Updated **12/13/2021**

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:

_____

_____

_____

PRINCIPAL:

By_____

By:_____

By:_____

WITNESS

_____

_____

_____

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 2022-2024
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 2022-24 (October 1, 2021 through September 30, 2024) MaineDOT has established an annual DBE participation goal of **1.97%** 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, 2024. MaineDOT 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 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 1.97% goal without the need to impose contract goals. DBE firms are listed on the MaineDOT website at:

http://www.maine.gov/mdot/disadvantaged-business-enterprises/pdf/directory.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 Southport Bridge Rehabilitation in the town of **BOOTHBAY HARBOR** and **SOUTHPORT**" 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 October 26, 2022 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. 2309401 WIN 021751.01

Location: In Lincoln County, Southport bridge is located on State Route 27/ Hendricks Hill Road/ Western Avenue over Townsend Gut on the town line.

Scope of Work: Southport bridge rehabilitation plus other incidental work.

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 Jason Stetson** 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.

Plans, specifications and bid forms may be seen at the MaineDOT Building in Augusta, Maine. 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 $120.00 ($127.00 by mail). Half size plans $60.00 ($63.75 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 5% of the bid amount, 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.

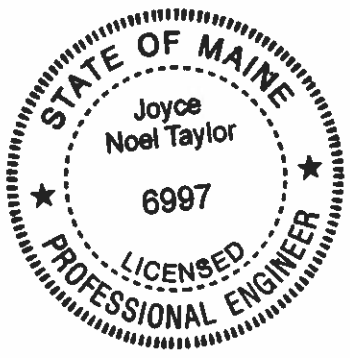
All work shall be governed *by State of Maine, Department of Transportation, Standard Specifications, March 2020 Edition,* price $10 [$15 by mail], and *Standard Details, March 2020 Edition*, price $10 [$15 by mail]. They also may be purchased by telephone at (207) 624-3536 between the hours of 8:00 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
October 5, 2022

Joyce Noel Taylor

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)

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 109.5.1(A)(3) of the Department's Standard 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: 021751.01 Project(s): 021751.01

SECTION: 1 INITIAL GROUP

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	202.01 REMOVING STRUCTURES AND OBSTRUCTIONS EXIST FENDER SYSTEM	LUMP SUM	LUMP SUM	_____.____
0020	202.01 REMOVING STRUCTURES AND OBSTRUCTIONS EXIST STL GRID DECK	LUMP SUM	LUMP SUM	_____.____
0030	202.08 REMOVING BUILDING NO.: 1, CONTROL HOUSE	LUMP SUM	LUMP SUM	_____.____
0040	202.12 REMOVING EXISTING STRUCTURAL CONCRETE	5.000 CY	_____.____	_____.____
0050	202.27 EXISTING MACHINERY REMOVAL AND DEMOLITION	LUMP SUM	LUMP SUM	_____.____
0060	202.56 REMOVE EXISTING ADVANCE WARNING BEACON	2.000 EA	_____.____	_____.____
0070	202.57 REMOVE EXISTING WARNING GATE BRIDGE MOUNTED	2.000 EA	_____.____	_____.____
0080	202.57 REMOVE EXISTING WARNING GATE FOUNDATION MOUNTED	2.000 EA	_____.____	_____.____
0090	203.20 COMMON EXCAVATION	270.000 CY	_____.____	_____.____
0100	203.35 CRUSHED STONE 3/4 INCH	5.000 CY	_____.____	_____.____

Proposal ID: 021751.01 Project(s): 021751.01

SECTION: 1 INITIAL GROUP

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
0110	206.082 STRUCTURAL EARTH EXCAVATION - MAJOR STRUCTURES	20.000 CY				
0120	304.10 AGGREGATE SUBBASE COURSE - GRAVEL	110.000 CY				
0130	403.208 HOT MIX ASPHALT 12.5 MM HMA SURFACE	30.000 T				
0140	403.213 HOT MIX ASPHALT 12.5 MM BASE	90.000 T				
0150	409.15 BITUMINOUS TACK COAT - APPLIED	32.000 G				
0160	501.239 DYNAMIC LOADING TESTS - PROVIDING FOR	4.000 EA				
0170	501.48 STEEL H-BEAM PILES 74 LBS/FT, DELIVERED	4,750.000 LF				
0180	501.481 STEEL H-BEAM PILES 74 LBS/FT, IN PLACE	4,750.000 LF				
0190	501.90 PILE TIPS	50.000 EA				
0200	501.91 PILE SPLICES	50.000 EA				
0210	501.92 PILE DRIVING EQUIPMENT MOBILIZATION	LUMP SUM	LUMP SUM			

Proposal ID: 021751.01 Project(s): 021751.01

SECTION: 1 INITIAL GROUP

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
0220	502.219 STRUCTURAL CONCRETE, ABUTMENTS AND RETAINING WALLS	LUMP SUM	LUMP SUM	_____.____
0230	502.26 STRUCTURAL CONCRETE ROADWAY AND SIDEWALK SLABS ON STEEL BRIDGES	LUMP SUM	LUMP SUM	_____.____
0240	502.291 SAW CUT GROOVING	LUMP SUM	LUMP SUM	_____.____
0250	502.49 STRUCTURAL CONCRETE CURBS AND SIDEWALKS	LUMP SUM	LUMP SUM	_____.____
0260	503.12 REINFORCING STEEL, FABRICATED AND DELIVERED	34,600.000 LB	_____.____	_____.____
0270	503.13 REINFORCING STEEL, PLACING	34,600.000 LB	_____.____	_____.____
0280	503.17 MECHANICAL WELDED SPLICE	685.000 EA	_____.____	_____.____
0290	504.70 STRUCTURAL STEEL FABRICATED AND DELIVERED	LUMP SUM	LUMP SUM	_____.____
0300	504.71 STRUCTURAL STEEL ERECTION	LUMP SUM	LUMP SUM	_____.____
0310	505.08 SHEAR CONNECTORS	LUMP SUM	LUMP SUM	_____.____
0320	506.1705 SURFACE PREP. OF EXISTING STRUCTURAL STEEL	LUMP SUM	LUMP SUM	_____.____

Proposal ID: 021751.01 Project(s): 021751.01

SECTION: 1 INITIAL GROUP

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
0330	506.1775 FIELD PAINTING NEW STL W/ ZINC RICH PAINT	LUMP SUM	LUMP SUM		_____	.____
0340	507.0841 STEEL PIPE HAND RAILING	LUMP SUM	LUMP SUM		_____	.____
0350	507.13 TEMPORARY BRIDGE RAILING	370.000 LF	_____	.____	_____	.____
0360	515.21 PROTECTIVE COATING FOR CONCRETE SURFACES	LUMP SUM	LUMP SUM		_____	.____
0370	518.50 REPAIR OF UPWARD FACING SURFACES - TO REINFORCING STEEL < 8 IN.	50.000 SF	_____	.____	_____	.____
0380	518.60 REPAIR OF VERTICAL SURFACES < 8 IN.	250.000 SF	_____	.____	_____	.____
0390	518.70 REPAIR OF OVERHEAD SURFACES < 8 IN.	50.000 SF	_____	.____	_____	.____
0400	526.301 PORTABLE CONCRETE BARRIER TYPE I	LUMP SUM	LUMP SUM		_____	.____
0410	526.305 PORTABLE CONCRETE BARRIER, BRACED TYPE 1	LUMP SUM	LUMP SUM		_____	.____
0420	526.34 PERMANENT CONCRETE TRANSITION BARRIER	4.000 EA	_____	.____	_____	.____
0430	528.01 STRUCTURAL TIMBER, FABRICATED AND DELIVERED	LUMP SUM	LUMP SUM		_____	.____

