicles will not be able to use the existing bridge during construction.

Construction of the piers and cofferdams requires access to the pier locations in the river for cranes, excavators, dump trucks, and concrete pump trucks. Construction of the superstructure will require moving large sections of steel girders. The applicant considered the potential for construction access by barge. However, the river depth during much of the year is not deep enough. In addition, the number of vehicles and activities that need to occur in river and the frequency of trips by vehicles makes this option inefficient and cost prohibitive.

Constructing a more direct access closer to the U.S. Bridge abutment location is also not practical. The bridge will span over an active railroad and will be located between the river and the construction effort for the new Land Port of Entry. A more direct route for overland construction access would require additional at grade railroad crossings, operational delays from stopping to wait for trains and would interfere with concurrent construction at the Land Port of Entry.

The vegetation and root systems, once disturbed, will require permanent stabilization. The existing riverbank on the US side is as steep as 1.4:1 in many places. There have been slope failures consistently along this stretch of the river and several areas have been stabilized with riprap in the past. In order to meet the stated project purpose, some impacts to the freshwater wetland and river are unavoidable.

B. Minimal Alteration. In support of an application and to address the analysis of the reasonableness of any impacts of a proposed project, the applicant must demonstrate that the activity will be kept to the minimum amount necessary for meeting the overall purpose of the project. The applicant is only proposing to stabilize areas with active erosion. Due to the slope and location of the eroded shoreline the applicant is unable to install the riprap exclusively above the normal high water line of the Saint John River.

The proposed method of access avoids middle river impacts by keeping temporary fill close to shore and maximizing the use of pile-supported structures. This minimizes impacts to river flows, flooding, and ice flow. In-river bridge construction will occur primarily from pile-supported trestles/work platforms. Trestles are generally considered a minimization measure over fill access points.

C. Compensation. In accordance with Chapter 310, § 5(C)(6)(d), compensation may be required to achieve the goal of no net loss of river functions and values, if the project impacts more than 300 linear feet of shoreline for a public project. The primary functions and values proposed to be impacted by the shoreline stabilization in the river are fish and shellfish habitat, recreation and wildlife habitat. To mitigate for the loss of these functions and values, the applicant proposes to make a contribution into the In-Lieu Fee program of the Maine Natural Resource Conservation Program in the amount of $81,267. Prior to the start of construction the applicant must submit the payment of $81,267, payable to "Treasurer, State of Maine", and directed to the attention of the In-Lieu Fee Program Administrator at 17 State House Station, Augusta, Maine, 04333.

In accordance with Chapter 310, § 5(C)(6)(a) compensation may be required to achieve the goal of no net loss of freshwater wetlands of special significance, if the project results in over 500 square feet of fill in the resource. The primary functions and values of the PEM freshwater wetland proposed to be impacted are groundwater discharge, wildlife habitat, education/scientific value and uniqueness/heritage. To mitigate for the loss of these functions and values, the applicant proposes to make a contribution into the In-Lieu Fee program of the Maine Natural Resource Conservation Program in the amount of $86,515. Prior to the start of construction, the applicant must submit a payment in the amount of $86,515, payable to "Treasurer, State of Maine", and directed to the attention of the In-Lieu Fee Program Administrator at 17 State House Station, Augusta, Maine 04333.

The Department finds that the applicant has avoided and minimized wetland impacts to the greatest extent practicable, and that the proposed project represents the least environmentally damaging alternative that meets the overall purpose of the project provided that prior to project construction, the applicant submits the In-Lieu Fee payments as described above.

7. OTHER CONSIDERATIONS:

The Department finds, based on the design, proposed construction methods, and location, the proposed project will not inhibit the natural transfer of soil from the terrestrial to the marine environment, will not interfere with the natural flow of any surface or subsurface waters, and will not cause or increase flooding. The proposed project is not located in a coastal sand dune system. The proposed project is a crossing of an outstanding river segment. The applicant has demonstrated there is no practicable alternative that would have less adverse impact upon the natural and recreational features of the river.

BASED on the above findings of fact, and subject to the conditions listed below, the Department makes the following conclusions pursuant to 38 M.R.S. §§ 480-A–480-JJ and Section 401 of the Federal Water Pollution Control Ac (33 U.S.C. § 1341):

A. The proposed activity will not unreasonably interfere with existing scenic, aesthetic, recreational, or navigational uses.

B. The proposed activity will not cause unreasonable erosion of soil or sediment.

C. The proposed activity will not unreasonably inhibit the natural transfer of soil from the terrestrial to the marine or freshwater environment.

D. The proposed activity will not unreasonably harm any significant wildlife habitat, freshwater wetland plant habitat, threatened or endangered plant habitat, aquatic or adjacent upland habitat, travel corridor, freshwater, estuarine, or marine fisheries or other aquatic life provided that prior to construction the applicant makes a contribution to the In-Lieu Fee program as described in Finding 6.

E. The proposed activity will not unreasonably interfere with the natural flow of any surface or subsurface waters.

F. The proposed activity will not violate any state water quality law including those governing the classifications of the State's waters.

G. The proposed activity will not unreasonably cause or increase the flooding of the alteration area or adjacent properties.

H. The proposed activity is not on or adjacent to a sand dune.

I. The proposed project is a crossing of an outstanding river segment identified in 38 M.R.S. § 480-P, however, the applicant has demonstrated there are no practicable alternatives that would have less adverse effect upon the natural and recreational features of the river segment.

THEREFORE, the Department APPROVES the above noted application of MAINE DOT to stabilize an eroding shoreline as described in Finding 1, SUBJECT TO THE ATTACHED CONDITIONS, and all applicable standards and regulations:

1. Standard Conditions of Approval, a copy attached.

2. The applicant shall take all necessary measures to ensure that their activities or those of their agents do not result in measurable erosion of soil on the site during the construction of the project covered by this approval.

3. Severability. The invalidity or unenforceability of any provision, or part thereof, of this License shall not affect the remainder of the provision or any other provisions. This License shall be construed and enforced in all respects as if such invalid or unenforceable provision or part thereof had been omitted.

4. Prior to the start of construction, the applicant shall submit a payment in the amount of $168,350 payable to “Treasurer, State of Maine”, to the attention of the In-Lieu Fee Program Administrator at 17 State House Station, Augusta, Maine 04333.

THIS APPROVAL DOES NOT CONSTITUTE OR SUBSTITUTE FOR ANY OTHER REQUIRED STATE, FEDERAL OR LOCAL APPROVALS NOR DOES IT VERIFY COMPLIANCE WITH ANY APPLICABLE SHORELAND ZONING ORDINANCES.

DONE AND DATED IN AUGUSTA, MAINE, THIS 1ST DAY OF OCTOBER, 2020.

DEPARTMENT OF ENVIRONMENTAL PROTECTION

BY: _____
For: Melanie Loyzim, Acting Commissioner

PLEASE NOTE THE ATTACHED SHEET FOR GUIDANCE ON APPEAL PROCEDURES.

SS/L28697ANBNCN/ATS#86566, 86567, 86228

FILED

October 2, 2020

State of Maine
Board of Environmental Protection

Natural Resources Protection Act (NRPA)
Standard Conditions

THE FOLLOWING STANDARD CONDITIONS SHALL APPLY TO ALL PERMITS GRANTED UNDER THE NATURAL RESOURCES PROTECTION ACT, 38 M.R.S. § 480-A ET SEQ., UNLESS OTHERWISE SPECIFICALLY STATED IN THE PERMIT.

A. Approval of Variations From Plans. The granting of this permit is dependent upon and limited to the proposals and plans contained in the application and supporting documents submitted and affirmed to by the applicant. Any variation from these plans, proposals, and supporting documents is subject to review and approval prior to implementation.

B. Compliance With All Applicable Laws. The applicant shall secure and comply with all applicable federal, state, and local licenses, permits, authorizations, conditions, agreements, and orders prior to or during construction and operation, as appropriate.

C. Erosion Control. The applicant shall take all necessary measures to ensure that his activities or those of his agents do not result in measurable erosion of soils on the site during the construction and operation of the project covered by this Approval.

D. Compliance With Conditions. Should the project be found, at any time, not to be in compliance with any of the Conditions of this Approval, or should the applicant construct or operate this development in any way other the specified in the Application or Supporting Documents, as modified by the Conditions of this Approval, then the terms of this Approval shall be considered to have been violated.

E. Time frame for approvals. If construction or operation of the activity is not begun within four years, this permit shall lapse and the applicant shall reapply to the Board for a new permit. The applicant may not begin construction or operation of the activity until a new permit is granted. Reapplications for permits may include information submitted in the initial application by reference. This approval, if construction is begun within the four-year time frame, is valid for seven years. If construction is not completed within the seven-year time frame,the applicant must reapply for, and receive, approval prior to continuing construction.

F. No Construction Equipment Below High Water. No construction equipment used in the undertaking of an approved activity is allowed below the mean high water line unless otherwise specified by this permit.

G. Permit Included In Contract Bids. A copy of this permit must be included in or attached to all contract bid specifications for the approved activity.

H. Permit Shown To Contractor. Work done by a contractor pursuant to this permit shall not begin before the contractor has been shown by the applicant a copy of this permit.

Revised September 2016

STATE OF MAINE
DEPARTMENT OF ENVIRONMENTAL PROTECTION
17 STATE HOUSE STATION, AUGUSTA, MAINE 04333

Erosion Control for Homeowners

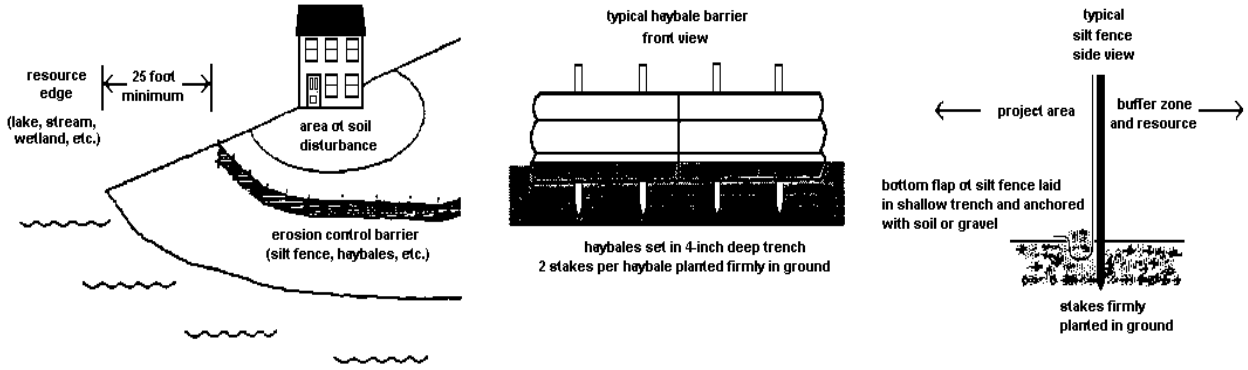
Before Construction

1. If you have hired a contractor, make sure you discuss your permit with them. Talk about what measures they plan to take to control erosion. Everybody involved should understand what the resource is, and where it is located. Most people can identify the edge of a lake or river. However, the edges of wetlands are often not so obvious. Your contractor may be the person actually pushing dirt around, but you are both responsible for complying with the permit.

2. Call around to find where erosion control materials are available. Chances are your contractor has these materials already on hand. You probably will need silt fence, hay bales, wooden stakes, grass seed (or conservation mix), and perhaps filter fabric. Places to check for these items include farm & feed supply stores, garden & lawn suppliers, and landscaping companies. It is not always easy to find hay or straw during late winter and early spring. It also may be more expensive during those times of year. Plan ahead – buy a supply early and keep it under a tarp.

3. Before any soil is disturbed, make sure an erosion control barrier has been installed. The barrier can be either a silt fence, a row of staked hay bales, or both. Use the drawings below as a guide for correct installation and placement. The barrier should be placed as close as possible to the soil-disturbance activity.

4. If a contractor is installing the erosion control barrier, double check it as a precaution. Erosion control barriers should be installed "on the contour," meaning at the same level or elevation across the land slope, whenever possible. This keeps stormwater from flowing to the lowest point along the barrier where it can build up and overflow or destroy the barrier.



During Construction

1. Use lots of hay or straw mulch on disturbed soil. The idea behind mulch is to prevent rain from striking the soil directly. It is the force of raindrops hitting the bare ground that makes the soil begin to move downslope with the runoff water, and cause erosion. More than 90% of erosion is prevented by keeping the soil covered.

2. Inspect your erosion control barriers frequently. This is especially important after a rainfall. If there is muddy water leaving the project site, then your erosion controls are not working as intended. You or your contractor then need to figure out what can be done to prevent more soil from getting past the barrier.

3. Keep your erosion control barrier up and maintained until you get a good and healthy growth of grass and the area is permanently stabilized.

After Construction

1. After your project is finished, seed the area. Note that all ground covers are not equal. For example, a mix of creeping red fescue and Kentucky bluegrass is a good choice for lawns and other high-maintenance areas. But this same seed mix is a poor selection for stabilizing a road shoulder or a cut bank that you don't intend to mow. Your contractor may have experience with different seed mixes, or you might contact a seed supplier for advice.

2. Do not spread grass seed after September 15. There is the likelihood that germinating seedlings could be killed by a frost before they have a chance to become established. Instead, mulch the area with a thick layer of hay or straw. In the spring, rake off the mulch and then seed the area. Don’t forget to mulch again to hold in moisture and prevent the seed from washing away or being eaten by birds or other animals.

3. Keep your erosion control barrier up and maintained until you get a good and healthy growth of grass and the area is permanently stabilized.

Why Control Erosion?

To Protect Water Quality

When soil erodes into protected resources such as streams, rivers, wetlands, and lakes, it has many bad effects. Eroding soil particles carry phosphorus to the water. An excess of phosphorus can lead to explosions of algae growth in lakes and ponds called blooms. The water will look green and can have green slime in it. If you are near a lake or pond, this is not pleasant for swimming, and when the soil settles out on the bottom, it smothers fish eggs and small animals eaten by fish. There many other effects as well, which are all bad.

To Protect the Soil

It has taken thousands of years for our soil to develop. It usefulness is evident all around us, from sustaining forests and growing our garden vegetables, to even treating our septic wastewater! We cannot afford to waste this valuable resource.

To Save Money ($$)

Replacing topsoil or gravel washed off your property can be expensive. You end up paying twice because State and local governments wind up spending your tax dollars to dig out ditches and storm drains that have become choked with sediment from soil erosion.

DEPARTMENT OF THE ARMY
NEW ENGLAND DISTRICT, CORPS OF ENGINEERS
696 VIRGINIA ROAD
CONCORD, MASSACHUSETTS 01742-2751

REPLY TO
ATTENTION OF

Regulatory Division
CENAE-RDC

October 28, 2020

Kristen Chamberlain,
Coordination and Permits Division Manager
Environmental Office
Maine Department of Transportation
16 State House Station
Augusta, Maine 04333

Dear Ms. Chamberlain:

This concerns multiple Department of the Army permits, referenced in the attached table, which authorized temporary and permanent discharges of fill material into waters of the U.S. throughout the State of Maine under the Maine General Permit (Maine GP) in effect from October 13, 2015 to October 13, 2020.

On October 14, 2020, we issued a compilation of 23 new general permits to replace the expired Maine GP. This document remains in effect until October 14, 2025. A copy of the Department of the Army General Permits for the State of Maine is attached for your reference.

You have requested that the work authorized by the permits referenced in the attached table be re-authorized under the new general permits as no work was undertaken before the prior authorization expired on October 13, 2020. Condition 38c of the new general permits notes that any work not commenced, not under contract to commence, nor completed that was originally authorized by the Corps under the GP in effect between October 13, 2015 and October 13, 2020 remains authorized subject to the terms and general conditions of the present general permits along with any special conditions included in written authorizations.

Therefore, unless the authorized work will not be undertaken before October 14, 2025, it remains authorized under the new general permits and no further action by the Corps of Engineers is required. The one exception however, also noted in Condition 38c, is if previously authorized work has not commenced or not under contract to commence and a new federally-listed threatened or endangered species may be affected, the Corps (and by association, Maine DOT) shall consult with the U.S. Fish and Wildlife Service or NOAA Fisheries prior to re-authorizing the work under these GPs.

If you have any questions concerning this matter, please contact me at 207-623-8367 at our Augusta, Maine Project Office.

Sincerely,

Jay L. Clement
Senior Project Manager
Maine Project Office

Attachment

MaineDOT Projects that require re-authorization under new PGP
10/27/2020

Advertised but not awarded by 10/13	**DOT Staff**	**Date Signed**	**Permit ID**	
Auburn 22224.00	Josh/Kristen	7/25/2019	NAE-2019-01363	
Kingfield, 18245.00 Route 16/27 (MDEP individual)	Danielle	2/4/2020	NAE-2019-02967	
Woodstock, 18767.00 Route 26	Danielle	3/27/2020	NAE-2020-00314	
Frenchboro, 22202.00 Ferry Terminal	Danielle	5/29/2020	NAE-2020-00315	
Swans Island 23480.00 Ferry Terminal	Danielle	3/27/2020	NAE-2020-00491	
Edgecomb 21783.00	Danielle	4/10/2020	NAE-2020-00668	
T3 Indian Purchase 23236.00	Andrea	6/9/2020	NAE-2020-01475	
Portland, 295 Veranda St Br 21745.00	Andrea	2/26/2020	NAE-2020-00108	
Patten 21810.00 Large Culvert	Audie	9/26/2019	NAE-2019-01961	
Jonesboro Drisko 23557.00	Andrea/Josh	8/5/2020	NAE-2020-01806	
Not Advertised (sorted in order of scheduled advertise)	**DOT Staff**	**Date Signed**	**Permit ID**	**Scheduled ADV Date**
Hodgdon 23625.00	Andrea/Josh	6/10/2020	NAE-2020-01480	11/18/2020
Camden 18283.00, 22608.00,22610.00	Danielle	9/3/2019	NAE-2019-01606	11/18/2020
Madawaska 21736.00	Kristen	10/8/2020	NAE-2020-01777	11/25/2020
Stockton Springs 24285.00 LG CUL	Audie	8/17/2020	NAE-2020-01669	12/9/2020
East Machias 19198.00	Audie	8/13/2020	NAE-2020-01824	12/16/2020
Durham 22662.00	Danielle	9/25/2020	NAE-2020-01619	1/13/2021
Rockland 18794.10	Audie	3/13/2019	NAE-2018-02922	1/20/2021
Dresden 23906.00 M&O	Audie	4/10/2018	NAE-2018-00218	2/3/2021
Dresden 23912.00 M&O	Audie	3/26/2018	NAE-2018-00216	2/3/2021
Dresden 23830.00 M&O	Audie	3/26/2018	NAE-2018-00215	2/3/2021
Canaan Canaan 21878.00	Andrea/Josh	10/14/2020	NAE-2020-02229	3/24/2021
Kennebunk 26993.00 M&O	Deb	9/24/2020	NAE-2020-02227	7/13/1905
Van Buren 20421.00	Audie	6/26/2019	NAE- 2019-01107	shelf ready

DEPARTMENT OF THE ARMY
NEW ENGLAND DISTRICT, CORPS OF ENGINEERS
696 VIRGINIA ROAD
CONCORD, MASSACHUSETTS 01742-2751

REPLY TO ATTENTION OF

MAINE GENERAL PERMIT (GP)
AUTHORIZATION LETTER AND SCREENING SUMMARY

ENVIRONMENTAL OFFICE
MAINE DEPARTMENT OF TRANSPORTATION
16 STATE HOUSE STATION
AUGUSTA, MAINE 04333

CORPS PERMIT # NAE-2020-01777
CORPS GP ID# 20-383
STATE ID# PBR

DESCRIPTION OF WORK:
Place temporary and permanent fill below the ordinary high water mark of the St. John River and in adjacent freshwater wetlands at Madawaska, Maine in order to replace the existing International Bridge to Edmundston, New Brunswick (CANADA). This work will result in approximately 31,007 s.f. of permanent and 37,186 s.f. of temporary river bed impact, and 30,040 s.f. of permanent wetland impact. This work is shown on the attached plans entitled "BRIDGE AVENUE MADAWASKA, AROOSTOOK COUNTY" in nine sheets
Project Description Continued on Page 2

LAT/LONG COORDINATES : 47.360286° N -68.328722° W **USGS QUAD:** MADAWASKA, ME

I. CORPS DETERMINATION:
Based on our review of the information you provided, we have determined that your project will have only minimal individual and cumulative impacts on waters and wetlands of the United States. **Your work is therefore authorized by the U.S. Army Corps of Engineers under the Federal Permit, the Maine General Permit (GP).** http://www.nae.usace.army.mil/Portals/74/docs/regulatory/StateGeneralPermits/ME/Maine_General_Permit_2015.pdf

You must perform the activity authorized herein in compliance with all the terms and conditions of the GP [including any attached Additional Conditions and any conditions placed on the State 401 Water Quality Certification including any required mitigation]. Please review the enclosed GP carefully, including the GP conditions beginning on page 5, to familiarize yourself with its contents. You are responsible for complying with all of the GP requirements; therefore you should be certain that whoever does the work fully understands all of the conditions. You may wish to discuss the conditions of this authorization with your contractor to ensure the contractor can accomplish the work in a manner that conforms to all requirements.

If you change the plans or construction methods for work within our jurisdiction, please contact us immediately to discuss modification of this authorization. This office must approve any changes before you undertake them.

Condition 38 of the GP (page 16) provides one year for completion of work that has commenced or is under contract to commence prior to the expiration of the GP on October 13, 2020. You will need to apply for reauthorization for any work within Corps jurisdiction that is not completed by October 13, 2021.

This authorization presumes the work shown on your plans noted above is in waters of the U.S. Should you desire to appeal our jurisdiction, please submit a request for an approved jurisdictional determination in writing to the undersigned.

No work may be started unless and until all other required local, State and Federal licenses and permits have been obtained. **This includes but is not limited to a Flood Hazard Development Permit issued by the town if necessary.**

II. STATE ACTIONS: PENDING [X], ISSUED [ ], DENIED [ ] DATE_____

APPLICATION TYPE: PBR:___, TIER 1:_____, TIER 2 :_____, TIER 3:__**X**__, LURC: _____ DMR LEASE: _____ NA: _____

III. FEDERAL ACTIONS:

JOINT PROCESSING MEETING:__7/16/20_____LEVEL OF REVIEW: CATEGORY 1:_____ CATEGORY 2:__X__

AUTHORITY (Based on a review of plans and/or State/Federal applications): SEC 10_____, 404__X____ 10/404_____, 103_____

EXCLUSIONS: The exclusionary criteria identified in the general permit do not apply to this project.

FEDERAL RESOURCE AGENCY OBJECTIONS: EPA_NO__, USF&WS_NO__, NMFS_NO__

If you have any questions on this matter, please contact my staff at 207-623-8367 at our Augusta, Maine Project Office. In order for us to better serve you, we would appreciate your completing our Customer Service Survey located at http://corpsmapu.usace.army.mil/cm_apex/f?p=136:4:0

CLEMENT.JAY.LANGDON.1006350980 Digitally signed by CLEMENT.JAY.LANGDON.1006350980 Date: 2020.10.08 11:26:00 -04'00'

JAY L. CLEMENT
SENIOR PROJECT MANAGER
MAINE PROJECT OFFICE

DELGIUDICE.FRANK.J.1228916567 Digitally signed by DELGIUDICE.FRANK.J.1228916567 Date: 2020.10.08 13:14:46 -04'00'

FRANK J. DEL GIUDICE DATE
CHIEF, PERMITS & ENFORCEMENT BRANCH
REGULATORY DIVISION

US Army Corps
of Engineers ®
New England District

Project Description Continued from Page 1

undated and "INTERNATIONAL BRIDGE, SAINT JOHN RIVER, MADAWASKA, ME, EDMUNDSTON, NB" in 15 sheets dated "06/20". **DOT WIN: 21736.00**

PLEASE NOTE THE FOLLOWING GENERAL AND SPECIAL CONDITIONS FOR DEPARTMENT OF THE ARMY GENERAL PERMIT NO. NAE-2020-01777

GENERAL CONDITIONS

14. Temporary Fill. Temporary fill that qualifies for Category 1 (e.g., <15,000 SF of combined temporary and permanent fill associated with the single and complete project) or is authorized in writing under Category 2, shall adhere to the following:

a. All temporary fill and disturbed soils shall be stabilized to prevent its eroding into waters of the U.S. where it is not authorized. Work shall include phased or staged development to ensure only areas under active development are exposed and to allow for stabilization practices as soon as practicable, typically within three calendar days after disturbance. Accelerated stabilization (the providing of temporary or permanent cover by the end of the work day to prevent erosion) shall be employed as necessary. Temporary fill must be placed in a manner that will prevent it from being eroded by expected high flows.

b. Unconfined temporary fill authorized for discharge into waters of the U.S. (e.g., temporary stream crossings) shall consist of material that minimizes impacts to water quality (e.g. washed stone, stone, etc.).

c. Appropriate measures must be taken to maintain normal downstream flows and minimize flooding to the maximum extent practicable when temporary structures, work, and discharges of dredged or fill material, including cofferdams, are necessary for construction activities, access fills, or dewatering of construction sites. Place materials in a location and manner that does not adversely impact surface or subsurface water flow into or out of the wetland. Temporary fill authorized for discharge into wetlands shall be placed on geotextile fabric or other appropriate material laid on the pre-construction wetland grade where practicable to minimize impacts and to facilitate restoration to the original grade. Construction mats are excluded from this requirement.

d. Temporary fill, construction mats and corduroy roads shall be entirely removed as soon as they are no longer needed to construct the authorized work. Temporary fill shall be placed in its original location or disposed of at an upland site and suitably contained to prevent its subsequent erosion into waters of the U.S. To qualify for Category 1, temporary fill placed during the: i.) growing season must be removed before the beginning of the next growing season; and ii.) non-growing season may remain throughout the following growing season, but must be removed before the beginning of the next growing season.

e. Temporary fill, construction mats and corduroy roads are considered temporary only if they are removed as soon as they are no longer needed to construct the authorized work.

f. Construction debris and/or deteriorated materials shall not be located in waters of the U.S.

16. Soil Erosion, Sediment and Turbidity Controls

a. Adequate sedimentation and erosion control management measures, practices and devices, such as phased construction, installation of sediment control barriers (i.e. silt fence, vegetated filter strips, geotextile silt fences, erosion control mixes, hay bales or other devices) downhill of all exposed areas, retention of existing vegetated buffers, application of temporary mulching during construction, and permanent seeding and stabilization shall be installed and properly maintained to reduce erosion and retain sediment on-site during and after construction. They shall be capable of preventing erosion; of collecting sediment, suspended and floating materials; and of filtering fine sediment.

b. Temporary sediment control barriers shall be removed upon completion of work, but not until all disturbed areas are permanently stabilized. The sediment collected by these sediment barriers shall be removed and placed at an upland location and stabilized to prevent its later erosion into a waterway or wetland.

c. All exposed soil and other fills shall be permanently stabilized at the earliest practicable date .

26. The permittee shall assure that a copy of this permit is at the work site whenever work is being performed and that all personnel performing work at the site of the work authorized by this permit are fully aware of the terms and conditions of the permit. This permit, including its drawings and any appendices and other attachments, shall be made a part of any and all contracts and sub-contracts for work which affects areas of Corps of Engineers' jurisdiction at the site of the work authorized by this permit. This shall be done by including the entire permit in the specifications for the work. If the permit is issued after construction specifications but before receipt of bids or quotes, the entire permit shall be included as an addendum to the specifications. The term "entire permit" includes permit amendments. Although the permittee may assign various aspects of the work to different contractors or sub-contractors, all contractors and sub-contractors shall be obligated by contract to comply with all environmental protection provisions of the entire permit, and no contract or sub-contract shall require or allow unauthorized work in areas of Corps of Engineers jurisdiction.

SPECIAL CONDITIONS

1. This authorization requires you to 1) notify us before beginning work so we may inspect the project, and 2) submit a Compliance Certification Form. You must complete and return the enclosed Work Start Notification Form(s) to this office at least two weeks before the anticipated starting date. You must complete and return the enclosed Compliance Certification Form within one month following the completion of the authorized work and any required mitigation (but not mitigation monitoring, which requires separate submittals).

2. The permittee must obtain a bridge permit or exemption from the US Coast Guard before beginning construction on the International Bridge. For information contact Commander (dpb), First Coast Guard District, One South Street - Battery Bldg, New York, NY 10004-1466; phone (212) 668-7021. The permittee shall comply with all terms and conditions of any bridge permit.

3. Compensatory mitigation shall consist of purchasing (0.347) credits from the Maine Natural Resource Conservation Fund. As of the date of this permit, the current cost to purchase these credits is $168,350.00. The permittee must send a cashier's check or bank draft for this amount, as calculated on the enclosed "In-Lieu Fee (ILF) Project Impact Worksheet" to: ME DEP, Attn: ILF Program Administrator, State House Station 17, Augusta, ME 04333. The check must include the Corps file number "NAE-2020-01777" and the statement: "For ILF account only". No impacts authorized by this permit shall begin until the Corps receives a copy of the letter from the Maine Department of Environmental Protection (ME DEP) to the permittee stating that the ME DEP has received the check and accepts responsibility for mitigation. The in-lieu fee amount is valid for one year from the date of this permit and is subject to change.

4. In order to fulfill the requirements of Section 106 of the National Historic Preservation Act of 1966, the permittee shall implement the stipulations contained in the attached Memorandum of Agreement between the Federal Highway Administration, the Maine State Historic Preservation Officer, and the Maine Dept. of Transportation.

MAINE IN-LIEU-FEE (ILF)
PROJECT IMPACT WORKSHEET

DEP Invoice # *Filled in by ILF Administrator in Augusta*

Project name: Maine DOT; Madawaska-Edmundston International Bridge

Permittee(s): Maine Dept. of Transportation

DEP/Corps permit #: /NAE-2020-01777 *Attach a copy of the permit*

DEP/Corps Project Manager: S. Smith/J. Clement

ILF Fee Amount: Riverine PEM Wetland: $86,515 + River: $81,835 = $168,350

Check Date: *Filled in by ILF Administrator in Augusta*

Project address: Bridge Avenue; Madawaska, Maine *Attach a locus map*

Biophysical region - Section: Aroostook Hills and Lowlands

Biophysical region - Subsection: St. John Uplands

Total impact area subject to compensation: Riverine PEM Wetland: 30,040 + River: 28,415 = Total 58,455

Resource(s) impacted:

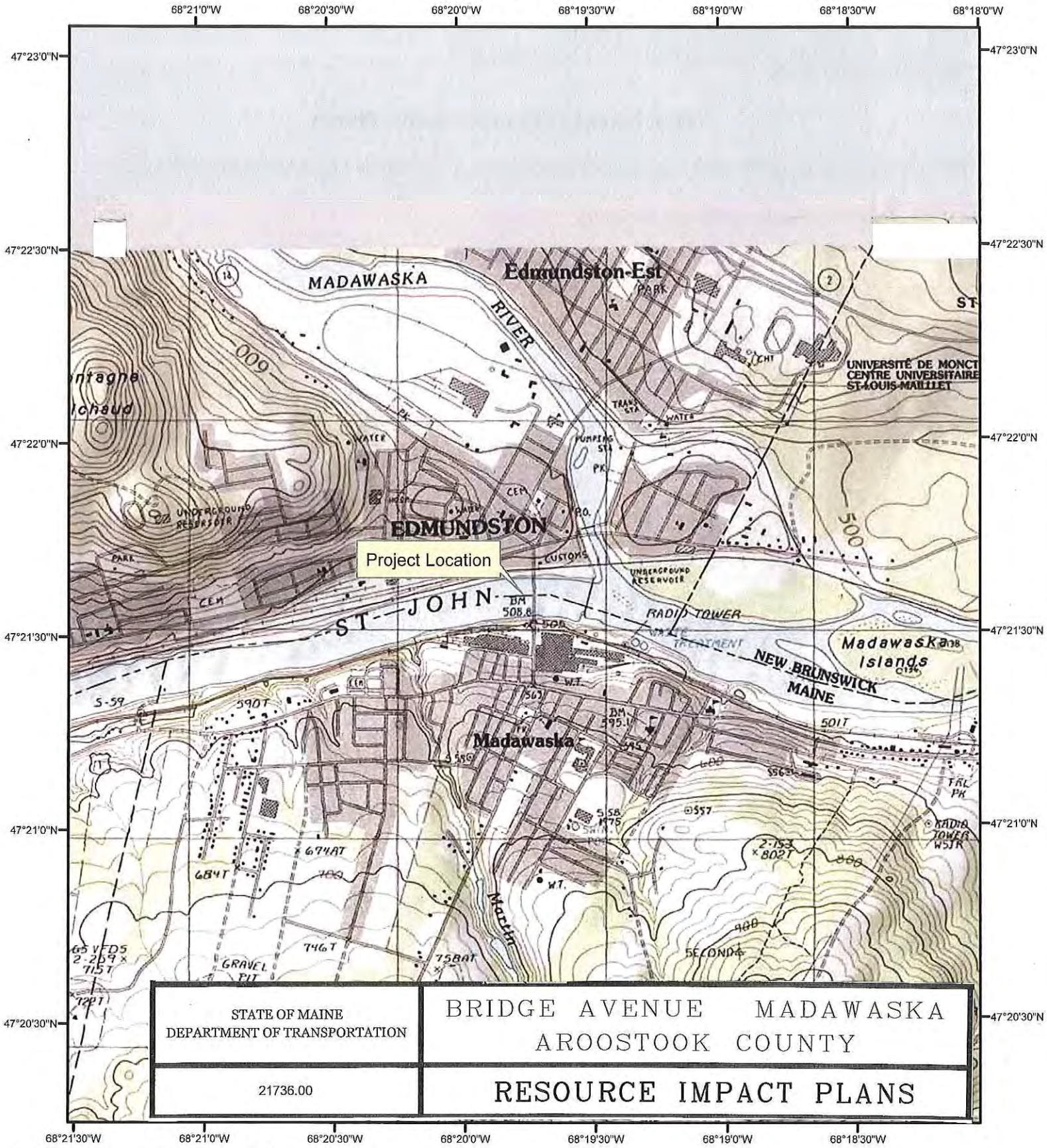
Resource Types (list all that apply)	**Functions & Values** (for wetland impacts) (list all that apply, by resource type)	**Types of Impacts** (list all that apply, by resource type)	**SF Impacted** (by resource type)	**Linear FT of Streams Impacted (for Corps use)**
PEM Riverine	GWR, WH, ESV, UH	Filling	30,040	NA
RSB	WH, FSH, R, SS	Filling	28,415	1,300
		Total impacts:	58,455	1,300

Resource Types: Wetlands by NWI Type (PEM, PFO, PSS, PUB, M1, M2, E1, E2, etc), significant vernal pool depression (SVP), significant vernal pool critical terrestrial habitat (VPCTH), shorebird feeding & staging habitat (shorebird), inland waterfowl & wading bird habitat (IWWH), Tidal waterfowl & wading bird habitat (TWWH), lake or pond (L1, L2), river/stream/brook (RSB)

Wetland Functions & Values: Groundwater recharge/discharge (GWR); floodflow alteration (FF); fish & shellfish habitat (FSH); sediment toxicant retention (STR); nutrient removal (NR); production export (PE); sediment/shoreline stabilization (SS); recreation (R); education/scientific value (ESV); uniqueness/heritage (UH); and visual quality/aesthetics (VQ); wildlife habitat (WH)

Types of Impacts: May include: filling, dredging, vegetation conversion (e.g. forested to shrub/scrub), excavation with associated discharge, etc.