Proposal ID: 021751.01 Project(s): 021751.01

SECTION: 1 INITIAL GROUP

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
0440	528.02 STRUCT TIMBER, ERECTION	LUMP SUM	LUMP SUM	_____.____
0450	530.02 PREFAB DECK PANEL	4,900.000 SF	_____.____	_____.____
0460	606.1722 BRIDGE TRANSITION - TYPE 2	6.000 EA	_____.____	_____.____
0470	606.25 TERMINAL CONNECTOR	2.000 EA	_____.____	_____.____
0480	606.55 GUARDRAIL TYPE 3 - SINGLE RAIL	210.000 LF	_____.____	_____.____
0490	609.11 VERTICAL CURB TYPE 1	40.000 LF	_____.____	_____.____
0500	610.08 PLAIN RIPRAP	115.000 CY	_____.____	_____.____
0510	626.11 PRECAST CONCRETE JUNCTION BOX	2.000 EA	_____.____	_____.____
0520	626.22 NON-METALLIC CONDUIT	450.000 LF	_____.____	_____.____
0530	626.221 NON-METALLIC CONDUIT CONCRETE ENCASED	125.000 LF	_____.____	_____.____
0540	626.251 NON-METALLIC UNDER PAVEMENT CONDUIT (SCHEDULE 80 OR GREATER RATING)	40.000 LF	_____.____	_____.____
0550	626.43 30 INCH DIAMETER FOUNDATION	28.000 LF	_____.____	_____.____

Proposal ID: 021751.01 Project(s): 021751.01

SECTION: 1 INITIAL GROUP

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
0560	626.451 42 INCH DIAMETER FOUNDATION	47.000 LF				
0570	627.733 4" WHITE OR YELLOW PAINTED PAVEMENT MARKING LINE	650.000 LF				
0580	627.75 WHITE OR YELLOW PAVEMENT & CURB MARKING	50.000 SF				
0590	629.05 HAND LABOR, STRAIGHT TIME	20.000 HR				
0600	631.10 AIR COMPRESSOR (INCLUDING OPERATOR)	12.000 HR				
0610	631.11 AIR TOOL (INCLUDING OPERATOR)	12.000 HR				
0620	631.12 ALL PURPOSE EXCAVATOR (INCLUDING OPERATOR)	12.000 HR				
0630	631.172 TRUCK - LARGE (INCLUDING OPERATOR)	12.000 HR				
0640	639.18 FIELD OFFICE TYPE A	1.000 EA				
0650	643.01 TRAFFIC SIGNALS AND GATES MOVABLE BR HYBRID WARN AND RESIST GATE	LUMP SUM	LUMP SUM			
0660	643.60 FLASHING BEACON AT: EASTBOUND APPR	LUMP SUM	LUMP SUM			

Proposal ID: 021751.01 Project(s): 021751.01

SECTION: 1 INITIAL GROUP

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
0670	643.60 FLASHING BEACON AT: WESTBOUND APPR	LUMP SUM	LUMP SUM	_____.____
0680	643.72 TEMPORARY TRAFFIC SIGNAL	LUMP SUM	LUMP SUM	_____.____
0690	643.80 TRAFFIC SIGNALS AT SOUTHPORT BR RT 27 OVER TOWNSEND GUT	LUMP SUM	LUMP SUM	_____.____
0700	643.92 PEDESTAL POLE	1.000 EA	_____.____	_____.____
0710	643.94 DUAL PURPOSE POLE W/ 35' WARNING BEACON	2.000 EA	_____.____	_____.____
0720	643.97 WOOD POLES WITH GUYS AND SPAN WIRE	1.000 EA	_____.____	_____.____
0730	652.33 DRUM	20.000 EA	_____.____	_____.____
0740	652.34 CONE	20.000 EA	_____.____	_____.____
0750	652.35 CONSTRUCTION SIGNS	300.000 SF	_____.____	_____.____
0760	652.361 MAINTENANCE OF TRAFFIC CONTROL DEVICES	LUMP SUM	LUMP SUM	_____.____
0770	652.38 FLAGGER	560.000 HR	_____.____	_____.____
0780	655.3002 BRIDGE CONTROL SYSTEM	LUMP SUM	LUMP SUM	_____.____

Proposal ID: 021751.01 Project(s): 021751.01

SECTION: 1 INITIAL GROUP

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
0790	659.10 MOBILIZATION	LUMP SUM	LUMP SUM	_____.____
0800	660.21 ON-THE-JOB TRAINING (BID)	1,000.000 HR	_____.____	_____.____
0810	815.00 BUILDING CONTROL HOUSE	LUMP SUM	LUMP SUM	_____.____
0820	860.1851 LIVE LOAD ROLLERS	LUMP SUM	LUMP SUM	_____.____
0830	860.1863 END JACK ASSEMBLIES	LUMP SUM	LUMP SUM	_____.____
0840	860.1864 END SEAT ASSEMBLIES	LUMP SUM	LUMP SUM	_____.____
0850	860.1865 FULLY CLOSED STOPS	LUMP SUM	LUMP SUM	_____.____
0860	860.187 MISCELLANEOUS MECHANICAL REPAIRS	LUMP SUM	LUMP SUM	_____.____
0870	860.231 SPAN DRIVE MACHINERY	LUMP SUM	LUMP SUM	_____.____
0880	860.30 FUNCTIONAL TESTING	LUMP SUM	LUMP SUM	_____.____
0890	880.02 BRIDGE BALANCING	LUMP SUM	LUMP SUM	_____.____
0900	880.031 BALANCE BLOCK STEEL	LUMP SUM	LUMP SUM	_____.____
0910	910.301 SPECIAL WORK STAFF GAUGES	LUMP SUM	LUMP SUM	_____.____

Proposal ID: 021751.01 Project(s): 021751.01

Section: 1 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 **021751.01** for **Southport Bridge Rehabilitation** in the town of **Southport** and **Boothbay Harbor**, County of **Lincoln**, 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 **May 30, 2025.** 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 _____

_____

$_____ 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 the 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 021751.01, Southport Bridge rehabilitation plus other incidental work,** 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.

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. 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 **021751.01** for **Southport Bridge Rehabilitation** in the town of **Southport** and **Boothbay Harbor**, County of **Lincoln**, 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 **May 30, 2025.** 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 _____

_____

$_____ 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 the 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 021751.01, Southport Bridge rehabilitation plus other incidental work,** 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.

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. 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

BRIDGE NO. 2789

The Maine Department of Transportation provides this publication for information only. Reliance upon this information is at user risk. It is subject to revision and may be incomplete depending upon changing conditions. The Department assumes no liability if injuries or damages result from this information. This map is not intended to support emergency dispatch.

0.035 Miles

1 inch = 0.04 miles

Date: 9/19/2022
Time: 11:46:08 AM

"General Decision Number: ME20220039 02/25/2022

Superseded General Decision Number: ME20210039

State: Maine

Construction Type: Highway

County: Lincoln County in Maine.

HIGHWAY CONSTRUCTION PROJECTS

Note: Contracts subject to the Davis-Bacon Act are generally required to pay at least the applicable minimum wage rate required under Executive Order 14026 or Executive Order 13658. Please note that these Executive Orders apply to covered contracts entered into by the federal government that are subject to the Davis-Bacon Act itself, but do not apply to contracts subject only to the Davis-Bacon Related Acts, including those set forth at 29 CFR 5.1(a)(2)-(60).

If the contract is entered into on or after January 30, 2022, or the contract is renewed or extended (e.g., an option is exercised) on or after January 30, 2022:	. Executive Order 14026 generally applies to the contract. . The contractor must pay all covered workers at least $15.00 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 2022.
If the contract was awarded on or between January 1, 2015 and January 29, 2022, and the contract is not renewed or extended on or after January 30, 2022:	. Executive Order 13658 generally applies to the contract. . The contractor must pay all covered workers at least $11.25 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on that contract in 2022.

The applicable Executive Order minimum wage rate will be adjusted annually. If this contract is covered by one of the Executive Orders and a classification considered necessary for performance of work on the contract does not appear on this wage determination, the contractor must still submit a conformance request.

Additional information on contractor requirements and worker protections under the Executive Orders is available at https://www.dol.gov/agencies/whd/government-contracts.

Modification Number	Publication Date
0	01/07/2022
1	02/25/2022

ENGI0004-022 04/01/2018

	Rates	Fringes
POWER EQUIPMENT OPERATOR: Grader/Blade, Milling Machine	$ 22.61	12.50

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* SUME2014-034 06/23/2017

	Rates	Fringes
CARPENTER, Includes Form Work	$ 18.34	2.84
HIGHWAY/PARKING LOT STRIPING: Laborer	$ 14.80 **	1.27
IRONWORKER, REINFORCING	$ 16.27	0.00
LABORER: Asphalt, Includes Raker, Shoveler, Spreader and Distributor	$ 15.40	2.69
LABORER: Common or General	$ 15.47	2.13
LABORER: Landscape	$ 18.69	2.70
LABORER: Wheelman	$ 15.64	4.29
OPERATOR: Backhoe/Excavator/Trackhoe	$ 18.80	4.16
OPERATOR: Bobcat/Skid Steer/Skid Loader	$ 21.66	4.91
OPERATOR: Broom/Sweeper	$ 19.09	5.20
OPERATOR: Bulldozer	$ 17.30	3.50
OPERATOR: Loader	$ 18.59	5.53
OPERATOR: Mechanic	$ 22.07	8.73
OPERATOR: Paver (Asphalt, Aggregate, and Concrete)	$ 21.46	8.78

OPERATOR: Screed.....$ 19.02 4.82

OPERATOR: Roller (Earth).....$ 16.43 3.40

OPERATOR: Roller Asphalt.....$ 21.97 7.81

TRAFFIC CONTROL: Flagger.....$ 9.38 ** 0.00

TRAFFIC CONTROL:
Laborer-Cones/
Barricades/Barrels -
Setter/Mover/Sweeper.....$ 17.47 4.80

TRUCK DRIVER: Dump Truck.....$ 15.07 5.15

TRUCK DRIVER: TackTruck.....$ 20.18 7.75

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

==========

** Workers in this classification may be entitled to a higher minimum wage under Executive Order 14026 ($15.00) or 13658 ($11.25). Please see the Note at the top of the wage determination for more information.

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 https://www.dol.gov/agencies/whd/government-contracts.

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 National Office because National Office has 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.

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END OF GENERAL DECISIO"

MaineDOT DBE Project Attainment Target (PAT)
for this Project is **.012 %**

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.

Town: **Southport/**
Boothbay Harbor
Project: **21751.01**
Date: **9/14/2022**

SPECIAL PROVISIONS
SECTION 104
Utilities

UTILITY COORDINATION

The Contractor has primary responsibility for coordinating their work with utilities after contract award. The Contractor shall communicate directly with the utilities 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.

The Contractor shall notify all utilities a **minimum of ten (10) working days** prior to commencement of **any** work on the project.

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 have been notified and will be furnished a project specification.

Overview of Utility Involvement:

Utility	Aerial	Underground
Central Maine Power *Jim Lemieux (207)607-2904*	X	
Consolidated Communications *Jim Scheid (207)626-2031*	X	
Charter Communications *Jason Cummings (207)620-3315*	X	
Town of Boothbay Harbor, Boothbay Region Water District, and East Boothbay Water District *John Ziegra (207)633-4723*		X

Temporary utility adjustments **are not** 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.

Unless otherwise specified, any underground utility 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 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.

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

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. 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* Central Maine Power Company. ****

Utility working days are Monday through Friday. Times are estimated on the basis of a single crew for each utility. 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

There are no aerial utility conflicts anticipated within the scope of work planned for this project. Should any arise the utility must be contacted as soon as possible. The bidding contractors are encouraged to review the pole and power line locations for crane clearances prior to bid.

At Existing pole #90 of the Westbound approach (Boothbay Harbor), the Maine Department of Transportation would like a riser installed to service the New Advance Warning Beacon that will be located on the east side of the bridge. The communication line for this advanced warning system will run west along Route 27 and shall be attached to the existing utility poles. A riser shall be installed on the existing pole at approximate Sta. 5+38, 13.67 Rt.

The Maine Department of Transportation plans to install a New Advance Warning Beacon at the west side bridge approach. A communication line for this advanced warning system shall start at a new Contractor installed utility pole at the corner of Route 27 and Route 238 and run through an underground conduit to existing pole #6. At existing pole #6 of the Eastbound approach (Southport), the Maine Department of Transportation would like a riser installed with a weather head drop to service the communication line for the warning beacon. The communication line will be attached to the existing utility poles and run east along Route 27 and cross Route 27 from pole #5 to pole #4 and continue to the riser pole at approximate Sta. 10+68, 13.67 Lt.

The Maine Department of Transportation will require an upgraded Transformer on the Southport side to power the new equipment for the swing bridge. The Contractor shall work directly with Central Maine Power to ensure that the transformer is installed according to the plans and specifications provided within the Contract Plans.

Pole List:

Existing Pole #	Existing Station	Left/Right		Existing Offset	Proposed Station	Left/Right		Proposed Offset	Comments
		LT	RT			LT	RT		
#99	4+38		X	13.5’					No Change
#100	5+18	X		17.16’					No Change
#101	5+31	X		17’					No Change
	5+46	X		16’					No Change
	5+38		X	13.67’					Install Riser, Add Meter (By Others)
	6+16		X	14.2’					Remove (By Others)
					10+33	X		13.25’	New Pole w/Meter (By Others)
	10+46	X		17.25’					Remove (By Others)
	10+57	X		15.6’					No Change
	10+68	X		13.67’					No Change
	11+10		X	18.33					No Change Install Riser (By Others)
	11+80	X		22.75’					No Change

SUBSURFACE (Underwater)

Central Maine Power has utilities within the project limits that run under water on the downstream end of the bridge. The depth and location of the utility line has not been verified. It will be the responsibility of the Contractor to protect the utility line from any damage during construction. Central Maine Power would like the Contractor to coordinate with them during construction to avoid any conflicts.

Charter Communications (Spectrum) has utilities within the project limits that run under water on the downstream end of the bridge. The depth and location of the utility line has not been verified. It will be the responsibility of the Contractor to protect the utility line from any damage during construction. Charter Communications (Spectrum) would like the Contractor to coordinate with them during construction to avoid any conflicts.

Consolidated Communications has utilities within the project limits that run under water on the upstream end of the bridge. The depth and location of the utility line has not been verified. It will be the responsibility of the Contractor to protect the utility line from any damage during construction. Consolidated Communications would like the Contractor to coordinate with them during construction to avoid any conflicts.

The Boothbay Water District and East Boothbay Water District have a water line in the area that runs under water on the upstream side of the bridge. The depth and location of the water line has not been verified. The water line is to remain in place. It will be the responsibility of the Contractor to protect the water line from any damage during construction. The Boothbay Water District and East Boothbay Water District would like the Contractor to coordinate with them during construction to avoid any conflicts.

The Contractor shall coordinate with the utility companies to locate the submerged facilities to avoid any conflicts. The submarine utilities shall be positively located prior to securing barges with spud piles and before removing/installing piles for the timber fender system using a method that is acceptable to the Resident and Utility Companies. All work required to locate submarine utilities shall be considered incidental to the Contract pay items.

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 PROVISION
SECTION 104
GENERAL RIGHTS & RESPONSIBILITIES
(Bridge Closure Notification)

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

104.4.10 Coordination of Bridge Closure/Bridge Width Restriction Notification:

Paragraph 2 is removed and replaced with the following:

A public notice shall be published in a local newspaper ten day prior to the closure.