Attachment 3: Project Location Map



Bridge Avenue, Madawaska
Aroostook County
WIN 21736.00
Madawaska, ME

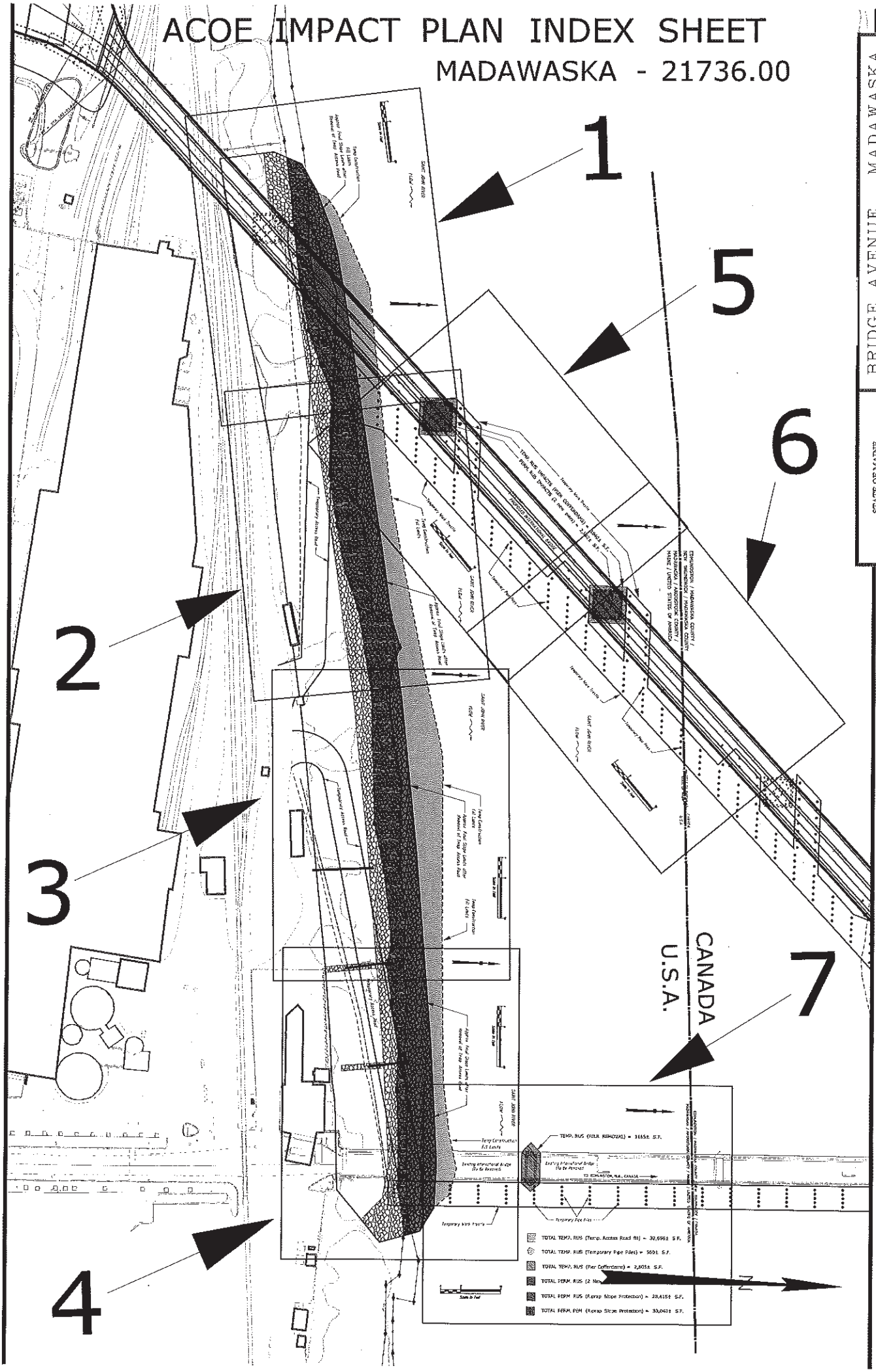
0 0.5 1 Miles

N
W E
S

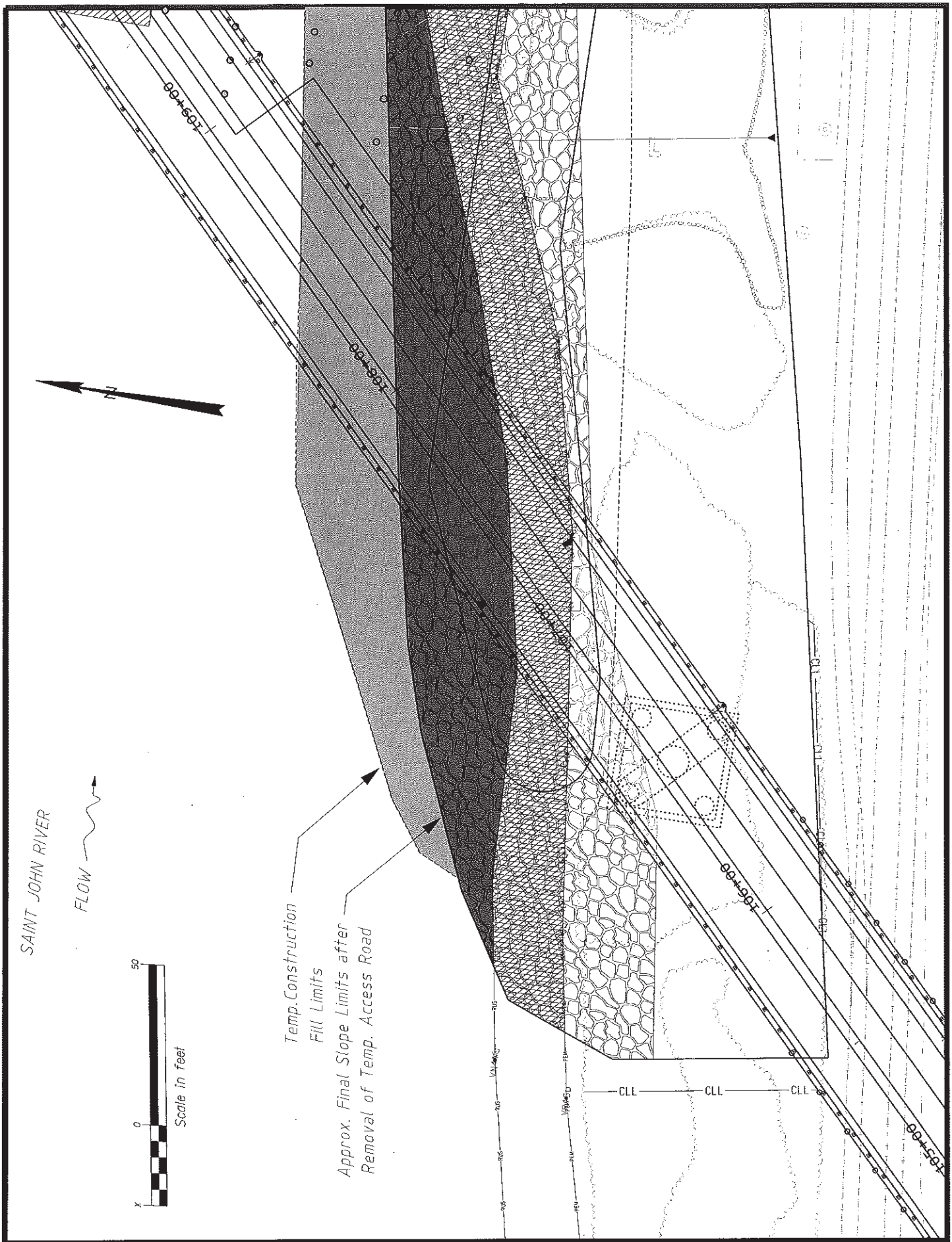
Project Location: 47.360286, -68.328722

ACOE IMPACT PLAN INDEX SHEET

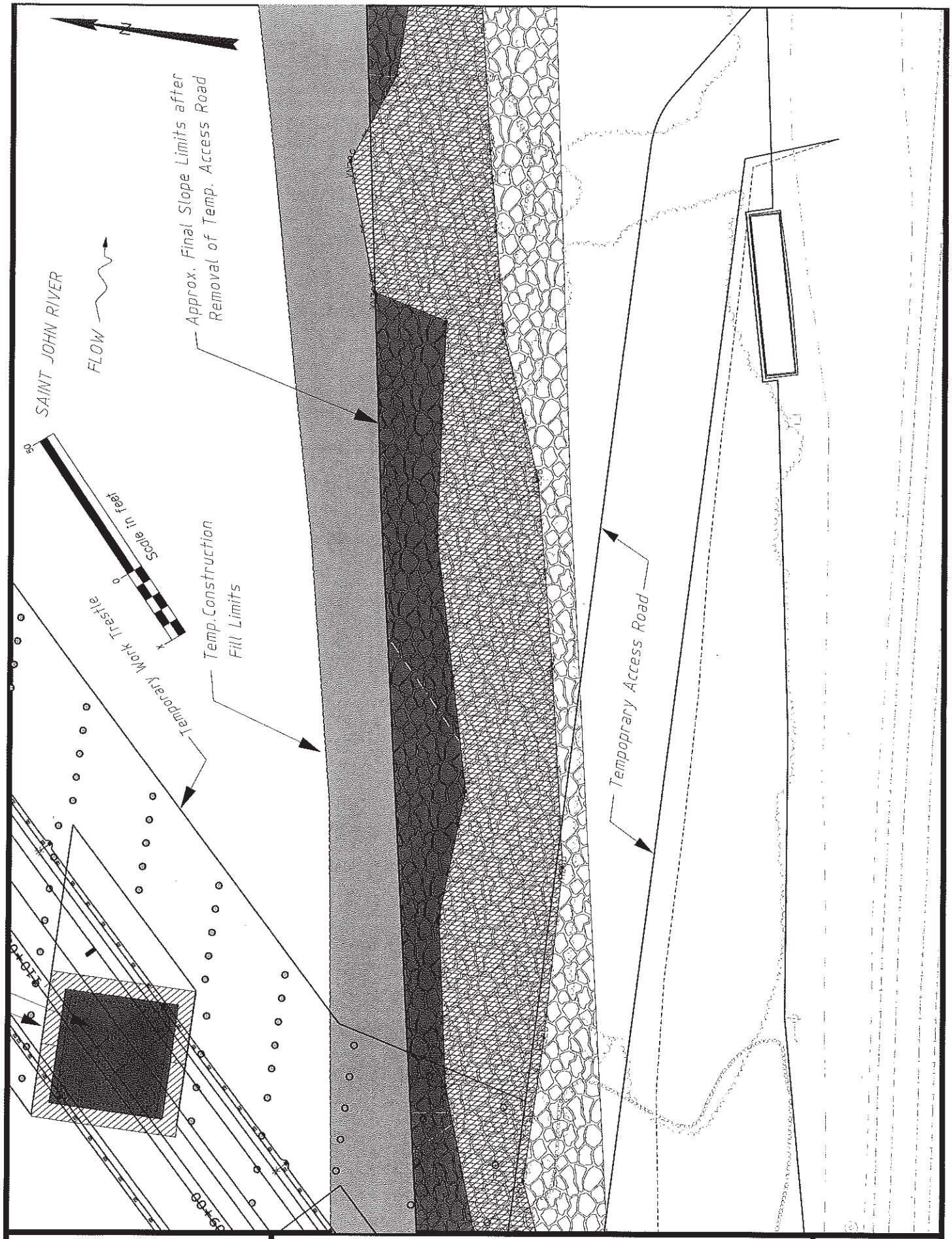
MADAWASKA - 21736.00



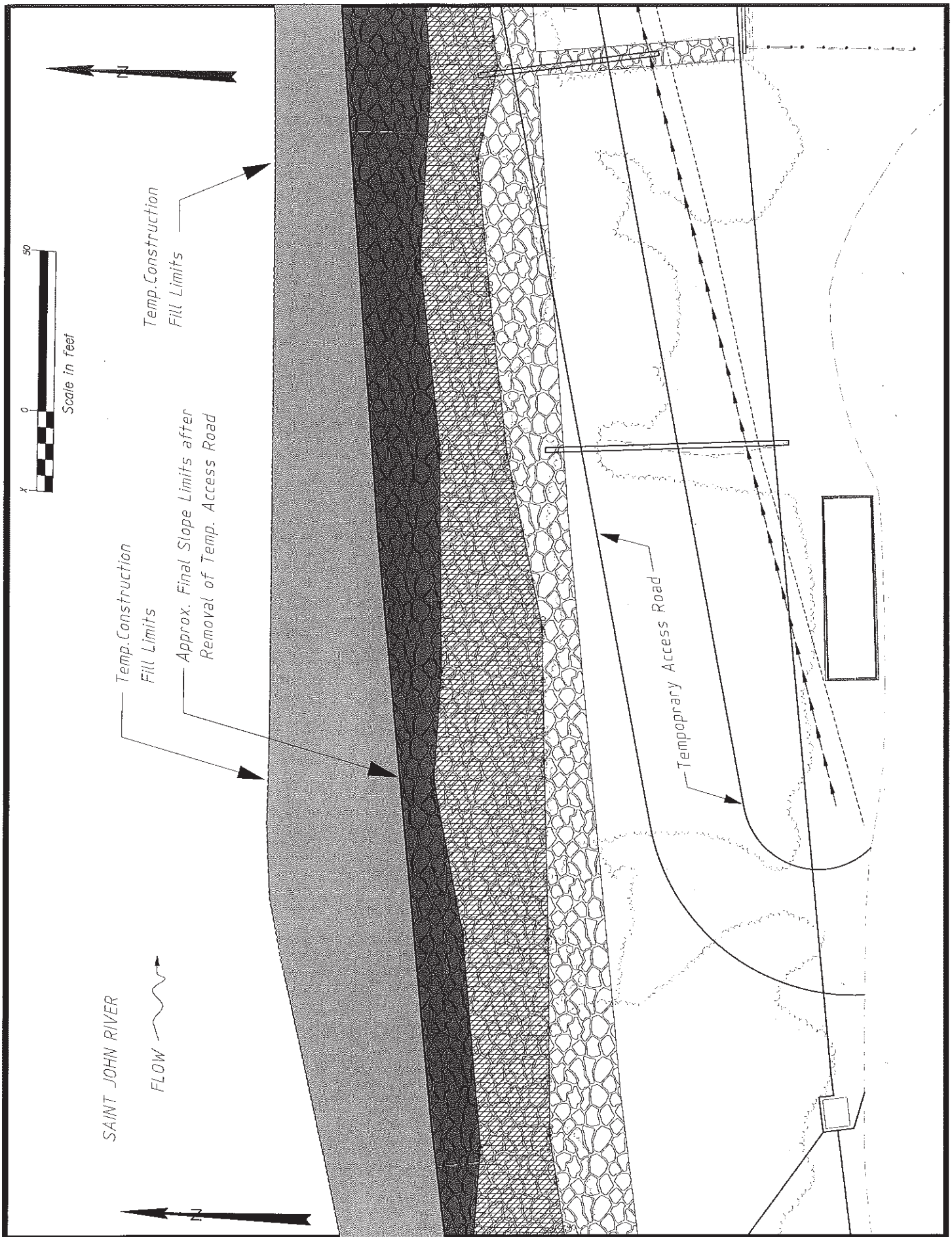
BRIDGE AVENUE MADAWASKA AROOSTOOK COUNTY	RESOURCE IMPACT PLANS
STATE OF MAINE DEPARTMENT OF TRANSPORTATION	21736.00



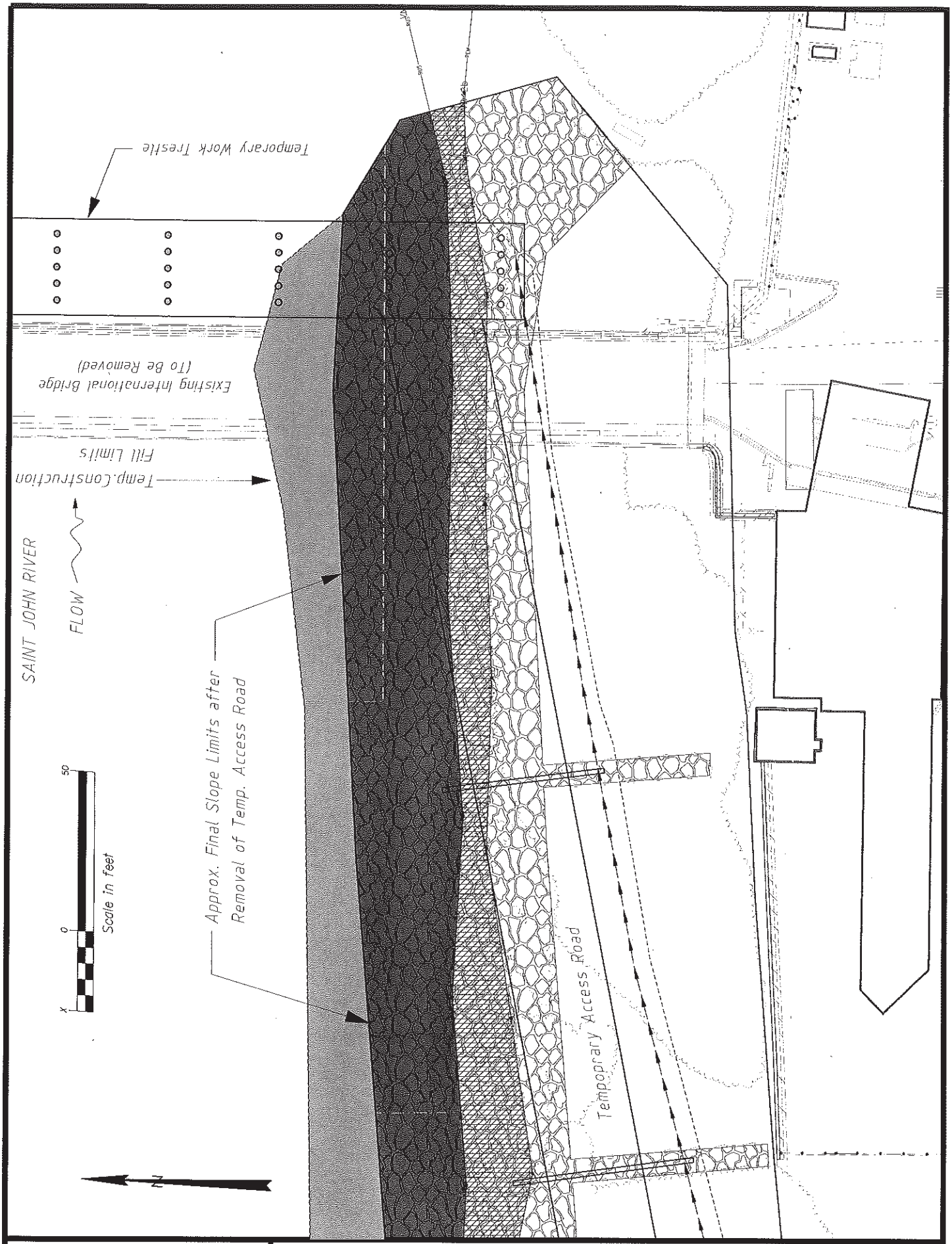
STATE OF MAINE DEPARTMENT OF TRANSPORTATION	BRIDGE AVENUE MADAWASKA AROOSTOOK COUNTY	SHEET NUMBER 1 OF7
21736.00	RESOURCE IMPACT PLANS	



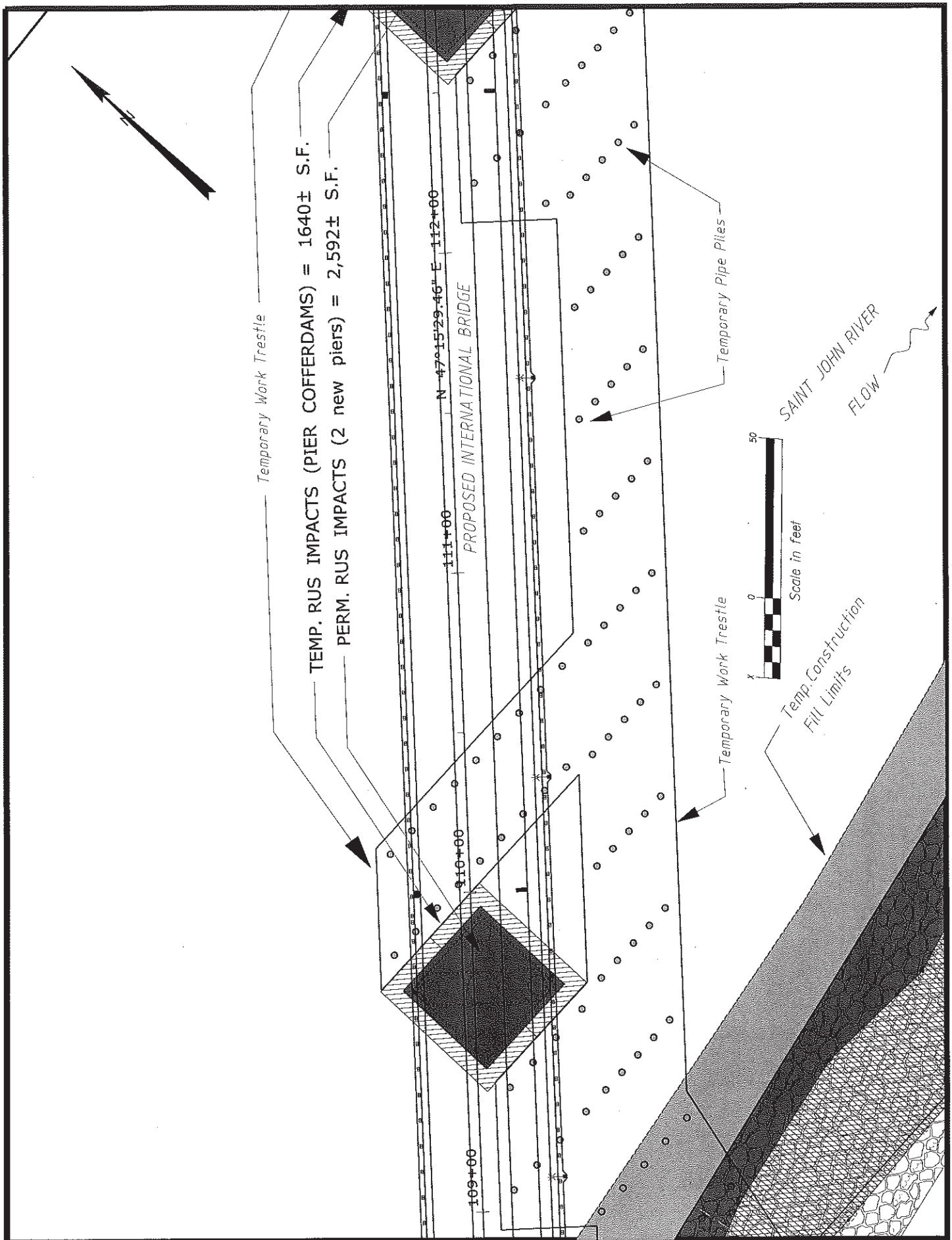
STATE OF MAINE DEPARTMENT OF TRANSPORTATION	BRIDGE AVENUE MADAWASKA AROOSTOOK COUNTY	SHEET NUMBER 2 OF7
21736.00	RESOURCE IMPACT PLANS	



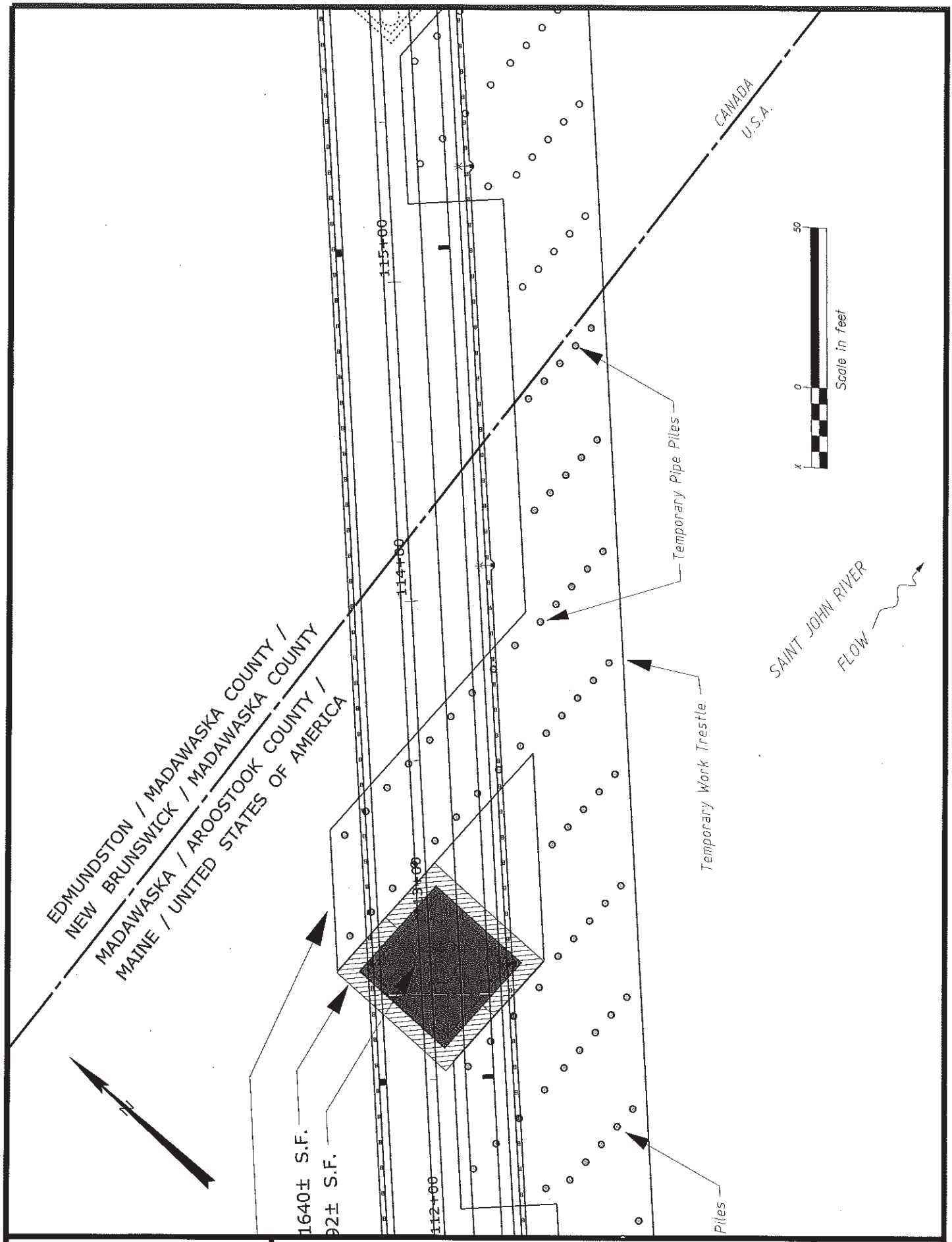
STATE OF MAINE DEPARTMENT OF TRANSPORTATION	BRIDGE AVENUE MADAWASKA AROOSTOOK COUNTY	SHEET NUMBER 3
21736.00	RESOURCE IMPACT PLANS	OF7



STATE OF MAINE DEPARTMENT OF TRANSPORTATION	BRIDGE AVENUE MADAWASKA AROOSTOOK COUNTY	SHEET NUMBER 4 OF7
21736.00	RESOURCE IMPACT PLANS	



STATE OF MAINE DEPARTMENT OF TRANSPORTATION	BRIDGE AVENUE MADAWASKA AROOSTOOK COUNTY	SHEET NUMBER 5 OF7
21736.00	RESOURCE IMPACT PLANS	



STATE OF MAINE DEPARTMENT OF TRANSPORTATION	BRIDGE AVENUE MADAWASKA AROOSTOOK COUNTY	SHEET NUMBER 6 OF7
21736.00	RESOURCE IMPACT PLANS	

EDMUNDSTON / MADAWASKA COUNTY / NEW BRUNSWICK / CANADA

MADAWASKA / AROOSTOOK COUNTY / MAINE / UNITED STATES OF AMERICA

N

TEMP. RUS (PIER REMOVAL) = 1165± S.F.

TO EDMUNDSTON, N.B., CANADA

Existing International Bridge (To Be Removed)

Temporary Pipe Piles

TOTAL TEMP. RUS (Temp. Access Road fill) = 32,656± S.F.

TOTAL TEMP. RUS (Temporary Pipe Piles) = 560± S.F.

TOTAL TEMP. RUS (Pier Cofferdams) = 2,805± S.F.

TOTAL PERM. RUS (2 New Piers) = 2,592± S.F.

TOTAL PERM. RUS (Riprap Slope Protection) = 28,415± S.F.

TOTAL PERM. PEM (Riprap Slope Protection) = 30,040± S.F.

SAINT JOHN RIVER

FLOW

Temp. Construction Fill Limits

Existing International Bridge (To Be Removed)

Temporary Work Trestle

fter

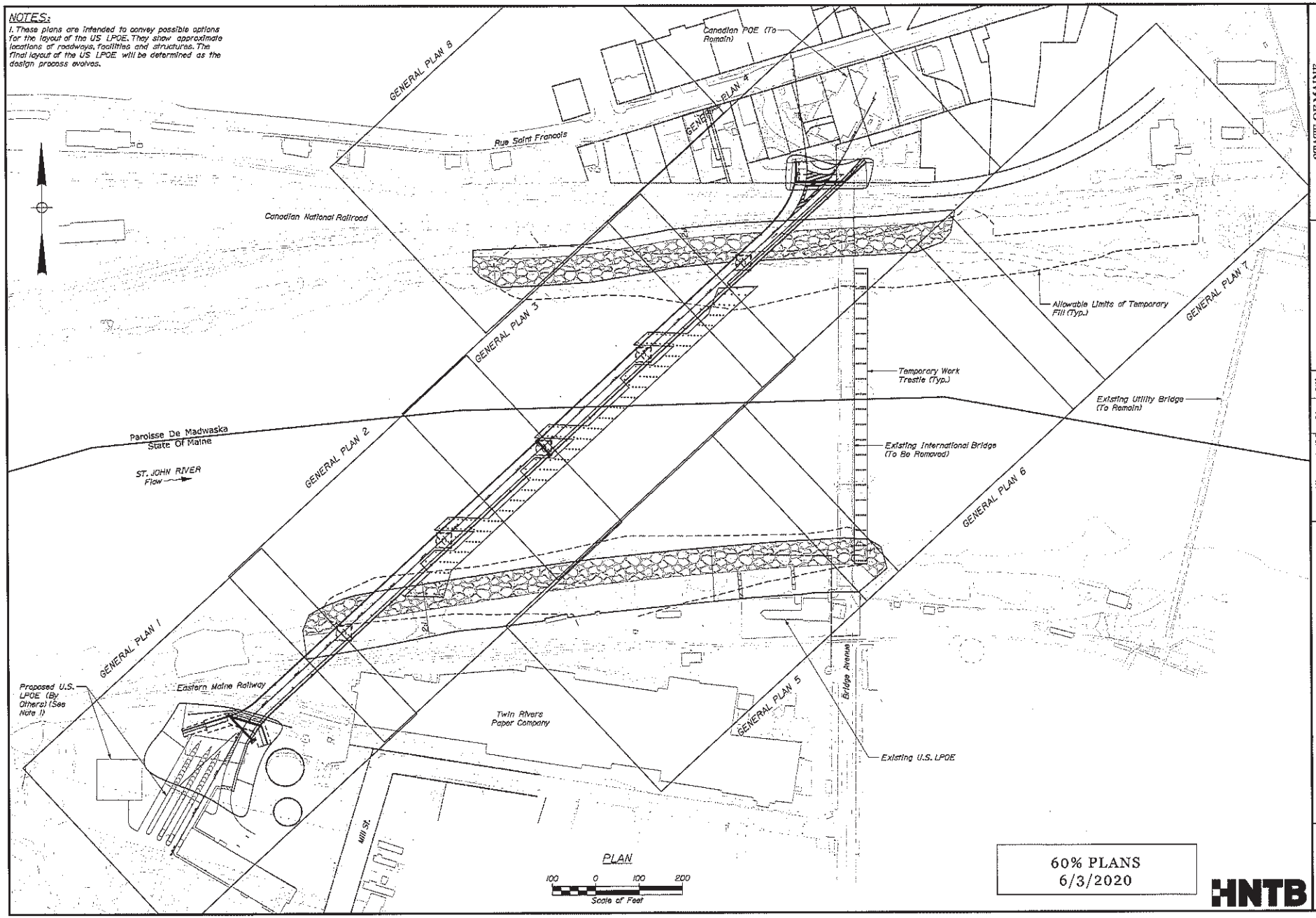
ad

50

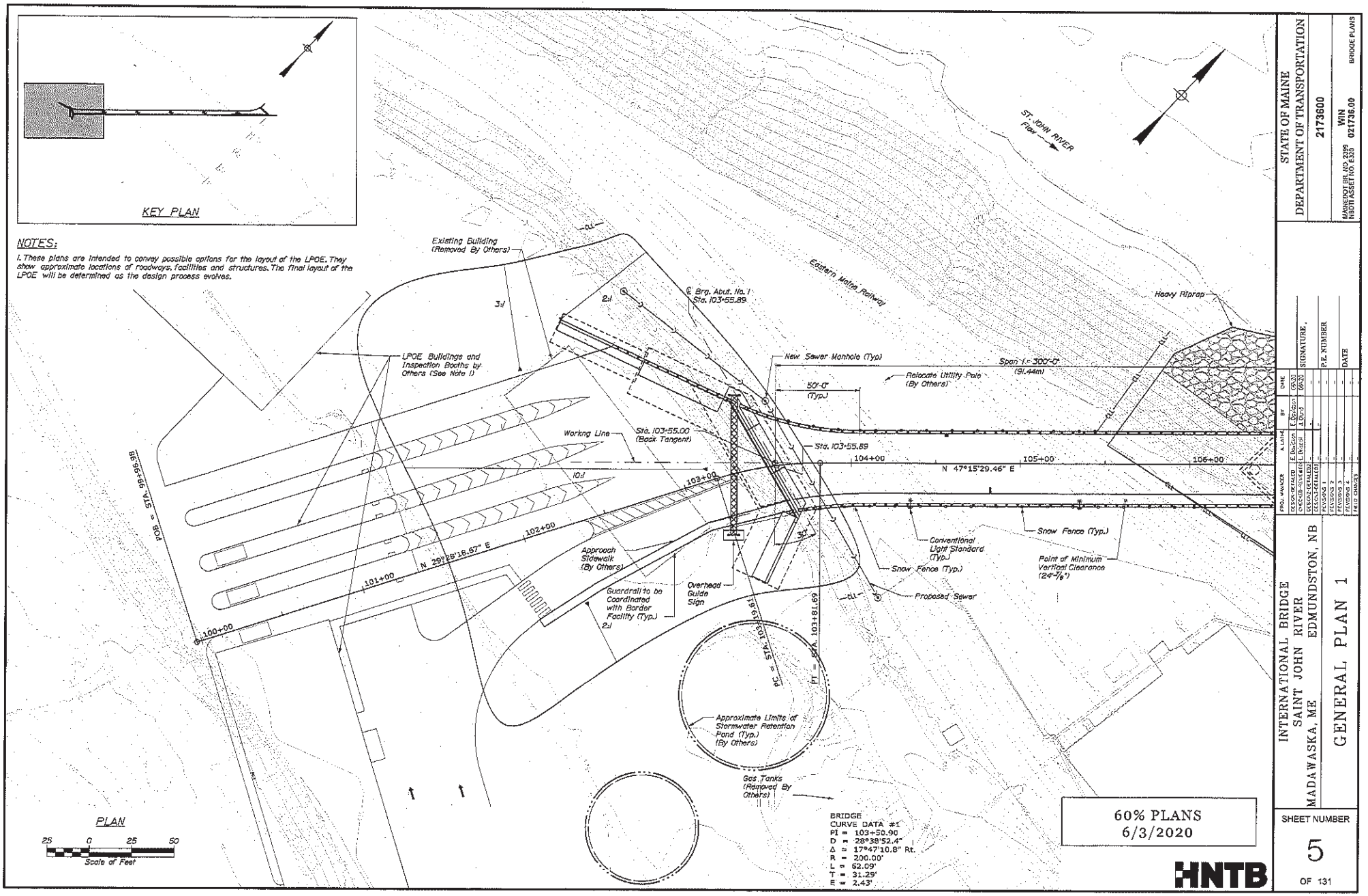
0

Scale in feet

STATE OF MAINE DEPARTMENT OF TRANSPORTATION	BRIDGE AVENUE MADAWASKA AROOSTOOK COUNTY	SHEET NUMBER 7
21736.00	RESOURCE IMPACT PLANS	OF7

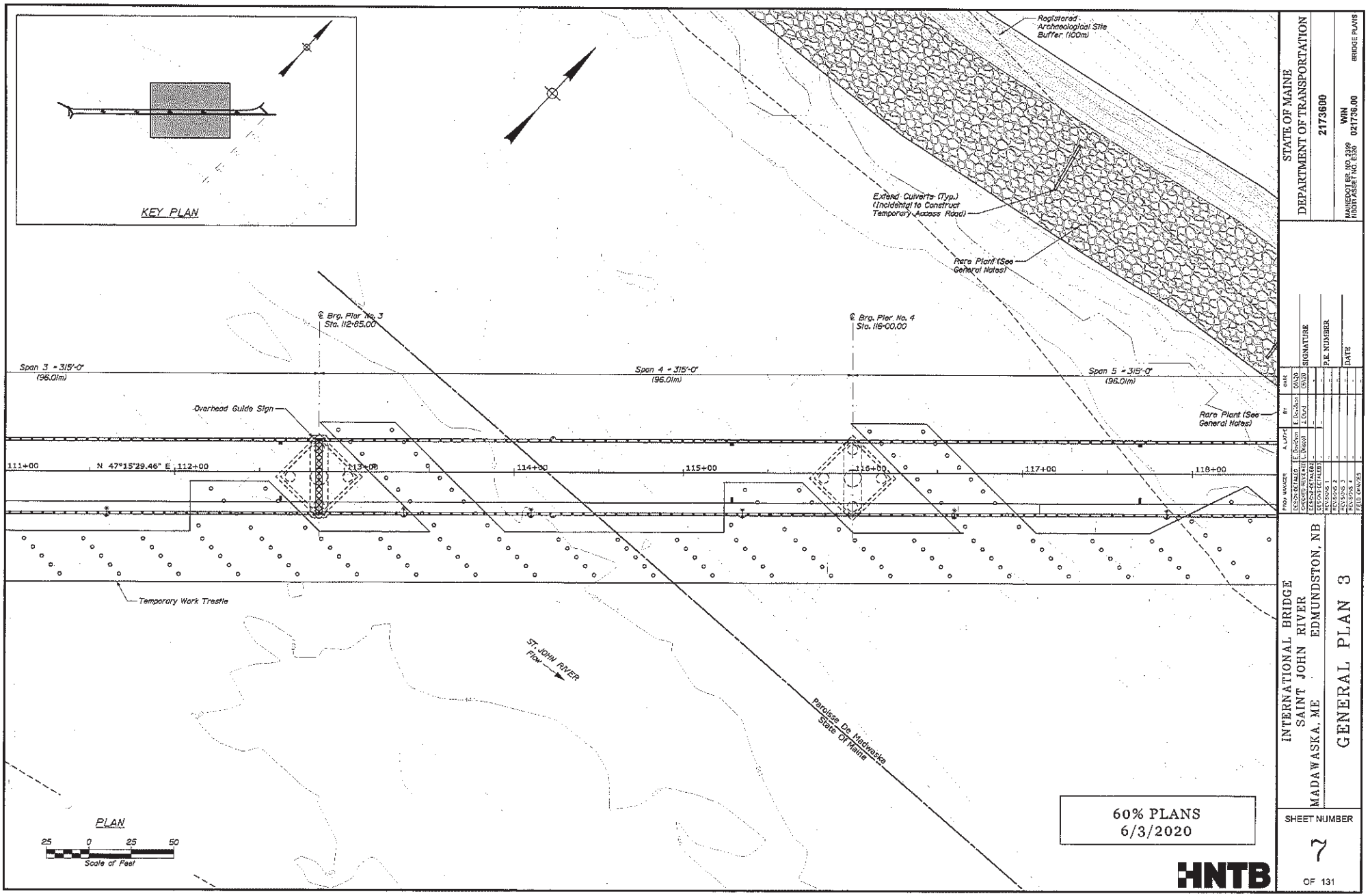


Filename: 004_Project Site Plan.dgn Division: Username: Date:6/3/2020


KEY PLAN
NOTES:
1. These plans are intended to convey possible options for the layout of the LPOE. They show approximate locations of roadways, facilities and structures. The final layout of the LPOE will be determined as the design process evolves.
Existing Building (Removed By Others)
℄ Brg. Abut. No. 1 Sta. 103+55.89
Eastern Maine Railway
ST. JOHN RIVER Flow
Heavy Riprap
LPOE Buildings and Inspection Booths by Others (See Note 1)
New Sewer Manhole (Typ)
Span 1 = 300'-0" (91.44m)
Relocate Utility Pole (By Others)
50'-0" (Typ.)
Working Line
Sta. 103+55.00 (Back Tangent)
Sta. 103+55.89
N 47°15'29.46" E
POB = STA. 98+96.98
N 29°28'16.67" E
Approach Sidewalk (By Others)
Guardrail to be Coordinated with Border Facility (Typ.)
Overhead Guide Sign
Conventional Light Standard (Typ.)
Snow Fence (Typ.)
Point of Minimum Vertical Clearance (24'-7⅛")
Proposed Sewer
PC = STA. 103+31.61
PT = STA. 103+81.69
Approximate Limits of Stormwater Retention Pond (Typ.) (By Others)
Gas Tanks (Removed By Others)
BRIDGE
CURVE DATA #1
PI = 103+50.90
D = 28°38'52.4"
Δ = 17°47'10.8" Rt.
R = 200.00'
L = 62.09'
T = 31.29'
E = 2.43'
PLAN
25 0 25 50
Scale of Feet
60% PLANS
6/3/2020
HNTB
STATE OF MAINE
DEPARTMENT OF TRANSPORTATION
2173600
MARKEPOT BR. NO. 2329
NBI 01 ASSET NO. E329
WIN 021736.00
BRIDGE PLANS
INTERNATIONAL BRIDGE
SAINT JOHN RIVER
MADAWASKA, ME EDMUNDSTON, NB
GENERAL PLAN 1
SHEET NUMBER
5
OF 131