Town: Southport-Boothbay
WIN #: 21751.01
Date: 9/12/2022

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

In-Water work consists of any activity conducted below the highest astronomical tide as identified in the tide tables published by the National Ocean Service. http://www.oceanservice.noaa.gov/

The following special conditions shall apply to this project:

I. In-Water Work shall not be allowed between the dates of March 15 and November 14.
In-water work is allowed November 15 – March 14

II. In-Water work window applies to the following water bodies at the following station #'s:
1. Townsend Gut/Atlantic Ocean at proposed bridge rehabilitation

III. Special Conditions:
1. Special Conditions of Informal Endangered Species Act (Section 7) FHWA Programmatic Consultation and Essential Fish Habitat Consultation with National Marine Fisheries Service (summarized in this Special Provision 105).
2. The contractor shall hold a pre-construction meeting with appropriate MaineDOT Environmental Office staff, other MaineDOT staff, and the MaineDOT construction crew or contractor(s) to review all procedures and requirements for avoiding and minimizing effects to Atlantic salmon and sturgeon. FHWA (Rachel LeVee, Rachel.levee@dot.gov), and National Marine Fisheries Service staff (Roosevelt Mesa - NOAA Affiliate, roosevelt.mesa@noaa.gov) shall be invited to attend.
3. **Special Conditions related to Migratory Bird Treaty Act -** An osprey nest is located on the bridge.
   a. Osprey are protected by the U.S. Migratory Bird Treaty Act. Osprey nesting period is approximately April 1 – September 1. **Once the birds lay an egg in a nest, the nest cannot be disturbed by construction activity and cannot be removed.** The contractor will need to preclude birds from nesting on the bridge to allow construction activities between April 1 and September 1. MaineDOT Environmental Office staff will be available to assist as necessary.
   b. The following measures shall be used to avoid adverse impacts to nesting osprey:
      1. The osprey nest shall be removed before March 25 or after September 1 (i.e., outside of the breeding season).
      2. Highly reflective mylar tape (1.25 inch) (such as https://reedjoseph.com/products/reflective-tape-one-inch/?search=&description=true&ocpage=2) will be used to deter nesting on the bridge during the osprey nesting season (the glare discourages nesting and perching). The reflective tape shall be applied to the upper surface of the two parallel top beams, end to end, and cross beams near the nest. It is suggested that a few twists be included in the tape application to maximize reflectivity and effectiveness.
      3. The bridge from end to end shall be monitored daily from March 25 through May 31 for any attempts to rebuild a nest.
      4. **Nesting materials are to be removed on a daily basis as needed to prevent osprey from nesting on the bridge.**
4. A vibratory hammer will be used as much as possible for all pile driving activities.
5. No blasting or use of explosives at any time.
6. Existing timber piles will either be removed or cut approximately 1-foot below the mudline.
7. If pile driving is occurring during a time of year when ESA-listed species may be present, and the anticipated noise is above the behavioral noise threshold, a "soft start" is required to allow animals an opportunity to leave the project vicinity before sound pressure levels increase. *In addition to using a soft start at the beginning of the work day for pile driving, one must also be used at any time following cessation of pile driving for a period of 30 minutes or longer.*
   a. For vibratory pile installation: the hammer shall be operated at reduced power for 15 seconds followed by a one-minute waiting period. This sequence of 15 seconds of reduced energy

driving, one-minute waiting period will be repeated two additional times, followed immediately by pile driving at full rate and energy.

b. For impact pile driving: pile driving will commence with an initial set of three strikes by the hammer at 40% energy, followed by a one minute wait period, then two subsequent three-strike sets at 40% energy, with one-minute waiting periods, before initiating continuous impact driving.

8. Maintain project (i.e., construction) vessels operating within the action area to speed limits below 10 knots
9. The Contractor shall conduct all construction activities in accordance with the MaineDOT-approved Soil Erosion and Water Pollution Control Plan. In stream turbidity shall be visually monitored and all erosion controls will be inspected daily to ensure that the measures taken are adequate. If inspection shows that the erosion controls are ineffective, immediate action shall be taken to repair, replace, or reinforce controls as necessary.

V. Approvals:

1. Temporary Soil Erosion and Water Pollution Control Plan
2. Permitted Wetland; No permit required for proposed work per ACOE letter dated 8/25/2022. Permit would be required for any temporary or permanent fill, excavation, or grading.

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

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

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

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

Southport-Boothbay
Southport Bridge #2789
Bridge Rehabilitation
WIN: 21751.01

GENERAL NOTE

The Southport Bridge (BR #2789) Rehabilitation project requires that the existing timber fender system be removed in its entirety. It is recognized that the timbers have been treated with creosote. During the duration of the project, the Contractor is responsible for proper disposal of any creosote treated timbers that are removed and/or which cannot be reused on site. The Contractor is responsible to have unused treated timbers disposed of as demolition waste at a landfill approved to accept demolition waste/debris. If the Contractor encounters other potential demolition debris and is not sure of proper disposal procedures, the Contractor shall notify the Resident. The Resident shall contact the Senior Geologist in Maine Department of Transportation Environmental Office (MaineDOT-ENV) at 207-624-3000 for clarification.

Further, if the Contractor encounters evidence of other environmental concerns, the Contractor shall stop work and immediately notify the Resident. The Resident shall contact the Senior Geologist in MaineDOT-ENV at 207-624-3000. Work may only continue with authorization from the Resident.

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

Section 105, General Scope of Work, of the Standard Specifications is amended as follows:

105.3 Traffic Control and Management:

Add the following to the end of the subsection:

At least one lane of alternating traffic shall be maintained through the project at all times, using temporary traffic signals. Before the temporary signals are in place and after they have been removed, alternating one-way traffic using flaggers may be allowed for specific work activities, as approved by the Resident, during working hours only. The minimum roadway width for alternating traffic shall be 11'-0".

There are several sensitive activities that may require the closure of the bridge to vehicular traffic. These activities include, but are not limited to:

1) Final Drilling and Reaming of:
    a. Span Drive Machinery (Motor SD1 and Brakes SD3 & SD4)
    b. End Seat Machinery (Actuator Cover Plate ES5 and Actuator Mounting Plate ES6)
    c. End Jack Machinery (Excluding End Jack Support EJ1)
    d. Live Load Shoe LL7
2) All Span Balance Testing
3) All final checks and functional testing required for commissioning the bridge.

Bridge closures for the activities listed above, or as approved by the Resident, may occur between 11pm-4am. The Contractor shall adhere to Standard Specification 104.4.10 Coordination of Road Closure/Bridge Closure/Bridge Width Restriction Notification for this work. During bridge closures, the Contractor shall monitor emergency radios and remain in contact with area emergency services. In the case of an emergency, the Contractor shall ensure that essential police, fire, rescue, and ambulance services have reasonable and timely access to and through the Project Limits. All closures of the bridge shall be approved by the Resident.

SPECIAL PROVISION 105
CONSTRUCTION AREA

A Construction Area located in the Town of **Boothbay Harbor** and **Southport** 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 Southport and Boothbay Harbor, Lincoln County on State Route 27/ Hendricks Hill Road/ Western Avenue over the Townsend Gut.

(b) (State Route 27) over Townsend Gut preceding abutment number 1 approximately 100 feet and extending to abutment number 2 and beyond approximately 100 feet 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 Boothbay Harbor** 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 105
CONSTRUCTION AREA

A Construction Area located in the Town of **Southport** and **Boothbay Harbor** 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 Southport and Boothbay Harbor, Lincoln County on State Route 27/ Hendricks Hill Road/ Western Avenue over the Townsend Gut.

(b) (State Route 27) over Townsend Gut preceding abutment number 1 approximately 100 feet and extending to abutment number 2 and beyond approximately 100 feet 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 Southport** 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 107
TIME
(Contract Time and Contract Completion Date)

The following is added to Standard Specifications Subsection 107.1, Contract Time and Contract Completion Date:

The specified Contract Completion Date is May 30, 2025.

SPECIAL PROVISION
SECTION 107
TIME
(Scheduling of Work, Disincentives)

Moveable Bridge Operations and Navigation Channel Restrictions:

The Contractor shall plan and prosecute work in such a manner to limit the closure of the movable bridge operations and full navigation channel restrictions to a maximum of two (2)-157 consecutive calendar day closures between October 25, 2023-March 29, 2024 and between October 24, 2024-March 28, 2025.

After the first closure period between October 25, 2023 and March 29, 2024 the bridge shall be returned to the drawbridge's normal operation schedule as defined by 33 CFR 117.537 and include a fully operational mechanical and electrical bridge control system, fully operational traffic safety and control system including but not limited to the existing signals, gates, and advanced warning lights.

After the second closure period between October 24, 2024 and March 28, 2025 the bridge shall be substantially complete and returned to the drawbridge's normal operation schedule as defined by 33 CFR 117.537. Substantially Complete is defined as having the following work complete and accepted at a minimum:

- Fully operational, new mechanical and electrical bridge control systems, including all field testing and commissioning activities.
- Fully operational, new traffic safety and control systems, including but not limited to the new traffic signals, barrier gates, and advanced warning signals.

A disincentive of $10,000.00 (ten thousand dollars) per calendar day shall be paid by the Contractor for every day that the navigation channels remain closed to boat traffic beyond the 157 consecutive calendar day closures allowed, other than any temporary waterway restrictions allowed per the Coast Guard General Construction Requirements and with coordination and approval by the Resident and the U.S. Coast Guard. The maximum disincentive paid by the Contractor shall be capped at $350,000.

SPECIAL PROVISION
SECTION 107
TIME
(Sundays and Holidays)

Subsection 107.3.3 of the Standard Specifications is amended as follows:

The Contractor shall be allowed to work on Sundays during the (2)-157 consecutive calendar day movable bridge closure periods. The Contractor shall provide the Resident with a minimum 48-hour notice before commencing work on a Sunday.

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

107.8.1 Fabrication Time

The Department has budgeted for the following amounts for fabrication/shop inspection for certain Work components:

Element	Time	Supplemental LD
Mechanical Work Items:	100 calendar days	$1200 per calendar day

The Contractor is responsible for requiring their fabricators, manufacturers, and/or 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 shop inspection beyond these times is required, then the corresponding Supplemental Liquidated Damages will be deducted as they occur from the amounts otherwise due 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 protective coating application.

For mechanical work items - from forging and casting, through machining, assembly, testing and painting.

SPECIAL PROVISION
SECTION 202
REMOVING STRUCTURES AND OBSTRUCTIONS
(Timber Fender Removal)

Section 202 – Removing Structures and Obstructions, of the Standard Specifications is amended as follows:

202.03 Removing Existing Superstructure, Structural Concrete, Railings, Curbs, Sidewalks and Bridges

Add the following after the first paragraph:

The existing timber walkway, timber and steel railings, and timber fender systems at piers 1, 2, and 3, along with associated connections shall be removed in their entirety accordance with the contract drawings and shall become the property of the contractor. The timber piles at the pier 2 fender system shall be removed in their entirety. If a pile cannot be fully removed, then the pile shall be removed to a minimum of 1-ft below mudline. All removed timber pile material and all related steel connection hardware shall become the property of the contractor.

The Contractor shall reference the existing plans for fender timber and pile sizes. The Contractor will be permitted to cut existing timbers to facilitate fender system removal. During fender removal operations the Contractor shall exercise caution to avoid damage to the existing bridge substructure, superstructure, and all related elements to remain. Any damage to any existing bridge elements to remain, which is the result of the Contractor's operations, shall be repaired at the expense of the Contractor in a manner approved by the Resident.

At least 14 days prior to beginning removal the removal of a particular fender system, the Contractor shall submit to Resident for review and approval the proposed method of removal, including, but not limited to:

- A plan of the general removal procedure, including pick weights and removal equipment.
- The proposed marine traffic control.

All fender system timber elements contain creosote or shall be assumed to contain creosote. The Contractor shall submit a plan to the Resident for review and approval at least 14 days prior to beginning work outlining the methods and equipment to be used to remove and dispose of all fender timber material. No work related to the removal of the fender systems shall be undertaken until the Department has approved, in writing, the above referenced plan. The Contractor is responsible for the containment, proper management, and disposal of all creosote-contaminated hazardous waste generated by the process of removing the existing timber fender systems, pursuant to Maine Department of Environmental Protection's "Maine Hazardous Waste Management Regulations," Chapter 850. The Contractor is responsible for implementing appropriate OSHA mandated personal protection standards related to this process.

202.07 Method of Measurement

Add the following to the end of the subsection:

Removing the existing timber fender systems, including timber piles to the extents indicated above and timber walkways and all other related items shall be measured as a lump sum payment that includes removal and disposal of the removed material, including any hazardous waste generated in the process of the required removals.

202.08 Basis of Payment

Insert the following as the fifth paragraph:

Removal and disposal of the existing timber fender systems, including timber piles to the extents indicated above and timber walkways and all other related items shall be paid for at the Contract Unit Bid Price, Lump Sum, which price shall include full compensation for all materials, transportation, tools, equipment, and labor required for the removal, containment, and proper disposal of all materials generated in the removal of the existing steel grid deck as specified herein, as shown on the contract drawings, and/or as directed by the Resident.

Pay Item	Pay Unit
202.01 Removing Structures and Obstructions, Existing Fender System	LS

SPECIAL PROVISION
SECTION 202
REMOVING STRUCTURES AND OBSTRUCTIONS

Section 202 – Removing Structures and Obstructions, of the Standard Specifications is amended as follows:

202.03 Removing Existing Superstructure, Structural Concrete, Railings, Curbs, Sidewalks and Bridges

Add the following after the first paragraph:

The entire existing steel grid deck supported by the steel structures of spans 1, 2, and 3, including concrete infill, damaged shear stud connectors, and all weldments shall be removed in accordance with the contract drawings and shall become the property of the contractor. The existing timber sidewalk shall also be removed in its entirety and shall become the property of the contractor.

The existing grid deck is 5" nominal thickness on spans 1 and 3 and 3" nominal thickness on the span 2 turnstile truss. The Contractor will be permitted to cut the existing deck to facilitate its removal from the bridge. During deck removal operations the Contractor shall exercise caution to avoid damage to the existing stringer deck end supports of the truss, as well as all floorbeams, stringers, girders, and all structural steel to remain. Any damage to the existing floorbeams, stringers, stringer deck end supports, girders, or any structural steel to remain, which is the result of the Contractor's operations, shall be repaired at the expense of the Contractor in a manner approved by the Resident.

The Contractor may remove the existing concrete infill with chipping hammers weighing a maximum of 35 pounds and utilizing chisel point bits, or other mechanical means as approved by the Resident. The shear stud connectors may be partially removed by cutting (oxy-acytelene, carbon air arc, or saw cut) at or above the top of the weld to the floorbeam top flange. The remaining portion of the connectors shall be removed by grinding. The Contractor shall exercise caution during removal of the connectors to avoid damage to the existing structural steel to remain. Any damage to the existing floorbeams, stringers, stringer deck end supports, girders, or any structural steel to remain, which is the result of the Contractor's operations, shall be repaired at the expense of the Contractor in a manner approved by the Resident.

At least 14 days prior to beginning deck removal, the Contractor shall submit to Resident for review and approval the proposed method of deck removal, including, but not limited to:

- The location(s) of any saw cutting of the existing deck.
- The procedure for removing shear stud connectors.
- The procedure for removing the deck from the supporting structural steel.
- The procedure for removing the welds attaching the steel grid deck to the supporting structural steel.

- The procedure for removing deck sections off the bridge.
- The proposed marine and vehicular traffic control.

Any paint remaining on the existing steel grid deck is a lead-based paint system. The Contractor shall submit a plan to the Resident for review and approval at least 14 days prior to beginning work outlining the methods and equipment to be used to remove and dispose of all steel grid deck material. No work related to the removal or modification of any steel grid deck shall be undertaken until the Department has approved, in writing, the above referenced plan. The Contractor is responsible for the containment and proper management of all lead-contaminated hazardous waste generated in the process of removing parts of the bridge superstructure, pursuant to Maine Department of Environmental Protection's "Maine Hazardous Waste Management Regulations," Chapter 850. The Contractor is responsible for implementing appropriate personal protection standards maintained by OSHA.

202.07 Method of Measurement

Add the following to the end of the subsection:

Removing the existing steel grid deck, including removing concrete infill, shear stud connectors, and weldments shall be measured as a lump sum payment that includes removal and disposal of the removed material, including any hazardous waste generated in the process of the required removals.

202.08 Basis of Payment

Insert the following as the fifth paragraph:

Removal and disposal of the existing steel grid deck concrete infill, shear stud connectors, and weldments shall be paid for at the Contract Unit Bid Price, Lump Sum, which price shall include full compensation for all materials, transportation, tools, equipment, and labor required for the removal, containment, and proper disposal of all materials generated in the removal of the existing steel grid deck as specified herein, as shown on the contract drawings, and/or as directed by the Resident.

Pay Item	Pay Unit
202.01 Removing Structures and Obstructions, Existing Steel Grid Deck	LS

SPECIAL PROVISION
SECTION 202
REMOVAL OF STRUCTURES AND OBSTRUCTIONS
(Building Removal)

202.01 Description This item shall include the complete demolition and removal of the existing control house mounted near the top of the truss span.