555

Filename: 006_Plan_02.dgn Division: Username: Date:6/3/2020



STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

2173600

MAINEDOT BR. NO. 2329
NBDOT ASSET NO. E320

WIN
021736.00

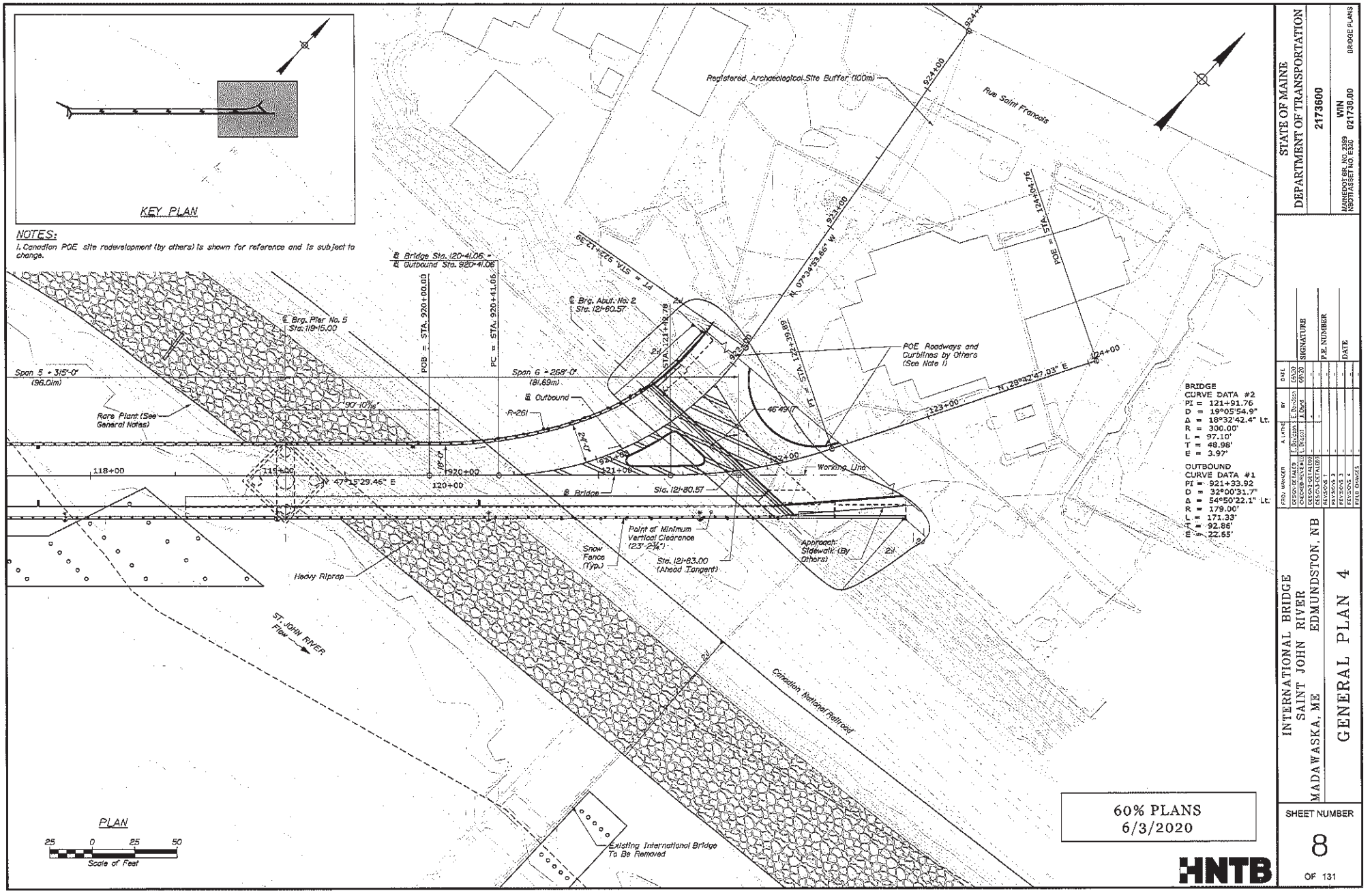
BRIDGE PLANS

INTERNATIONAL BRIDGE
SAINT JOHN RIVER
MADAWASKA, ME EDMUNDSTON, NB

GENERAL PLAN 3

SHEET NUMBER
7
OF 131

Date: 6/3/2020
Username:
Division:
Filename: 007_Plan_03.dgn



STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

2173600

MAINSPOT OR NO. 2389 WIN 021736.00
NBI/TI ASSET NO. E336

BRIDGE PLANS

	A. LAMB	BY	DATE
PROJ. MANAGER			
DESIGN DETAILED	L. DOUCETTE	E. BOUCHER	6/3/20
CHECKED-REVIEWED	L. DOUCETTE	J. DAVIS	6/3/20
DESIGN DETAILED			
DESIGN DETAILED			
REVISIONS 1			
REVISIONS 2			
REVISIONS 3			
REVISIONS 4			
FIELD CHANGES			

SIGNATURE

P.E. NUMBER

DATE

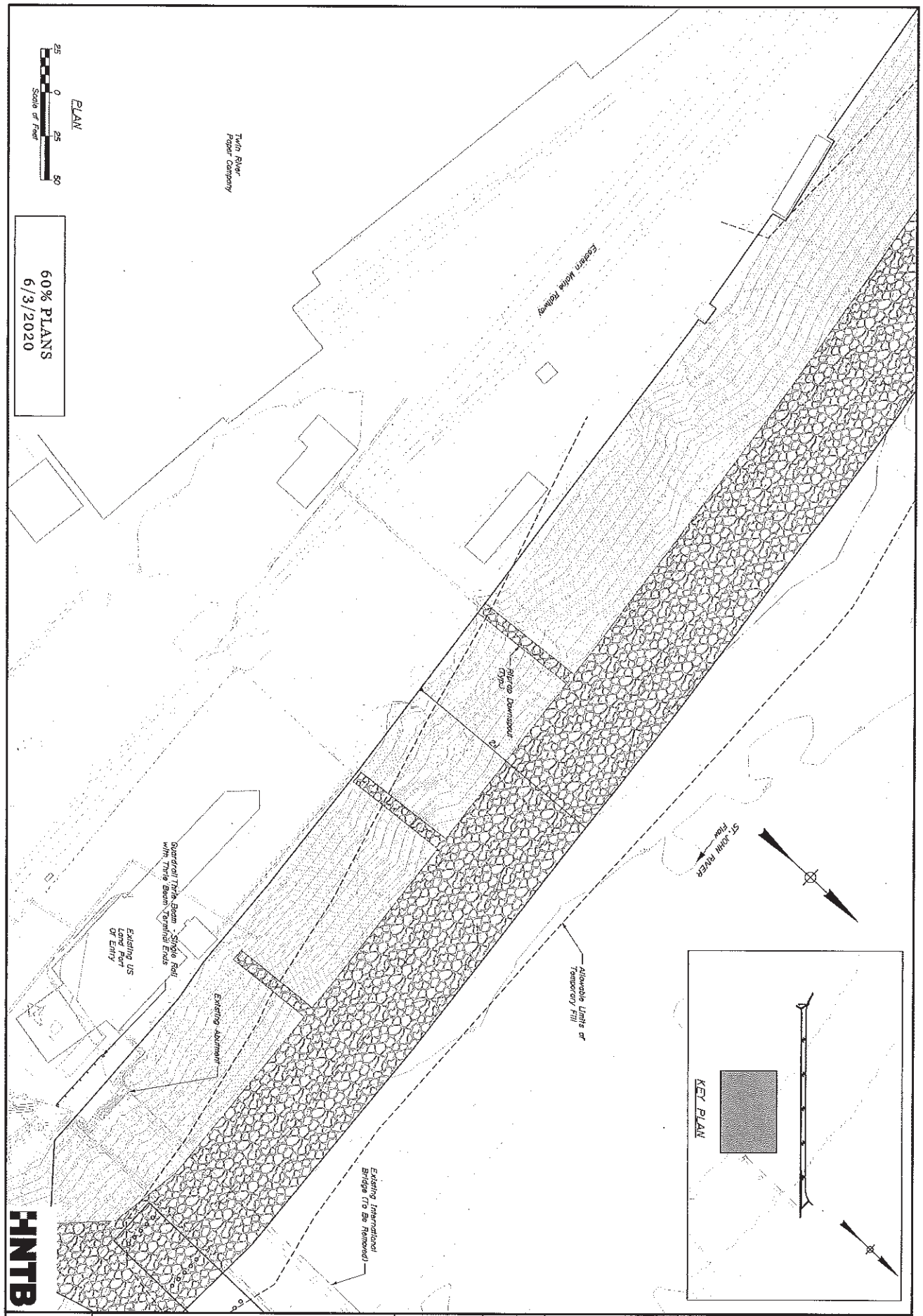
INTERNATIONAL BRIDGE
SAINT JOHN RIVER
MADAWASKA, ME EDMUNDSTON, NB

GENERAL PLAN 4

SHEET NUMBER
8
OF 131

Date: 6/3/2020
Username:
Division:
Filename: 008_Plan_04.dgn

Filename: 009_Plan_05.dgn Division: Username: Date:6/3/2020



HNTB

SHEET NUMBER 9 OF 131

INTERNATIONAL BRIDGE
SAINT JOHN RIVER
MADAWASKA, ME EDMUNDSTON, NB

GENERAL PLAN 5

PROJ. MANAGER	A. LATHI	BY	DATE
DESIGN-DETAILED	E. Davidson	E. Davidson	05/20
CHECKED-REVIEWED	L. Driscoll	J. Duval	06/20
DESIGN2-DETAILED2	-	-	-
DESIGN3-DETAILED3	-	-	-
REVISIONS 1	-	-	-
REVISIONS 2	-	-	-
REVISIONS 3	-	-	-
REVISIONS 4	-	-	-
FIELD CHANGES	-	-	-

SIGNATURE

P.E. NUMBER

DATE

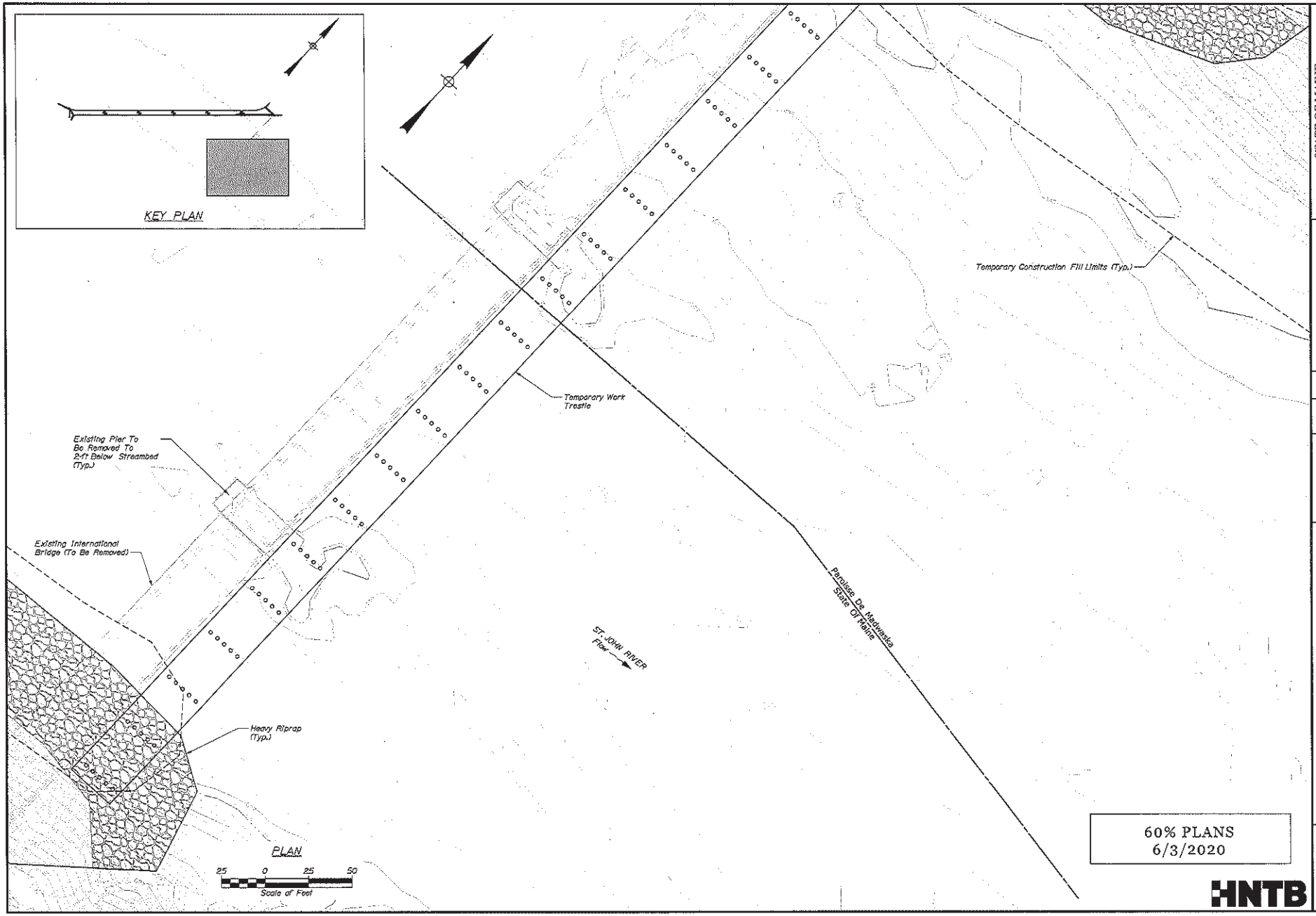
STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

2173600

MAINEDOT BR. NO. 2399
NBDTI ASSET NO. E320

WIN 021736.00

BRIDGE PLANS



STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

2173600

MAINEDOT BR. NO. 2369 WIN 021738.00
NBDOT ASSET NO. E330

BRIDGE PLANS

	A. LAST	BY	DATE
PROJ. MANAGER			
DESIGN DETAILED	E. Davidson	E. Davidson	06/20
CHECKED REVIEWED	L. Dostie	J. Duda	06/20
DESIGNED DETAILED	-	-	-
DESIGNED REVIEWED	-	-	-
REVISIONS 1	-	-	-
REVISIONS 2	-	-	-
REVISIONS 3	-	-	-
REVISIONS 4	-	-	-
FIELD CHECKS	-	-	-

SIGNATURE

P.E. NUMBER

DATE

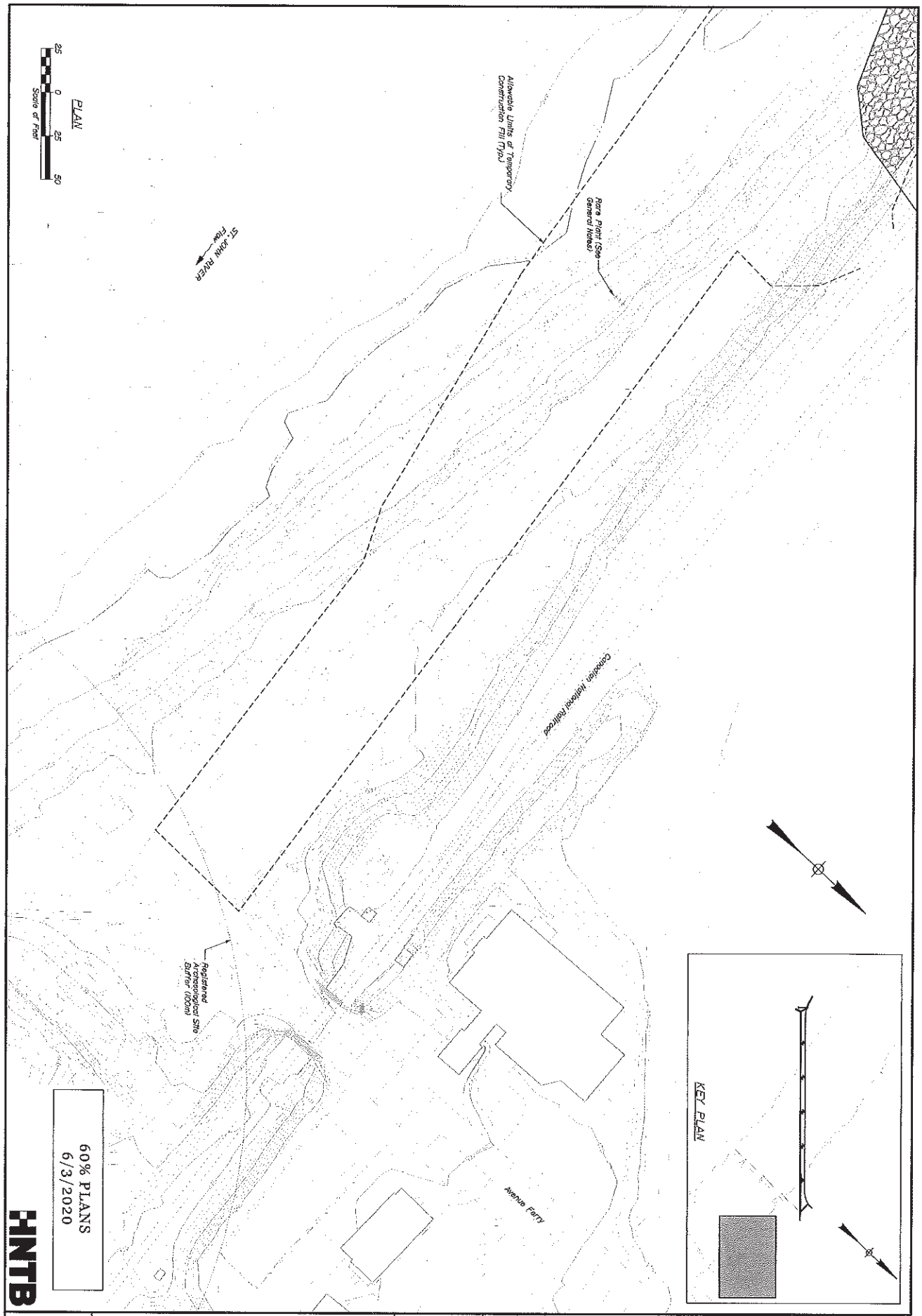
INTERNATIONAL BRIDGE
SAINT JOHN RIVER
MADAWASKA, ME — EDMUNDSTON, NB

GENERAL PLAN 6

SHEET NUMBER
10
OF 131

Filename: 010_Plan_06.dgn Division: Username: Date:6/3/2020

Filename: 011_Plan_07.dgn Division: Username: Date:6/3/2020



60% PLANS
6/3/2020

HNTB

INTERNATIONAL BRIDGE
SAINT JOHN RIVER
MADAWASKA, ME EDMUNDSTON, NB

GENERAL PLAN 7

SHEET NUMBER 11 OF 131

		BY	DATE
PROJ MANAGER	R. RATHE		
DESIGN-DETAILED	E. Davidson	E. Davidson	06/20
CHECKED-REVIEWED	L. Dubord	J. Dunn	06/20
DESIGN2-DETAILED2	-	-	-
DESIGN3-DETAILED3	-	-	-
REVISIONS 1	-	-	-
REVISIONS 2	-	-	-
REVISIONS 3	-	-	-
REVISIONS 4	-	-	-
FIELD CHANGES	-	-	-

SIGNATURE

P.E. NUMBER

DATE

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

2173600

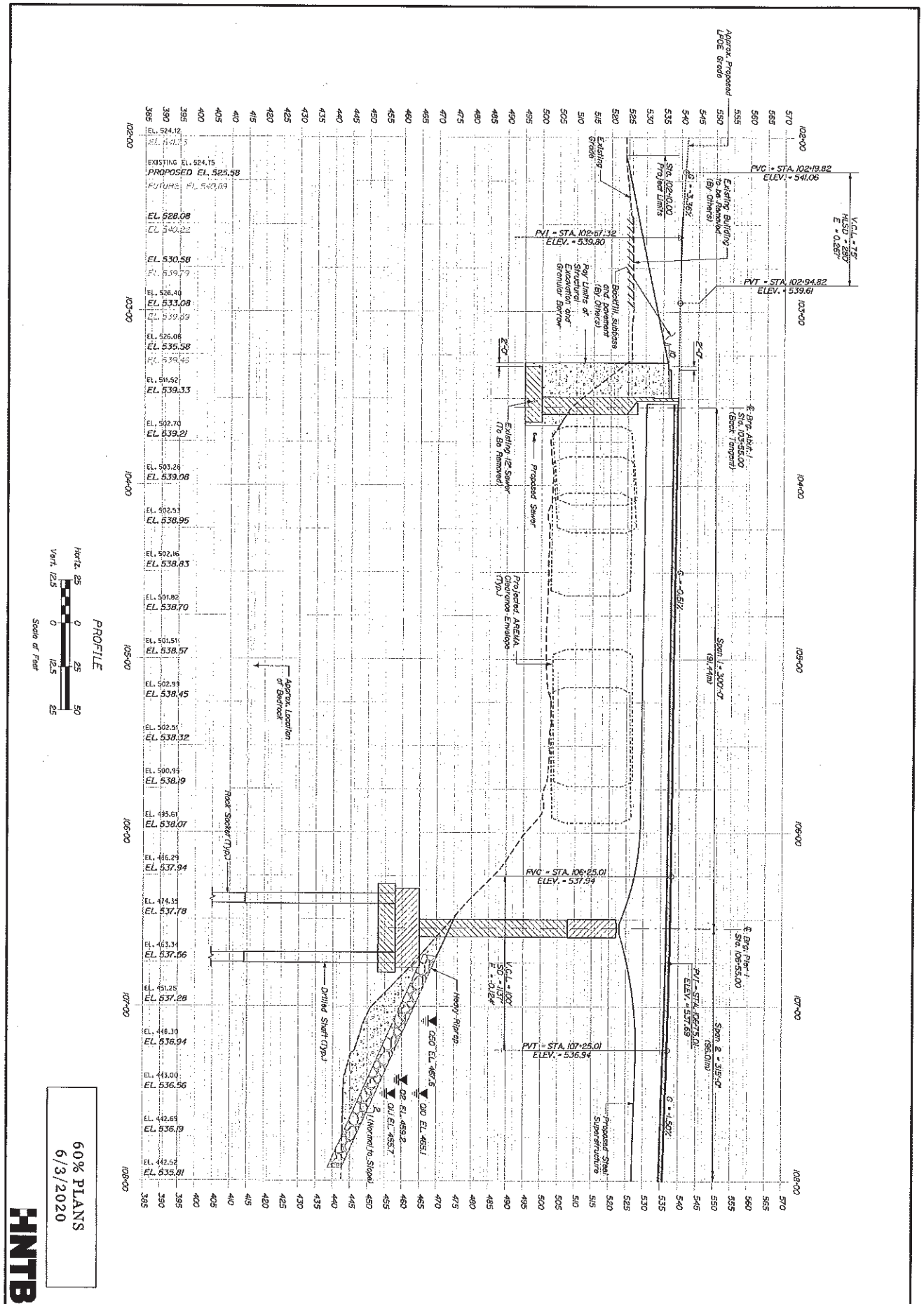
MAINEDOT BR. NO. 2399
NBDTI ASSET NO. E320

WIN
021736.00

BRIDGE PLANS

| | | |

Filename: 013_Profile_Ldgn Division: Username: Date:6/3/2020

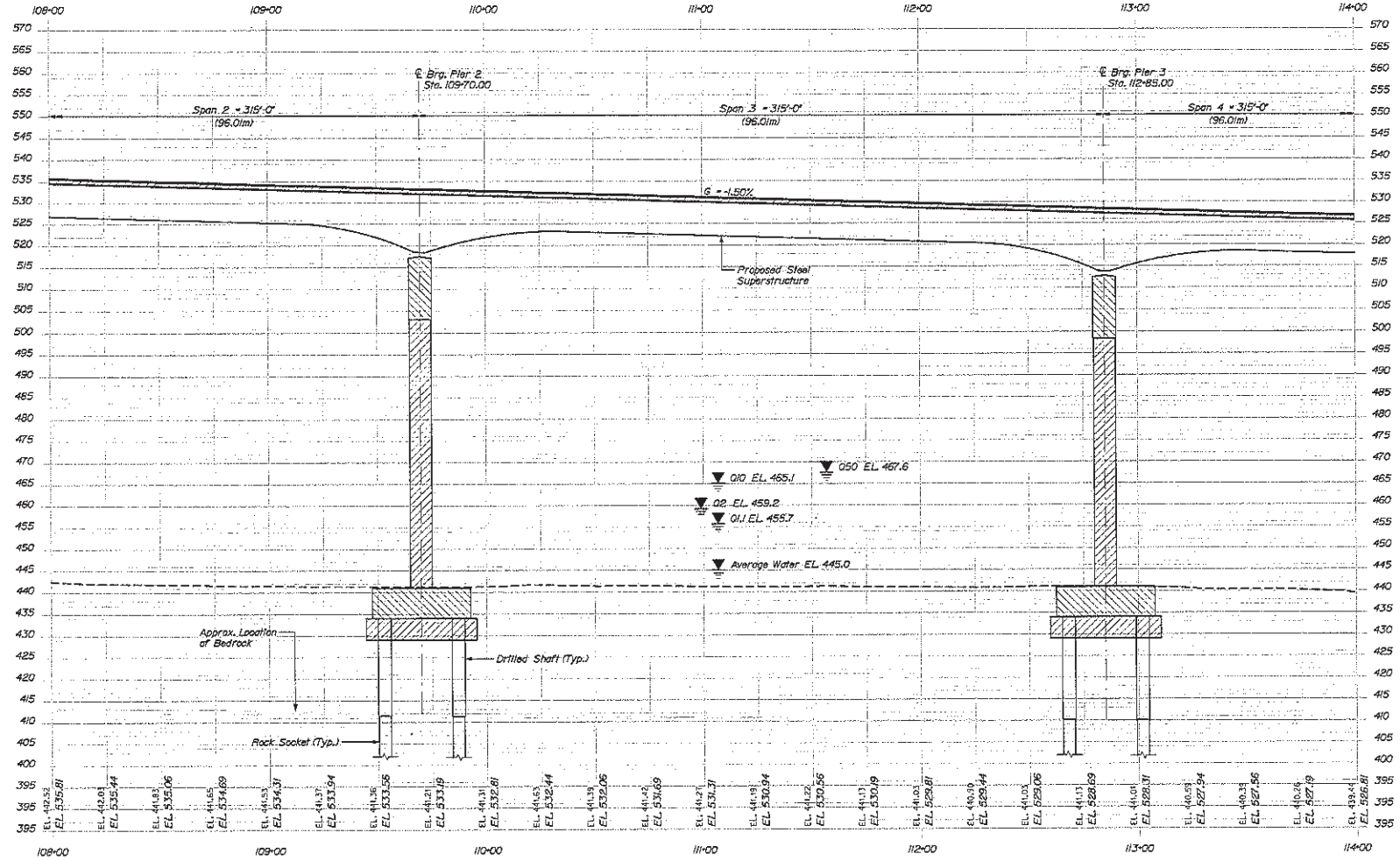


60% PLANS
6/3/2020

HNTB

INTERNATIONAL BRIDGE SAINT JOHN RIVER MADAWASKA, ME EDMUNDSTON, NB	PROJ MANAGER	A. LATHE	BY	DATE	STATE OF MAINE DEPARTMENT OF TRANSPORTATION
	DESIGN-DETAILED	E. Davidson	C. Bernstein	08/20	
	CHECKED-DESIGNED	L. Dyson	J. Dyer	08/20	2173600
	DESIGN2-DETAILED2			-	SIGNATURE
	DESIGN3-DETAILED3			-	
PROFILE 1	REVISIONS 1			-	P.E. NUMBER
	REVISIONS 2			-	
	REVISIONS 3			-	DATE
	REVISIONS 4			-	MAINEDOT BR. NO. 2399 WIN 021736.00 BRIDGE PLANS
	FIELD CHANGES			-	NBDOT ASSET NO. E320

SHEET NUMBER 13 OF 131



PROFILE

Horiz. 25 0 25 50

Vert. 12.5 0 12.5 25

Scale of Feet

60% PLANS
6/3/2020

HNTB

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

2173600

MAINEDOT BR. NO. 2389 WIN
RBDTI ASSET NO. E330 021736.00

BRIDGE PLANS

PROJ MANAGER	A. LAMB	BY	DATE
DESIGN-LEAD	J.E. Boulton	E. Boulton	06/20
DESIGN-REVIEW	L. Dubois	J. Dick	06/20
DESIGN-DETAILED	-	-	-
DESIGN-CHECKED	-	-	-
PS&E SUBMIT 1	-	-	-
PS&E SUBMIT 2	-	-	-
PS&E SUBMIT 3	-	-	-
PS&E SUBMIT 4	-	-	-
FIELD CHANGES	-	-	-

SIGNATURE

P.E. NUMBER

DATE

INTERNATIONAL BRIDGE
SAINT JOHN RIVER
MADAWASKA, ME EDMUNDSTON, NB

PROFILE 2

SHEET NUMBER

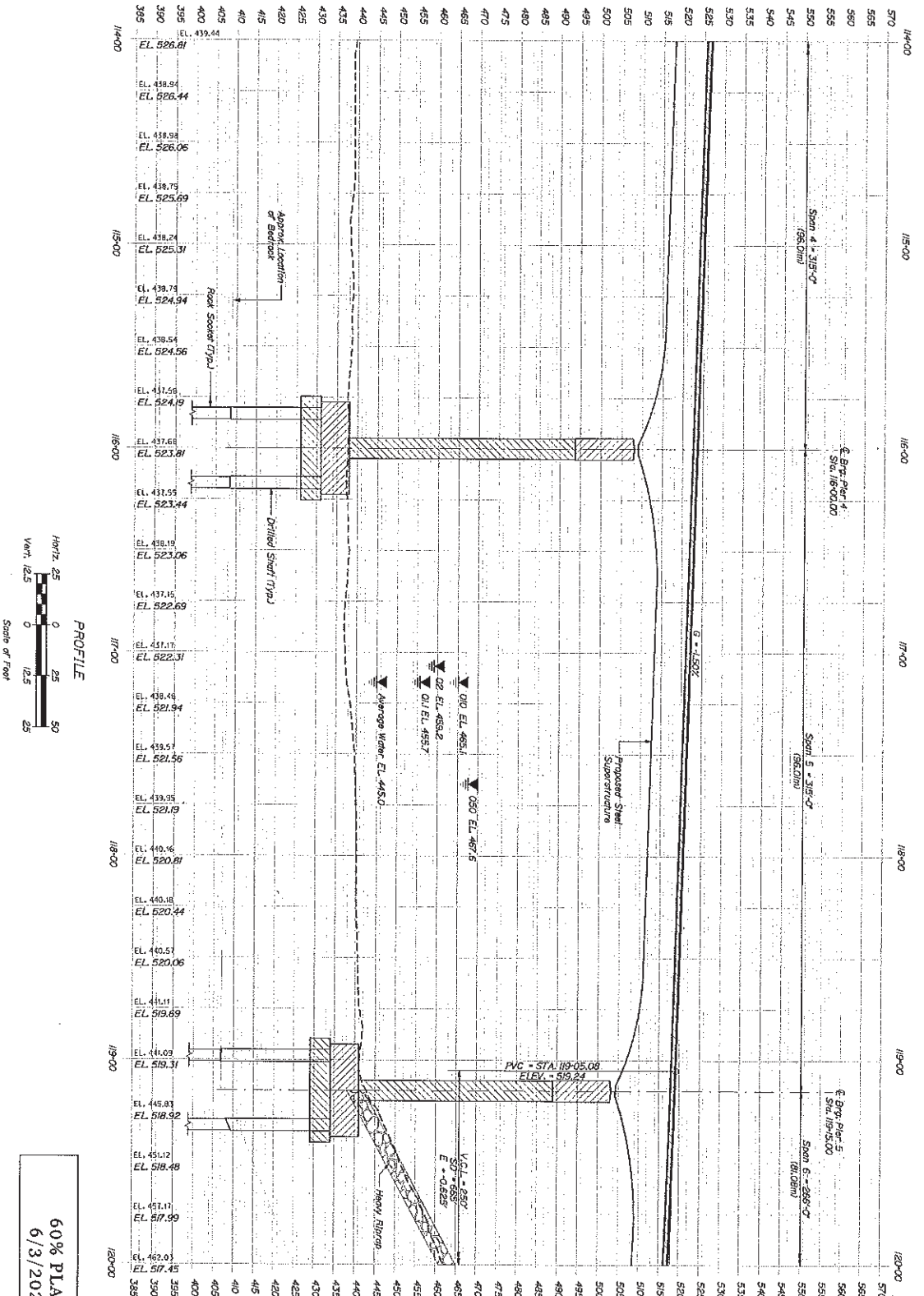
14

OF 131

Filename: 014_Profile_2.dgn Division: Username: Date: 6/3/2020

564

Filename: 015_ProfRe...3.dgn Division: Username: Date: 6/3/2020

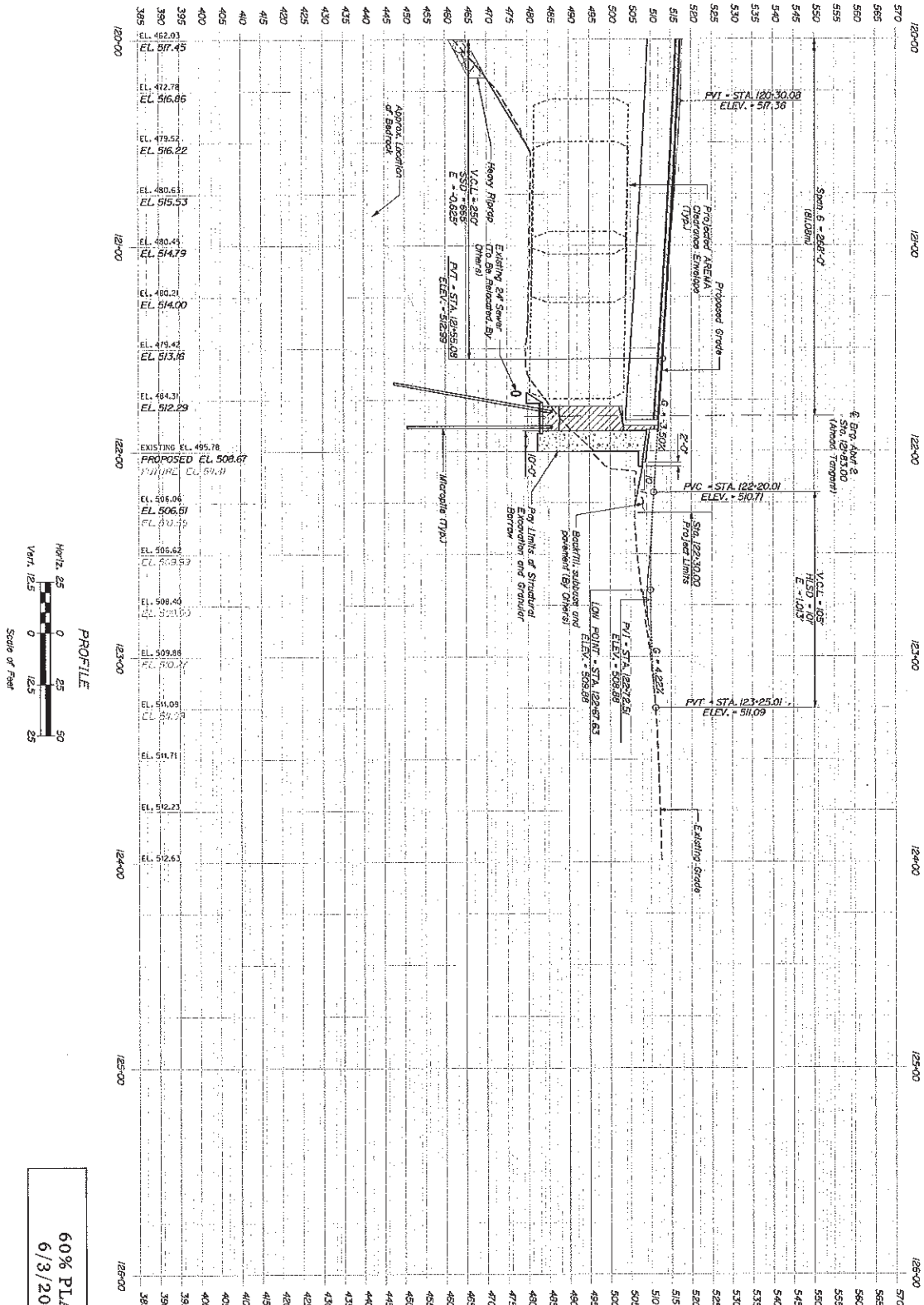


60% PLANS
6/3/2020

HNTB

SHEET NUMBER 15 OF 131	INTERNATIONAL BRIDGE SAINT JOHN RIVER MADAWASKA, ME EDMUNDSTON, NB PROFILE 3	PROJ. MANAGER: A. LATHE DESIGN-DETAILED: E. Davidson — BY: E. Davidson — DATE: 05\20 CHECKED-ISSUED: L. Driscoll — J. Dunn — 06\20 DESIGN2-DETAILED2: – – – CHECKED-DETAILED2: – – – REVISIONS 1: – – – REVISIONS 2: – – – REVISIONS 3: – – – REVISIONS 4: – – – FIELD CHANGES: – – –	SIGNATURE P.E. NUMBER DATE
	STATE OF MAINE DEPARTMENT OF TRANSPORTATION 2173600 MAINEDOT BR. NO. 2399 NBDTI ASSET NO. E320 WIN 021736.00 BRIDGE PLANS		

Filename: 016_Profile_4.dgn Division: Username: Date:6/3/2020



60% PLANS
6/3/2020

HNTB

INTERNATIONAL BRIDGE SAINT JOHN RIVER MADAWASKA, ME EDMUNDSTON, NB	PROJ. MANAGER	A. LATHE	BY / DATE
	DESIGN DETAILED	E. Davidson	E. Davidson 08\20
	CHECKED-REVIEWED	L. Driscoll	J. Ouellette 08\20
	DESIGNED-DETAILED	_	_ _
	DESIGNED-DETAILED	_	_ _
	REVISIONS 1	_	_ _
	REVISIONS 2	_	_ _
	REVISIONS 3	_	_ _
	REVISIONS 4	_	_ _
	FIELD CHANGES	_	_ _

SIGNATURE

P.E. NUMBER

DATE

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

2173600

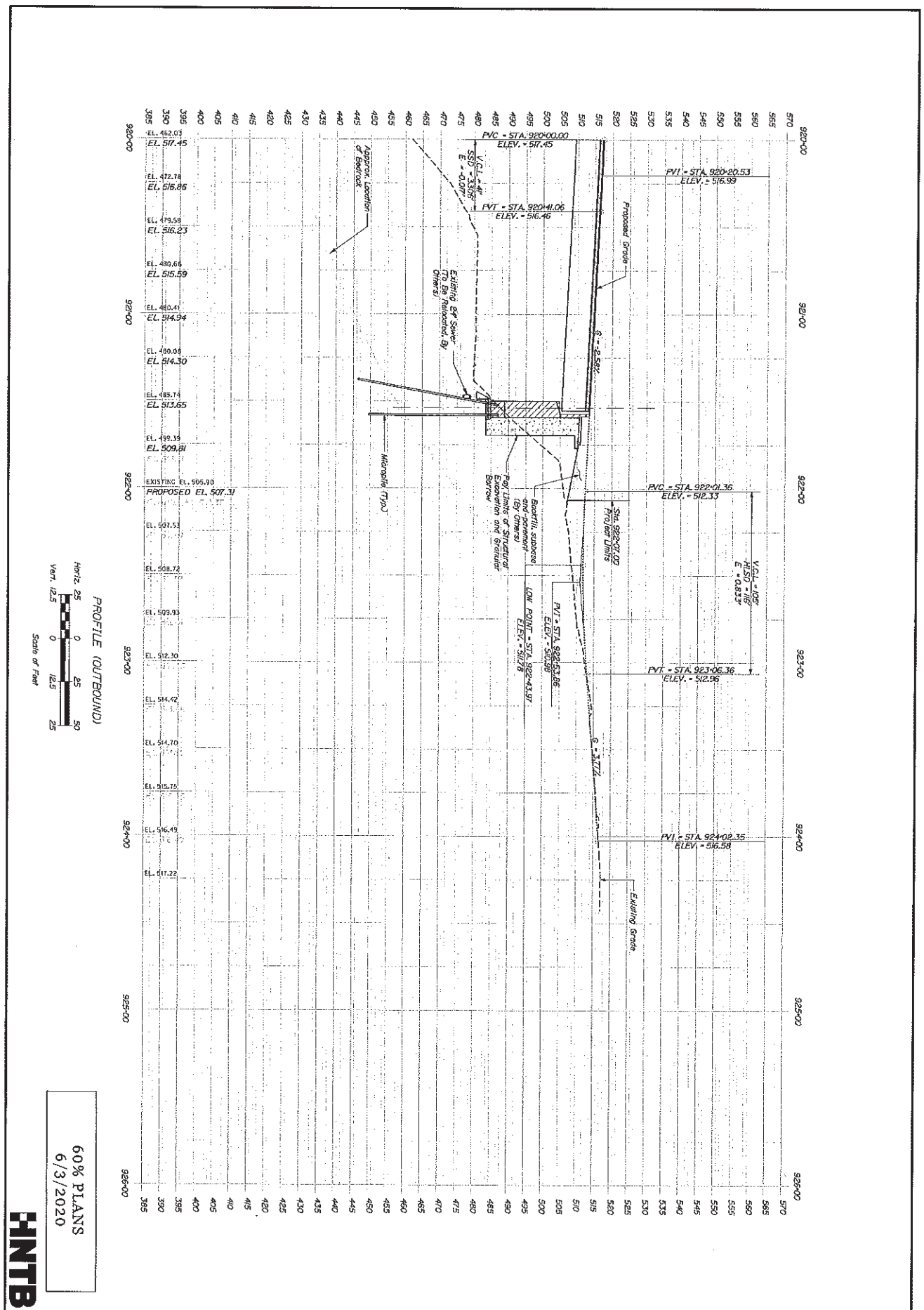
MAINEDOT BR. NO. 2399
NBDTI ASSET NO. E320

WIN
021736.00

BRIDGE PLANS

PROFILE 4

SHEET NUMBER 16 OF 131



PROFILE (OUTBOUND)

Horiz. 25 0 25 50
Vert. 12.5 0 12.5 25
Scale of Feet

60% PLANS
6/3/2020

HNTB

PROJ. MANAGER	A. LATHI	BY	DATE	
DESIGN-DETAILED	E. Davidson	E. Davidson	06\20	
CHECKED/REVIEWED	L. Dubois	J. Quist	06\20	SIGNATURE
DESIGN2-DETAILED2	_	_	_	
DESIGN3-DETAILED3	_	_	_	P.E. NUMBER
REVISIONS 1	_	_	_	
REVISIONS 2	_	_	_	
REVISIONS 3	_	_	_	DATE
REVISIONS 4	_	_	_	
FIELD CHANGES	_	_	_	

INTERNATIONAL BRIDGE
SAINT JOHN RIVER
MADAWASKA, ME EDMUNDSTON, NB

PROFILE OUTBOUND

SHEET NUMBER 17 OF 131

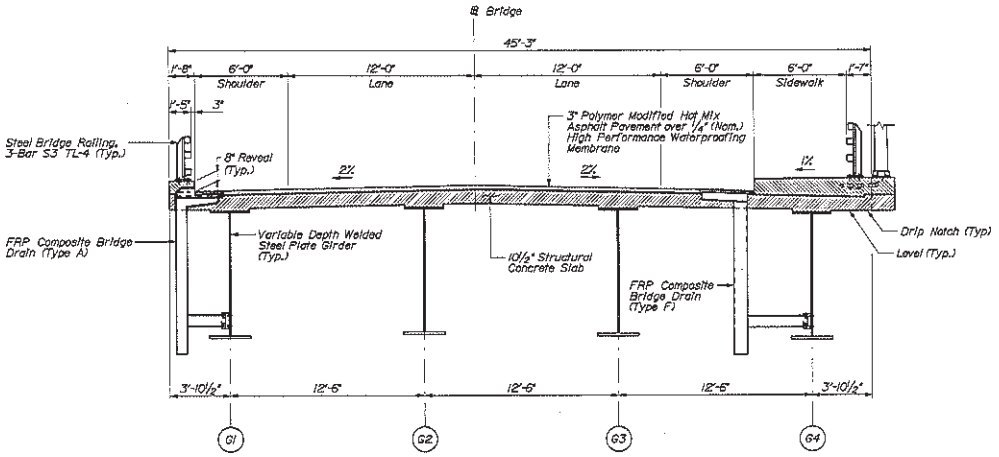
STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

2173600

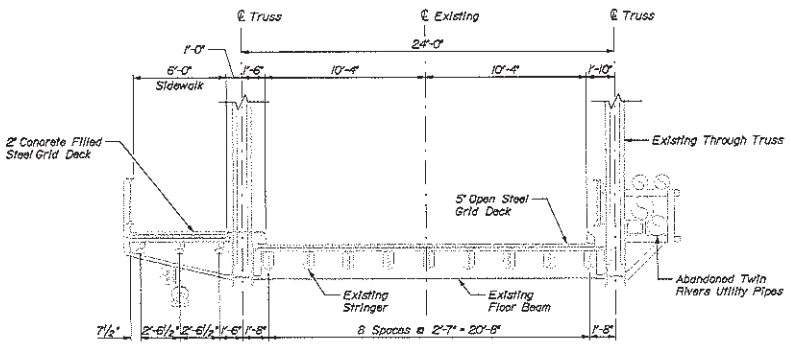
MAINEDOT BR. NO. 2399
NBDTI ASSET NO. E320

WIN 021736.00

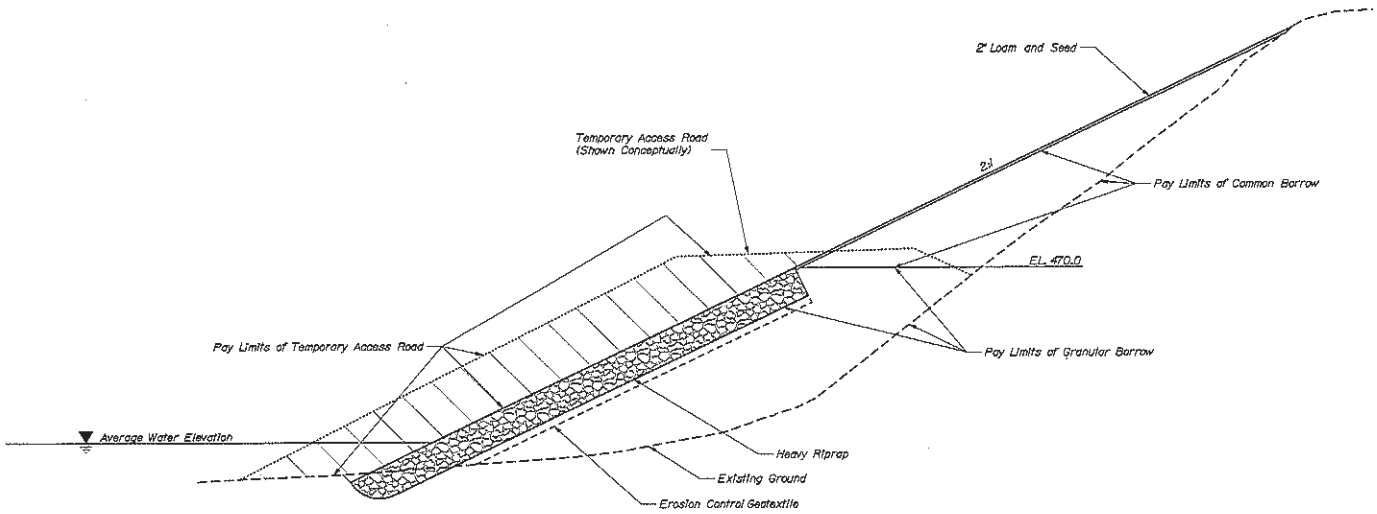
BRIDGE PLANS



PROPOSED BRIDGE SECTION



EXISTING BRIDGE SECTION



CHANNEL BANK SECTION

(U.S. Channel Bank Shown, Canadian Channel Bank Similar)

60% PLANS
6/3/2020

HNTB

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

2173600

MAINEDOT BR. NO. 2389 WIN 021736.00
MDOT ASSET NO. 5328

BRIDGE PLANS

	A. LAPE	BY	DATE
PROJ MANAGER	A. LAPE		
DESIGNED/LRFD	J. Rich	P. Bishop	6/5/20
CHECKED/REVIEWED	J. Rich	J. Rich	6/5/20
DESIGN DETAILED	-	-	-
REVISION 1	-	-	-
REVISION 2	-	-	-
REVISION 3	-	-	-
REVISION 4	-	-	-
FIELD CHANGES	-	-	-

SIGNATURE

P.E. NUMBER

DATE

INTERNATIONAL BRIDGE
SAINT JOHN RIVER
MADAWASKA, ME EDMUNDSTON, NB

TYPICAL SECTIONS

SHEET NUMBER
18
OF 131

Filename: 018_Typical Sections.dgn Division: Username: Date: 6/3/2020

MEMORANDUM OF AGREEMENT

AMONG THE FEDERAL HIGHWAY ADMINISTRATION,

ADVISORY COUNCIL ON HISTORIC PRESERVATION,

MAINE DEPARMENT OF TRANSPORTATION,

AND MAINE STATE HISTORIC PRESERVATION OFFICER

REGARDING THE INTERNATIONAL BRIDGE #2399

REPLACEMENT

AROOSTOOK COUNTY, MAINE

WHEREAS, the Federal Highway Administration (FHWA) plans to fund the International Bridge project (undertaking) between Madawaska, Maine, and Edmunston, New Brunswick; and

WHEREAS, the undertaking consists of replacing the International Bridge #2399 which carries Bridge Avenue over the St. John River located .27 of a mile north of Route 1 on the Canadian border.

WHEREAS, the FHWA Maine Division Administrator is the "Agency Official" responsible for ensuring that the undertaking complies with Section 106 of the National Historic Preservation Act (NHPA) ((54 U.S.C. § 306108), as amended, and codified in its implementing regulations, 36 CFR Part 800, as amended (August 5, 2004)); and

WHEREAS, the Maine Department of Transportation (MaineDOT) has been delegated responsibilities under the November 4, 2004 *Programmatic Agreement Among Federal Highway Administration, Federal Transit Administration, the Advisory Council on Historic Preservation, The Maine State Historic Preservation Officer, and Maine Department of Transportation, Regarding the Implementation of the Federal Aid Highway and Federal Transit Programs in Maine*; and

WHEREAS, FHWA has defined the undertaking's area of potential effect (APE) for the International Bridge replacement project in accordance with 36 CFR Section 800.16(d); and

WHEREAS, FHWA has consulted with the Maine State Historic Preservation Officer (Maine SHPO) pursuant to 36 CFR Part 800, regulations implementing Section 106 of the NHPA (16 U.S.C. Section 470(f)); and

WHEREAS, FHWA has consulted with the Section 106 consulting parties identified for the project, including the Madawaska Town Manager, regarding the effects and resolution of effects of the undertaking on historic properties; and

WHEREAS, FHWA has determined that the undertaking has an adverse effect on the International Bridge, which is eligible for listing in the National Register of Historic Places (NRHP) under Criteria A, B, & C; and

WHEREAS, FHWA has consulted with federally-recognized Indian tribes (Tribes) including the Aroostook Band of Micmacs, Houlton Band of Maliseet Indians, Passamaquoddy Tribe, and Penobscot Nation on the proposed undertaking in accordance with 36 CFR Section 800.3 (f)(2). Emails were sent to the Tribes on December 13, 2017 in accordance with their preferred method of receiving information from the MaineDOT. The Penobscot Nation replied on January 11, 2018, the Passamaquoddy Tribe responded on December 28, 2017, and the Houlton Band of Maliseets replied on January 2, 2018 and indicated that this undertaking will have no impact on a structure or site of historic, architectural or archaeological significance to their Tribes. Additional information was provided on the preferred alternative and archaeological review on February 4, 2019, via email. The Houlton Band of Maliseets, Passamaquoddy Tribe, and Penobscot Nation replied and indicated no concern with this additional information; and

WHEREAS, FHWA is aware of concerns raised by the Wolastoqey Nation in New Brunswick on the proposed undertaking in accordance with 36 CFR Section 800.3 (f)(2).

WHEREAS, in accordance with 36 CFR 800.2(d), FHWA has requested input and considered the views of consulting parties and the public in a manner that reflects the nature and complexity of the undertaking and its effects on historic properties. Two public meetings were held June 28, 2017, and January 31, 2018, to consult with and obtain input from the public. A study-specific website was developed early in the process and provided an opportunity to submit comments directly to FHWA. Information on effects to the International Bridge was sent to the Town of Madawaska and posted to the website. A public notice was placed to solicit review and comment regarding effects to the International Bridge; and

WHEREAS, in accordance with 36 CFR Section 800.6(c)(2), FHWA has invited the MaineDOT to be an invited signatory; and

WHEREAS, in accordance with 36 CFR Section 800.6(a)(1), FHWA has notified the ACHP of the adverse effect determination. FHWA invited the ACHP to consult and the ACHP has chosen to participate in the consultation pursuant to 36 CFR Section 800.6(a)(1)(iii) on March 4, 2019; and

NOW, THEREFORE, the ACHP, FHWA and the Maine SHPO agree that the undertaking shall be implemented in accordance with the following stipulations in order to take into account the effect of the undertaking on historic properties.

STIPULATIONS

FHWA, with assistance from MaineDOT, shall ensure that the following measures are carried out:

I. New Bridge Design Review Process

MaineDOT will consult with the Maine SHPO and the consulting parties on the final design of the new bridge. MaineDOT will provide the Maine SHPO and the consulting parties, for their review and comments, details on aesthetic bridge design features, including public space, viewing, railing, lighting, and signage options to ensure compatibility with existing historic features. The information will be provided at 60% and 90% relevant design documents via email and posted on the MaineDOT International Bridge web page at https://www.maine.gov/mdot/planning/studies/meib/. The Maine SHPO and consulting parties will have 30 calendar days to review and provide any comments to MaineDOT.

II. Coordination with Wolastoqey Nation in New Brunswick

FHWA will coordinate with the Wolastoqey Nation in New Brunswick on the proposed undertaking, including providing project area archaeological information, meeting with the First Nations representatives if requested, and inviting representatives to stakeholder and/or consulting party meetings.

III. Historic American Engineering Recordation

MaineDOT will provide recordation of the International Bridge (#2399) in consultation with the National Park Service as to the required level of Historic American Engineering Record (HAER) documentation and shall ensure such documentation is consistent with National Park Service standards. Documentation will be prepared by an architectural historian who meets the Secretary of Interior's Professional Qualifications Standards (48 FR 44738-44739). All materials submitted as documentation will follow the requirements stated by the Heritage Documentation Program and the National Park Service Northeast Regional Office's schedule of documentation. The Maine SHPO will be provided an opportunity of forty-five (45) days to review and comment on one draft before the HAER is submitted to the National Park Service. The Maine SHPO may request a second round of review. NPS approval of the completed documentation is required prior to any alteration or demolition of the International Bridge.

MaineDOT will be responsible for providing the following to:

*Maine SHPO
one (1) archival printed copy of the HAER, one (1) set of large format photos and negatives, and pdfs on a USB flash drive.

*Town of Madawaska
one (1) archival printed copy of the HAER and one (1) set of large format photos and negatives.

*City of Edmunston, New Brunswick

one (1) archival printed copy of the HAER and one (1) set of large format photos and negatives.

MaineDOT will complete the recordation and distribution by December 2022.

IV. Adaptive Reuse or Reuse of Portions of the Structure

Prior to dismantling, MaineDOT and FHWA shall offer the International Bridge or a portion of the bridge to any group that could legally take possession of the bridge and maintain it at a new location, provided the group assumes all future legal and financial liability. Costs to induce acceptance of the offer of donation may not exceed the cost to dismantle the bridge. FHWA, the Maine SHPO and MaineDOT will work jointly to determine the most appropriate use of the existing bridge from any proposals received.

If no offers are received for adaptive reuse, then a portion and/or feature of the International Bridge will be retained and offered to the Town of Madawaska and the City of Edmunston.

MaineDOT will offer the bridge for adaptive reuse within sixty (60) days after issuance of the Record of Decision (ROD), anticipated in Fall 2019. If no offers are received MaineDOT will coordinate with the Town of Madawaska and the City of Edmunston, New Brunswick on portions of the bridge beginning approximately one month after the offer is published.

V. Duration

This agreement will be null and void if its terms are not carried out within five (5) years from the date of its execution. Prior to such time, FHWA may consult with the other signatories to reconsider the terms of the agreement and amend it in accordance with Stipulation XI.

VI. Post-Review Discoveries

If potential historic properties are discovered or unanticipated effects on historic properties found, FHWA shall consult in accordance with 36 CFR Section 800.13. If any unanticipated discoveries of historic properties or archaeological sites are encountered during the implementation of this undertaking, MaineDOT shall suspend work in the area of the discovery in accordance with MaineDOT Standard Specification *105.9: Historic and Archaeological Considerations* and MaineDOT shall immediately notify the FHWA. In compliance with 36 CFR §800.13, FHWA shall notify within 24 hours the ACHP, the Maine SHPO, any federally recognized tribal organizations that attach religious and/or cultural significance to the affected property, and the Wolastoqey Nation in New Brunswick. The Maine SHPO, the FHWA, MaineDOT, Tribes, and Wolastoqey Nation in New Brunswick representatives, as appropriate, may conduct a joint field review within 72 hours of the notification to the FHWA. The FHWA, in consultation with the appropriate parties, will determine an appropriate treatment of the discovery prior to the resumption of construction activities in the area of the discovery.

VII. Discovery of Human Remains

MaineDOT shall ensure that any human remains and/or grave-associated artifacts encountered during the construction are brought to the immediate attention of the FHWA, the Maine SHPO, any federally recognized Tribes that may attach religious and/or cultural significance to the affected

property, and the Wolastoqey Nation in New Brunswick. Notification will be within 48 hours of the discovery. No activities which might disturb or damage the remains will be conducted until FHWA, in consultation with the appropriate parties, has developed a treatment plan that considers the comments of the appropriate parties. All procedures will follow the guidance outlined in the National Park Service Publication *National Register Bulletin 41: Guidelines for Evaluating and Registering Cemeteries and Burial Places*, taking into account the Native American Graves Protection and Repatriation Act of 1990 (PL 101-601). If Native American cultural materials are encountered during the course of the project, MaineDOT will abide by the MaineDOT Standard Specification *105.9: Historic and Archaeological Considerations* by stopping all activities in the area of discovery and notifying FHWA, SHPO, ACHP, the Aroostook Band of Micmacs, Houlton Band of Maliseet Indians, Passamaquoddy Tribe, Penobscot Nation, and the Wolastoqey Nation in New Brunswick.

VIII. Reporting

Each year, by December 1, following the execution of this agreement until it expires or is terminated, MaineDOT shall provide all parties to this agreement a summary report detailing work undertaken pursuant to its terms. Such report shall include any scheduling changes proposed, any problems encountered, and any disputes and objections received in MaineDOT' s efforts to carry out the terms of this agreement. Failure to provide such summary report may be considered noncompliance with the terms of this MOA; and

IX. Dispute Resolution

Should any party to this agreement object at any time to any actions proposed or the manner in which the terms of this MOA are implemented, FHWA shall consult with the objecting party(ies) to resolve the objection. If FHWA determines, within 30 days, that such objection(s) cannot be resolved, FHWA will:

A. Forward all documentation relevant to the dispute to the ACHP in accordance with 36 CFR Section 800.2(b)(2). Upon receipt of adequate documentation, the ACHP shall review and advise FHWA on the resolution of the objection within 30 days. Any comment provided by the ACHP, and all comments from the parties to the MOA, will be taken into account by FHWA in reaching a final decision regarding the dispute.

B. If the ACHP does not provide comments regarding the dispute within 30 days after receipt of adequate documentation, FHWA may render a decision regarding the dispute. In reaching its decision, FHWA will take into account all comments regarding the dispute from the parties to the MOA.

C. FHWA's responsibility to carry out all other actions subject to the terms of this MOA that are not the subject of the dispute remain unchanged. FHWA will notify all parties of its decision in writing before implementing that portion of the Undertaking subject to dispute under this stipulation. FHWA's decision will be final

X. Resolving Public Objections

At any time during implementation of the terms of this Agreement, should any member of the public raise an objection in writing pertaining to such implementation to any signatory party to this Agreement, that signatory party shall immediately notify FHWA. FHWA shall:

A. Immediately notify the other signatory parties in writing of the objection. Any signatory party may choose to comment on the objection to FHWA.

B. Establish a 30-day comment period. FHWA shall consider the objection, and in reaching its decision, FHWA will take all comments from the other parties into account.

C. Within 15 days following closure of the comment period, FHWA will render a decision regarding the objection and respond to the objecting party. FHWA will promptly notify the other signatory parties of its decision in writing, including a copy of the response to the objecting party. FHWA's decision regarding resolution of the objection will be final.

D. Following the issuance of its final decision, FHWA may authorize the action subject to dispute hereunder to proceed in accordance with the terms of that decision. Nothing in this paragraph creates additional legal rights or responsibilities on the FHWA that are not already afforded under the NHPA.

E. FHWA's responsibility to carry out all other actions or terms of this MOA that are not the subject of the objection remain unchanged and may proceed.

XI. Amendments

This MOA may be amended when such an amendment is agreed to in writing by all signatories. The amendment will be effective on the date a copy signed by all of the signatories is filed with the ACHP.

XII. Termination

If the MOA is not amended following the consultation set out in Stipulation XI it may be terminated by any signatory or invited signatory. Within 30 days following termination, FHWA shall notify the signatories if it will initiate consultation to execute an MOA with the signatories under 36 CFR §800.6(c)(1) or request the comments of the ACHP under 36 CFR §800.7(a) and proceed accordingly.

XIII. Coordination with Other Federal Reviews

In the event that another federal agency not initially a party to or subject to this MOA receives an application for funding/license/permit for the Undertaking as described in this MOA, that agency may fulfill its Section 106 responsibilities by stating in writing it concurs with the terms of this MOA and notifying the FHWA, SHPO, and the ACHP that it intends to do so, and adherence to the terms of this MOA.

Execution of this MOA by the FHWA, Maine SHPO, and ACHP and implementation of its terms evidence that FHWA has taken into account the effects of this undertaking on historic properties and afforded the ACHP an opportunity to comment.

SIGNATORIES:

Federal Highway Administration

Todd D. Jorgensen Date 5/10/19
Todd D. Jorgensen
Division Administrator

Maine State Historic Preservation Officer

Kirk F. Mohney Date 5/6/19
Kirk Mohney
State Historic Preservation Officer

Advisory Council on Historic Preservation

John M. Fowler Date 5/21/19
John M. Fowler
Executive Director

INVITED SIGNATORY:

Maine Department of Transportation

Bruce A. Van Note Date 4/29/19
Bruce A. Van Note
Commissioner

Applicant: General Public, State of Maine

Effective Date: October 14, 2020
Expiration Date: October 14, 2025

DEPARTMENT OF THE ARMY
GENERAL PERMITS FOR
THE STATE OF MAINE

The New England District of the U.S. Army Corps of Engineers (Corps) hereby issues 23 General Permits (GPs), listed below, for activities subject to Corps jurisdiction in waters of the United States within the boundaries of the State of Maine including tribal lands, and in adjacent ocean waters to the seaward limit of the outer continental shelf. These GPs are issued in accordance with Corps regulations at 33 CFR 320 – 332 and specifically 33 CFR 325.2(e)(2). These GPs will protect the aquatic environment and the public interest while effectively authorizing activities that have no more than minimal individual and cumulative adverse environmental effects.

This document contains the following sections:		Pages
I.	CORPS JURISDICTION	1
II.	GENERAL CRITERIA	2
III.	PROCEDURES	3 – 4
IV.	GENERAL CONDITIONS	5 – 19
V.	MAINE GENERAL PERMITS	20 – 35
VI.	SELF-VERIFICATION NOTIFICATION FORM	36
VII.	CONTENT OF A PRE-CONSTRUCTION NOTIFICATION	37 – 42
VIII.	AGENCY CONTACTS	43 – 45
IX.	DEFINITIONS	46 – 51

I. CORPS JURISDICTION

1. Permits are required from the Corps for the following work:

a. The construction of any structure in, over, or under any navigable water of the U.S. (see 33 CFR 328), the excavating or dredging from or depositing of material in such waters, or the accomplishment of any other work affecting the course, location, condition, or capacity of such waters. The Corps regulates these activities under Section 10 of the Rivers and Harbors Act of 1899 (see 33 CFR 322);

b. The discharge of dredged or fill material and certain discharges associated with excavation into waters of the U.S. including wetlands. The Corps regulates these activities under Section 404 of the Clean Water Act (see 33 CFR 323); and

c. The transportation of dredged material for the purpose of disposal in the ocean. The Corps regulates these activities under Section 103 of the Marine Protection, Research and Sanctuaries Act of 1972 (see 33 CFR 324).

2. Related laws: Section 408 of the Rivers and Harbors Act of 1899, Section 401 of the Clean Water Act, Section 402 of the Clean Water Act, Section 307(c) of the Coastal Zone Management Act of 1972, Section 106 of the National Historic Preservation Act of 1966, Section 7 of the Endangered Species Act, the Fish and Wildlife Coordination Act of 1956, the Magnuson-Stevens Fishery Conservation and Management Act, Section 302 of the Marine Protection, Research and Sanctuaries Act of 1972, and Section 7(a) of the Wild and Scenic Rivers Act.

II. GENERAL CRITERIA

1. In order for activities to qualify for these General Permits (GPs), they shall meet the GPs terms and eligibility criteria on pages 1-4, all applicable general conditions (GCs) in Section IV, and terms of the Maine General Permits in Section V. Any activity not specifically listed may still be eligible for authorization under these GPs; prospective permittees are advised to contact the Corps for specific eligibility determination.

2. Under these GPs, activities may qualify for the following:

- **SELF-VERIFICATION (SV)**: Notification to the Corps is required at least two weeks before work commences; the Corps will acknowledge receipt and GP eligibility of the SV activity in writing.
- **PRE-CONSTRUCTION NOTIFICATION (PCN)**: Notification to and written verification from the Corps is required. *No work under PCN may proceed until written verification from the Corps is received.*

The thresholds for activities eligible for SV and PCN are defined in the general conditions in Section IV and Maine General Permits in Section V.

3. Prospective permittees shall review:

a. Section I to determine if the activity requires Corps authorization.

b. Sections III , IV, and V to determine if the activity is eligible for authorization under these GPs, and specifically whether it is eligible for SV, or whether a PCN is required.

4. Prospective permittees are encouraged to contact the Corps with questions at any time (U.S. Army Corps of Engineers, Maine Project Office, 442 Civic Center Drive, Suite 350, Augusta, Maine 04330, ph. 207-623-8367). Pre-application meetings, whether arranged by the Corps or requested by a prospective permittee, are encouraged to facilitate the review of projects. Pre-application meetings and/or site visits help streamline the authorization process by alerting the prospective permittee to potentially time-consuming factors that are likely to arise during the evaluation of their project (e.g. avoidance, minimization and compensatory mitigation requirements, historic properties, endangered species, essential fish habitat, vernal pools, and dredging of contaminated sediments).

5. Permittees shall ensure compliance with all applicable GCs in Section IV and GPs in Section V. Non-compliance with these GPs and GCs may subject the permittee to criminal, civil, or administrative criminal penalties, and/or an ordered restoration, and/or the permit may be modified, suspended or revoked by the Corps.

III. PROCEDURES

1. State Approvals. Applicants are responsible for applying for and obtaining any required state or local approvals. Federal and state jurisdiction and review criteria may differ in some instances. State permits may be required for specific projects regardless of the GP category.

In order for authorizations under these GPs to be valid, when any of the following state approvals or statutorily-required reviews is also required, the approvals shall be obtained prior to the commencement of work in Corps jurisdiction:

- Maine Department of Environmental Protection (DEP): Natural Resources Protection Act (NRPA) permit, including permit-by-rule (PBR) and general permit authorizations; Site Location of Development Act permit; Maine Waterway Development and Conservation Act permit; and Maine Hazardous Waste, Septage, and Solid Waste Management Act license.
- Maine Department of Agriculture, Conservation and Forestry: Land Use Planning Commission (LUPC) permit.
- Maine Department of Marine Resources: Aquaculture Leases and Licenses.
- Maine Department of Agriculture, Conservation and Forestry, Bureau of Parks and Lands, Submerged Lands: Submerged Lands Lease.

2. How to Obtain/Apply for Corps Authorization.

a. **Self-Verification (SV)**: Prospective permittees shall confirm that the activity meets all the applicable terms and conditions of SV. Consultation with the Corps and/or other relevant federal and state agencies may be necessary to ensure compliance with the applicable general conditions (GCs) and related federal laws such as the National Historic Preservation Act (GC 15), the Endangered Species Act (GC 16), the Magnuson-Stevens Fishery Conservation and Management Act (GC 17), and the Wild and Scenic Rivers Act (GC 13). Activities that are eligible for SV are authorized under these GPs provided the prospective permittee has:

i. Confirmed that the activity meets all applicable terms and conditions of SV.

ii. Provided notifications to the State Historic Preservation Officer (SHPO) (the SHPO in the State of Maine is the Maine Historic Preservation Commission, or MHPC) and all five federally-recognized tribes in the State of Maine (Tribal Historic Preservation Officers, or THPOs) listed in Section VIII before submitting the SV to the Corps in order to be reviewed for the presence of historic, archeological, architectural, or tribal resources in the action area that the activity may affect (see GC 15). Prospective permittees are not required to wait for a response to their notifications before submitting the SV to the Corps.

iii. At least two weeks before work is to commence, submitted to the Corps a Self-Verification Notification Form (SVNF, page 36) with all of the following attachments: location map, project plans, and an Official Species List of federally threatened and endangered species that may occur in the activity's action area and the email address of the person who generated the list (see GC 16).

NOTE: A copy of a state permit application form may be an acceptable surrogate for the SVNF itself; however, the applicant shall not rely on the state permitting agency to provide the Corps a copy of their state permit application.

b. **Pre-Construction Notification (PCN)**: Notification to, and written verification from the Corps is required. For activities that do not qualify for SV or where otherwise required by the terms and conditions of the GPs, the prospective permittee shall submit a PCN and obtain written verification from the Corps before starting work in Corps jurisdiction. The Corps will coordinate review of all PCN activities with other federal and state agencies, as appropriate. The Corps will attempt to issue written verification of the PCN within 60 days of receiving a complete application.

All prospective permittees for PCN activities shall follow the instructions on found on pages 37 – 42, and in particular:

i. Submit directly to the Corps application form *ENG Form 4345* (pages 40 – 42), or the surrogate state permit application form as noted above.

ii. Provide project information outlined on pages 37 – 42 (Content of a Pre-Construction Notification).
iii. Submit an Official Species List of federally threatened and endangered species that may occur in the activity's action area and the email address of the person who generated the list (GC 16).
iv. Provide notifications to the SHPO (MHPC) and all five THPOs in the State of Maine listed in Section VIII before submitting the PCN to the Corps in order to be reviewed for the presence of historic, archeological, architectural, or tribal resources in the action area that the activity may affect (see GC 15). The PCN shall include documentation that MHPC and all of the THPOs were notified (a copy of the prospective permittee's cover letter or emails to MHPC and the THPOs is acceptable). Prospective permittees are not required to wait for a response to their notifications before submitting a PCN to the Corps.

c. **Individual Permit (IP):** Projects that are not eligible for these GPs require an IP (33 CFR 325.5(b)) and prospective permittees shall submit an application directly to the Corps. These GPs do not affect the Corps IP review process or activities exempt from Corps regulation. For general information regarding IPs prospective permittees are encouraged to contact the Corps. ***In addition, the Corps retains discretionary authority on a case-by-case basis to elevate GP-eligible activities to an IP based on concerns for the aquatic environment or for any other factor of the public interest (33 CFR 320.4(a)). Whenever the Corps notifies a prospective permittee that an IP is required, no work in Corps jurisdiction may be conducted until the Corps issues the required authorization in writing indicating that the work may proceed.***

d. **Emergency Situations:** Contact the Corps immediately in the event of an emergency situation for information on the verification process. Emergency situations are limited to sudden, unexpected occurrences that could potentially result in an unacceptable hazard to life, a significant loss of property, or an immediate, unforeseen, and significant economic hardship if corrective action requiring a permit is not undertaken within a time period less than the normal time needed to process an application under standard procedures. Emergency work is subject to the same terms and conditions of these GPs as non-emergency work, and similarly, must qualify for authorization under these GPs; otherwise an IP is required. The Corps will work with all applicable agencies to expedite verification according to established procedures in emergency situations.

IV. GENERAL CONDITIONS

An activity is authorized under the General Permits (GPs) only if that activity and the permittee satisfy all of the applicable GPs terms and following general conditions (GCs):

1. Federal Jurisdiction.
2. Minimal Direct, Secondary and Cumulative Effects.
3. Other Permits.
4. Water Quality and Coastal Zone Management.
5. Fills Within 100-Year Floodplains.
6. Discretionary Authority.
7. Single and Complete Project.
8. Use of Multiple General Permits.
9. Mitigation (Avoidance, Minimization, and Compensatory Mitigation).
10. Corps Projects and Property.
11. Navigation.
12. National Lands.
13. Wild and Scenic Rivers.
14. St. John/St. Croix Rivers.
15. Historic Properties.
16. Federal Threatened and Endangered Species.
17. Essential Fish Habitat.
18. Aquatic Life Movements and Management of Water Flows.
19. Spawning, Breeding, and Migratory Areas.
20. Vernal Pools.
21. Restoration of Special Aquatic Sites (Including Wetland Areas).
22. Invasive and Other Unacceptable Species.
23. Soil Erosion, Sediment, and Turbidity Controls.
24. Time-of-Year Work Windows/Restrictions.
25. Pile Driving and Pile Removal in Navigable Waters.
26. Temporary Fill.
27. Heavy Equipment in Wetlands or Mudflats.
28. Bank and Shoreline Stabilization Including Living Shorelines.
29. Stream Work and Crossings, and Wetland Crossings.
30. Utility Line Installation and Removal.
31. Storage of Seasonal Structures.
32. Aquaculture.
33. Permit(s)/Authorization Letter On-Site.
34. Inspections.
35. Maintenance.
36. Federal Liability.
37. Property Rights.
38. Previously Authorized Activities.
39. Transfer of GP Verifications.
40. Modification, Suspension, and Revocation.
41. Special Conditions.
42. False or Incomplete Information.
43. Abandonment.
44. Enforcement Cases.
45. Duration of Authorization.

1. Federal Jurisdiction.

a. Applicability of these GPs shall be evaluated with reference to federal jurisdictional boundaries (e.g. mean high water mark, high tide line, ordinary high water mark, and wetland boundary). Activities shall be evaluated with reference to "waters of the U.S." under the Clean Water Act (33 CFR 328) and "navigable waters of the U.S." under Section 10 of the Rivers and Harbors Act of 1899 (33 CFR 329). Prospective permittees are responsible for ensuring that the boundaries used satisfy the federal criteria defined at 33 CFR 328 – 229. These sections prescribe the policy, practice and procedures to be used in determining the extent of the Corps jurisdiction. Note: Waters of the U.S. includes all waters pursuant to 33 CFR 328.3(a), and in adjacent wetlands as that term is defined in 33 CFR 328.3(c).

b. Permittees shall identify on project plans wetlands, other special aquatic sites (SAS) including vegetated shallows (or submerged aquatic vegetation, SAV) and mudflats, and other waters, such as lakes and ponds, and perennial and intermittent streams on the project site. Wetlands shall be delineated in accordance with the Corps of Engineers Wetlands Delineation Manual and the most recent regional supplement pertaining to the State of Maine. GP-eligible activities may utilize wetland determinations conducted by State of Maine staff in-lieu of a wetland delineation. For activities located in Essential Fish Habitat (GC 17), permittees shall also identify on project plans natural rocky habitats and shellfish areas in order to satisfy the Magnuson-Stevens Fishery Conservation and Management Act.

2. Minimal Direct, Secondary and Cumulative Effects. To be eligible and subsequently authorized by these GPs, an activity shall result in no more than minimal individual and cumulative effects on the aquatic environment as determined by the Corps in accordance with the criteria listed within these GPs and GCs. This may require project modifications involving avoidance, minimization, or compensatory mitigation for unavoidable impacts to ensure that the net adverse effects of an activity are no more than minimal.

3. Other Permits. Permittees shall obtain other Federal, State, or local authorizations as required by law. Permittees are responsible for applying for and obtaining all required State of Maine or local approvals including a Flood Hazard Development Permit issued by the town/city. Work that is not regulated by the State of Maine, but is subject to Corps jurisdiction, may still be eligible for authorization under these GPs.

4. Water Quality and Coastal Zone Management.

a. Permittees shall satisfy any conditions imposed by the State of Maine and EPA, where applicable, in their Clean Water Act Section 401 Water Quality Certification (WQC) for these GPs, or in any Individual Section 401 WQC. See Section VIII for state-specific contact info and to determine if any action is required to obtain a 401 WQC. The Corps may require additional water quality management measures to ensure that the authorized activity does not cause or contribute to a violation of water quality standards. All projects authorized by these GPs shall be designed, constructed and operated to minimize or eliminate the discharge of pollutants.

b. Permittees shall satisfy any additional conditions imposed by the State of Maine in their Coastal Zone Management (CZM) Act of 1972 consistency concurrences for these GPs, or in any Individual CZM consistency concurrences. The Corps may require additional measures to ensure that the authorized activity is consistent with state coastal zone management requirements.

5. Fills Within 100-Year Floodplains. The activity shall comply with applicable Federal Emergency Management Agency (FEMA) approved State of Maine or municipal floodplain management requirements. Permittees should contact FEMA and/or the State of Maine Floodplain Management Program regarding floodplain management requirements (see Section VIII for Federal and state-specific contact info).

6. Discretionary Authority. Notwithstanding compliance with the terms and conditions of these GPs, the Corps retains discretionary authority to require a PCN or IP review based on concerns for the aquatic environment or for any other factor of the public interest (see 33 CFR 320.4(a)). This authority is invoked on a case-by-case basis whenever the Corps determines that the potential consequences of the proposal warrant a higher level of review based on the concerns stated above. This authority may be invoked for projects that may contribute to cumulative environmental impacts that are more than minimal or if there is a special resource or concern associated with a particular project.

7. Single and Complete Project. The term "single and complete project" is defined at 33 CFR 330.2(i) as the total project proposed or accomplished by one owner/developer or partnership or other association of owners/developers. These GPs shall not be used for piecemeal work and shall be applied to single and complete projects and as such, the same GP shall not be used more than once for the same single and complete project.

a. For non-linear projects, a single and complete project shall have independent utility. Portions of a multi-phase project that depend upon other phases of the project do not have independent utility. Phases of a project that would be constructed even if the other phases were not built can be considered as separate single and complete projects with independent utility.

b. Unless the Corps determines the activity has independent utility, all components of a single project and/or all planned phases of a multi-phased project (e.g., subdivisions should include all work such as roads, utilities, and lot development) shall be treated together as constituting one single and complete project. If any component of a single and complete project requires a PCN, the entire single and complete project shall be reviewed under PCN.

c. For linear projects such as power lines or pipelines with multiple crossings, a "single and complete project" is all crossings of a single water of the U.S. (i.e. single waterbody) at a specific location. For linear projects crossing a single waterbody several times at separate and distant locations, each crossing is considered a single and complete project. However, individual channels in a braided stream or river, or individual arms of a large, irregularly-shaped wetland or lake, etc., are not separate waterbodies, and crossings of such features cannot be considered separately.

8. Use of Multiple General Permits. The use of more than one GP for a single and complete project is prohibited, except when the acreage loss of waters of the U.S. authorized by the GPs does not exceed the acreage limit of the GPs with the highest specified acreage limit. For example, if a road crossing over waters is constructed under GP 10, with an associated utility line crossing authorized by GP 9, if the maximum acreage loss of waters of the U.S. for the total project is ≥3 acres it shall be evaluated as an IP.

9. Mitigation (Avoidance, Minimization, and Compensatory Mitigation).

a. Activities shall be designed and constructed to avoid and minimize adverse effects, both temporary and permanent, to waters of the U.S. to the maximum extent practicable to ensure that adverse effects to the aquatic environment are no more than minimal.

b. Compensatory mitigation for unavoidable impacts to waters of the U.S., including direct, secondary and temporal loss, will generally be required for permanent impacts that exceed the SV limits (SV limits are detailed in Section V), and may be required for temporary impacts that exceed the SV limits, to offset unavoidable impacts which remain after all appropriate and practicable avoidance and minimization has been achieved and to ensure that the adverse effects to the aquatic environment are no more than minimal. Proactive restoration projects or temporary impact work with no secondary effects may generally be excluded from this requirement.

c. Mitigation proposals shall follow the guidelines found in the Compensatory Mitigation for Losses of Aquatic Resources; Final Rule April 10, 2008; 33 CFR 332 (which can be found at: *www.nae.usace.army.mil/Missions/Regulatory/Mitigation* under "Compensatory Mitigation for Losses of Aquatic Resources, 33 CFR 332 (Compensatory Mitigation Rule)") and any other regulation. Permittees considering the use of a monetary payment *in-lieu* of permittee-responsible mitigation as compensation for unavoidable impacts to waters of the U.S. in the State of Maine may utilize the Maine Natural Resources Conservation Program (MNRCP). Information regarding this compensatory program can be found at: *www.mnrcp.org* For unavoidable jurisdictional impacts affecting federally-endangered Atlantic salmon and/or its critical habitat, permittees may be required to compensate for the impacts by utilizing the Maine Atlantic Salmon Restoration and Conservation Program. Information regarding this *in-lieu-fee* compensatory program can be found at: *www.maine.gov/dmr/science-research/searun/programs/ilffacts.html*

10. Corps Projects and Property.

a. Corps projects and property can be found at: *www.nae.usace.army.mil/Missions/Civil-Works*

b. In addition to any authorization under these GPs, prospective permittees shall contact the Corps Real Estate Division at (978) 318-8585 for work occurring on or potentially affecting Corps properties and/or Corps-controlled easements to initiate reviews and determine what real estate instruments are necessary to perform work. Permittees may not commence work on Corps properties and/or Corps-controlled easements until they

have received any required Corps real estate documents evidencing site-specific permission to work.

c. Any proposed temporary or permanent modification or use of a Federal project (including but not limited to a levee, dike, floodwall, channel, anchorage, breakwater, seawall, bulkhead, jetty, wharf, pier, or other work built or maintained but not necessarily owned by the United States), which may obstruct or impair the usefulness of the Federal project in any manner, is not eligible for SV and requires review and approval by the Corps pursuant to 33 USC 408 (Section 408).

d. A PCN is required for all work in, over, under, or within a distance of three times the authorized depth of a Corps Federal Navigation Project (FNP) and may require permission under Section 408.

e. Any structure or work that extends closer to the horizontal limits of any FNP than a distance of three times the project's authorized depth shall be subject to removal at the owner's expense prior to any future Corps dredging or the performance of periodic hydrographic surveys.

f. Where a Section 408 permission is applicable, written verification for the PCN will not be issued prior to the decision on the Section 408 permission request.