202.02 General Removal of building shall include all attached structures including the wooden platform, metal handrails, and any other incidentals, as directed by the Resident. The existing steel support structure and steel stairway shall remain.

Under Section 202.02 of the Standard Specifications, ownership of buildings and all equipment, fixtures, and materials therein shall be interpreted as meaning all equipment, fixtures, and materials that are recognized as real property. Any items that are recognized as personal property are exempt and are reserved to the owner. If the bidder is in doubt as to whether any item not listed is real or personal property, they shall request a determination of the matter prior to date on which bids are to be received.

All debris and unusable materials shall be removed to an approved transfer station or approved landfill. Under no circumstances shall any material or debris be disposed of by burning on the premises nor shall the debris be burned at an off-premise site.

Rodent Control: With the "Notice to Proceed", or when a building becomes available to the Contractor, the Contractor will designate whether rodent control measures are required or not.

The Contractor shall not remove a building until the Contractor has certified it to be free of rodents. Should rodent control measures be required, the Contractor shall procure the extermination services as soon as possible. The Contractor will re-inspect the building within 7 days after the extermination services are performed. The cost of extermination services until the building is found to be rodent free will be paid for as a specialty item under Section 109.04(g) of the Standard Specifications.

Each building shall be removed promptly after notification that it is free of rodents. All subsequent inspection costs and extermination services necessary to assure that the building is rodent free at time of removal will be at the expense of the Contractor.

This building may or may not contain asbestos. Prior to any demolition of building(s) the Contractor will conduct an asbestos survey on the building(s) to determine if any asbestos exists. The survey will be conducted by a DEP certified Asbestos Inspector. No separate payment will be made for the survey and it shall be considered incidental. The survey results will be communicated with the Resident. If no asbestos is discovered, the demolition process may proceed. If asbestos is found, the Contractor will employ a DEP certified Asbestos Abatement Contractor for its' removal and disposal. The Department will bear all expenses incurred in the

abatement of any asbestos containing material as detailed in Standard Specification 109.7.5 – Force Account. Any questions can be directed to the Office of Legal Service (624-3020).

The Contractor shall remove all utility service connections prior to demolition of any building. The Contractor shall coordinate disconnection of overhead utilities with the appropriate utility companies.

Contractor shall provide and maintain all temporary barricades, signs or other safety measures as necessary to complete the work. Contractor shall obtain any and all permits or licenses necessary for the performance of the work and conform to all Federal, State and local laws, regulations or ordinances applicable to the work.

Any oil/fuel tanks encountered will need to be properly disposed of. The fuel is a regulatory material and may be reused or disposed of in accordance to local, state, and federal regulations. The tanks shall also be disposed of in accordance to local, state, and federal regulations.

All plywood panels, hasps, padlocks, and other materials used to secure these buildings will remain the property of the Department of Transportation. These panels and padlocks will be transported to a location in the area to be determined by the Resident.

202.03 Method of Measurement The Work specified herein will be measured for payment by lump sum.

202.04 Basis of Payment All work for will be paid for at the contract Lump Sum price, which shall be full compensation for all materials, labor and equipment necessary for the work described above and as shown in the Plans, and/or as directed by the Resident.

Payment will be made under:

Pay Item		Pay Unit
202.08	Remove Building: Control House	LS

SPECIAL PROVISION
SECTION 202
REMOVING STRUCTURES AND OBSTRUCTIONS
(Remove Advance Warning Beacon)
(Remove Warning Gate)

Standard Specification Section 202 shall apply with the following additions and modifications:

202.01 Description

The work shall consist of removing and satisfactory disposing of all designated advance warning beacons and warning gates. Their removal shall be as described in this special provision.

202.032 Remove Existing Advance Warning Beacon

The removal of the advance warning beacon shall include but is not limited to the following:

- Removal of all above ground components and appurtenances.
- Removal of post and base.
- Removal of the foundation to at least 3-feet below grade.
- Placement of embankment in resulting excavations (foundation holes) level with the surrounding ground.

202.033 Remove Existing Warning Gate, Bridge Mounted

The removal of the warning gate shall include but is not limited to the following:

- Removal of all above deck components and appurtenances.
- Removal of base and connection to bridge structure.
- Design and installation of new decking surface, as needed, where gate has been.
- Installation of extension of existing bridge railing and installation of chain to close gap(s) from gate removal. The Contractor shall submit an installation plan of decking, railing, and chains to the Resident for review and approval prior to fabrication and installation. Designs shall be in accordance with OSHA and AASHTO.

202.033 Remove Existing Warning Gate, Foundation Mounted

The removal of the warning gate shall include but is not limited to the following:

- Removal of all above ground components and appurtenances.
- Removal of base.
- Removal of the foundation to at least 3-feet below grade or to the extent necessary for the installation of proposed barrier gate foundations in accordance with the Contract Plans and Specifications.
- Placement of embankment in resulting excavations (foundation holes) level with the surrounding ground.

202.07 Method of Measurement

Remove advance warning beacons with signs and equipment at each location shall constitute a single system. Each removal will be measured for payment by each removed.

Remove existing warning gate, bridge mounted and remove existing warning gate, foundation mounted at each location shall constitute a single system. Each removal will be measured for payment by each removed.

202.08 Basis of Payment

Remove Warning Beacon will be paid for at the contract lump sum price, which payment will be full compensation for demounting and removing all materials including, but not limited to the LED beacon arrays, flasher, timer, lockable controller cabinet, pedestals and foundations, wiring and power service, pole risers, communication devices and all appurtenances and incidentals included in an existing installation.

Remove Warning gate will be paid for at the contract lump sum price, which payment will be full compensation for demounting and removing all materials including, but not limited to the barrier arm, lights, control box, pedestals and foundations and all appurtenances and incidentals included in an existing installation. Conduit and electrical wiring shall be removed under the electrical Item 655.3002.

Payment will be made under:

Pay Item		Pay Unit
202.56	Remove Existing Advance Warning Beacon	EA
202.57	Remove Existing Warning Gate, Bridge Mounted	EA
202.57	Remove Existing Warning Gate, Foundation Mounted	EA

SPECIAL PROVISIONS
SECTION 202
REMOVING STRUCTURES AND OBSTRUCTIONS
(Removing Pavement Surface)

The March 2020 Revision of the Standard Specifications, Section 202-Removing Structures and Obstructions, subsection 202.061-Removing Pavement Surface, has been removed and replaced in its entirety by the following:

202.061 Removing Pavement Surface The equipment for removing the bituminous surface shall be a power operated milling machine or grinder capable of removing bituminous concrete pavement to the required depth, transverse cross slope, and profile grade using an automated grade and slope control system. The controls shall automatically increase or decrease the pavement removal depth as required, and readily maintain desired cross slope, to compensate for surface irregularities in the existing pavement course. The equipment shall be capable of accurately establishing profile grades by referencing from a fixed reference such as a 30 foot minimum contact ski (floating beam), 24 foot non-contact ski (floating beam) with 3 or more sensors; or 3 non-contact sensors directly affixed at the fore, mid, and aft points of the milling machine. Systems designed to incorporate a contact sensor located at the mid-point of the milling machine in lieu of the non-contact sensor will be permitted. Grade control sensors shall all be located on the same side. A single sensor, contact or otherwise, shall not be permitted unless otherwise approved by the Department.

The rotary drum shall be a minimum of 7 feet in width and utilize carbide tip tools at a minimum triple wrap configuration. The difference in height from the top of any ridge to the bottom of the groove adjacent to that ridge shall not exceed ¼ inch. The forward speed of the milling machine shall be adjusted to produce a milled surface meeting the groove spacing, groove depth, and surface tolerance requirements of this specification. The tools on the revolving cutting drum must be continually maintained and shall be replaced as warranted to provide a uniform pavement texture. The Department may evaluate the texture of the milled surface for information purposes by performing the Sand Patch test according to ASTM E 965.