11. Navigation

a. There shall be no unreasonable interference with general navigation by the existence or use of the activity authorized herein, and no attempt shall be made by the permittee to prevent the full and free use by the public of all navigable waters at or adjacent to the activity authorized herein.

b. Work in, over, under, or within a distance of three times the authorized depth of an FNP shall specifically comply with GC 10.

c. Any safety lights and/or signals prescribed by the U.S. Coast Guard, State of Maine or municipality, through regulations or otherwise, shall be installed and maintained at the permittee's expense on authorized facilities in navigable waters of the U.S.

d. The permittee understands and agrees that, if future operations by the U.S. require the removal, relocation, or other alteration, of the structure or work herein authorized, or if, in the opinion of the Secretary of the Army or his authorized representative, said structure or work shall cause unreasonable obstruction to the free navigation of the navigable waters, the permittee will be required, upon due notice from the Corps, to remove, relocate, or alter the structural work or obstructions caused thereby, without expense to the U.S. No claim shall be made against the U.S. on account of any such removal or alteration.

12. National Lands. Activities that impinge upon the value of any National Lands or Federal Properties including but not limited to a National Wildlife Refuge, National Forest, or any area administered by the National Park Service , U.S. Fish and Wildlife Service or U.S. Forest Service are not eligible for SV and require PCN.

13. Wild and Scenic Rivers.

a. The following activities in designated rivers of the National Wild and Scenic River (NWSR) System, or in a river designated by Congress as a "study river" for possible inclusion in the system, require a PCN unless the National Park Service has determined in writing to the prospective permittee that the proposed work will not adversely affect the NWSR designation or study status:

i. Activities that occur in NWSR segments, in and 0.25 miles up or downstream of NWSR segments, or in tributaries within 0.25 miles of NWSR segments.

ii. Activities that occur in wetlands within 0.25 miles of NWSR segments.

iii. Activities that have the potential to alter free-flowing characteristics in NWSR segments.

b. As of October 14, 2020, National Wild and Scenic Rivers and congressional study rivers in Maine include: the Allagash River beginning at Telos Dam continuing to Allagash checkpoint at Eliza Hole Rapids, approximately 3 miles upstream of the confluence with the St. John River (length = 92 92.5 miles); and 11.25 miles of the York River, in the State of Maine, from its headwaters at York Pond to the mouth of the river at York Harbor, plus tributaries (the York River is currently under study).

14. St. John/St. Croix Rivers. A PCN is required for any work within the Saint John and Saint Croix River basins that requires approval of the International Joint Commission. In addition, a PCN is required if any temporary or permanent use, obstruction or diversion of international boundary waters could affect the natural flow or levels of waters on the Canadian side of the line; or if any construction or maintenance of remedial works,

protective works, dams, or other obstructions in waters downstream from boundary waters could raise the natural level of water on the Canadian side of the boundary.

15. Historic Properties.

a. No undertaking shall cause effects (as defined at 33 CFR 325 Appendix C and 36 CFR 800) on properties listed on, determined to be eligible for listing on, or potentially eligible for listing on the National Register of Historic Places, including previously unknown historic properties within the permit area, unless the Corps or another federal action agency has satisfied the consultation requirements of Section 106 of the National Historic Preservation Act (NHPA). The majority of historic properties are not listed on the National Register of Historic Places and may require identification and evaluation by qualified historic preservation and/or archeological consultants in coordination with the Corps and the State Historic Preservation Officer (SHPO) (the SHPO in the State of Maine is the Maine Historic Preservation Commission, MHPC) and/or the five federally-recognized tribes in the State of Maine (Tribal Historic Preservation Officers, or THPOs). The MHPC, the THPOs, and the National Register of Historic Places can assist with locating information on:

i. Previously identified historic properties; and

ii. Areas with potential for the presence of historic resources, which may require identification and evaluation by qualified historic preservation and/or archaeological consultants in consultation with the Corps and MHPC and/or the THPO(s).

b. For activities eligible for these GPs, permittees shall ensure that the activity will not cause effects as stated above in 15(a). In order to comply with this condition, both SV and PCN prospective permittees shall notify MHPC and all five THPOs for their identification of historic properties. MHPC and the THPOs will generally respond within 30 days of receiving the notification if they believe that the activity may have an adverse effect to historic properties. A PCN is required if an activity may have an adverse effect to historic properties. The PCN shall be submitted as soon as possible if a proposed activity may cause effects as stated above in 15(a) a to ensure that the Corps is aware of any potential effects of the proposed activity on any historic property to ensure all Section 106 requirements are met.

c. All PCNs shall:

i. Show notification to MHPC and all five THPOs for their identification of historic properties;

ii. State which historic properties may be affected by the proposed work or include a vicinity map indicating the location of the historic properties or the potential for the presence of historic properties; and

iii. Include any available documentation from MHPC or the THPO(s) indicating that there are or are not historic properties affected.

d. The requirements to comply with Section 106 of the NHPA may be satisfied by a Programmatic Agreement (PA) or Programmatic Consultation (PC) with the Corps, New England District or another federal agency. New England District PAs and PCs are found at *www.nae.usace.army.mil/Missions/Regulatory*

e. If the permittee discovers any previously unknown historic, cultural or archeological remains and artifacts while accomplishing the activity authorized by these permits, the permittee shall immediately notify the district engineer of what was found, and avoid construction activities that may affect the remains and artifacts until the required coordination has been completed. The district engineer will initiate the Federal, Tribal and state coordination required to determine if the items or remains warrant a recovery effort or if the site is eligible for listing in the National Register of Historic Places.

f. Federal agencies should follow their own procedures for complying with the requirements of Section 106 of the NHPA. Federal permittees shall provide the Corps with the appropriate documentation to demonstrate compliance with those requirements.

g. Federal and non-federal applicants should coordinate with the Corps before conducting any onsite archeological work (reconnaissance, surveys, recovery, etc.) requested by MHPC or the THPOs, as the Corps will determine the Permit Area for the consideration of historic properties based on 33 CFR 325 Appendix C. This is to ensure that work done is in accordance with Corps requirements.

16. Federal Threatened and Endangered Species.

a. No activity is authorized by these GPs which:

i. Is likely to directly or indirectly jeopardize the continued existence of a threatened or endangered species or a species proposed for such designation, as identified under the Federal Endangered Species Act (ESA), or which will directly or indirectly destroy or adversely modify the critical habitat or proposed critical habitat of such species;

ii. "May affect" a listed species or critical habitat, unless Section 7 consultation addressing the effects of the proposed activity has been completed;

iii. Is "likely to adversely affect" a listed species or critical habitat unless Section 7 consultation has been completed by the Corps or another lead action agency in coordination with the Corps under the provisions of a Programmatic Agreement (PA) or Programmatic Consultation (PC); or

iv. Violates the ESA.

b. All prospective permittees shall attach to their SVNF or PCN an Official Species List obtained from the U.S. Fish and Wildlife Service's Information for Planning and Consultation (IPaC) found at: *https://ecos.fws.gov/ipac* and provide the email address of the person who generated the list.

c. For proposed activities in tidal waters, prospective permittees should also refer to the National Oceanic and Atmospheric Administration (NOAA) Fisheries' Section 7 Mapper for federally-listed species found at: *https://noaa.maps.arcgis.com/apps/webappviewer/index.html*

d. A PCN is required if a threatened or endangered species, a species proposed for listing as threatened or endangered, or designated or proposed critical habitat (all hereinafter referred to as "listed species or habitat"), as identified under the ESA, may be affected by the proposed work. An activity may remain eligible for SV if the only listed species affected is the northern long-eared bat (*Myotis septrionalis*), and only after Section 7 consultation has been completed by the Corps under the 4(d) Rule Streamlined Consultation.

e. Federal agencies shall follow their own procedures for complying with the requirements of the ESA while ensuring that the Corps and any other federal action agencies are included in the consultation process.

f. Non-federal representatives designated by the Corps to conduct informal consultation or prepare a biological assessment shall follow the requirements in the designation document(s) and the ESA. Non-federal representatives shall also provide the Corps with the appropriate documentation to demonstrate compliance with those requirements. The Corps will review the documentation and determine whether it is sufficient to address ESA compliance for the GP activity, or whether additional ESA consultation is necessary.

g. The requirements to comply with Section 7 of the ESA may be satisfied by a Programmatic Agreement (PA) or Programmatic Consultation (PC) with the Corps, New England District or another federal agency. New England District PAs and PCs are found at: *www.nae.usace.army.mil/Missions/Regulatory*

17. Essential Fish Habitat (EFH).

a. PCN activities in tidal waters and the following rivers and streams, including all tributaries to the extent that they are currently or were historically accessible for salmon migration, shall be reviewed for the potential to adversely affect EFH (activities meeting SV criteria have been determined to result in no more than minimal adverse effects to EFH and therefore need no additional review):

Androscoggin River	Aroostook River	Boyden River	Dennys River
Ducktrap River	East Machias River	Hobart Stream	Kennebec River
Machias River	Narraguagus River	Orland River	Passagassawaukeag River
Patten Stream	Penobscot River	Pleasant River	Presumpscot River
Saco River	Sheepscot River	St. Croix River	Tunk Stream
Union River			

b. Prospective permittees may be required to describe and identify potential adverse effects to EFH and should refer to the NOAA Fisheries' EFH Mapper found at: *www.fisheries.noaa.gov/resource/map/essential-fish-habitat-mapper*

c. The requirements to comply with the Magnuson-Stevens Fishery Conservation and Management Act may be satisfied by a Programmatic Agreement (PA) or Programmatic Consultation (PC) with the Corps, New England District or another federal agency. New England District PAs and PCs are found at: *www.nae.usace.army.mil/Missions/Regulatory*

18. Aquatic Life Movements and Management of Water Flows.

a. No activity may substantially disrupt the necessary life cycle movements of those species of aquatic life indigenous to the waterbody, including those species that normally migrate through the area, unless the activity's primary purpose is to impound water. Unless otherwise stated, activities permanently impounding water in a stream require a PCN to ensure impacts to aquatic life species are avoided and minimized. All permanent and temporary crossings of waterbodies and wetlands shall be:

i. Suitably spanned, bridged, culverted, or otherwise designed and constructed to maintain low flows to sustain the movement of those aquatic species; and

ii. Properly aligned and constructed to prevent bank erosion or streambed scour both adjacent to and inside the crossing.

b. To avoid adverse impacts on aquatic organisms, the low flow channel/thalweg shall remain unobstructed during periods of low flow, except when it is necessary to perform the authorized work.

c. For work in tidal waters, in-stream controls (e.g. cofferdams) should be installed in such a way as to not obstruct fish passage.

d. To the maximum extent practicable, the preconstruction course, condition, capacity, and location of open waters must be maintained for each activity, including stream channelization, storm water management activities, and temporary and permanent road crossings, except as provided below. The activity must be constructed to withstand expected high flows. The activity shall not restrict or impede the passage of normal or high flows, unless the primary purpose of the activity is to impound water or manage high flows. The activity may alter the pre-construction course, condition, capacity, and location of open waters if it benefits the aquatic environment (e.g. stream restoration or relocation activities).

e. Activities that temporarily or permanently adversely impact upstream or downstream flood conditions require a PCN.

19. Spawning, Breeding, and Migratory Areas.

a. Jurisdictional activities in waters of the U.S. such as certain excavations, discharges of dredged or fill material, and/or suspended sediment producing activities that provide value as fish migratory areas, fish and shellfish spawning or nursery areas, or amphibian and migratory bird breeding areas, during spawning or breeding seasons shall be avoided and minimized to the maximum extent practicable.

b. Jurisdictional activities in waters of the U.S. that provide value as breeding areas for migratory birds must be avoided to the maximum extent practicable. The permittee is responsible for ensuring their action complies with the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act. The permittee is responsible for contacting the U.S. Fish and Wildlife's Maine Field Office (see Section VIII for contact info) to determine applicable measures to reduce impacts to migratory birds or eagles, including whether "incidental take" permits are necessary and available under the Migratory Bird Treaty Act or Bald and Golden Eagle Protection Act for a particular activity.

20. Vernal Pools.

a. A PCN is required if a discharge of dredged or fill material is proposed within a vernal pool depression located within waters of the U.S.

b. GC 20(a) above does not apply to projects that are within a municipality that meets the provisions of a Corps-approved vernal pool Special Area Management Plan (SAMP) and are otherwise eligible for SV, and the applicant meets the requirements to utilize the vernal pool SAMP.

21. Restoration of Special Aquatic Sites (Including Wetland Areas).

a. In areas of authorized temporary disturbance, if trees are cut they shall be cut at or above ground level and not uprooted in order to prevent disruption to the wetland soil structure and to allow stump sprouts to revegetate the work area, unless otherwise authorized.

b. The introduction or spread of invasive plant species in disturbed areas shall be controlled. If construction mats are to be used in areas of invasive plant species, they shall be thoroughly cleaned before re-use.

c. Wetland areas where permanent disturbance is not authorized shall be restored to their original condition and elevation. Original condition means protection and/or removal of existing soil and vegetation, and replacement back to the original location such that the original soil layering and vegetation schemes are

approximately the same, unless otherwise authorized. Restoration shall typically commence no later than the completion of construction.

d. Upon completion of construction, all areas of authorized disturbed wetland area shall be stabilized with a wetland seed mix containing only plant species native to New England and shall not contain any species listed in the "Invasive and Other Unacceptable Plant Species" Appendix K in the "New England District Compensatory Mitigation Guidance" found at: *www.nae.usace.army.mil/Missions/Regulatory/Mitigation*

22. Invasive and Other Unacceptable Species.

a. The introduction or spread of invasive or other unacceptable plant or animal species on the project site or areas adjacent to the project site caused by the site work shall be avoided to the maximum extent practicable. For example, construction mats and equipment shall be thoroughly cleaned and free of vegetation and soil before and after use. The introduction or spread of invasive plant or animal species on the project site caused by the site work shall be controlled.

b. No cultivars, invasive or other unacceptable plant species may be used for any mitigation, bioengineering, vegetative bank stabilization or any other work authorized by these GPs. However, non-native species and cultivars may be used when it is appropriate and specified in a written verification, such as using *Secale cereale* (Annual Rye) to quickly stabilize a site. All PCNs shall justify the use of non-native species or cultivars.

c. For the purposes of these GPs, plant species that are considered invasive and unacceptable are provided in Appendix K "Invasive and Other Unacceptable Plant Species" of the most recent "New England District Compensatory Mitigation Guidance" and is found at: *www.nae.usace.army.mil/Missions/Regulatory/Mitigation* The June 2009 "U.S. Army Corps of Engineers Invasive Species Policy" provides policy, goals and objectives and is located at *www.nae.usace.army.mil/Missions/Regulatory/Invasive-Species* If an Invasive Species Control/Management Plan has been prepared it should be included with any SV or PCN.

23. Soil Erosion, Sediment, and Turbidity Controls.

a. Adequate sedimentation and erosion control management measures, practices and devices, such as phased construction, installation of sediment control barriers (i.e. silt fence, vegetated filter strips, geotextile silt fences, erosion control mixes, hay bales or other devices) downhill of all exposed areas, retention of existing vegetated buffers, application of temporary mulching during construction, and permanent seeding and stabilization shall be installed and properly maintained to reduce erosion and retain sediment on-site during and after construction. They shall be capable of preventing erosion; of collecting sediment, suspended and floating materials; and of filtering fine sediment.

b. Temporary sediment control barriers shall be removed upon completion of work, but not until all disturbed areas are permanently stabilized. The sediment collected by these sediment barriers shall be removed and placed at an upland location and stabilized to prevent its later erosion into a waterway or wetland.

c. All exposed soil and other fills shall be permanently stabilized at the earliest practicable date.

24. Time-of-Year Work (TOY) Windows/Restrictions. In-water work shall be conducted during the following TOY work windows (work allowed) under SV and any in-water work proposed during the following TOY restrictions (no work) shall be reviewed under PCN (and shall contain written justification for deviation from the work allowed windows). The term "in-water work" does not include conditions where the work site is "in-the-dry" (e.g. intertidal areas exposed at low tide). The term also does not include work contained in a cofferdam so long as the cofferdam was installed and subsequently removed within the work allowed window.

	TOY Restriction (***no work***)	TOY Work Window (***work allowed***)
Non-tidal waters	Oct. 1st to Jul. 14th	Jul. 15th to Sep. 30th
Tidal waters	Apr. 10th to Nov. 7th	Nov. 8th to Apr. 9th

Alternate work windows proposed under PCN will generally be coordinated with the U.S. Fish and Wildlife Service, National Marine Fisheries Service, Maine Department of Inland Fisheries and Wildlife, and/or Maine Department of Marine Resources and resulting written verifications may include species-specific work allowed windows.

25. Pile Driving and Pile Removal in Navigable Waters.

a. Derelict, degraded, or abandoned piles and sheet piles in the project area shall be removed in their entirety as practicable and properly disposed of in an upland location and not in wetlands. In areas of fine-grained substrates, piles/sheets shall be removed by direct, vibratory, or clamshell pull method in order to minimize potential turbidity and sedimentation impacts. If removal is not practicable, said piles/sheets shall be cut off or driven to a depth of at least one foot below substrate.

b. Work involving pile installation and/or removal should adhere to one of the five methods below:

i. "In-the-dry", or

ii. In-water between Nov. 8th to Apr. 9th, or

iii. Drilled and pinned to ledge, or

iv. Vibratory hammers used to install any size and quantity of wood, concrete, or steel, or impact hammers limited to one hammer and <50 piles installed/day with the following: wood piles of any diameter, concrete piles ≤18-inches diameter, steel piles ≤12-inches diameter if: (1) the hammer is ≤3,000 pounds and a wood cushion or equivalent is used between the hammer and steel pile, or (2) a soft start is used. Soft starts require an initial set of three strikes from the impact hammer at 40% energy, followed by a 1-minute waiting period between subsequent three-strike sets. The soft-start procedure shall be conducted any time hammering ceases for more than 30 minutes.

26. Temporary Fill.

a. Temporary fills, including but not limited to construction mats and corduroy roads shall be entirely removed as soon as they are no longer needed to construct the authorized work. Temporary fill shall be placed in its original location or disposed of at an upland site and suitably contained to prevent its subsequent erosion into waters of the U.S.

b. All temporary fill and disturbed soils shall be stabilized to prevent its eroding into waters of the U.S. where it is not authorized. Work shall include phased or staged development to ensure only areas under active development are exposed and to allow for stabilization practices as soon as practicable. Temporary fill shall be placed in a manner that will prevent it from being eroded by expected high flows.

c. Unconfined temporary fill authorized for discharge into waters of the U.S. shall consist of material that minimizes impacts to water quality (e.g. washed stone, stone, etc.).

d. Appropriate measures shall be taken to maintain normal downstream flows and minimize flooding to the maximum extent practicable when temporary structures, work, and discharges of dredged or fill material, including cofferdams, are necessary for construction activities, access fills, or dewatering of construction sites. Materials shall be placed in a location and manner that does not adversely impact surface or subsurface water flow into or out of the wetland. Temporary fill authorized for discharge into wetlands shall be placed on geotextile fabric or other appropriate material laid on the pre-construction wetland grade where practicable to minimize impacts and to facilitate restoration to the original grade. Construction mats are excluded from this requirement.

e. Construction debris and/or deteriorated materials shall not be placed or otherwise located in waters of the U.S.

27. **Heavy Equipment in Wetlands or Mudflats.** Operating heavy equipment (drill rigs, fixed cranes, etc.) within wetlands shall be minimized, and to the maximum extent practicable such equipment shall not be stored, maintained or repaired in wetlands. Where construction requires heavy equipment operation in wetlands, the equipment shall: a) have low ground pressure (typically <3 psi); b) be placed on swamp/construction/timber mats (herein referred to as "mats") that are adequate to support the equipment in such a way as to minimize disturbance of wetland soil and vegetation; or c) be operated on adequately dry or frozen wetlands such that shear pressure does not cause subsidence of the wetlands immediately beneath equipment and upheaval of adjacent wetlands. Mats are to be placed in the wetland from the upland or from equipment positioned on mats if already working within a wetland. Other support structures that are capable of safely supporting equipment may be used with written Corps authorization. Similarly, the permittee may request written authorization from the Corps to waive use of mats during frozen or dry conditions. Construction mats should be managed in accordance with construction mat best management practices (BMPs) found at:
www.nae.usace.army.mil/Missions/Regulatory/State-General-Permits/Maine-General-Permit

28. Bank and Shoreline Stabilization Including Living Shorelines.

a. Projects involving construction of or repair, replacement, and maintenance of bank or shoreline stabilization structures including living shorelines within Corps jurisdiction shall be designed to minimize environmental effects, effects to neighboring properties, scour, etc. to the maximum extent practicable.

b. Prospective permittees shall design and construct these stabilization projects using this sequential avoidance and minimization process: avoidance of aquatic resource impacts, diversion of overland flow, vegetative stabilization, living shorelines, stone-sloped surfaces, and walls/bulkheads. New vertical walls/bulkheads shall only be used in situations where reflected wave energy can be tolerated. Prospective permittees proposing new vertical walls/bulkheads shall provide written justification demonstrating why other methods of stabilization are not practicable and how the surrounding area would be affected by the resulting reflected wave energy.

Additional conditions to meet SV eligibility criteria for *non-tidal* bank and shoreline stabilization activities:

a. Fill shall be ≤500 linear feet in total length as measured below the plane of the ordinary high water mark (OHWM), includes total if more than one stream bank.
b. Fill placed below the plane of the OHWM shall be ≤1 cubic yard per linear foot.
c. Fill shall not be angled steeper than 1H:1V.
d. No discharge of fill in special aquatic sites other than wetlands.
e. Stone revetment shall be comprised of angular material.
f. No material shall be of the type, or placed in any location, or in any manner, to impair surface water flow into or out of any water of the U.S.
g. No material shall be placed in a manner that will be eroded by normal or expected high flows (properly anchored trees and treetops may be used in low energy areas).
h. The activity shall not be a stream channelization activity.

Additional conditions to meet SV eligibility criteria for *tidal* bank and shoreline stabilization activities:

a. All in-water work shall be conducted "in-the-dry".
b. Fill shall be ≤500 linear feet in total length as measured below the plane of the high tide line (HTL) and shall be ≤200 linear feet in total length as measured below the plane of the mean high water mark (MHWM), includes total for more than one bank. Vertical structures shall be ≤200 linear feet in total length as measured below the plane of the MHWM and shall be ≤18 inches waterward of the existing vertical face.
c. Fill placed below the plane of the HTL shall be ≤1 cubic yard per linear foot.
d. Stone revetment shall be comprised of angular material.
e. Shall not impact special aquatic sites (SAS, incl. submerged aquatic vegetation, SAV), impacts to natural rocky habitats are ≤100 square feet, and impacts to intertidal and shellfish areas are ≤1,000 square feet).
f. No structures/fill shall be steeper than 1H:1V.
g. No new groins, breakwaters, or jetties.

29. Stream Work and Crossings, and Wetland Crossings.

a. A PCN is required for all new and replacement crossings in navigable waters.

b. In order to effectively size and configure crossings in navigable waters, new and replacement crossings shall consider factors including but not limited to: local tidal elevations over the range of tidal heights, basin topography and bathymetry, existing and proposed road elevations. Flood risk tolerance, conditions of habitat and natural community types present, and sea level rise during the useful life of the crossing.

c. A PCN is required for activities that result in unavoidable impacts to wetlands in excess of SV thresholds.

d. In-stream work and crossings and wetland crossings shall adhere to all applicable GCs including but not limited to:

i. GC 16 (Federally Threatened and Endangered Species)
ii. GC 17 (Essential Fish Habitat)
iii. GC 18 (Aquatic Life Movements and Management of Water Flows)

iv. GC 23 (Soil Erosion, Sediment and Turbidity Controls)
v. GC 24 (Time-of-Year Work Windows/Restrictions)
vi. GC 26 (Temporary Fill)
vii. GC 28 (Bank Stabilization)

e. Slip Lining. Work resulting in a decreased width, height, or diameter of an existing crossing (e.g. slip lining and invert lining) is discouraged and requires PCN. Written justification shall be provided for this activity.

f. Culvert Extensions. A PCN is required for any extension to an existing culvert.

g. Scour protection or armoring of the inlet and/or outlet of a crossing shall not disrupt normal flow patterns or substantially disrupt the necessary life cycle movements of those species of aquatic life indigenous to the waterbody, including those species that normally migrate through the area (see GC 18).

h. The permittee shall maintain the work authorized herein in good condition and in conformance with the terms and general conditions of this permit to facilitate aquatic life passage as stated in GC 18. Culverts that develop "hanging" inlets or outlets, result in bed washout, or a stream that doesn't match the characteristics of the substrate in the natural stream channel such as mobility, slope, stability confinement will require maintenance or repair to comply with this GC (this does not apply to temporary stream crossings).

Additional conditions to meet SV eligibility criteria for Stream Work and Crossings:

a. Crossings shall be designed and constructed using the techniques and principles outlined in Stream Simulation, Stream Smart, Habitat Connectivity Design.
b. Crossings shall be designed to be at least 1.2 times bankfull width. Any footings, abutments, and/or abutment armoring shall also be at least 1.2 times bankfull width.
c. Crossings shall have a natural bottom substrate under or within the structure matching the characteristics of the substrate in the natural stream channel. Crossings shall be designed and constructed with appropriate streambed forms and streambed characteristics so that water depths and velocities are comparable to those found in the adjacent natural channel at a variety of flows.
d. Crossings shall include a bank on both sides of the stream matching the horizontal profile of the existing stream and banks in order to allow terrestrial passage for wildlife and to prevent undermining of the footings as applicable.
e. Closed bottom culverts shall be embedded at least 25 percent of the maximum height of the culvert.
f. No unconfined fill or excavation in flowing waters is allowed. In-stream construction work shall be conducted "in-the-dry" under no-flow conditions or by using cofferdams, temporary flume pipes, culverts, etc. Downstream flows shall be maintained during in-stream construction. It is recommended that project plans include pertinent details for working in-the-dry and maintaining downstream flows.
g. Conditions (a) thru (e) immediately above do not apply to temporary stream crossings; however, in addition to conditions (f) immediately above, temporary stream crossings shall adhere to the following:
    i. Be placed on geotextile fabric or other material where practicable to ensure restoration to the original grade. Soil may not be used to construct or stabilize these structures and rock shall be large enough to allow for easy removal without disrupting the streambed.
    ii. Be designed and maintained to withstand and pass high flows. Water height shall be no higher than the top of the culvert's inlet. A minimum culvert diameter of two feet is required to pass debris. Culverts shall be aligned to prevent bank erosion or streambed scour.
    iii. Be equipped with energy dissipating devices installed downstream if necessary to prevent scour.
    iv. Be designed and maintained to prevent soil from entering the waterbody.
    v. Be removed upon the completion of work. Impacts to the streambed or banks requires restoration to their original condition using the methods in (a) above.

PCN Conditions for Stream Work and Crossings:

a. Crossings are recommended to meet the conditions for SV; written justification shall be provided for any deviation from SV conditions.

b. Crossings shall be designed using the least intrusive and environmentally damaging method following this sequential minimization process: 1) spans with no stream impacts, 2) spans with stream impacts, and 3) embedded culverts with Stream Simulation, Stream Smart, or Habitat Connectivity.

Additional Conditions for Wetland Crossings:

a. New and replacement wetland crossings that are permanent shall be constructed in such a manner as to preserve hydraulic and ecological connectivity, at its present level, between the wetlands on either side of the road. Crossing structures commonly include but are not limited to spans and culverts. To meet this condition, spans or culverts should be placed at least every 50 feet with an opening at least 2 feet high and 3 feet wide at ground level. Closed bottom culverts should be embedded at least 6 inches and should have a natural bottom substrate within the structure. Alternative crossing designs that preserve wetland hydraulic and ecological connectivity (e.g. "rock sandwiches) may also be considered.

b. Any work that results in flooding, or impacts to wetland drainage from the upgradient side of the wetland crossing does not qualify for SV.

c. In the case of non-compliance, the permittee shall take necessary measures to correct wetland damage due to lack of hydraulic and ecological connectivity.

30. Utility Line Installation and Removal.

a. Utility lines in jurisdictional waters should be installed subsurface and shall be maintained in such a way so that they remain subsurface. If it is necessary to discharge dredged or filled material to keep such utility lines buried or restore them to their original subsurface condition, a PCN and written verification from the Corps may be required (e.g., in the case of side casting into wetlands from utility trenches).

b. For subsurface utility lines the bottom and side slope cover associated with the initial installation under Federal Navigation Projects (FNPs) is a technical determination. The depth requirement varies based on geotechnical (composition of bottom materials and layering), hydraulic (current, or wave induced scour depth), navigation (propeller induced scour depth and ships' anchor penetration), maintenance dredging (penetration of barge spuds), construction factors (energy from blasting potentially transmitted to utility crossings), physical conditions (exposed open water conditions or sheltered/harbor conditions), and the proposed location of the utility crossing within any FNP or within navigable waters, including areas dredged by others. On a case-by-case basis, the Corps will determine the depth and cover requirements for each proposed utility crossing. Additional conditions to the GP will be attached to address pre and post installation requirements. In waterways that do not have existing FNPs, this depth should be taken as two feet below the existing bottom or maximum depth of proposed dredging, as applicable.

c. Aerial utility lines crossing navigable waters require PCN and shall meet minimum clearances per 33 CFR 322.5(i).

d. For horizontal directional drilling work, returns of drilling fluids to the surface (i.e., frac-outs) are not authorized and require restoration to the maximum extent practicable in accordance with the terms and conditions of these GPs. The permittee and its contractor shall have onsite and shall implement the procedures detailed in a frac-out contingency plan for monitoring drilling operations and for the immediate containment, control and recovery/removal of drilling fluids released into the environment should a discharge of material occur during drilling operations.

e. For new installations within waters of the U.S., any abandoned or inactive utility lines should be removed and faulty lines (e.g., leaking hazardous substances, petroleum products, etc.) shall be removed or repaired to the extent practicable. A PCN is required if they are to remain in place, e.g., to protect sensitive areas or ensure safety.

f. No work shall drain a water of the U.S. by providing a conduit for water on or below the surface. Trench plugs installed along pipelines may be effective.

g. Trenches should be backfilled with native sediment immediately after completion of work.

h. Pre-construction elevations should be re-established. Any additional material needed to accomplish this should be of consistent type and grain-size as the existing substrate sediment.

i. Utility line activities in non-tidal waters adjacent to special aquatic sites, and all work in tidal waters should utilize horizontal directional drilling as practicable.

31. Storage of Seasonal Structures. Seasonal or recreational structures such as pier sections, floats, aquaculture structures, etc. that are removed from the waterway for a portion of the year shall be stored in an upland location and not in wetlands, tidal wetlands, their substrate, or on mudflats. These seasonal structures may be stored on the fixed, pile-supported portion of a structure that is waterward of the mean high water mark or the ordinary high water mark, e.g. the storage of a ramp or gangway on the pile-supported pier. Seasonal storage of structures in navigable waters, e.g., in a protected cove, requires prior Corps approval and local harbormaster approval.

32. Aquaculture. Activities involving the cultivation of Atlantic salmon and other salmonids, or other federally-listed threatened or endangered species are not eligible for authorization under these GPs. All other aquaculture activities shall adhere to all applicable GCs including but not limited to:

a. GC 3 (Other Permits) In particular, permittees shall maintain a current State of Maine Department of Marine Resources lease or license.
b. GC 10 (Corps Projects and Property)
c. GC 11 (Navigation)
d. GC 16 (Federal Threatened and Endangered Species)
e. GC 17 (Essential Fish Habitat)
f. GC 18 (Aquatic Life Movements and Management of Water Flows)
g. GC 31 (Storage of Seasonal Structures)

Additional conditions to meet SV eligibility criteria for Tidal Aquaculture:

a. Shall not exceed 400 square feet in area.
b. Shall receive signed approval from Harbormaster or appropriate Town Official.
c. Shall not include enclosures or impoundments.
d. Shall not be located in or within a distance of three times the authorized depth of a FNP.
e. Shall not be located in or impinge upon the value of National Lands and Federal Properties including but not limited to National Parks and National Wildlife Refuges.
f. Shall not impact special aquatic sites (SAS, incl. submerged aquatic vegetation, SAV), impacts to natural rocky habitats are ≤100 square feet, and impacts to intertidal and shellfish areas are ≤1,000 square feet.
g. No structures, cages, gear, or shell hash shall be located in/within 25 feet of SAV.
h. All gear, except for mooring tackle, when not in use on the site shall be stored in an upland location above the mean high water mark and not on wetland (incl. salt marsh).

33. Permit(s)/Authorization Letter On-Site. The permittee shall ensure that a copy of the terms and conditions of these GPs and any accompanying authorization letter with attached plans are at the site of the work authorized by these GPs whenever work is being performed and that all construction personnel performing work which may affect waters of the U.S. are fully aware of the accompanying terms and conditions. The entire permit authorization shall be made a part of any and all contracts and subcontracts for work that affects areas of Corps jurisdiction at the site of the work authorized by these GPs. This shall be achieved by including the entire permit authorization in the specifications for work. The term "entire permit authorization" means all terms and conditions of the GPs, the GPs, and the authorization letter (including its drawings, plans, appendices and other attachments) and subsequent permit modifications as applicable. If the authorization letter is issued after the construction specifications, but before receipt of bids or quotes, the entire permit authorization shall be included as an addendum to the specifications. If the authorization letter is issued after receipt of bids or quotes, the entire permit authorization shall be included in the contract or subcontract. Although the permittee may assign various aspects of the work to different contractors or subcontractors, all contractors and subcontractors shall be obligated by contract to comply with all environmental protection provisions contained within the entire GP authorization, and no contract or subcontract shall require or allow unauthorized work in areas of Corps jurisdiction.

34. Inspections. The permittee shall allow the Corps to make periodic inspections at any time deemed necessary in order to ensure that the work is eligible for authorization under these GPs, is being, or has been performed in accordance with the terms and conditions of these GPs. To facilitate these inspections, the permittee shall

complete and return to the Corps the Work-Start Notification Form and the Compliance Certification Form when either is provided with an authorization letter. The Corps may also require post-construction engineering drawings and/or photographs for completed work or post-dredging survey drawings for any dredging work to verify compliance.

35. Maintenance. The permittee shall maintain the activity authorized by these GPs in good condition and in conformance with the terms and condition of these permits. This does not include maintenance dredging, related disposal, or beach nourishment projects, which are subject to review thresholds for GP 5 on page 30, unless specified in written authorization from the Corps.

36. Federal Liability. In issuing these permits, the Federal Government does not assume any liability for the following:

a. Damages to the permitted project or uses thereof as a result of other permitted or unpermitted activities or from natural causes;

b. Damages to the permitted project or uses thereof as a result of current or future activities undertaken by or on behalf of the U.S. in the public interest;

c. Damages to persons, property, or to other permitted or unpermitted activities or structures caused by the activity authorized by this permit;

d. Design or construction deficiencies associated with the permitted work; or

e. Damage claims associated with any future modification, suspension, or revocation of this permit.

37. Property Rights. Per 33 CFR 320.4(g)(6), these GPs do not convey any property rights, either in real estate or material, or any exclusive privileges, nor does it authorize any injury to property or invasion of rights or any infringement of federal, state, or local laws or regulations.

38. Previously Authorized Activities.

a. Projects that received prior authorization from the Corps (via Category 1 or 2) and that completed authorized work under the previous nationwide permits, programmatic permits, regional general permits or letters of permission, shall remain authorized in accordance with the original terms and conditions of those authorizations, including their terms, general conditions, expiration date, and any special conditions provided in a written verification.

b. Activities authorized pursuant to 33 CFR Part 330.3 ("Activities occurring before certain dates") are not affected by these GPs.

c. Any work not commenced, not under contract to commence, nor completed that was originally authorized by the Corps under the GP in effect between October 13, 2015 and October 13, 2020 remains authorized subject to the terms and general conditions of this GP along with any special conditions included in written authorizations. Exception: if previously authorized work has not commenced or not under contract to commence and a new federally-listed threatened or endangered species may be affected, the Corps shall consult with the U.S. Fish and Wildlife Service or NOAA Fisheries prior to re-authorizing the work under these GPs. Requests for re-authorization shall include an Official Species List per GC 16.

39. Transfer of GP Verifications. If the permittee sells the property associated with a GP verification, the permittee may transfer the GP verification to the new owner by submitting a letter to the Corps to validate the transfer. A copy of the GP verification shall be attached to the letter, the letter shall contain the name, address, phone number and email of the transferee (new owner), shall include the following statement and signature, and be mailed to: U.S. Army Corps of Engineers, Maine Project Office, 442 Civic Center Drive, Suite 350, Augusta, Maine 04330:

> "When the structures or work authorized by these GPs are still in existence at the time the property is transferred, the terms and conditions of these GPs, including any special conditions, will continue to be binding on the new owner(s) of the property."
>
> _____
> Transferee Printed Name
>
> _____
> Transferee Signature Date

40. Modification, Suspension, and Revocation. These GPs and any individual authorization issued thereof may be either modified, suspended, or revoked, in whole or in part, pursuant to the policies and procedures of 33 CFR 325.7, and any such action shall not be the basis for any claim for damages against the U.S.

41. Special Conditions. The Corps may independently or in coordination with federal resource agencies impose special conditions on a project authorized pursuant to these GPs that are determined necessary to minimize adverse navigational and/or environmental effects, or based on any other factor of the public interest. Failure to comply with all terms and conditions of the authorization, including special conditions, constitutes a permit violation and may subject the permittee to criminal, civil or administrative penalties and/or an ordered restoration.

42. False or Incomplete Information. If the Corps makes a determination regarding the eligibility of a project under these GPs and subsequently discovers that it has relied on false, incomplete or inaccurate information provided by the permittee, the Corps may determine that the GP authorization is not valid; modify, suspend or revoke the authorization; and the U.S. Government may institute legal proceedings.

43. Abandonment. If the permittee decides to abandon the activity authorized under these GPs, unless such abandonment is merely the transfer of property to a third party, he/she may be required to restore the area to the satisfaction of the Corps.

44. Enforcement cases. These GPs do not apply to any existing or proposed activity in Corps jurisdiction associated with an ongoing Corps or EPA enforcement action, until such time as the enforcement action is resolved or the Corps or EPA, as appropriate, determines that the activity may proceed independently without compromising the enforcement action.

45. Duration of Authorization.

a. These GPs expire on October 14, 2025 unless otherwise specifically indicated in an individual authorization letter. Activities authorized under these GPs that have either commenced or are under contract to commence in reliance upon this authorization will have an additional year from the expiration date to complete the work. The permittee must be able to document to the Corps' satisfaction that the activity commenced or was under contract to commence by the expiration date of these GPs. If work is not completed within the one year extended timeframe, the permittee must contact the Corps. The Corps may issue a new authorization, provided the activity meets the applicable terms and conditions of the Maine GPs that are in effect at the time.

b. Activities authorized under these GPs will remain authorized until these GPs expire, unless discretionary authority has been exercised on a case-by-case basis to modify, suspend, or revoke the authorization in accordance with 33 CFR 325.2(e)(2). Activities completed under the SV or PCN authorizations of these GPs will continue to be authorized after its expiration date.

TURLEY.TAMMY.R.1229735124

Digitally signed by TURLEY.TAMMY.R.1229735124
Date: 2020.10.13 10:09:04 -04'00'

Tammy R. Turley
Chief, Regulatory Division

V. MAINE GENERAL PERMITS

An activity is authorized under General Permits 1 through 23 listed below only if that activity and the permittee satisfy all of the applicable GP terms and general conditions. Any activity not specifically listed may still be eligible for authorization under these GPs; prospective permittees are advised to contact the Corps for specific eligibility determination.

1. Repair, Replacement, and Maintenance of Authorized Structures and Fills;
Repair, rehabilitation, or replacement of any previously authorized, currently serviceable structure, or fill and minor expansions thereof.

2. Moorings
New moorings and mooring fields, the relocation of previously authorized moorings, expansions, boundary reconfigurations or modifications of previously authorized mooring fields, conversion of mooring types (e.g. private to rental), and maintenance and replacement of moorings. Moored floats, lobster cars, rafts, and similar float structures are not included in this GP.

3. Structures, Floats and Lifts
New, expansions, reconfigurations or modifications of structures for navigational access in waters of the U.S. including but not limited to temporary/seasonal or permanent pile and crib-supported piers, floats, stairs, shore outhauls, and boat and float lifts/ways. Floats may include lobster cars, work floats, moored floats, swim floats, and shellfish upweller floats.

4. Aids to Navigation, and Temporary Recreational Structures
Aids to navigation and regulatory markers which are approved by and installed in accordance with the requirements of the U.S. Coast Guard (see 33 CFR, chapter I, subchapter C, part 66) and temporary buoys, markers, small floating docks, and similar structures placed for recreational use during specific events such as fireworks displays, water skiing competitions, and boat races or seasonal use.

5. Dredging, Disposal of Dredged Material, Beach Nourishment, and Rock Removal and Relocation
New, maintenance, and improvement dredging, including: a) Disposal of dredged material at a confinedaquatic disposal, beach nourishment, near shore, designated open water or ocean water disposal site(s), provided the Corps finds the dredged material to be suitable for such disposal; (b) Beach nourishment not associated with dredging; (c) Rock removal and relocation for navigation.

6. U.S. Coast Guard Approved Bridges and Causeways
Discharges of dredged or fill material incidental to the construction and modification of bridges across navigable waters of the U.S., including cofferdams abutments, foundation seals, piers, approach fills, and temporary construction and access fills provided that the USCG authorizes the construction of the bridge structure under Section 9 of the Rivers and Harbors Act of 1899 or other applicable laws.

7. Bank and Shoreline Stabilization Including Living Shorelines
Bank stabilization activities necessary for erosion protection along the banks of lakes, ponds, streams, and marine/tidal waters. Includes bulkheads, seawalls, riprap, revetments or slope protection & similar structures as well as vegetative planting, soil bioengineering or alternative techniques that are a combination of the two (i.e. living shorelines), specifically for the purpose of shoreline protection.

8. Residential, Commercial and Institutional Developments, and Recreational Facilities
Discharges of dredged or fill material into waters of the U.S for the construction or expansion of: residences and residential subdivisions; commercial and institutional buildings or subdivisions; and recreational facilities; and attendant features including but not limited to roads, parking lots, garages, stormwater management facilities, yards, and utilities.

9. Utility Line Activities

Activities required for (a) the construction, maintenance, relocation, repair, & removal of utility lines, including outfall and intake structures, and the associated excavation, backfill, or bedding for utility lines; (b) the construction, maintenance or expansion of utility line substation facilities associated with a power/utility line in non-tidal waters; and (c) the construction and maintenance of foundations for overhead utility line towers, poles, and anchors provided the foundations are the minimum size necessary and separate footings for each tower leg (rather than a larger single pad) are used where feasible. This GP authorizes the construction of access roads to facilitate construction of the above activities provided the activity, in combination with all other activities included in one single and complete project.

10. Linear Transportation Projects

Activities required for the construction, expansion, modification, or improvement of linear transportation projects (e.g., driveways, roads, highways, railways, trails, airport runways, and taxiways) and attendant features.

11. Mining Activities

Temporary or permanent discharges of dredged or fill material into waters of the U.S. for mining activities.

12. Boat Ramps and Marine Railways

Temporary or permanent discharges of dredged or fill material, excavation and other work in waters of the U.S. required for the construction of temporary or permanent boat ramps and marine railways.

13. Land and Water-Based Renewable Energy Generation Facilities and Hydropower Projects

Structures and work and discharges of dredged or fill material into waters of the U.S. for the construction, expansion, modification or removal of: (a) land-based renewable energy production facilities (e.g. solar and wind) and their attendant features; (b) water-based wind or hydrokinetic renewable energy generation pilot projects and their attendant features; and (c) discharges of dredged or fill material associated with hydropower projects. Attendant features may include, but are not limited to, land-based collection and distribution facilities, control facilities, and parking lots.

14. Reshaping Existing Drainage Ditches and Mosquito Management

Discharges to modify the cross-sectional configuration of currently serviceable drainage ditches constructed in waters of the U.S., for the purpose of improving water quality by regrading the drainage ditch with gentler slopes, which can reduce erosion, increase growth of vegetation, and increase uptake of nutrients and other substances by vegetation. Also authorized are mosquito reduction activities.

15. Response Operations for Oil or Hazardous Substances

Activities conducted in response to a discharge or release of oil and hazardous substances that are subject to the National Oil and Hazardous Substances Pollution Contingency Plan (40 CFR 300) including containment, cleanup, and mitigation efforts, provided activities are done under either (i) The Spill Prevent, Control & Countermeasure Plan require by 40 CFR 112.3; (ii) The direction or oversight of the Federal on-site coordinator designated by 40 CFR 300; or (iii) Any approved existing State, regional or local contingency plan provided that the Regional Response Team (if one exists in the area) concurs with the proposed response efforts or does not object to the response effort. Activities required for the cleanup of oil releases in waters of the U.S. from electrical equipment that are governed by EPA's polychlorinated biphenyl (PCB) spill response regulations at 40 CFR 761. Booms placed in tidal waters. Use of temporary structures & fills for spill response training exercises.

16. Cleanup of Hazardous and Toxic Waste

Specific activities to effect the containment, stabilization or removal of hazardous or toxic waste materials, including court ordered remedial action plans or related settlements which are performed, ordered or sponsored by a government agency with established legal or regulatory authority.

17. Scientific Measurement Devices
Scientific devices for measuring and recording scientific data, such as staff gauges, tide and current gauges, meteorological stations, water recording and biological observation devices, water quality testing and improvement devices, and similar structures.

18. Survey Activities
Survey activities such as soil borings, core sampling, seismic exploratory operations, plugging of seismic shot holes and other exploratory-type bore holes, exploratory trenching and historic resources surveys (but not recovery).

19. Agricultural Activities
Regulated discharges of dredged or fill material in non-tidal waters of the U.S. for agricultural activities, including the construction of building pads for farm buildings. Authorized activities include: (a) installation, placement, or construction of drainage tiles, ditches, or levees; mechanized land clearing; land leveling; the relocation of existing serviceable drainage ditches; and similar activities; (b) construction of farm ponds, excluding perennial streams, provided the farm pond is used solely for agricultural purposes; and (c) discharges of dredged or fill material to relocate existing serviceable drainage ditches constructed in non-tidal streams.

20. Fish and Wildlife Harvesting, Enhancement, and Attraction Devices
Activities in waters of the U.S. associated with fish and wildlife harvesting devices including pound nets, crab and lobster traps, crab dredging, eel pots, duck blinds, and clam and oyster digging, fish aggregating devices, and small fish attraction devices such as open water fish concentrators (sea kites, etc.). This GP does not include aquaculture activities.

21. Habitat Restoration, Establishment and Enhancement Activities
Activities in waters of the U.S. associated with the restoration, enhancement and establishment of non-tidal and tidal wetlands and riparian areas, including invasive, non-native or nuisance species control; the restoration and enhancement of non-tidal streams and other non-tidal open waters; the relocation of non-tidal waters, including non-tidal streams & associated wetlands for reestablishment of a natural stream morphology and reconnection of the floodplain; the restoration and enhancement of shellfish, finfish and wildlife; and the rehabilitation or enhancement of tidal streams, tidal wetlands and tidal open waters; provided those activities result in net increases in aquatic resource functions and services. Also included are shellfish enhancement measures including but not limited to “brushing”, clam pots, boxes, and netting.

22. Stream and Wetland Work and Crossings
Activities required for the construction, expansion, modification, or improvement of linear transportation projects that cross waters of the U.S. (e.g., driveways, roads, highways, railways, trails, airport runways, and taxiways) and attendant features. Crossing structures include, but are not limited to temporary or permanent jurisdictional spans, bridges, culverts, and fords. Any stream channel modification is limited to the minimum necessary to construct or protect the project; such modifications must be in the immediate vicinity of the project.

23. Aquaculture
The installation of buoys, floats, racks, trays, nets, lines or other structures in waters of the U.S. for the containment and cultivation of fish, shellfish and seaweed/kelp. Also authorized are anchored upweller floats, small-scale shellfish hatchery seawater intake/discharge structures, and discharges of dredged or fill material associated with cultivation such as the placement of cultch or spatted-shell on bottom.

USER NOTE: All Self-Verification and Pre-Construction Notification activities shall comply with all applicable terms (pages 1 - 4), General Conditions (pages 5 - 19), and additional terms below.

GENERAL PERMITS FOR THE STATE OF MAINE		
A. INLAND WATERS AND WETLANDS	Inland Waters and Wetlands are defined as waters that are regulated under Section 404 of the Clean Water Act, including rivers, streams, lakes, ponds, and wetlands, and ***excludes Section 10 Navigable Waters of the U.S.*** The jurisdictional boundaries are the ordinary high water mark (OHWM) in the absence of adjacent wetlands; beyond the OHWM to the limit of adjacent wetlands when adjacent wetlands are present; and the wetland limit when only wetlands are present. For the purposes of these GPs and designated activities, fill placed in the area between the mean high water mark (MHWM) and the high tide line (HTL), and in the bordering and contiguous wetlands to tidal waters are reviewed in the Navigable Waters section below beginning on page 28.	
	Activities not meeting the Self-Verification terms below require Pre-Construction Notification and activities not meeting the Pre-Construction Notification terms below require an application for an Individual Permit (IP).	
GENERAL PERMIT #	**SELF-VERIFICATION (SV)**	**PRE-CONSTRUCTION NOTIFICATION (PCN)**
1. Repair, Replacement, and Maintenance of Authorized Structures and Fills *(for stream crossings see GP 22)*	Repair, replacement, and maintenance of existing, currently serviceable, authorized fills with no expansion or change in use, provided: • Conditions of the original authorization apply. • Minor deviations in fill design allowed. • The repair, rehabilitation, or replacement of those structures or fills destroyed or damaged by storms, floods, fire or other discrete events is authorized, provided the work is commenced, or is under contract to commence, within two years of the date of their destruction or damage. • Drawdown of impoundments for dam/levee repair does not exceed 18 months and one growing season (Apr-Sept).	Repair, replacement, and maintenance of existing authorized fills not eligible for SV, provided: • <3 acres of permanent and/or temporary inland waterway and/or wetland fill, and associated secondary impacts.
2. Moorings	Not Applicable – these activities in non-navigable inland waters do not require Corps authorization.	Not Applicable – these activities in non-navigable inland waters do not require Corps authorization.
3. Structures, Floats, and Lifts	Pile-supported structures, floats and lifts located in non-navigable inland waters do not require Corps authorization. Solid fill or crib-supported structures with <15,000 SF of permanent and/or temporary inland waterway and/or wetland fill, and associated secondary impacts.	Fill activities associated with structures, floats, and lifts not eligible for SV, provided: • <3 acres of permanent and/or temporary inland waterway and/or wetland fill, and associated secondary impacts.
4. Aids to Navigation and Temporary Recreational Structures	Not Applicable – these activities in non-navigable inland waters do not require Corps authorization.	Not Applicable – these activities in non-navigable inland waters do not require Corps authorization.
5. Dredging, Disposal of Dredged Material, Beach Nourishment, and Rock Removal and Relocation	Those activities with <15,000 SF of permanent and/or temporary inland waterway and/or wetland fill, and associated secondary impacts, provided: • No stream channelization, relocation, or loss of streambed including impoundments or discharges of tailings into streams.	Those activities not eligible for SV, provided: • <3 acres of permanent and/or temporary inland waterway and/or wetland fill, and associated secondary impacts.

	SELF-VERIFICATION (SV)	PRE-CONSTRUCTION NOTIFICATION (PCN)
6. U.S. Coast Guard Approved Bridges and Causeways	Not applicable in inland waters and wetlands; see B. Navigable Waters on page 31 below.	Not applicable in inland waters and wetlands; see B. Navigable Waters on page 31 below.
7. Bank and Shoreline Stabilization Including Living Shorelines (see also GC 28)	Bank and shoreline stabilization activities with <15,000 SF of permanent and/or temporary inland waterway and/or wetland fill, and associated secondary impacts, provided: • Fill is ≤500 LF in total length as measured below the plane of the OHWM, includes total if more than one stream bank. • Fill placed below the plane of the OHWM is ≤1 CY per linear foot. • There is no discharge in special aquatic sites other than wetlands. • Revetment is comprised of angular material. • In-stream work is limited to Jul. 15th to Sep. 30th • No structures angled steeper than 1H:1V.	Bank and shoreline stabilization activities not eligible for SV, provided: • <3 acres of permanent and/or temporary inland waterway and/or wetland fill, and associated secondary impacts.
8. Residential, Commercial and Institutional Developments, and Recreational Facilities	Those developments and facilities with <15,000 SF of permanent and/or temporary inland waterway and/or wetland fill, and associated secondary impacts. Fill area includes all temporary and permanent fill, and regulated discharges associated with excavation. Provided: • The historic fill and proposed fill area <15,000 SF specifically complies with GC 5 Single and Complete Projects. • No work in special aquatic sites other than wetlands.	Those developments and facilities not eligible for SV, provided: • <3 acres of permanent and/or temporary inland waterway and/or wetland fill, and associated secondary impacts. *Mechanical clearing of areas within Corps jurisdiction without grubbing or other soil disturbance >3 acres as a secondary impact may still be eligible for PCN at the discretion of the Corps.*
9. Utility Line Activities (see also GC 30)	Utility line activities with <15,000 SF of permanent and/or temporary inland waterway and/or wetland fill (excluding mats), and associated secondary impacts, provided: • There is no permanent change in pre-construction contours in waters in the U.S. • Material resulting from trench excavation is temporarily side cast into waters of the U.S. for <3 months and is placed in such a manner that is not dispersed by current or other forces. • The line does not run parallel to, or along a streambed. • No stream channelization, relocation, or loss of streambed including impoundments. • There is no discharge in special aquatic sites other than wetlands. • Construction mats of any area necessary to conduct activities provided mats are removed as soon as work is completed and shall be in place no longer than one single growing season. • In-stream work is limited to Jul. 15th to Sep. 30th • In-water work is conducted in-the-dry. • Intake structures that are dry hydrants used exclusively for firefighting activities with no stream impoundments. • Construction mats of any area necessary to conduct activities provided mats are removed as soon as work is completed and shall be in place no longer than one single growing season.	Utility line activities not eligible for SV, provided: • <3 acres of permanent and/or temporary inland waterway and/or wetland fill, and associated secondary impacts. *Mechanical clearing of areas within Corps jurisdiction without grubbing or other soil disturbance >3 acres as a secondary impact may still be eligible for PCN at the discretion of the Corps.*

	SELF-VERIFICATION (SV)	PRE-CONSTRUCTION NOTIFICATION (PCN)
10. Linear Transportation Projects *(for stream crossings refer to GP 22)*	Linear transportation activities with <15,000 SF of permanent and/or temporary inland waterway and/or wetland fill (excl. mats), and associated secondary impacts, provided: • The historic fill and proposed fill area <15,000 SF specifically complies with GC 5 Single and Complete Projects. • There is no discharge in special aquatic sites other than wetlands. • Construction mats of any area necessary to conduct activities provided mats are removed as soon as work is completed and shall be in place no longer than one single growing season.	Linear transportation activities not eligible for SV, provided: • <3 acres of permanent and/or temporary inland waterway and/or wetland fill, and associated secondary impacts. *Mechanical clearing of areas within Corps jurisdiction without grubbing or other soil disturbance >3 acres as a secondary impact may still be eligible for PCN at the discretion of the Corps.*
11. Mining Activities	Mining activities with <15,000 SF of permanent and/or temporary inland waterway and/or wetland fill, and associated secondary impacts, provided: • No stream channelization, relocation, or loss of streambed including impoundments.	Mining activities not eligible for SV, provided: • <3 acres of permanent and/or temporary inland waterway and/or wetland fill, and associated secondary impacts.
12. Boat Ramps	Boat ramps with <15,000 SF of permanent and/or temporary inland waterway and/or wetland fill, and associated secondary impacts, and temporary fills.	Boat ramps not eligible for SV, provided: • <3 acres of permanent and/or temporary inland waterway and/or wetland fill, and associated secondary impacts.
13. Land and Water-Based Renewable Energy Generation Facilities and Hydropower Projects	Those facilities and projects with <15,000 SF of permanent and/or temporary inland waterway and/or wetland fill, and associated secondary impacts, provided: • No stream channelization, relocation, or loss of streambed including impoundments. • No new water-based facilities are eligible.	Those facilities and projects not eligible for SV, provided: • <3 acres of permanent and/or temporary inland waterway and/or wetland fill, and associated secondary impacts. *Mechanical clearing of areas within Corps jurisdiction without grubbing or other soil disturbance >3 acres as a secondary impact may still be eligible for PCN at the discretion of the Corps.*
14. Reshaping Existing Ditches and Mosquito Management	Not applicable in inland waters and wetlands; see B. Navigable Waters on page 33 below.	Not applicable in inland waters and wetlands; see B. Navigable Waters on page 33 below.
15. Response Operations for Oil or Hazardous Substances	The SVNF or a surrogate state reporting form may be submitted after-the-fact for response operations. This GP also authorizes the use of temporary structures and fills in waters of the U.S. for spill response training exercises with <15,000 SF of permanent and/or temporary inland waterway and/or wetland fill, and associated secondary impacts (*SVNF is required prior to the activity*).	Those response operations not eligible for SV, provided: • <3 acres of permanent and/or temporary inland waterway and/or wetland fill, and associated secondary impacts.

	SELF-VERIFICATION (SV)	PRE-CONSTRUCTION NOTIFICATION (PCN)
16. Cleanup of Hazardous and Toxic Waste	Those cleanup activities with <15,000 SF of permanent and/or temporary inland waterway and/or wetland fill, and associated secondary impacts, provided: • No stream channelization, relocation, or loss of streambed including impoundments. • The activity does not involve establishing new disposal sites or expanding existing sites used for the disposal of hazardous or toxic waste.	Those cleanup activities not eligible for SV, provided: • <3 acres of permanent and/or temporary inland waterway and/or wetland fill, and associated secondary impacts. • The activity does not involve establishing new sites for the disposal of hazardous or toxic waste.
17. Scientific Measurements Devices	Those devices with <15,000 SF of permanent and/or temporary inland waterway and/or wetland fill, and associated secondary impacts, provided: • No biological sampling devices. • Devices do not restrict or concentrate movement of aquatic organisms. • Upon completion of use, the devices and any associated fills shall be removed in their entirety.	Those devices not eligible for SV, provided: • <3 acres of permanent and/or temporary inland waterway and/or wetland fill, and associated secondary impacts.
18. Survey Activities	Those survey activities with <15,000 SF of permanent and/or temporary inland waterway and/or wetland fill, and associated secondary impacts, provided: • Exploratory trenches are restored in accordance with GC 21. • No discharge of excavated material from test wells for oil and gas exploration (the plugging of such wells is authorized).	Those survey activities not eligible for SV, provided: • <3 acres of permanent and/or temporary inland waterway and/or wetland fill, and associated secondary impacts.
19. Agricultural Activities	Those agricultural activities subject to Corps jurisdiction with <15,000 SF of permanent and/or temporary inland waterway and/or wetland fill, and associated secondary impacts, provided: • No stream channelization, relocation, or loss of streambed including impoundments.	Those agricultural activities subject to Corps jurisdiction not eligible for SV, provided: • <3 acres of permanent and/or temporary inland waterway and/or wetland fill, and associated secondary impacts.
20. Fish and Wildlife Harvesting, Enhancement and Attraction Devices and Activities	Not applicable in inland waters and wetlands; see B. Navigable Waters on page 34 below.	Not applicable in inland waters and wetlands; see B. Navigable Waters on page 34 below.
21. Habitat Restoration, Establishment, and Enhancement	Those activities with <15,000 SF of permanent and/or temporary inland waterway and/or wetland fill, and associated secondary impacts, provided: • No water impoundments allowed. • No conversion of a stream to wetland or vice versa, a wetland to a pond or uplands, or one wetland type to another. • No dam removal.	Those activities not eligible for SV, provided: • <3 acres of permanent and/or temporary inland waterway and/or wetland fill, and associated secondary impacts.

	SELF-VERIFICATION (SV)	PRE-CONSTRUCTION NOTIFICATION (PCN)
22. Stream and Wetland Work and Crossings (see also GC 29)	Stream work and crossings with <15,000 SF of permanent and/or temporary inland waterway and/or wetland fill, and associated secondary impacts, provided: • No work in designated or proposed critical habitat for endangered species. • Crossings are designed and constructed using the techniques and principles outlined in Stream Simulation, Stream Smart, or Habitat Connectivity Design. • Crossings are designed to be 1.2 times bankfull width. • Crossings have a natural bottom substrate. • Crossings include a bank on both sides of the channel. • Closed bottom culverts are embedded at least 25% of the maximum width of the culvert. • In-stream work is limited to Jul. 15th to Sep. 30th • In-stream work is conducted "in-the-dry". • No slip lining. • No culvert extensions. • No stream channelization, relocation, or loss of streambed including impoundments. Wetland work and crossings, provided: • No flooding or impacts to wetland drainage from the upgradient side of the crossing.	Stream and Wetland Work and Crossings not eligible for SV, provided: • <3 acres of permanent and/or temporary inland waterway and/or wetland fill, and associated secondary impacts.
23. Aquaculture (see also GC 32)	Aquaculture activities with <15,000 SF of permanent and/or temporary inland waterway and/or wetland fill, and associated secondary impacts, provided: • No water impoundments allowed. • No conversion of i) a stream to wetland or vice versa, a wetland to a pond or uplands, and ii) one wetland type to another.	Aquaculture activities not eligible for SV, provided: • <3 acres of permanent and/or temporary inland waterway and/or wetland fill, and associated secondary impacts.

USER NOTE: All Self-Verification and Pre-Construction Notification activities shall comply with all applicable terms (pages 1 - 4), General Conditions (pages 5 - 19), and additional terms below.

B. NAVIGABLE WATERS	**Navigable Waters of the U.S. are defined as** those waters that are subject to the ebb and flow of the tide in addition to the non-tidal portions of the following federally-designated waters in Maine (the Kennebec River to Moosehead Lake, the Penobscot River to the confluence of the East and West Branch at Medway and, Lake Umbagog within the State of Maine) (Section 10 Rivers and Harbors Act of 1899). The jurisdictional limits are the mean high water mark (MHWM) in tidal waters and the ordinary high water mark (OHWM) in non-tidal portions of the federally-designated navigable rivers. For the purposes of these GPs, fill placed in the area between the mean high water mark (MHWM) and the high tide line (HTL), and in the bordering and contiguous wetlands to tidal waters are also reviewed in this Navigable Waters section.	
	Activities not meeting the Self-Verification terms below require Pre-Construction Notification and activities not meeting the Pre-Construction Notification terms below require an application for an Individual Permit.	
GENERAL PERMIT #	**SELF-VERIFICATION**	**PRE-CONSTRUCTION NOTIFICATION**
1. Repair, Replacement, and Maintenance of Authorized Structures and Fills **See GC 25 for pile driving and removal conditions.*	Repair, replacement, or maintenance of previously authorized, currently serviceable structures or fills, provided: • Conditions of the original authorization apply. • No expansion or change in use. Shall be rebuilt in same footprint, however minor deviations in design allowed. • The repair, rehabilitation, or replacement of those structures or fills destroyed or damaged by storms, floods, fire or other discrete events is authorized, provided that work is commenced, or is under contract to commence, within two years of the date of their destruction or damage. • In-water work is conducted "in-the-dry" (see GC 24). • No impacts to special aquatic sites (SAS) (incl. submerged aquatic vegetation, SAV), impacts to natural rocky habitat ≤100 SF, and impacts to intertidal area ≤1,000 SF • Slope stabilization is ≤500 LF in total length as measured below the plane of the HTL and is ≤200 LF in total length as measured below the plane of the MHWM or OHWM. Vertical structures are ≤200 LF in total length as measured below the plane of the MHWM or OHWM and are ≤18 inches waterward of existing face. • Dam and flood control, or levee work does not alter water levels or flood elevations. • Discharge of accumulated bottom sediments from or through a dam is not more than *de minimus*. • Tide gate work has a Corps-approved operation and maintenance plan and no effect to hydraulic regime, or tide gates that solely convey stormwater and/or Maine National Pollutant Discharge Elimination System-permitted discharges.	Repair, replacement, or maintenance of previously authorized structures or fills not eligible for SV, provided: • ≤0.5 acre temporary or permanent impacts, fill, excavation, and/or secondary impacts. • Temporary and/or permanent fill or excavation in SAV <1,000 SF • Permanent fill or excavation in other SAS <4,300 SF

	SELF-VERIFICATION (SV)	PRE-CONSTRUCTION NOTIFICATION (PCN)
2. Moorings	Private, non-commercial, non-rental, single-boat moorings, provided: • Authorized by the local harbormaster/town. • Not associated with any boating facility (e.g. marinas). • Not located within a Federal Navigational Project (other than in a Federal Anchorage) or within a distance of three times the authorized depth of a Federal Navigation Project. Moorings in a Federal Anchorage must not be associated with a boating facility and must not be for rent. • No interference with navigation. • Mooring is not located in SAS (incl. SAV) or intertidal areas. Minor relocation of previously authorized moorings, provided: • Authorized by the local harbormaster/town. • Relocation is not within a Federal Navigational Project (other than in a Federal Anchorage) or within a distance of three times the authorized depth of a Federal Navigation Project. • No interference with navigation. • Relocated mooring is not located in SAS (incl. SAV) or intertidal areas. **SV Moorings above do not require a SVNF.*	Moorings not eligible for SV and don't require an IP. This includes private moorings with no harbormaster or means of local approval or moorings associated with a boating facility (e.g. marina). *Locating new moorings in SAS (incl. SAV) shall be avoided to the maximum extent practicable. If SAS cannot be avoided, consideration shall be given to alternative mooring systems that prevents mooring chains from resting or dragging on the bottom substrate at all tides.* An IP is required for moorings located within the horizontal limits, or with moored vessels that extend into the horizontal limits of a Federal Navigation Project (other than in a Federal Anchorage).
3. Structures, Floats, and Lifts *Cont'd below on page 30*	Reconfiguration of such existing authorized structures with all intertidal work conducted "in-the-dry" (see GC 24). Minor relocation of previously authorized floats provided: • Relocation is not into a Federal Navigation Project or within a distance of three times the authorized depth of a Federal Navigation Project (other than a Federal Anchorage). • No interference with navigation. • Not relocated in or within 25 feet of SAV. • Seasonal floats are stored above the MHWM and not on wetland (incl. salt marsh). New private, non-commercial ramp and float structures attached to land (no piers) or new floats provided: • Not located in or within a distance of three times the authorized depth of a Federal Navigation Project. • No interference with navigation. • No structure extends across >25% of the waterway width at mean low water. • Not located in or within 25 feet of SAV. • Ramp is <150 LF over salt marsh waterward of the MHWM and is ≥1:1 height:width ratio over salt marsh.	New structures, floats, and/or lifts including floatways/skidways, built to access waterway (both seasonal and permanent). Includes pile-supported, solid fill-supported, and crib-supported structures. Also includes expansions to existing authorized boating facilities (e.g. marinas). Provided: • <1 acre temporary or permanent impacts, fill, excavation, and/or secondary impacts. • Temporary and/or permanent fill or excavation in SAV <1,000 SF • Permanent fill or excavation in other SAS <4,300 SF **See GC 25 for pile driving and pile removal conditions.* Compliance with the following is recommended: • *Lowermost part of floats are ≥18 inches above the substrate during all tides.* • *Structures are ≥1:1 height:width ratio over salt marsh.* • *Structures and floats are not located in or within 25 feet of SAV.* • *Moored vessels are not positioned over SAV.* • *Structures attached to land are located ≥ 25 feet from the property line (The Corps may require a letter of no objection from the abutter if located within 25 feet of the property line.)*

	SELF-VERIFICATION (SV)	PRE-CONSTRUCTION NOTIFICATION (PCN)
Cont'd from page 29	• Ramp and floats attached to land are located ≥25 feet from the property line. • Seasonal ramp and floats are stored above the HTL and not on wetland (incl. salt marsh). Compliance with the following is recommended: • *Lowermost part of floats is ≥18 inches above the substrate during all tides.*	• *No structure extends across >25% of the waterway width at mean low water.* • *Not located within a distance of three times the authorized depth of a Corps Federal Navigation Project.* An IP is required for structures, floats, and/or lifts including floatways/skidways, located in such that they and/or vessels docked or moored at them are within the horizontal limits of a Corps Federal Navigation Project. An IP is also required for structures and floats associated with a new or previously unauthorized boating facility (e.g. marinas).
4. Aids to Navigation and Temporary Recreational Structures	Aids to navigation and regulatory markers which are approved by and installed in accordance with the requirements of the U.S. Coast Guard. (See 33 CFR 66, Chapter I, subchapter C). **These SV Aids do not require a SVNF.* Temporary buoys, markers, floats, etc. for recreational use during specific events, provided: • They are removed within 30 days after the specific event has concluded. • No interference with navigation. • No impact to SAV.	Aids and temporary structures not eligible for SV.
5. Dredging, Disposal of Dredged Material, Beach Nourishment, and Rock Removal and Relocation	Maintenance dredging of <1,000 CY for navigational purposes with upland disposal including return water from upland contained disposal area, provided: • Proper siltation controls are used. • No expansion of footprint. • No dredging in or within a distance of three times the authorized depth of a Federal Navigation Project. • Dredging operation is limited to Nov. 8th to Apr. 9th (it is recommended that in areas populated by winter flounder, dredging should cease by March 15th). • No impacts to SAS (incl. SAV), impacts to natural rocky habitat ≤100 SF, and impacts to intertidal area ≤1,000 SF • No dredging within 25 feet of SAV. • No dredging in or within 100 feet of shellfish areas. • No blasting. • No dredging in designated or proposed critical habitat for endangered species.	Maintenance dredging not eligible for SV and new dredging <25,000 CY Includes return water from upland contained disposal areas. Disposal includes: • Upland. • Beach nourishment (above MHW line) of any area provided the dredging's primary purpose is navigation or the sand is from an upland source. • Open water & confined aquatic disposal if Corps finds the material suitable. Beach nourishment associated with dredging when the primary purpose is not navigation requires at least a PCN. Temporary and/or permanent fill or excavation in SAV <1,000 SF and Permanent fill or excavation in other SAS <4,300 SF

	SELF-VERIFICATION (SV)	PRE-CONSTRUCTION NOTIFICATION (PCN)
6. U.S. Coast Guard Approved Bridges and Causeways	Discharges of dredged or fill material associated with U.S. Coast Guard Approved Bridges and Causeways, provided: • In-water work is conducted "in-the-dry" (see GC 24). • Discharge of dredged or fill material <15,000 SF • No impacts to SAS (incl. SAV), impacts to natural rocky habitat ≤100 SF, and impacts to intertidal area ≤1,000 SF Compliance with the following is recommended: • *Discharge of dredged or fill material should not occur within 100 feet of SAV or within 25 feet of natural rocky habitat or other SAS.* *Note: new causeways and approach fills are not eligible for SV.*	Discharges of dredged or fill material associated with U.S. Coast Guard Approved Bridges and Causeways not eligible for SV, provided: • <1 acre temporary or permanent impacts, fill, excavation, and/or secondary impacts. • Temporary and/or permanent fill or excavation in SAV <1,000 SF • Permanent fill or excavation in other SAS <4,300 SF
7. Bank and Shoreline Stabilization Including Living Shorelines (see also GC 28)	Bank and shoreline stabilization activities, provided: • In-water work is conducted "in-the-dry" (see GC 24). • Fill is ≤500 LF in total length as measured below the plane of the HTL and is ≤200 LF in total length as measured below the plane of the MHWM or OHWM (includes total for more than one bank). Replacement vertical structures are ≤200 LF in total length as measured below the plane of the MHWM or OHWM and are ≤18 inches waterward of existing face. • Fill placed below HTL is ≤1 CY per linear foot. • Stone revetment is comprised of angular material. • No fills angled steeper than 1H:1V. • No impacts to SAS (incl. SAV), impacts to natural rocky habitat ≤100 SF, and impacts to intertidal or shellfish areas ≤1,000 SF • No new groins, breakwaters, or jetties.	Bank and shoreline stabilization activities not eligible for SV, provided: • <1 acre temporary or permanent impacts, fill, excavation, and/or secondary impacts, provided: • Temporary and/or permanent fill or excavation in SAV <1,000 SF • Permanent fill or excavation in other SAS <4,300 SF
8. Residential, Commercial and Institutional Developments, and Recreational Facilities	Not Eligible	Residential, commercial and institutional developments and recreational facilities, provided: • <1 acre temporary or permanent impacts, fill, excavation, and/or secondary impacts, provided: • Temporary and/or permanent fill or excavation in SAV <1,000 SF • Permanent fill or excavation in other SAS <4,300 SF Conversions of previously authorized pile-supported buildings over navigable waters to residences, offices, or other non-water dependent uses require PCN. Floating house boats or businesses on floats require PCN.

	SELF-VERIFICATION (SV)	PRE-CONSTRUCTION NOTIFICATION (PCN)
9. Utility Line Activities (see also GC 30)	Repair, replacement, or maintenance of previously authorized, currently serviceable utilities with no expansion or change in use, provided: • Conditions of the original authorization apply. • In-water work limited to Nov. 8th to Apr. 9th. • Trenching or filling confined to existing footprint and <100 LF; trenches shall be backfilled immediately. • Jet-plow, fluidization, or other direct burial methods confined to existing footprint and <200 LF • No impacts to SAS (incl. SAV), impacts to natural rocky habitat ≤100 SF, and impacts to intertidal or shellfish areas ≤1,000 SF • No work in designated or proposed critical habitat for endangered species. New work in, over, or under navigable waters including new outfalls and any intake structure work requires PCN. Aerial utility lines over navigable waters requires PCN.	Those utility activities not eligible for SV, provided: • <1 acre temporary or permanent impacts, fill, excavation, and/or secondary impacts. • Temporary and/or permanent fill or excavation in SAV <1,000 SF • Permanent fill or excavation in other SAS <4,300 SF
10. Linear Transportation Projects *(for stream crossings refer to GPs 6 and 22)*	Not Eligible	Linear transportation projects, provided: • <1 acre temporary or permanent impacts, fill, excavation, and/or secondary impacts. • Temporary and/or permanent fill or excavation in SAV <1,000 SF • Permanent fill or excavation in other SAS <4,300 SF
11. Mining Activities	Not Eligible	Not Eligible
12. Boat Ramps and Marine Railways	No new boat ramps or marine railways. In-water work is conducted “in-the-dry” (see GC 24). No impacts to SAS (incl. SAV), impacts to natural rocky habitat ≤100 SF, and impacts to intertidal or shellfish areas ≤1,000 SF Boat ramp and marine railway work not eligible for maintenance (i.e. not currently serviceable) may be replaced “in-kind” with minor deviations provided: • Work is confined to the intertidal zone. • No impacts to SAS (incl. SAV), impacts to natural rocky habitat ≤100 SF, and impacts to intertidal or shellfish areas ≤1,000 SF	Those ramps and railways not eligible for SV, provided: • <1 acre temporary or permanent impacts, fill, excavation, and/or secondary impacts, provided: • Temporary and/or permanent fill or excavation in SAV <1,000 SF • Permanent fill or excavation in other SAS <4,300 SF

	SELF-VERIFICATION (SV)	PRE-CONSTRUCTION NOTIFICATION (PCN)
13. Land and Water-Based Renewable Energy Generation Facilities and Hydropower Projects	Not Eligible	Work associated with those facilities and projects, provided: • <1 acre temporary or permanent impacts, fill, excavation, and/or secondary impacts. • Temporary and/or permanent fill or excavation in SAV <1,000 SF • Permanent fill or excavation in other SAS <4,300 SF For each single and complete project, no more than 10 generation units (e.g., wind turbines or hydrokinetic devices) may be authorized. No new impoundments.
14. Reshaping Existing Ditches and Mosquito Management	≤500 LF of drainage ditch will be modified. The reshaping of the ditch cannot increase drainage capacity beyond the original as-built capacity nor can it expand the area drained by the ditch as originally constructed (i.e., the capacity of the ditch shall be the same as originally constructed and it cannot drain additional wetlands or other waters of the U.S.). No new ditches or relocation of drainage ditches constructed in waters of the U.S.; the location of the centerline of the reshaped drainage ditch shall be approximately the same as the location of the centerline of the original drainage ditch. No impacts to SAS (incl. SAV), impacts to natural rocky habitat ≤100 SF, and impacts to intertidal or shellfish areas ≤1,000 SF	Those activities not eligible for SV, provided: • <1 acre temporary or permanent impacts, fill, excavation, and/or secondary impacts. • Temporary and/or permanent fill or excavation in SAV <1,000 SF • Permanent fill or excavation in other SAS <4,300 SF
15. Response Operations for Oil or Hazardous Substances	The SVNF or a surrogate state reporting form may be submitted after-the-fact for spill response activities. This GP also authorizes the use of temporary structures and fills in waters of the U.S. for spill response training exercises (*SVNF is required prior to the activity*), provided: • No impacts to SAS (incl. SAV), impacts to natural rocky habitat ≤100 SF, impacts to intertidal or shellfish areas ≤1,000 SF, and impacts to tidal resources <0.5 acre	Those response operations not eligible for SV, provided: • <1 acre temporary or permanent impacts, fill, excavation, and/or secondary impacts. • Temporary and/or permanent fill or excavation in SAV <1,000 SF • Permanent fill or excavation in other SAS <4,300 SF
16. Cleanup of Hazardous and Toxic Waste	Only booms placed for hazardous and toxic waste containment and absorption and prevention are eligible for SV. *A SVNF is not required for these eligible containment booms.*	Cleanup activities not eligible for SV, provided: • <1 acre temporary or permanent impacts, fill, excavation, and/or secondary impacts. • Temporary and/or permanent fill or excavation in SAV <1,000 SF • Permanent fill or excavation in other SAS <4,300 SF An IP is require for the establishment of new disposal sites or expanding existing sites used for the disposal of hazardous or toxic waste.