The Contractor shall locate and remove all objects in the pavement through the work area that would be detrimental to the milling or grinding machine. Any structures or obstructions left within the travel lane or shoulders shall have tapers installed according to Standard Detail 202(01). The finished milled surface will be inspected before being accepted, and any deviations in the profile exceeding ½ inch under a 16 foot string line or straightedge placed parallel to the centerline will be corrected. Any deviations in the cross-slope that exceed $^{3}/_{8}$ inch under a 10 foot string line or straightedge placed transversely to centerline will be corrected. All corrections will be made with approved methods and materials. Any areas that require corrective measures will be subject to the same acceptance tolerances. Excess material that becomes bonded to the milled surface will be removed to the Resident's satisfaction before the area is accepted.

On roadways with adjoining lanes carrying traffic, the Contractor shall remove the pavement surface in each lane per the conditions in Table 1, unless otherwise noted by the Department in Special Provision, Section 105 – Limitations of Operations.

TABLE 1: MILLING CONDITIONS FOR ADJOINING LANES

Depth (At Centerline)	Milling Conditions
Vertical Longitudinal Joint	
2" and less	The Contractor may remove the pavement on a single travel lane width for each production day and will be required to mill the adjacent section of travel lane before the end of the following calendar day.
Greater than 2"	The Contractor shall remove the pavement over the full width of the traveled way section being paved that day.
12:1 Tapered Centerline Joint	
1 ½" to 2"	The Contractor may remove the pavement on a single travel lane width for each production day and will be required to mill 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 shall remove the pavement on a single travel lane width for each production day and will be required to mill the adjacent section of travel lane before the end of the following calendar day.

The Contractor will be required to remove the pavement over the full width of the mainline traveled way, regardless of highway type, cut depth, or longitudinal joint type prior to Memorial Day, July 4th, Labor Day, suspensions exceeding three days, or other dates as specified by Special Provision, Section 105 – Limitations of Operations.

The Contractor will also be responsible for installing 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 RPM application, or temporary painted line. 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.

On roadways with immediately adjacent shoulders, the Contractor shall remove the pavement surface in each lane per the conditions in Table 2, unless otherwise noted by the Department in Special Provision, Section 105 – Limitations of Operations.

TABLE 2: MILLING CONDITIONS FOR THE EDGE OF TRAVELED WAY

Depth (At Edge of Traveled Way)	Conditions
2" and less	The Contractor may leave a vertical edge joint exposed for up to **21 days** after milling is performed. The Contractor shall treat vertical edge joints exposed beyond 21 days per the criteria below.
Greater than 2"	The Contractor shall treat vertical edge joints exposed per the criteria below.

When required by Table 2, the Contractor shall treat vertical edge joints through one of the options below:

1. The vertical edge shall be tapered to a zero edge by means of milling a 12:1 transition from the edge of traveled way onto the shoulder before opening the lane to traffic. Tapers shall be removed to form a vertical edge prior to the placement of the new pavement course. No additional payment will be made for tapers, or taper removal.
2. An additional 2 feet of pavement shall be removed from the shoulder to eliminate the vertical edge at the edge of travelway before opening the lane to traffic. Unless otherwise authorized by the Department, no additional payment will be made for the additional milling.
3. A pavement layer shall be placed to reduce the vertical edge to 1 inch or less before opening the lane to traffic.

As a minimum, the use of temporary painted line, or RPMs placed along the edge of traveled way at 200 foot intervals is required for all elevation differentials. When pavement milling is extended into the shoulder (including milled tapers), appropriate channelization devices shall be placed 2 feet outside the edge of the vertical face at intervals not exceeding 600 feet, and RPMs shall be placed on the remaining pavement surface along the vertical edge at 200 foot intervals. Uneven pavement signs shall be placed at a maximum spacing of ½ mile when any pavement milling operations leaves an exposed uneven pavement surface.

Weepers shall be ground across the full width sections adjacent shoulders or remaining pavement surface matching the milled travel way or shoulder milled depth to minimize water ponding in any lanes carrying traffic. Weepers shall typically be 18 - 24” inches in width, installed along each lane, at a frequency of approximately one per half mile at locations as directed by the Resident or in areas that will provide drainage for the milled areas. Installation of weepers will not be paid for directly but will be considered incidental to the contracts pavement removal item. The replacement of mix in the weeper locations shall be performed concurrently within the pavement placement operation closure using the appropriate HMA item produced for the Contract or a MaineDOT approved 9.5mm HMA. There will be no separate payment for repaving the weeper locations as they are considered incidental to the square yard price of the contracts pavement removal item.

The milled surface shall be cleaned of all material resulting from the pavement removal operation. Loaders, skid steers, motorized side cast brooms, sweeper pick up brooms, vacuum pick up machines and hand labor may be used in any number or sequence as determined by the Contractor in order to clean the milled surfaces to the satisfaction of the Department before acceptance and opening the area up to traffic. The use of compressed air may be required to loosen any bonded materials from the surface to aid in cleaning.

Any areas of concern, such as de-lamination or pot-holing shall be identified on a continuous basis as milling progresses. Proper corrective action will be determined by the Resident and paid for under the appropriate contract items, and if required, completed prior to opening lane to traffic. Any issues that arise up to 7 calendar days after being milled will be the responsibility of the MaineDOT unless otherwise noted in Special Provision Section 105 – Limitations Of Operations.

Basis of Payment

The square yard or hourly rental contract price will be full compensation for mobilizing to the site, de-mobilizing from the site, labor, supervision, cleaning of the milled surface, and all other incidentals required to complete the work. Hauling and stockpiling of the material will not be paid for directly, but will be considered incidental to the milling items.

Square Yard: Payment will be made at the contract unit price for the number of square yards removed.

Hourly: Payment will be made at the contract unit price for the number of hours of operation removing pavement surface as directed by the Resident. The equipment used for pavement removal shall be operated at the minimum speed of 50 fpm, unless the Resident directs otherwise for milled surface quality reasons, or traffic control limitations impact pavement removal operations, or site conditions make operations at the prescribed rate unreasonable. Trimming to create a vertical face along curb line, guardrail, or around structures will be considered incidental to the 202.202 items. Additional trimming beyond the incidental work described will be paid under the appropriate rental items as listed in the Contract.

Pay Item	Pay Unit
202.202 Removing Pavement Surface	S.Y.
202.20201 Removing Pavement Surface (Hourly)	Hour

SPECIAL PROVISIONS
SECTION 202
REMOVING STRUCTURES AND OBSTRUCTIONS
(Vacuum Truck)

Description The Contractor shall provide a vacuum truck as part of the pavement removal surface cleaning operation. The vacuum truck may act as a supplement to the contractors normal milled surface cleaning equipment train, or act as the primary cleaning equipment. Number of vacuum trucks to be used, the sequence of how they are used, and duration they are to be used will generally be up to the contractor with the exception that the vacuum truck will be required in any final cleanup operation prior to the roadway being opened up to traffic.

The equipment shall meet the minimum criteria outlined in this Special Provision.

Equipment The equipment for vacuuming the pavement surface removing the bituminous surface shall be a power operated regenerative air sweeper equipped with cleaning and vacuum system that contains the materials being cleaned and vacuumed from the surface, filters the air of any milling debris, contains the milling debris in a sealed, onboard self-off-loading hopper, and returns the air to the sweeper heads to aid in continued surface cleaning.

Each machine shall use a controlled blast of air the width of the pickup head to dislodge debris from the surface. It will be equipped with a mid-mount, on demand wide sweeper broom, gutter brooms, and vacuum system which will use high velocity recycled air to assist in removing millings and dirt from the surface. The broom assist pick-up head shall work independently of gutter brooms. Recycled air will be distributed across the entire width of a pick-up head(s), covering the entire width of the sweeper. The sweeper shall have positive contact suction heads designed to remove milling debris and dust from surface. All debris picked up by the pick-up head is directed up a large diameter heavy duty 12” -14” suction hose into the hopper. A high-capacity dust separator located before the blower is required limiting polluted air (dust) to re-enter back into the atmosphere. Each air assisted vacuum head shall be equipped with a minimum of 2 water nozzle jets used to minimize dust. The additional use of compressed air and air wand may be required to loosen bonded materials from the surface in preparation of vacuuming.