	SELF-VERIFICATION (SV)	PRE-CONSTRUCTION NOTIFICATION (PCN)
17. Scientific Measurements Devices	Those scientific measurements devices, provided: • Devices do not restrict or concentrate movement of aquatic organisms. • No interference with navigation. • No blasting. • No biological sampling devices. • No impacts to SAS (incl. SAV), impacts to natural rocky habitat ≤100 SF, impacts to intertidal areas ≤1,000 SF, and impacts to tidal resources ≤0.5 acre • Upon completion of use, the devices and any associated structures or fills are removed in their entirety.	Those scientific measurements devices not eligible for SV, provided: • <1 acre temporary or permanent impacts, fill, excavation, and/or secondary impacts. • Temporary and/or permanent fill or excavation in SAV <1,000 SF • Permanent fill or excavation in other SAS <4,300 SF
18. Survey Activities	Those survey activities, provided: • No blasting. • No interference with navigation. • No seismic exploratory operations. • No oil and gas exploration. • No trenching or other silt-producing activities. • No fill for roads or construction pads. • No impacts to SAS (incl. SAV), impacts to natural rocky habitat ≤100 SF, impacts to intertidal areas ≤1,000 SF, and impacts to tidal resources <0.5 acre • No blasting. • No biological sampling devices. *A SVNF is not required for required sediment sampling for Corps-regulated dredge proposals.*	Those survey activities not eligible for SV, provided: • <1 acre temporary or permanent impacts, fill, excavation, and/or secondary impacts. • Temporary and/or permanent fill or excavation in SAV <1,000 SF • Permanent fill or excavation in other SAS <4,300 SF
19. Agricultural Activities	Not Eligible	Not Eligible
20. Fish and Wildlife Harvesting, Enhancement and Attraction Devices and Activities *(for aquaculture refer to GP 23)*	Those devices and activities, provided: • No impacts to SAS (incl. SAV), impacts to natural rocky habitat ≤100 SF, impacts to intertidal areas ≤1,000 SF, and impacts to tidal resources ≤0.5 acre • No interference with navigation. • No artificial reefs or enclosures • No impoundments or semi-impoundments for the culture or holding of motile species such as lobster, or the use of covered oyster trays or clam racks. • Structures and shell hash should not be located within 25 feet of SAV. • All gear, except for mooring tackle, when not in use on the site is stored in an upland location above the MHWM and not on wetland (incl. salt marsh). *A SVNF is not required for these eligible devices and activities.*	Those devices and activities not eligible for SV, provided: • <1 acre temporary or permanent impacts, fill, excavation, and/or secondary impacts. • Temporary and/or permanent fill or excavation in SAV <1,000 SF • Permanent fill or excavation in other SAS <4,300 SF Impoundments or semi-impoundments of waters of the U.S. for the culture or holding of motile species such as lobster and new fish weirs with an impounded area <0.5 acre

	SELF-VERIFICATION (SV)	PRE-CONSTRUCTION NOTIFICATION (PCN)
21. Habitat Restoration, Establishment, and Enhancement	Those activities, provided: • No impacts to SAS (incl. SAV), impacts to natural rocky habitat ≤100 SF, impacts to intertidal areas ≤1,000 SF, and impacts to tidal resources <0.5 acre • No thin layer deposition for salt marsh restoration. • SAS planting and transplanting is <100 SF • No artificial or living reefs. • The activity is authorized in writing by a local, state, or non-Corps federal environmental agency. Water impoundments require PCN. • No conversion of i) a stream to wetland or vice versa, wetland to a pond or uplands, and ii) one wetland type to another. • No dam removal.	Those activities not eligible for SV provided those activities are proactive and result in net increases in aquatic resource functions and services.
22. Stream and Wetland Work and Crossings (see also GC 29) (*see GP 6 for bridges & causeways*)	Not Eligible	Those crossings of tidal navigable water not including bridges and causeways, provided: • <1 acre temporary or permanent impacts, fill, excavation, and/or secondary impacts. • Temporary and/or permanent fill or excavation in SAV <1,000 SF • Permanent fill or excavation in other SAS <4,300 SF
23. Aquaculture* **(see also GC 32)**	Shellfish and marine algae installations that do not exceed 400 SF in area, provided: • Signed approval from Harbormaster or appropriate Town Official. • No enclosures or impoundments. • Not located in or within a distance of three times the authorized depth of a Federal Navigation Project. • Not located in or impinge upon the value of any National Lands or Federal Properties. • No impacts to SAS (incl. SAV), impacts to natural rocky habitat ≤100 SF, and impacts to intertidal and shellfish areas ≤1,000 SF • No structures, cages, gear, or shell hash located in/within 25 feet of SAV. • All gear, except for mooring tackle, when not in use on the site is stored in an upland location above the MHWM and not on wetland (incl. salt marsh).	Shellfish, finfish, and marine algae aquaculture (with the exception of Atlantic salmon and any other salmonid, or other federally-listed endangered or threatened species), or other aquaculture facilities with no more than minimal individual and cumulative impacts to environmental resources or navigation. This is inclusive but not limited to cages, nets, bags, racks, long lines, fences, posts, poles, predator screening, etc. ***State of Maine Aquaculture guidelines are provided at: *www.maine.gov/dmr/aquaculture/index.html***

Section VIII: Agency Contacts

1. Federal

U.S. Army Corps of Engineers
Maine Project Office
442 Civic Center Drive, Suite 350
Augusta, Maine 04330
(207) 623-8367; (207) 623-8206 (fax)
Email: cenae-r-me@usace.army.mil

U.S. Environmental Protection Agency
5 Post Office Square
Suite 100 (OEP05–2)
Boston, Massachusetts 02109-3912
(617) 918-1589

U.S. Fish and Wildlife Service
Maine Field Office
P.O. Box A
East Orland, Maine 04431
(207) 469-7300; (207) 902-1588 (fax)
(Federal endangered species)

National Marine Fisheries Service
Maine Field Office
17 Godfrey Drive, Suite 1
Orono, Maine 04473
(207) 866-7379; (207) 866-7342 (fax)
(Federal endangered species)

FEMA Region 1
Federal Insurance and Mitigation Division
99 High Street 6th Floor
Boston, Massachusetts 02110
(floodplains)

Federal Emergency Management Agency
99 High Street
Boston, Massachusetts 02110
(877) 336-2734
(Floodplain Management)

National Marine Fisheries Service
55 Great Republic Drive
Gloucester, Massachusetts 01930
(978) 281-9102; (978) 281-9301 (fax)
(Federal endangered species & EFH)

National Park Service
North Atlantic Region
15 State Street
Boston, Massachusetts 02109
(617) 223-5203
(Wild and Scenic Rivers)

Commander (dpb)
First Coast Guard District
One South Street - Battery Building
New York, New York 10004-1466
(212) 668-7021; (212) 668-7967 (fax)
(bridge permits)

2. State of Maine

a. Department of Environmental Protection (*State permits & Water Quality Certifications*)

Augusta Regional Office
17 State House Station
Augusta, Maine 04333
(207) 287-7688

Southern Maine Regional Office
312 Canco Road
Portland, Maine 04103
(201) 822-6300

Eastern Maine Regional Office
106 Hogan Road
Bangor, Maine 04401
(207) 941-4570

Northern Maine Regional Office
1235 Central Drive
Presque Isle, Maine 04769
(207) 764-0477

b. Department of Agriculture, Conservation and Forestry

i. Maine Land Use Planning Commission (LUPC) (*State permits & Water Quality Certifications for the unorganized areas of the State*)

Augusta Office
22 State House Station
Augusta, Maine 04333-0022
(207) 287-2631; (207) 287-7439 (fax)

Greenville Regional Office
43 Lakeview Drive
P.O. Box 1107
Greenville, Maine 04441
(207) 695-2466; (207) 695-2380 (fax)

Western Region Office
932 U.S. Route 2
East Wilton, Maine 04992
(207) 670-7492; (207) 287-7439 (fax)

Downeast Regional Office
106 Hogan Road, Suite 8
Bangor, Maine 04401
(207) 215-4685; (207) 941-4222 (fax)

Ashland Regional Office
45 Radar Road
Ashland, Maine 04732-3600
(207) 435-7963; (207) 435-7184 (fax)

Eastern Region Office
191 Main Street
East Millinocket, Maine 04430
(207) 399-2176; (207) 746-2243 (fax)

ii. Maine Coastal Program

21 State House Station
Augusta, Maine 04333
(207) 707-2324; (207) 624-6024 (fax)
(CZM consistency determinations)

iii. Division of Parks and Public Lands

22 State House Station
Augusta, Maine 04333
(207) 287-3061; (207) 287-6170 (fax)
(submerged lands leases)

iv. Maine Floodplain Management Program

17 Elkins Lane
Augusta, Maine 04333
(207) 287-8063
(floodplains)

c. Department of Marine Resources

21 State House Station
Augusta, Maine 04333
(207) 633-9500; (207) 624-6024 (fax)
(aquaculture leases/licenses)

3. Historic Properties

a. State Historic Preservation Officer (SHPO)

Kirk F. Mohney, Director
Maine Historic Preservation Commission
65 State House Station
Augusta, Maine 04333-0065
(207) 287-2132; (207) 287-2335 (fax)

b. Tribal Historic Preservation Officers (THPOs)

Houlton Band of Maliseet Indians
88 Bell Road
Littleton, Maine 04730
(207) 532-4273, x215; (207) 532-6883 (fax)
istjohn@maliseets.com

Aroostook Band of Micmacs
7 Northern Road
Presque Isle, Maine 04769
(207) 764-1972; (207) 764-7667 (fax)
jdennis@micmac-nsn.gov

Passamaquoddy Tribe of Indians
Pleasant Point Reservation
P.O. Box 343
Perry, Maine 04667
(207) 853-2600; (207) 853-6039 (fax)
soctomah@gmail.com

Penobscot Nation
Cultural and Historic Preservation Dept.
12 Wabanaki Way
Indian Island, Maine 04468
(207) 817-7471
chris.sockalexis@penobscotnation.org

Passamaquoddy Tribe of Indians
Indian Township Reservation
P.O. Box 301
Princeton, Maine 04668
(207) 796-2301; (207) 796-5256 (fax)
soctomah@gmail.com

Section IX: Definitions

Action Area: The "Endangered Species Consultation Handbook – Procedures for Conducting Consultation and Conference Activities Under Section 7 of the ESA," defines action area as "all areas to be affected directly or indirectly by the federal action and not merely the immediate area involved in the action. [50 CFR 402.02]."

Agricultural Activities: The Clean Water Act exempts certain discharges associated with normal farming, ranching, and forestry activities such as plowing, cultivating, minor drainage, and harvesting for the production of food, fiber, and forest products, or upland soil and water conservation practices (Section 404(f)(1)(A)). Prospective permittees are strongly advised to contact the Corps for a determination of whether their activity is exempt or requires a permit.

Attendant Features: Occurring with or as a result of; accompanying.

Aquatic Habitat Restoration, Establishment and Enhancement: The Corps will decide if a project qualifies and must determine in consultation with federal and state agencies that the net effects are beneficial. The Corps may refer to Nationwide Permit 27 published in the January 6, 2017 Federal Register. Activities authorized here may include, but are not limited to: the removal of accumulated sediments; the installation, removal, and maintenance of small water control structures, dikes, and berms; the installation of current deflectors; the enhancement, restoration, or establishment of riffle and pool stream structure; the placement of in-stream habitat structures; modifications of the stream bed and/or banks to restore or establish stream meanders; the backfilling of artificial channels and drainage ditches; the removal of existing drainage structures; the construction of small nesting islands in inland waters**;** the construction of open water areas; the construction of native shellfish species habitat over unvegetated bottom for the purpose of habitat protection or restoration in tidal waters; shellfish seeding; activities needed to reestablish vegetation, including plowing or discing for seed bed preparation and the planting of appropriate wetland species; mechanized land clearing to remove non-native invasive, exotic, or nuisance vegetation; and other related activities. Only native plant species shall be planted at the site.

Biodegradable: A material that decomposes into elements found in nature within a reasonably short period of time and will not leave a residue of plastic or a petroleum derivative in the environment after degradation. Examples of biodegradable materials include jute, sisal, cotton, straw, burlap, coconut husk fiber (coir) or excelsior. In contrast, degradable plastics break down into plastic fragments that remain in the environment after degradation.

Boating facilities: These provide, rent or sell mooring space, such as marinas, yacht clubs, boat yards, dockominiums, town facilities, land/home owners, etc. Not classified as boating facilities are piers shared between two abutting properties or town mooring fields that charge an equitable user fee based on the actual costs incurred.

Bordering and Contiguous Wetlands: A bordering wetland is immediately next to its adjacent waterbody and may lie at, or below, the ordinary high water mark (mean high water mark in navigable waters) of that waterbody and is directly influenced by its hydrologic regime. Contiguous wetlands extend landward from their adjacent waterbody to a point where a natural or manmade discontinuity exists. Contiguous wetlands include bordering wetlands as well as wetlands that are situated immediately above the ordinary high water mark and above the normal hydrologic influence of their adjacent waterbody.

Brushing: The placement of tree boughs, wooden lath structure, or small-mesh fencing on mudflats, or any bottom disturbance (e.g., discing, plowing, raking, etc.), to enhance recruitment of shellfish.

Buffer Zone: The buffer zone of an FNP is equal to three times the authorized depth of the FNP.

Construction mats: Constructions, swamp and timber mats (herein referred to as "construction mats") are generic terms used to describe structures that distribute equipment weight to prevent wetland damage while facilitating passage and providing work platforms for workers and equipment. They are comprised of sheets or mats made from a variety of materials in various sizes. A timber mat consists of large timbers bolted or cabled together. Corduroy roads, which are not considered to be construction mats, are cut trees and/or saplings with the

crowns and branches removed, and the trunks lined up next to one another. Corduroy roads are typically installed as permanent structures. Like construction mats, they are considered as fill whether they are installed temporarily or permanently.

Cumulative effects: See "Direct, secondary, and cumulative effects."

Currently Serviceable: Useable as-is or with some maintenance, but not so degraded as to essential require reconstruction.

Direct, secondary, and cumulative effects:
Direct Effects: The loss of aquatic ecosystem within the footprint of the discharge of dredged or fill material. Direct effects are caused by the action and occur at the same time and place.
Secondary Effects: These are effects on an aquatic ecosystem that are associated with a discharge of dredged or fill materials, but do not result from the actual placement of the dredged or fill material. Information about secondary effects on aquatic ecosystems shall be considered prior to the time final Section 404 action is taken by permitting authorities. Some examples of secondary effects on an aquatic ecosystem are a) aquatic areas drained, flooded, fragmented, or mechanically cleared, b) fluctuating water levels in all impoundment and downstream associated with the operation of a dam, c) septic tank leaching and surface runoff from residential or commercial developments on fill, and d) leachate and runoff from a sanitary landfill located in waters of the U.S. See 40 CFR 230.11(h).
Cumulative Effects: The changes in an aquatic ecosystem that are attributable to the collective effect of a number of individual 1) discharges of dredged or fill material, or 2) structures. Although the impact of a particular discharge may constitute a minor change in itself, the cumulative effect of numerous such piecemeal changes can result in a major impairment of the water resources and interfere with the productivity and water quality of existing aquatic ecosystems. See 40 CFR 230(g).

Dredging:
Maintenance Dredging: Includes areas and depths previously authorized by the Corps and dredged.
The Corps may require proof of authorization. Maintenance dredging typically refers to the routine removal of accumulated sediment from channel beds to maintain the design depths of navigation channels, harbors, marinas, boat launches and port facilities. Routine maintenance dredging is conducted regularly for navigational purposes (typically at least once every ten years) and does not include any expansion of the previously dredged area or depth. The Corps may review a maintenance dredging activity as new dredging if sufficient time has elapsed to allow for the colonization of SAS, shellfish, etc. The main characteristics of maintenance dredging projects are variable quantities of material; soft, uncompacted soil; contaminant content possible; thin layers of material; occurring in navigation channels and harbors; repetitive activity
New Dredging: Dredging of an area or to a depth that has never been authorized by the Corps or dredged.

Dredged material & discharge of dredged material: These are defined at 323.2(c) and (d). The term dredged material means material that is excavated or dredged from waters of the U.S.

Essential Fish Habitat (EFH): This is broadly defined to include those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity.

Fill material & discharge of fill material: These are defined at 323.2(e) and (f). The term fill material is defined as material placed in waters of the U.S. where the material has the effect of either replacing any portion of a water of the U.S. with dry land or changing the bottom elevation of any portion of a water of the U.S.

Fill area: Fill area includes all temporary and permanent fill (including mats), and regulated discharges associated with excavation.

Federal navigation projects (FNPs): These areas are maintained by the Corps; authorized, constructed and maintained on the premise that they will be accessible and available to all on equal terms; and are comprised of Federal Anchorages, Federal Channels and Federal Turning Basins. The buffer zone is equal to three times the authorized depth of a FNP. More information on the following FNPs is provided at *www.nae.usace.army.mil/missions/navigation.aspx* >> Navigation Projects.

Flume: An open artificial water channel, in the form of a gravity chute that leads water from a diversion dam or weir completely aside a natural flow. A flume can be used to measure the rate of flow.

Frac out: During normal drilling operations, drilling fluid travels up the borehole into a pit. When the borehole becomes obstructed or the pressure becomes too great inside the borehole, the ground fractures and fluid escapes to the surface.

Habitat Connectivity Design: projects designed and constructed for consistency with natural stream dimensions, profiles, and dynamics, in accordance with the following technical references: U.S. Forest Service guide (Forest Service Stream-Simulation Working Group 2008), augmented by documents published by the states of Washington (Barnard et al. 2013), Vermont (Bates and Kirn 2009) and California (Love and Bates 2009).

Independent utility: A test to determine what constitutes a single and complete non-linear project in the Corps regulatory program. A project is considered to have independent utility if it would be constructed absent the construction of other projects in the project area. Portions of a multi-phase project that depend upon other phases of the project do not have independent utility. Phases of a project that would be constructed even if the other phases were not built can be considered as separate single and complete projects with independent utility.

Individual Permit: A Department of the Army authorization that is issued following a case-by-case evaluation of a specific structure or work in accordance with the procedures of 33 CFR 322, or a specific project involving the proposed discharge(s) in accordance with the procedures of 33 CFR 323, and in accordance with the procedures of 33 CFR 325 and a determination that the proposed discharge is in the public interest pursuant to 33 CFR 320.

Living Shoreline: Living shorelines stabilize banks and shores in coastal waters along shores with small fetch and gentle slopes that are subject to low-to mid-energy waves. A living shoreline has a footprint that is made up mostly of native material. It incorporates vegetation or other living, natural "soft" elements alone or in combination with some type of harder shoreline structure (e.g., oyster or mussel reefs or rock sills) for added protection and stability. Living shorelines shall maintain the natural continuity of the land-water interface, and retain or enhance shoreline ecological processes. Living shorelines must have a substantial biological component, either tidal or lacustrine fringe wetlands or oyster or mussel reef structures.

Maintenance:

a. The repair, rehabilitation, or replacement of any previously authorized, currently serviceable structure or fill, or of any currently serviceable structure or fill authorized by 33 CFR 330.3 – "Activities occurring before certain dates," provided that the structure or fill is not to be put to uses differing from those uses specified or contemplated for it in the original permit or the most recently authorized modification.

- Minor deviations in the structure's configuration or filled area, including those due to changes in materials, construction techniques, or current construction codes or safety standards that are necessary to make repair, rehabilitation, or replacement are authorized.
- Currently serviceable means useable as is or with some maintenance, but not so degraded as to essentially require reconstruction.
- No seaward expansion for bulkheads or any other fill activity is considered SV maintenance.
- Only structures or fills that were previously authorized and are in compliance with the terms and condition of the original authorization can be maintained as a non-regulated activity under 33 CFR 323.4(a)(2), or in accordance with the SV or PCN thresholds in Section V.

b. The state's maintenance provisions may differ from the Corps and may require reporting and written authorization from the state.

c. Contact the Corps to determine whether stream crossing replacements require a PCN.

d. Exempted Maintenance. In accordance with 33 CFR 323.4(a)(2), any discharge of dredged or fill material that may result from any of the following activities is not prohibited by or otherwise subject to regulation under Section 404 of the CWA: "Maintenance, including emergency reconstruction of recently damaged parts, of currently serviceable structures such as dikes, dams, levees, groins, riprap, breakwaters, causeways, bridge abutments or approaches, and transportation structures. Maintenance does not include any modification that changes the character, scope, or size of the original fill design."

The following definition is also applicable:

Minor deviations: Deviations in the structure's configuration or filled area, including those due to changes in materials, construction techniques, or current construction codes or safety standards, which are necessary to make repair, rehabilitation, or replacement are permitted, provided the adverse environ-mental effects resulting from such repair, rehabilitation, or replacement are minimal.

Marina reconfiguration zone: A Corps-authorized area in which permittees may rearrange pile-supported structures and floats without additional authorizations. A reconfiguration zone does not grant exclusive privileges to an area or an increase in structure or float area.

Natural Rocky Habitats: Natural rocky habitats are intertidal and subtidal substrates composed of pebble-gravel, cobble, boulder, or rock ledge and outcrops. Manufactured stone (e.g. cut or engineered rip-rap) is not considered a natural rocky habitat. Natural rocky habitats are either found as pavement (consolidated pebble-gravel, cobble, or boulder areas) or as a mixture with fines (i.e. clay and sand) and other substrates.

Navigable waters of the U.S.: See Waters of the U.S. below.

Overall project: See "single and complete linear project" below.

Practicable: Available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purposes.

Permanent impacts: Permanent impacts means waters of the U.S. that are permanently affected by filling, flooding, excavation, or drainage because of the regulated activity. Permanent impacts include permanent discharges of dredged or fill material that change an aquatic area to dry land, increase the bottom elevation of a waterbody, or change the use of a waterbody.

Pre-construction notification (PCN): A request submitted by a prospective permittee to the Corps for confirmation that a particular activity is authorized by this GP. The request may be a permit application, letter, or similar document that includes information about the proposed work and its anticipated environmental effects. Pre-construction notification may be required by the terms and conditions of these GPs. A PCN may be voluntarily submitted in cases where PCN is not required and the project proponent wants confirmation that the activity is authorized under this GP.

Re-establishment: The manipulation of the physical, chemical, or biological characteristics of a site with the goal of returning natural/ historic functions to a former aquatic resource. Re-establishment results in rebuilding a former aquatic resource and results in again in aquatic resource area and functions.

Rehabilitation: The manipulation of the physical, chemical, or biological characteristics of a site with the goal of repairing natural/historic functions to a degraded aquatic resource. Rehabilitation results in a gain in aquatic resource function, but does not result in a gain in aquatic resource area. Restoration: The manipulation of the physical, chemical, or biological characteristics of a site with the goal of returning natural/historic functions to a former or degraded aquatic resource. For the purpose of tracking net gains in aquatic resource area, restoration is divided into two categories: re-establishment and rehabilitation.

Restoration: The manipulation of the physical, chemical, or biological characteristics of a site with the goal of returning natural/historic functions to a former or degraded aquatic resource. For the purpose of tracking net gains in aquatic resource area, restoration is divided into two categories: re-establishment and rehabilitation.

Riffle and pool complexes: Riffle and pool complexes are special aquatic sites under the 404(b)(1) Guidelines. Riffle and pool complexes sometimes characterize steep gradient sections of streams. Such stream sections are recognizable by their hydraulic characteristics. The rapid movement of water over a course substrate in riffles results in a rough flow, a turbulent surface, and high dissolved oxygen levels in the water. Pools are deeper areas associated with riffles. A slower stream velocity, a streaming flow, a smooth surface, and a finer substrate characterize pools.

Secondary effects: See "Direct, secondary, and cumulative effects."

Shellfish Areas: Areas that currently support molluscan shellfish. Information regarding these locations can be obtained from the State of Maine GeoLibrary Data Catalog at: *www.maine.gov/geolib/catalog.html*

Shellfish seeding: The placement of shellfish seed and/or suitable substrate to increase shellfish production. Shellfish seed consists of immature individual shellfish or individual shellfish attached to shells or shell fragments (i.e., spat on shell). Suitable substrate may consist of shellfish shells, shell fragments, or other appropriate materials placed into waters for shellfish habitat.

Single and complete linear project: A linear project is a project constructed for the purpose of getting people, goods, or services from a point of origin to a terminal point, which often involves multiple crossings of one or more waterbodies at separate and distant locations. The term "single and complete project" is defined as that portion of the total linear project proposed or accomplished by one owner/developer or partnership or other association of owners/developers that includes all crossings of a single water of the U.S. (i.e., a single waterbody) at a specific location. For linear projects crossing a single or multiple waterbodies several times at separate and distant locations, each crossing is considered a single and complete project for the purposes of this GP. However, individual channels in a braided stream or river, or individual arms of a large, irregularly shaped wetland or lake, etc., are not separate waterbodies, and crossings of such features cannot be considered separately.
The overall project, for purposes of this GP, includes all regulated activities that are reasonably related and necessary to accomplish the project purpose.

Single and complete non-linear project: For non-linear projects, the term "single and complete project" is defined at 33 CFR 330.2(i) as the total project proposed or accomplished by one owner/developer or partnership or other association of owners/developers. For non-linear projects, the single and complete project shall have independent utility (see definition).

Special aquatic sites (SAS): These are defined at 40 CFR 230 Subpart E. They include sanctuaries and refuges, wetlands, mud flats, vegetated shallows (submerged aquatic vegetation, SAV), coral reefs, and riffle and pool complexes.

Stream: The term "stream" in the document means rivers, streams, brooks, etc.

Stream bed: The substrate of the stream channel between the ordinary high water marks. The substrate may be bedrock or inorganic particles that range in size from clay to boulders. Wetlands contiguous to the stream bed, but outside of the ordinary high water marks, are not considered part of the stream bed.

Stream channelization: The manipulation of a stream's course, condition, capacity, or location that causes more than minimal interruption of normal stream processes. A channelized stream remains a water of the United States.

Stream Simulation: A method for designing and building road-stream crossings intended to permit free and unrestricted movements of any aquatic species. Reference:
https://www.nae.usace.army.mil/Missions/Regulatory/Stream-and-River-Continuity/

Stream Smart Design: projects designed to allow the stream to act like a stream by passing fish and wildlife as well as the higher flows that come with large infrequent storms while protecting the stability of the road and public safety. Stream Smart Design follows the "Four S's": The culvert must SPAN the stream, allowing for passage of aquatic and terrestrial wildlife. The culvert has to be SET at the right elevation. The SLOPE of the culvert must match the stream. There must be SUBSTRATE (natural sediment) in the crossing. Reference:
www1.maine.gov/mdot/publications/docs/brochures/pocket_guide_stream_smart_web.pdf

Temporary impacts: Temporary impacts include waters of the U.S. that are temporarily filled, flooded, excavated, drained or mechanically cleared because of the regulated activity.

Temporal loss: The time lag between the loss of aquatic resource functions caused by the permitted impacts and the replacement of aquatic resource functions at the compensatory mitigation site(s) (33 CFR 332.2).

Utility line: Any pipe or pipeline for the transportation of any gaseous, liquid, liquescent, or slurry substance, for any purpose, and any cable, line, or wire for the transmission for any purpose of electrical energy, telephone, and telegraph messages, and radio and television communication. The term 'utility line' does not include activities that drain a water of the U.S., such as drainage tile or French drains, but it does apply to pipes conveying drainage from another area.

Vegetated shallows/Submerged Aquatic Vegetation (SAV): Permanently inundated areas that under normal circumstances support communities of rooted aquatic vegetation, such as eelgrass in marine systems as well as a number of freshwater species in rivers and lakes. Note: Eelgrass surveys should be conducted be conducted between May and October unless otherwise directed.

Vernal pools (VPs): The State of Maine, Department of Environmental Protection has specific protections for VPs. For the purposes of these GPs, VPs are depressional wetland basins that typically go dry in most years and may contain inlets or outlets, typically of intermittent flow. Vernal pools range in both size and depth depending upon landscape position and parent material(s). In most years, VPs support one or more of the following obligate indicator species: wood frogs (*Rana sylvatica*), spotted salamanders (*Ambystoma maculatum*), blue-spotted salamanders (*Ambystoma laterale*), and fairy shrimp (*Eubranchipus* sp.). However, they should preclude sustainable populations of predatory fish.

Water dependency: activity requiring access or proximity to or siting within a special aquatic site (SAS) to fulfill its basic project purpose.

Water diversions: Water diversions are activities such as bypass pumping (e.g., "dam and pump") or water withdrawals. Temporary flume pipes, culverts or cofferdams where normal flows are maintained within the stream boundary's confines aren't water diversions. "Normal flows" are defined as no change in flow from pre-project conditions.

Weir: A barrier across a river designed to alter the flow characteristics. In most cases, weirs take the form of a barrier, smaller than most conventional dams, across a river that causes water to pool behind the structure (not unlike a dam) and allows water to flow over the top. Weirs are commonly used to alter the flow regime of the river, prevent flooding, measure discharge and help render a river navigable.

Waters of the United States (U.S.)

Waters of the U.S.: The term waters of the U.S. and all other terms relating to the geographic scope of jurisdiction are defined at 33 CFR 328. Also see Section 502(7) of the Federal CWA [33 USC 1352(7)]. Waters of the U.S. include jurisdictional wetlands. Not all waters and wetlands are jurisdictional. Contact the Corps with any questions regarding jurisdiction.

Navigable waters: Refer to 33 CFR 329. These waters include the following federally-designated navigable waters in New England. This list represents only those waterbodies for which affirmative determinations have been made; absence from this list shall not be taken as an indication that the waterbody is not navigable: In Maine, navigable waters are those waters that are subject to the ebb and flow of the tide in addition to the non-tidal portions of the following federally-designated waters in Maine (the Kennebec River to Moosehead Lake, the Penobscot River to the confluence of the East and West Branch at Medway and, Lake Umbagog within the State of Maine).

Non-tidal wetland: A non-tidal wetland is a wetland that is not subject to the ebb and flow of tidal waters. Non-tidal wetlands contiguous to tidal waters are located landward of the high tide line (i.e., spring high tide line).

Tidal wetland: A tidal wetland is a jurisdictional wetland that is inundated by tidal waters. Tidal waters rise and fall in a predictable and measurable rhythm or cycle due to the gravitational pulls of the moon and sun. Tidal waters end where the rise and fall of the water surface can no longer be practically measured in a predictable rhythm due to masking by other waters, wind, or other effects. Tidal wetlands are located channelward of the high tideline.

U.S. Department of Homeland Security

UNITED STATES COAST GUARD

BRIDGE PERMIT

8 DEC 2020

(3-20-1)

WHEREAS by an act of Congress approved 26 September 1972 entitled "International Bridge Act of 1972," (33 U.S.C. § 535), the consent of Congress was granted for the construction, maintenance and operation of any bridge and approaches thereto which will connect the United States with any foreign country;

AND WHEREAS said consent is subject to the provisions of an act entitled "An Act to regulate the construction of bridges over navigable waters," approved 23 March 1906 (33 U.S.C. § § 491-498 except Section 6 of 33 U.S.C. § 496);

AND WHEREAS the approval of the Secretary of Homeland Security as required by that act shall be given only subsequent to the President's approval for the construction, maintenance and operation of the International Bridge, as provided for in Section 4 of the "International Bridge Act of 1972" and said Presidential approval is not required as authorization to construct, maintain, and operate the bridge was granted by an act of Congress approved 11 July 1919, as amended;

AND WHEREAS the functions, powers and duties which were vested in the Secretary of Homeland Security under Section 5 of the "International Bridge Act of 1972" as they relate to navigable waterways other than the Saint Lawrence River, have been delegated by the Secretary to the Commandant, U.S. Coast Guard by Department of Homeland Security Delegation Number: 0170.1;

AND WHEREAS the - **STATE OF MAINE** - has submitted for approval the location and plans of an international bridge to be constructed across the St. John River between Madawaska, Maine, and Edmundston, New Brunswick, Canada;

NOW THEREFORE, This is to certify that the location and plans dated 21 February 2020 are hereby approved by the Commandant, subject to the following conditions:

1. No deviation from the approved plans may be made either before or after completion of the structure unless the modification of said plans has previously been submitted to and received the approval of the Commandant.

2. The construction of falsework, pilings, cofferdams or other obstructions, if required, shall be in accordance with plans submitted to and approved by the Commander, First Coast Guard District, prior to construction of the bridge. All work shall be so conducted that the free navigation of the waterway is not unreasonably interfered with and the present navigable depths are not impaired. Timely notice of any and all events that may affect navigation shall be given to the District Commander during construction of the bridge. The channel or channels through the structure shall

be promptly cleared of all obstructions placed therein or caused by the construction of the bridge to the satisfaction of the District Commander, when in the judgment of the District Commander the construction work has reached a point where such action should be taken.

3. Issuance of this permit does not relieve the permittee of the obligation or responsibility for compliance with the provisions of any other law or regulation as may be under the jurisdiction of any federal, state or local authority having cognizance of any aspect of the location, construction or maintenance of said bridge.

4. This bridge permit approves only that portion of the permanent and temporary trestle to be constructed across waters under the jurisdiction of the United States.

5. A bridge protective system shall be installed and maintained in good condition by and at the expense of the owner of the bridge when so required by the District Commander. Said installation and maintenance shall be for the safety of navigation and be in accordance with plans submitted to and approved by the District Commander prior to its construction.

6. Clearance gauges shall be installed and maintained in a good and legible condition by and at the expense of the owner of the bridge when so required by the District Commander. The type of gauges and the locations in which they are to be installed will be submitted to the District Commander for approval.

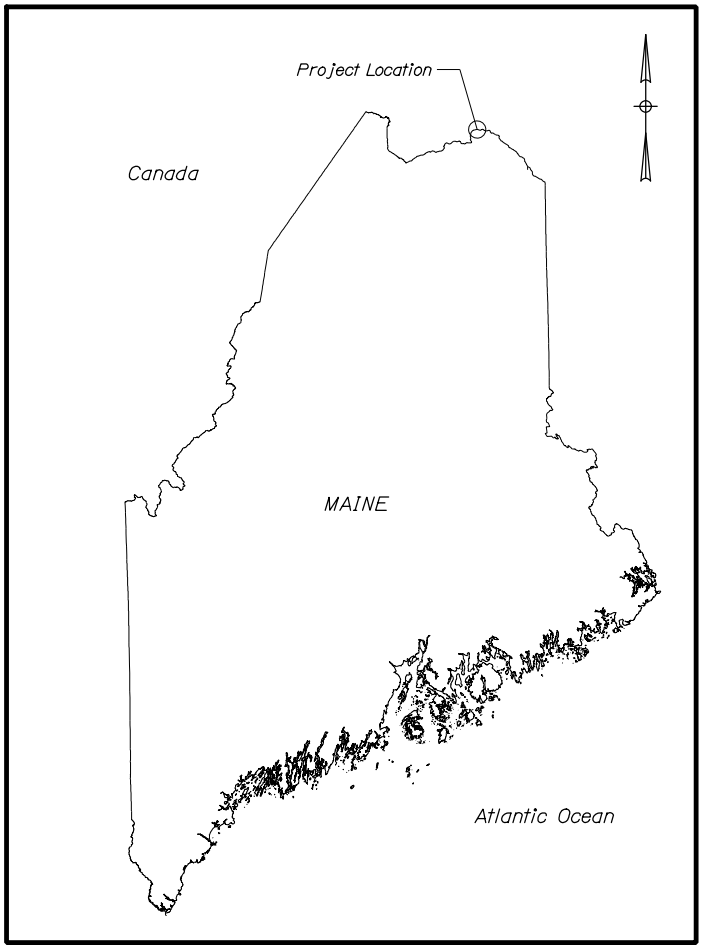
7. The temporary trestles across the St. John River, mile 232.0, shall be constructed in accordance with the approved plan sheets 6 and 7 (of 7) dated 21 February 2020. All parts of the temporary trestles, or incomplete parts thereof, shall be removed in their entirety and the waterway cleared to the satisfaction of the District Commander. Such removal and clearance shall be completed by and at the expense of the owner of the bridge upon due notice from the District Commander.

8. All parts of the existing to-be-replaced Madawaska-Edmundston International Bridge across the St. John River, mile 232.0, not utilized in the new bridge shall be removed down to a minimum of two feet below the mud line or natural ground line and the waterway cleared to the satisfaction of the District Commander. Such removal and clearance shall be completed when the District Commander determines that the construction of the new bridge, mile 232.0, has reached a point where such action should be taken.

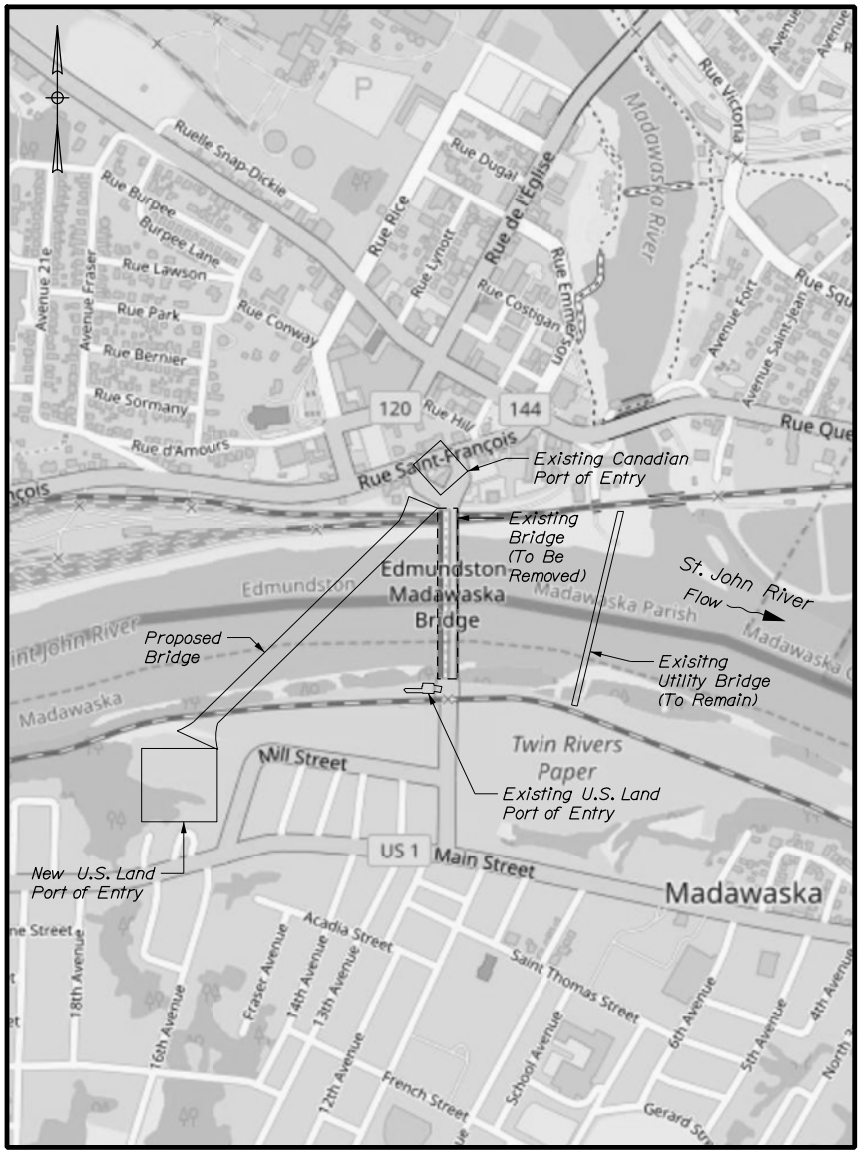
9. When the proposed bridge is no longer used for transportation purposes, that portion of the bridge constructed across waters under the jurisdiction of the United States shall be removed in its entirety or to an elevation deemed appropriate by the District Commander and the waterway cleared to the satisfaction of the District Commander. Such removal and clearance shall be completed by and at the expense of the owner of the bridge upon due notice from the District Commander.

10. The approval hereby granted shall cease and be null and void unless construction of the bridge is commenced within two years and completed within five years after the date of this permit.

Brian L. Dunn
Chief, Office of Bridge Programs
U.S. Coast Guard
By direction of the Commandant



VICINITY MAP



PROJECT LOCATION MAP

500 0 500 1000 Scale of Feet

100 0 100 200 Scale of Meters

APPROVED
8 DEC 2020
P (3-20-1)
U.S. COAST GUARD

STATE OF MAINE
JOSHUA K. OLUND
No. 12130
LICENSED PROFESSIONAL ENGINEER

NOTE:

The proposed project area does not include any archaelogical historical or wildlife and waterfowl refuge sites.

February 21, 2020

HNTB

STATE OF MAINE DEPARTMENT OF TRANSPORTATION	BRIDGE NO. 2399	WIN 021736.00	BRIDGE PLANS
ST. JOHN RIVER, MILE POINT 232.0 BETWEEN MADAWASKA, ME. AROOSTOOK COUNTY AND EDMUNDSTON, MADAWASKA COUNTY, NEW BRUNSWICK, CANADA			

MADAWASKA-EDMUNDSTON INTERNATIONAL BRIDGE

LOCATION & VICINITY MAP

SHEET NUMBER 1 OF 6

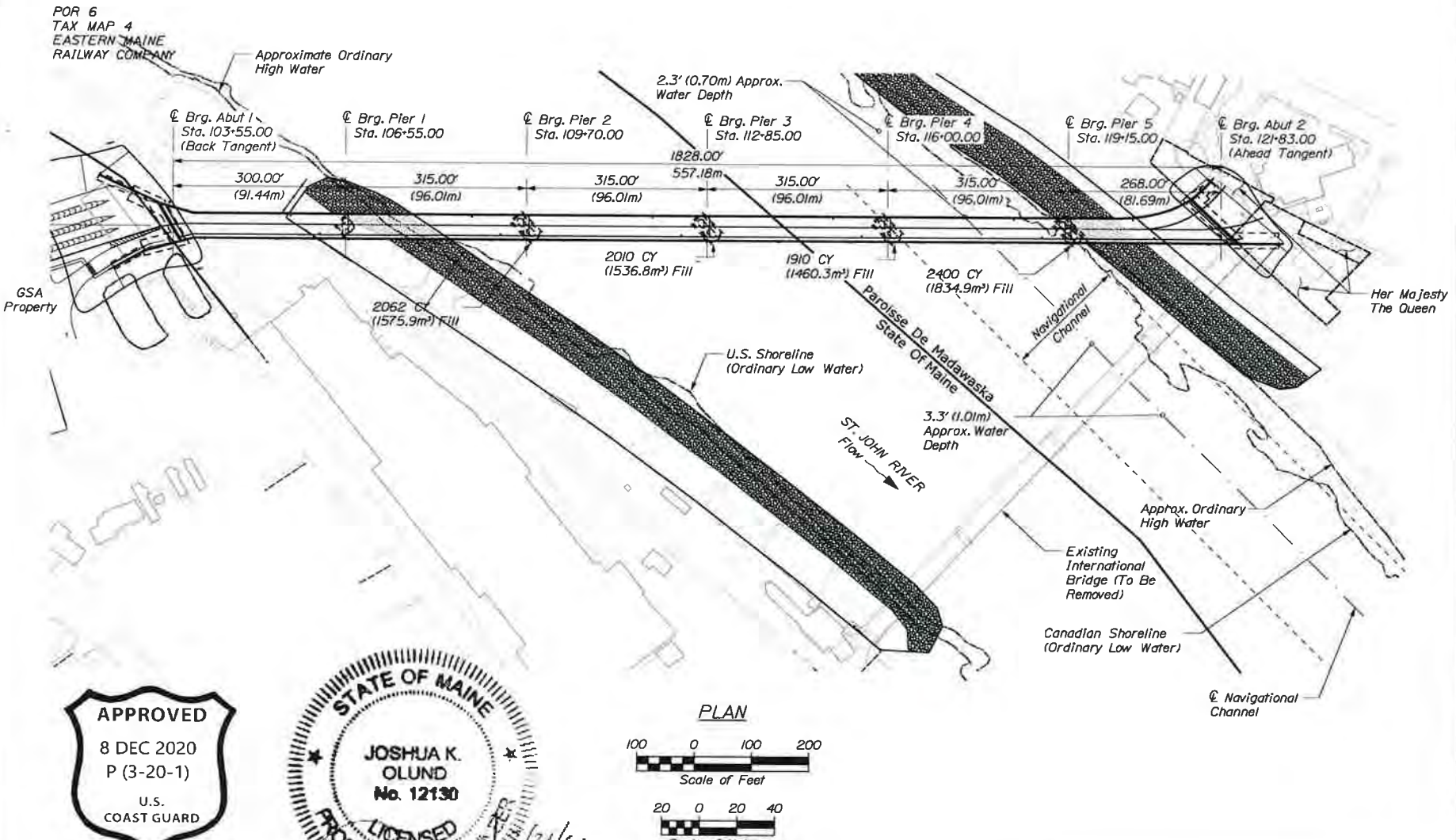
623

NOTES:

1. Conceptual plans utilized to obtain Coast Guard bridge permit.

2. No bridge protection system is required and the piers meet AASHTO standards.

3. The U.S. Coast Guard is not responsible for approving fill and riprap locations and quantities.



PLAN

100 0 100 200
Scale of Feet

20 0 20 40
Scale of Meters

Datum: NAVD88

APPROVED
8 DEC 2020
P (3-20-1)
U.S.
COAST GUARD

STATE OF MAINE
JOSHUA K.
OLUND
No. 12130
LICENSED
PROFESSIONAL ENGINEER
2/21/20

February 21, 2020

HNTB

STATE OF MAINE DEPARTMENT OF TRANSPORTATION	BRIDGE NO. 2399	WIN 021736.00	BRIDGE PLANS
ST. JOHN RIVER, MILE POINT 232.0 BETWEEN MADAWASKA, ME. AROOSTOOK COUNTY AND EDMUNDSTON, MADAWASKA COUNTY, NEW BRUNSWICK, CANADA			

MADAWASKA-EDMUNDSTON
INTERNATIONAL BRIDGE

BRIDGE PLAN

SHEET NUMBER
2
OF 6

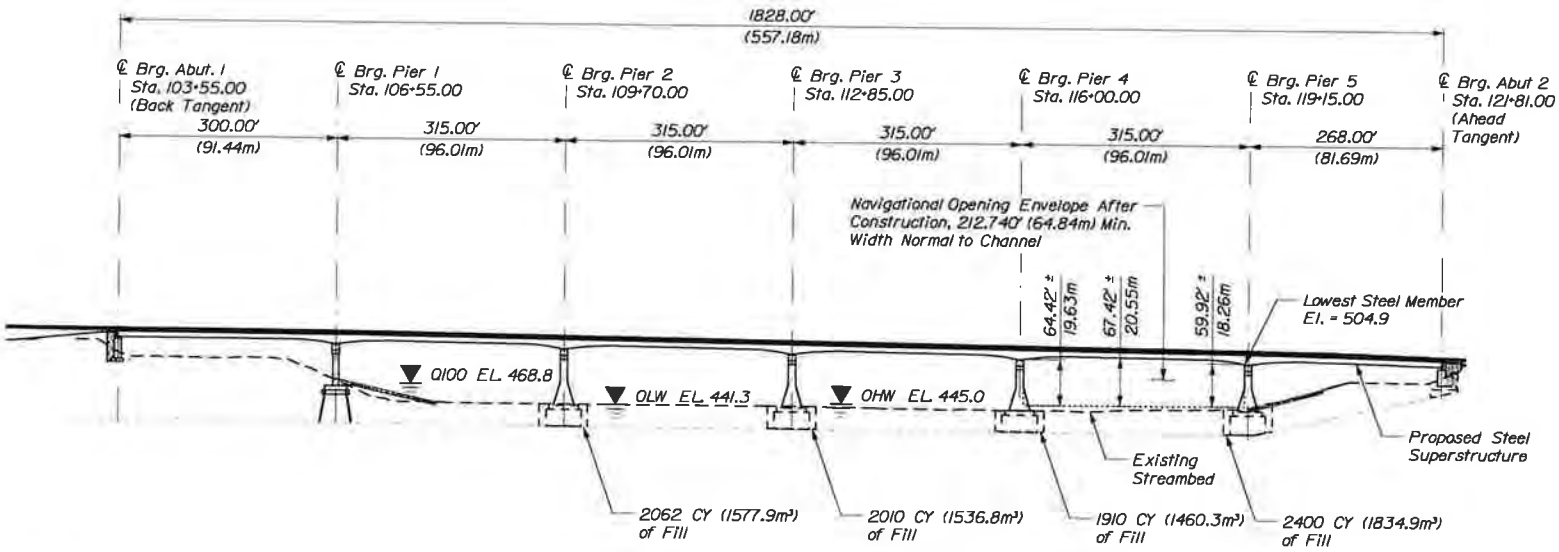
624

NOTES:

1. Conceptual plans utilized to obtain Coast Guard bridge permit.

2. Q100 = 100 year flood elevation.

3. The U.S. Coast Guard is not responsible for approving fill and riprap locations and quantities.



(Elevation View is shown perpendicular to the structure and approximately 45° to the channel)

APPROVED
8 DEC 2020
P (3-20-1)
U.S.
COAST GUARD

STATE OF MAINE
JOSHUA K. OLUND
No. 12130
LICENSED PROFESSIONAL ENGINEER
2/21/20

PLAN

100 0 100 200
Scale of Feet

20 0 20 40
Scale of Meters

Datum: NAVD88

February 21, 2020

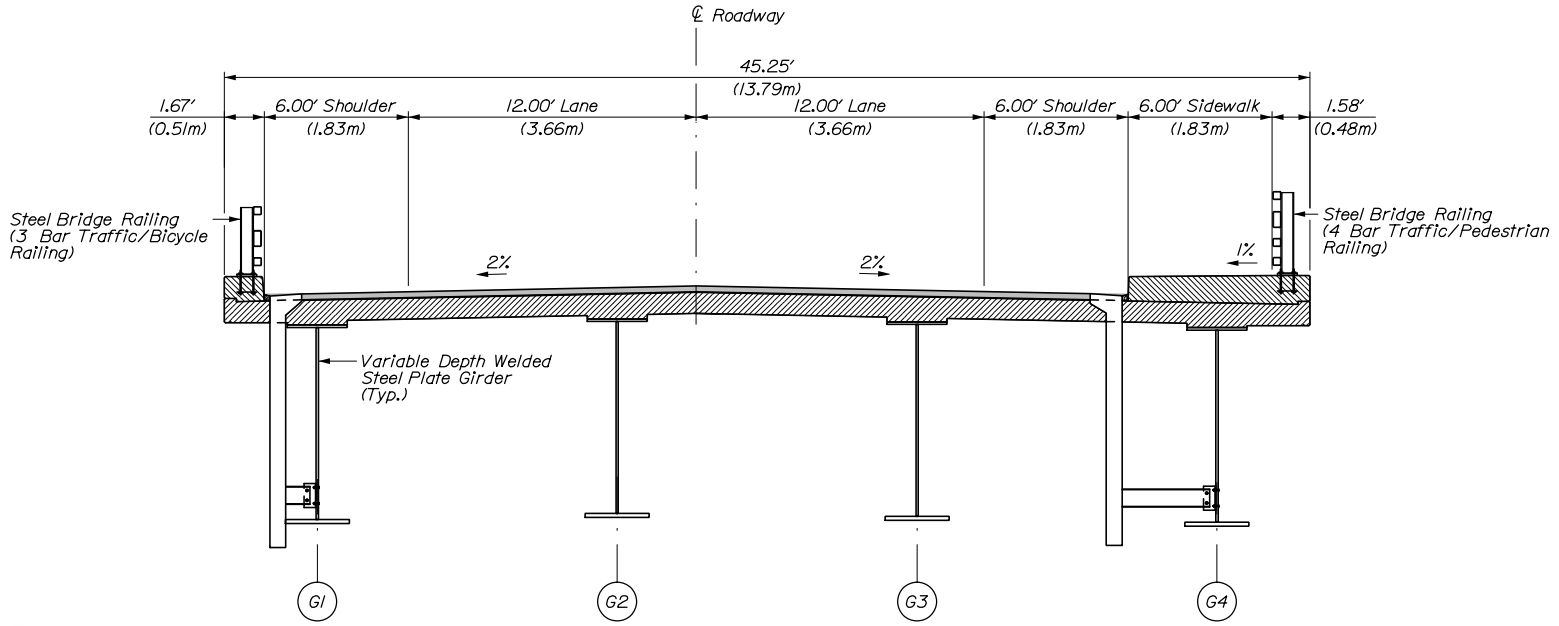
HNTB

STATE OF MAINE DEPARTMENT OF TRANSPORTATION	BRIDGE NO 2399	WIN 021736.00	BRIDGE PLANS	MADAWASKA-EDMUNDSTON INTERNATIONAL BRIDGE	SHEET NUMBER 3 OF 6
ST. JOHN RIVER, MILE POINT 232.0 BETWEEN MADAWASKA, ME. AROOSTOOK COUNTY AND EDMUNDSTON, MADAWASKA COUNTY, NEW BRUNSWICK, CANADA				BRIDGE ELEVATION	

625

NOTES:

1. Conceptual plans utilized to obtain Coast Guard bridge permit.



PROPOSED BRIDGE SECTION

APPROVED
8 DEC 2020
P (3-20-1)
U.S.
COAST GUARD

STATE OF MAINE
JOSHUA K.
OLUND
No. 12130
LICENSED
PROFESSIONAL ENGINEER

4 0 4 8
Scale of Feet

1 0 1 2
Scale of Meters

February 21, 2020

HNTB

STATE OF MAINE DEPARTMENT OF TRANSPORTATION	BRIDGE NO. 2399	WIN 021736.00	BRIDGE PLANS
ST. JOHN RIVER, MILE POINT 232.0 BETWEEN MADAWASKA, ME. AROOSTOOK COUNTY AND EDMUNDSTON, MADAWASKA COUNTY, NEW BRUNSWICK, CANADA			

MADAWASKA-EDMUNDSTON INTERNATIONAL BRIDGE

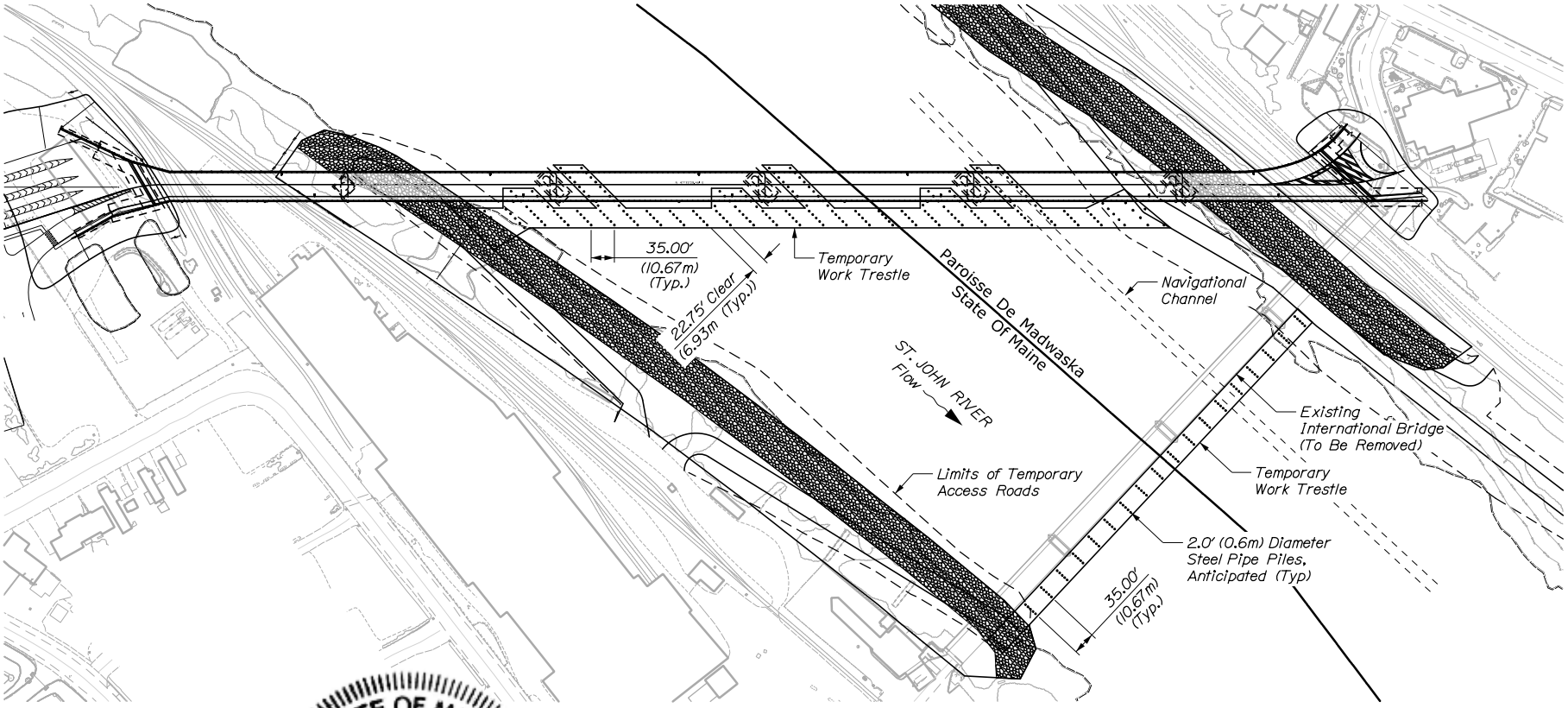
TYPICAL SECTIONS

SHEET NUMBER 4 OF 6

626

NOTES:

1. Conceptual plans utilized for informational use only.



PLAN

100 0 100 200
Scale of Feet

20 0 20 40
Scale of Meters

Datum: NAVD88

APPROVED
8 DEC 2020
P (3-20-1)
U.S.
COAST GUARD

STATE OF MAINE
JOSHUA K.
OLUND
No. 12130
LICENSED
PROFESSIONAL ENGINEER
12/11/20

February 21, 2020

HNTB

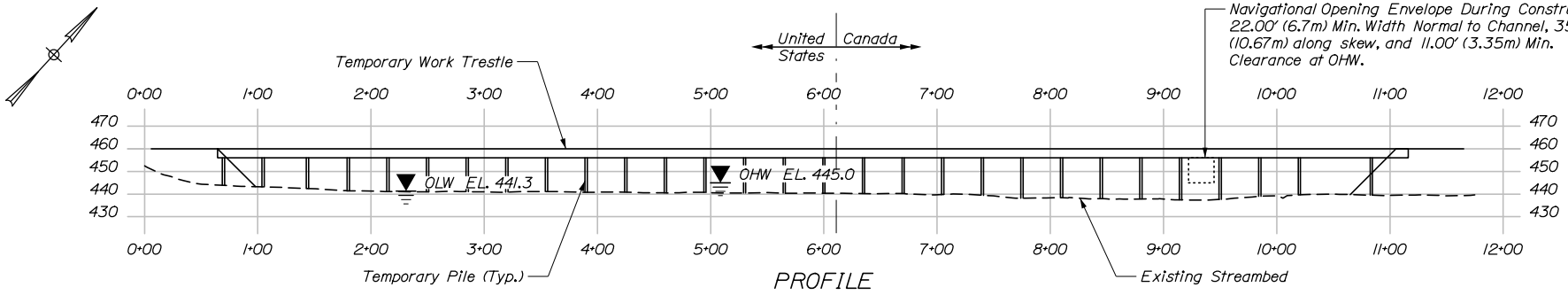
STATE OF MAINE DEPARTMENT OF TRANSPORTATION	BRIDGE NO. 2399	WIN 021736.00	BRIDGE PLANS
ST. JOHN RIVER, MILE POINT 232.0 BETWEEN MADAWASKA, ME. AROOSTOOK COUNTY AND EDMUNDSTON, MADAWASKA COUNTY, NEW BRUNSWICK, CANADA			

MADAWASKA-EDMUNDSTON INTERNATIONAL BRIDGE

TEMPORARY TRESTLE PLAN

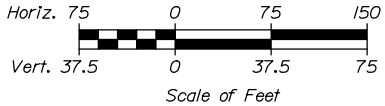
SHEET NUMBER 5 OF 6

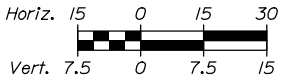
627

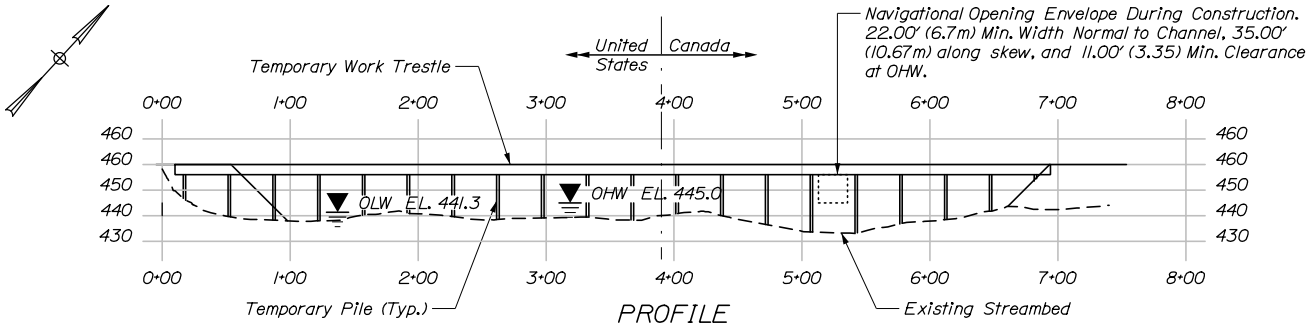


PROFILE

ELEVATION
TEMPORARY TRESTLE AT PROPOSED BRIDGE

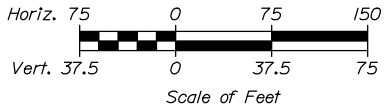


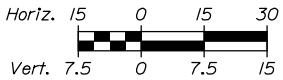




PROFILE

ELEVATION
TEMPORARY TRESTLE AT EXISTING BRIDGE





APPROVED
8 DEC 2020
P (3-20-1)
U.S.
COAST GUARD

STATE OF MAINE
JOSHUA K. OLUND
No. 12130
LICENSED PROFESSIONAL ENGINEER
12/21/20

February 21, 2020

NOTES:

1. Conceptual plans utilized for informational use only.

2. Temporary structures will not be on the waterway at the same time.

HNTB

STATE OF MAINE DEPARTMENT OF TRANSPORTATION	BRIDGE NO. 2399	WIN 021736.00	BRIDGE PLANS
ST. JOHN RIVER, MILE POINT 232.0 BETWEEN MADAWASKA, ME. AROOSTOOK COUNTY AND EDMUNDSTON, MADAWASKA COUNTY, NEW BRUNSWICK, CANADA			

MADAWASKA-EDMUNDSTON INTERNATIONAL BRIDGE

TEMPORARY STRUCTURES PROFILES

SHEET NUMBER 6 OF 6

628

UNITED STATES COAST GUARD (COAST GUARD) RECORD OF DECISION (ROD) FOR THE MADAWASKA-EDMUNDSTON INTERNATIONAL BRIDGE ACROSS THE ST. JOHN RIVER, MILE 232.0

P(3-20-1)

Description of proposed project:

The U.S. General Services Administration (GSA) and the U.S. Customs and Border Protection (CBP) are proposing to replace the existing U.S. Land Port of Entry (LPOE), and in a coordinated action, the Federal Highway Administration (FHWA) and the Maine Department of Transportation (MaineDOT), in cooperation with the U.S. Coast Guard (USCG), and in coordination with the New Brunswick Department of Transportation and Infrastructure (NBDTI), Public Services and Procurement Canada (PSPC), and the Canada Border Services Agency (CBSA), are proposing to replace the existing International Bridge between Madawaska, Aroostook County, Maine, and Edmundston, New Brunswick, Canada, with a new U.S. LPOE and International Bridge to improve safety, security, and functionality at the border crossing.

Decision: The Commander, First Coast Guard District has recommended and the Commandant, U.S. Coast Guard has decided to approve the location and plans for the replacement of the Highway Bridge over the St John River, Mile 232.0, between Madawaska, Aroostook County, Maine and Edmundston, New Brunswick, Canada. This decision is considered to be in the best public interest for satisfying the project objectives with the least impacts on navigation and the environment. The Preferred Alternative (Bridge Alternative 2), has been selected for the proposed Bridge site.

The purpose and need for the action is: The purpose of this project is to provide for the long-term safe and efficient flow of current and projected traffic volumes, including the movement of goods and people, between Madawaska, Maine and Edmundston, New Brunswick, Canada. The proposed project is needed because the existing International Bridge is nearing the end of its useful life and the size and conditions of the existing building and overall site of the Madawaska LPOE are substandard, preventing the agencies from adequately fulfilling their respective missions.

Alternatives examined are: The alternatives analysis for the proposed project considered Bridge Alternative 1, Bridge Alternative 2, Bridge Alternative 3 and the No-Build Alternative.

Bridge Alternative 1 consisted of the construction of a cast-in-place segmental concrete bridge approximately 1,870 feet in length with five spans. Of the four piers needed, one would be on the bank of the Saint John River in Madawaska, two would be in the Saint John River, and one would be near the bottom of the riverbank in Edmundston.

Bridge Alternative 2 consisted of the construction of a steel girder bridge approximately 1,840 feet in length with six spans. Of the five piers needed, one will be near the top of the riverbank in Madawaska, three piers will be in the river, and one will be near the bottom of the riverbank in Edmundston.

Bridge Alternative 3 consisted of the construction of a steel girder bridge approximately 1,870 feet in length with seven spans. Bridge Alternative 3 is similar to the Bridge Alternative 2 but has an additional pier and span to reduce span lengths, reduce girder depths, and improve the shipment and erection of the steel girders. Of the six piers needed, one would be positioned between the Maine Northern Railroad tracks in Madawaska, four piers would be in the river, and one would be on the riverbank in Edmundston.

Under the No-Build Alternative, operation of the existing LPOE and International Bridge would continue at their existing locations with the ongoing use of existing facilities. Except for regular maintenance and minor

repairs to the existing infrastructure and equipment, no new construction or demolition would take place. No new inspection and travel lanes, facilities, or bridge structure would be built.

The preferred alternative is: Bridge Alternative 2.

For the purposes of navigation, the design will provide:

Horizontal Clearance:

212.74 feet (64.84 meters) at OHW between piers normal to the axis of the channel

Vertical Clearance:

59.92 feet (18.26 meters) above OHW Elevation 445.0 NAVD 88

All practicable means of avoiding or minimizing environmental harm have been incorporated into the selected alternative.

The following mitigation, monitoring, and enforcement have been adopted (if applicable): GSA, FHWA, and MaineDOT have agreed to a list of mitigation measures and commitments summarized in the Final Supplemental Environmental Impact Statement and Final Programmatic Section 4(f) Evaluation. Section N of that document, Mitigation and Commitments, contains these adopted measures.

Conclusion: Based on an independent review of the facts presented in the case record of the U.S. General Services Administration and Federal Highway Administration's documentation and the Coast Guard's navigation and environmental evaluations, it is concluded that the proposed construction of the international bridge will meet the reasonable needs of navigation, and that all planning and mitigation to minimize the environmental impacts have been accomplished.

I reviewed the Supplemental Final Environmental Impact (SFEIS)/ROD and submitted my written comments to the Proponent.

12/08/20 P. Foley

Paige A. Foley
Environmental Reviewer

Bridge Management Specialist — Title/Position
Level II — Warrant Level

I reviewed the SFEIS/ROD and submitted my written comments to the Proponent.

12/08/20 P. Foley

Paige A. Foley
Senior Environmental Professional

Bridge Management Specialist — Title/Position
Level II — Warrant Level

I have reviewed the SFEIS/ROD and had the opportunity to submit written comments to the Proponent.

PAVILONIS.TIMOTHY.WILLIAM.1037230061 Digitally signed by PAVILONIS.TIMOTHY.WILLIAM.1037230061 Date: 2020.12.08 13:30:35 -05'00'

Timothy W. Pavilonis
Legal Reviewer

USCG Legal Counsel
Title/Position

In reaching my decision/recommendation on the Coast Guard's proposed action, I considered the information contained in this SFEIS/ROD and considered and acknowledged the written comments submitted to me from the Environmental and Legal Reviewers.

12/08/2020

Brian L. Dunn
Proponent

Chief, Office of Bridge Programs
Title/Position

UNITED STATES COAST GUARD ADOPTION OF SUPPLEMENTAL FINAL ENVIRONMENTAL IMPACT STATEMENT

MADAWASKA-EDMUNDSTON INTERNATIONAL BRIDGE ACROSS THE ST. JOHN RIVER, MILE 232.0

After an independent review of the Supplemental Final Environmental Impact Statement (SFEIS) for the Proposed Fixed Highway Bridge approved by the GSA and FHWA on October 4, 2019, the Coast Guard has determined that the document adequately assesses the impacts of the proposed Madawaska International Bridge project for replacing the bridge across St. John River, Mile 232 at Madawaska, Aroostook County, Maine, and Edmundston, New Brunswick, Canada.

Therefore, the Coast Guard hereby adopts the bridge related portions of the SFEIS.

12/08/20	Paige A. Foley Document Preparer	Bridge Management Specialist Title/Position	

I reviewed the bridge related portions of the SFEIS and submitted my written comments to the Proponent.

12/08/20	Paige A. Foley Environmental Reviewer	Bridge Management Specialist Title/Position	II Warrant Level

I reviewed the bridge related portions of the SFEIS and submitted my written comments to the Proponent.

12/08/20	Paige A. Foley Senior Environmental Professional	Bridge Management Specialist Title/Position	II Warrant Level

I reviewed the bridge related portions of the SFEIS and had the opportunity to submit my written comments to the Proponent.

	PAVILONIS.TIMOTHY.WILLIAM.1037230061 Digitally signed by PAVILONIS.TIMOTHY.WILLIAM.1037230061 Date: 2020.12.08 13:32:06 -05'00' Timothy W. Pavilonis Legal Reviewer	USCG Legal Counsel Title/Position	

In reaching my decision/recommendation on the Coast Guard's proposed action, I considered the information contained in the bridge related portions of this SFEIS and considered and acknowledged the written comments submitted to me from the Environmental and Legal Reviewers.

12/08/2020	Brian L. Dunn Proponent	Chief, Office of Bridge Programs Title/Position	

New Brunswick, Canada Permits

The items listed in **bold** are currently pending and will be provided to the contractor as soon as they are available. Work may not begin until they have been issued and the Department has issued written permission to the contractor. All other items are included in the bid documents.

1. Environmental Impact Assessment (EIA) Certificate of Determination (CoD)
2. **Environmental Management Plan (EMP) required as part of the EIA CoD Conditions**
3. **Watercourse and Wetland (WAWA) permit**
4. **Fisheries Act Authorization (FAA)**
5. **Canadian Navigable Waters Act (CNWA) Approval**
6. **International Bridges and Tunnels Act (IBTA) Approval**
7. **Lease Agreement between the Canadian National (CN) railway company and New Brunswick Department of Transportation and Infrastructure (NBDTI).**

CERTIFICATE OF DETERMINATION
CERTIFICAT DE DÉCISION

NEW BRUNSWICK ENVIRONMENTAL IMPACT ASSESSMENT REGULATION
RÈGLEMENT SUR LES ÉTUDES D'IMPACT SUR L'ENVIRONNEMENT DU NOUVEAU-BRUNSWICK

File Number/*Numéro du dossier*: 4561-3-1517

This Certificate of Determination to **PROCEED** is hereby issued to the following proponent:
*Ce Certificat de décision pour **PROCÉDER** est accordé au promoteur suivant:*

New Brunswick Department of Transportation and Infrastructure

Description of undertaking/*Description de l'ouvrage:*	Madawaska-Edmundston International Bridge Replacement
Location of undertaking and PID/*Emplacement de l'ouvrage et NID:*	City of Edmundston, Madawaska County, New Brunswick at the Canada/USA international border to Madawaska, Maine, USA. The project PIDs are located south of Rue St-François and include a portion of PID 35265909, PID 35311430, a portion of Ferry Avenue, within the Saint John River (PID 00000002), and PIDs located between PID 35133222 and PIDs 35133032, 35181676, and 35263227.
Address of proponent/ *Adresse postale du promoteur:*	440 King Street, Kings Place, 2nd Floor, Fredericton, New Brunswick E3B 5H1
Conditions of approval/*Conditions d'agrément:*	**AS PER THE ATTACHED DOCUMENT "A"/*DOCUMENT 'A' CI-JOINT***
Date of issue/*Date d'émission*:	December 16, 2020

Recommended by:
Recommandé par: Crystale Hawley
(acting) Director, Environmental Impact Assessment Branch
Directeur, Direction des études d'impact sur l'environnement

Determination by:
Décision par: Gary Crossman
Minister of Environment and Climate Change
Ministre de l'Environnement et du Changement climatique

Environment and Local Government
Environnement et Gouvernement locaux

DOCUMENT "A"

MINISTER'S DETERMINATION
CONDITIONS OF APPROVAL
Pursuant to Regulation 87-83 under the *Clean Environment Act*
December 16, 2020
File Number: 4561-3-1517

1. In accordance with section 6(6) of the Regulation, it has been determined that the undertaking may proceed following approval under all other applicable acts and regulations.

2. Commencement of this undertaking must occur within three years of the date of this Determination. Should commencement not be possible within this time period, the undertaking must be registered under the *Environmental Impact Assessment Regulation* (87-83) – *Clean Environment Act* again, unless otherwise stated by the New Brunswick Minister of Environment and Climate Change.

3. The proponent shall adhere to all obligations, commitments, monitoring, and mitigation measures presented in the Environmental Impact Assessment (EIA) registration document dated February 2019 as well as all those identified in subsequent correspondence during the registration review. Additionally, the proponent shall submit a summary table detailing the status of each Condition listed in this Determination to the Environmental Impact Assessment (EIA) Branch (the Director), Department of Environment and Local Government (DELG) every six months from the date of this Determination until such a time as all the Conditions have been met or until it is deemed by the Director to be no longer required.

4. Prior to commencing any project related activities, the proponent must submit to the Director of the EIA Branch, DELG, written confirmation that an agreement has been reached with the current landowners for the use of the lands (e.g. a land use or lease agreement, and/or land transfer agreement).

5. The proponent must fulfill all project related commitments made to First Nations and must continue to engage and support the consultation process with First Nations, as appropriate, in an effort to understand the potential impacts on Aboriginal and treaty rights and avoid or mitigate these impacts where possible. The status of each commitment made to First Nations must be reported to the Director of the EIA Branch, DELG, as a part of the six-month summary updates (Condition 3, above).

6. If it is suspected that archaeological resources are discovered during any project related activity, as per the New Brunswick *Heritage Conservation Act*, all activity shall be stopped near the find and the Archaeology and Heritage Branch, New Brunswick Department of Tourism, Heritage and Culture (THC), must be contacted immediately at (506) 453-2738 for further direction.

7. If any material excavated from the wetted portion of the river bed during project activities is planned to be disposed of in the Province of New Brunswick, a description of the final disposal plan and location must be submitted to the Director, EIA Branch, DELG, for review and must be approved prior to disposal. Sampling results must be submitted with the description.

8. A Decommissioning Plan for the existing bridge must be prepared and submitted to the Director of the EIA Branch, DELG, for review and approval prior to commencing any activities associated with decommissioning.

9. The proponent shall prepare and submit an Environmental Management Plan (EMP) for all project phases to the Director of the EIA Branch, DELG, for review and approval prior to commencing any activity associated with that phase. The EMP must include but is not limited to, project specific mitigation, contingency plans, and emergency response plans.

10. A Wetland Monitoring Plan must be submitted within six months following the completion of project construction to the Director of the EIA Branch, DELG for review and approval. At a minimum, the Wetland Monitoring Plan must include monitoring of wetland function at years one, three, and five post-construction. Additional mitigation may be required for any further impacts to delineated wetlands based on the results of the Wetland Monitoring Plan. Once approved, the Wetland Monitoring Plan should be added into the approved EMP for this project

11. The proponent shall ensure that any proposed project modifications or future expansions are submitted to the Director, EIA Branch, DELG, for review and approval prior to implementing the changes.

12. In the event of the sale, lease, or any other conveyance or change of control of the property, or any portion thereof, the proponent must provide written acknowledgement from the lessee, controller, or purchaser confirming that they will comply with the Conditions of this Determination to the Director, EIA Branch, DELG.

13. The proponent shall ensure that all developers, contractors and operators associated with the project comply with the above requirements.

Environmental Summary Sheet

WIN: 21736.00 **Date Submitted: 12/17/2020**
Town: Madawaska
MaineDOT Team Leader: Kristen Chamberlain **ENV Field Contact: Ryan Annis**
Key ENV Contacts in New Brunswick: See Table 5.1 of the New Brunswick Environmental Management Plan

US-NEPA Complete: 2/12/2020- Record of Decision -Supplemental Environmental Impact Statement (EIS)

☒ **Section 106 -United States National Historic Preservation Act**
SHPO Concurrence- Adverse Effect. The International Bridge is eligible for listing in the National Register of Historic Places under Criteria A, B, &C. Adverse Effects resolved through a Memorandum of Agreement. Mitigation stipulations include coordination with the Town of Madawaska and the City of Edmundston, New Brunswick to obtain a portion of the bridge for re-use. See Special Provision 202 (Existing Bridge Removal).

☒ **Section 4(f) and 6(f)-United States Department of Transportation Act**
Section 4(f)
Review Complete- Programmatic Section 4(f) Evaluation completed as Appendix to SEIS.
Section 6(f)
Not Applicable- No Section 6(f) properties.

☒ **Maine Department of Inland Fisheries and Wildlife**
Review complete. No Essential Habitat or fisheries concerns.

☒ **Section 7 of the U.S. Endangered Species Act**
Species of Concern: Northern Long-Eared Bat-May Affect
Comments/References: Streamlined 4(d) Consultation complete 6/11/2020**.**

Species of Concern: Canada Lynx-No Effect
Comments/References: Project is within Canada lynx range, but not within designated critical habitat. Project site is highly unlikely to be inhabited by Canada lynx due to its proximity to development.

☒ **Essential Fish Habitat-U.S. Magnusen-Stevens Fisheries Act**- Not Present

☒ **Maine Department of Conservation/Public Lands, Submerged Land Lease -**Complete. Plans sent to BPL by DEP.

☒ **Maine Department of Environmental Protection**
Individual Permit.
-Contracts needs to notify Kristen Chamberlain upon Intent to Award to coordinate payment of ILF Mitigation.
**Applicable Standards and Permits are included with the contract. See Special Provision 105.*

☒ U.S. **Army Corps of Engineers, Section 10 of the Rivers and Harbors Act/Section 404 of the Clean Water Act.**
Category 2 Programmatic General Permit
-Work Start Notification Form and Compliance Certification Form must be completed by the Resident and/or ENV Field Contact and submitted to the Army Corps of Engineers with copy to Andrea Brady and Kristen Chamberlain.
**Additional Special Conditions apply. Applicable Standards and Permits are included with the contract. See Special Provision 105.*

☒ **Stormwater Review- complete.**

☒ **New Brunswick, Canada- Permits, Authorizations & Approvals**
The items listed in bold are currently pending and will be provided to the contractor as soon as they are available. Work may not begin until they have been issued and the Department has issued written permission to the contractor. All other items are included in the bid documents.

1. Environmental Impact Assessment (EIA) Certificate of Determination (CoD)
2. **Environmental Management Plan (EMP) required as part of the EIA CoD Conditions**
3. **Watercourse and Wetland (WAWA) permit**
4. **Fisheries Act Authorization (FAA)**
5. **Canadian Navigable Waters Act (CNWA) Approval**
6. **International Bridges and Tunnels Act (IBTA) Approval**
7. **Lease Agreement between the Canadian National (CN) railway company and New Brunswick Department of Transportation and Infrastructure (NBDTI).**

MaineDOT

Environmental Summary Sheet

☒	**Special Provisions Required (provided by ENV)**	
	Special Provision 105-Environmental Requirements	Applicable☒
	Standard Specification 656-Erosion Control Plan	Applicable☒
	Special Provision 203-Dredge Spec	Applicable☒
	General Note for Hazardous Waste	Applicable☒
	Special Provision 203-Hazardous Waste	N/A☒
	Special Provision 105.9- Archaeological/Cultural Requirements	Applicable☒
☒	**Other Special Provisions that address ENV requirements (provided by others)**	
	Special Provision 202- Existing Bridge Removal	Applicable☒
	Special Provision 105-Temporary Work Trestles	Applicable☒
	Special Provision 610-Sulfide Bearing Rock	Applicable☒