Basis of Payment Payment will not be made directly for the vacuum truck but will be considered incidental to the square yard or hourly rental contract price for removing pavement surface and will be full compensation for mobilizing to the site, de-mobilizing from the site, labor, supervision, and cleaning of the milled surface, and disposal of all vacuumed materials removed from required surfaces. Hauling and stockpiling of the material will not be paid for directly but will be considered incidental to the pavement removal items.

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. A means for sampling the PG binder with additive introduced will be provided. The sampling point shall be after the additive is mixed with the PGAB before entering the drum or mixer unit.

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.

d. 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 eights 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.

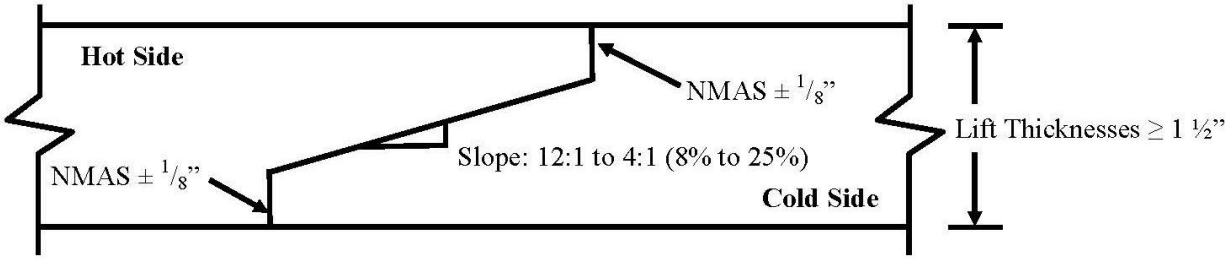

FIGURE 1: Notched Wedge Joint

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.
   -

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.

Unless otherwise noted in Section 403 - Hot Mix Asphalt Pavement, the Contractor shall submit a modified QC Plan detailing, how the mix is to be placed, 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.
A QCP, certified QC personnel, and a 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 visual or Method D. An approved JMF shall be provided to the Resident prior to placement.

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 submit all QC test and inspection reports and updated control charts to the Resident and QC.mainedot@maine.gov by email. The reports and updated control charts shall be signed by the appropriate technician and be submitted to the Department by 1:00 P.M. on the next working day, except when otherwise noted in the QCP and approved by the Department.

The Contractor shall also 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 Quality Control for Method D, (sidewalks, drives, islands & incidentals) and visual acceptance items

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 visual or Method D. 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.

401.201 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. 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.

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	Target +/- 0.5%	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)	94.5% +/- 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.

401.211 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 in 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 Projects to have their pavement smoothness 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
SECTION 403
HOT MIX ASPHALT PAVEMENT

Desc. Of Course	Grad Design.	Item Number	Total Thick	No. Of Layers	Comp. Notes
6" – Route 27 Travel Way, Shoulders, Guardrail Flareouts & Widenings Full Depth Construction					
Wearing	12.5 mm	403.208	1½"	1	4,10
Base	12.5 mm	403.213	1½"	1	4,10
Base	12.5 mm	403.213	3"	2/more	4,10
3" – Route 27 Travel Way & Shoulders – Mill & Overlay					
Wearing	12.5 mm	403.208	1½"	1	4,10
Base	12.5 mm	403.213	1½"	1	4,10

COMPLEMENTARY NOTES

4. The aggregate qualities shall meet the design traffic level of 3 to <10 million ESALS for mix placed under this contract. The design, verification, Quality Control, and Acceptance tests for this mix will be performed at **65 gyrations**.
10. Section 106.6 Acceptance, (2) **Method D** as specified Section 401.21 - Quality Assurance Methods C and D.

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
(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 Resistance, 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.

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 retap the pile. 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 reducing the hammer drop height 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 Departments 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 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	$ 600.00 /trip
Field Testing	$1,350.00 /day
Overnight Stay	$ 275.00 /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

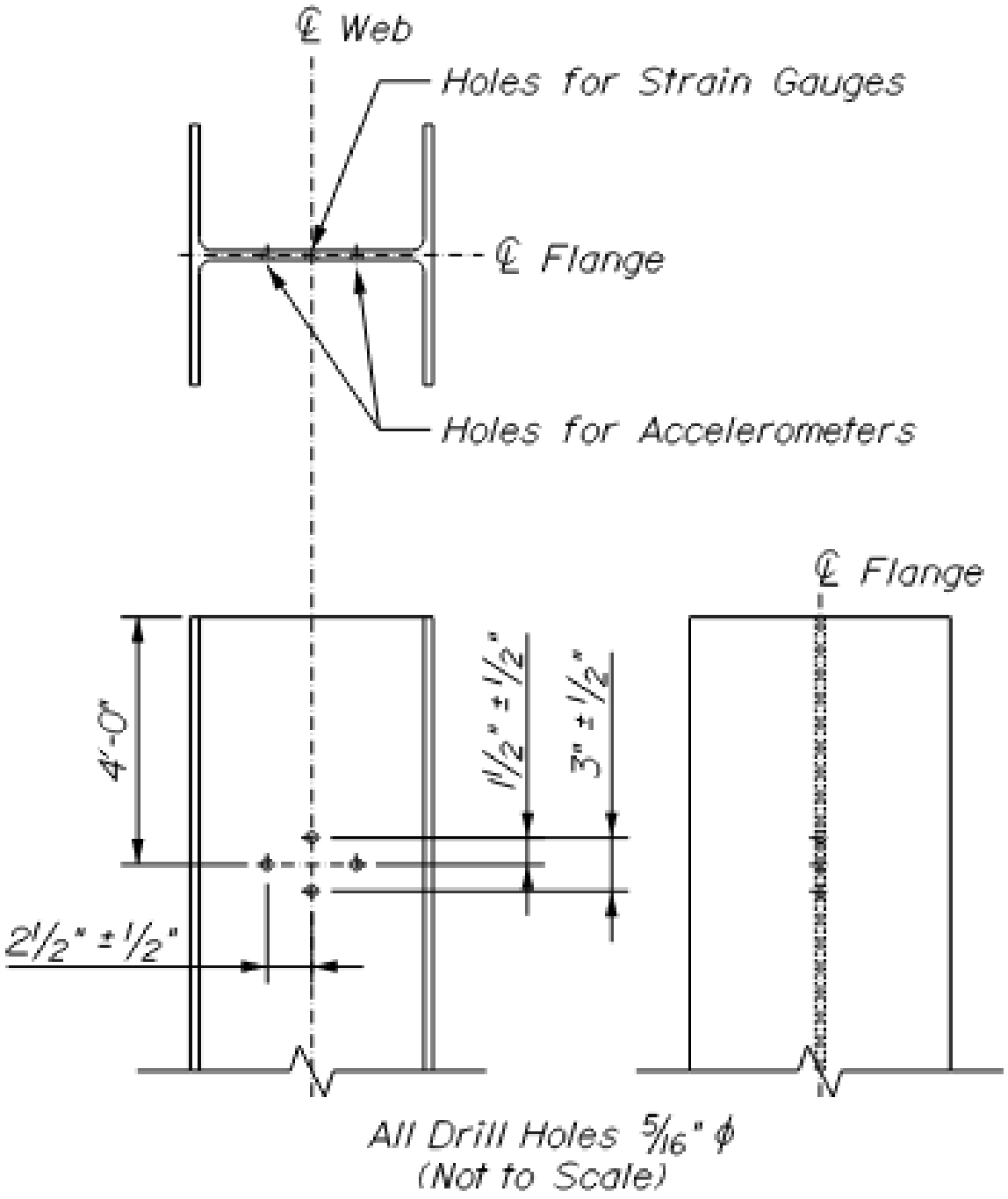

Figure 1. Drill-Hole Layout for H-Piles

SPECIAL PROVISION
SECTION 501
FOUNDATION PILES
(Vibratory Pile Installation and Retapping)

Description. This work shall consist of installing foundation piles in accordance with Section 501 of the Standard Specifications, except as amended herein.

Under Section 501.042 Equipment for Driving Piles, replace the subsection Hammers, with the following:

Hammers: Piles shall be installed to practical refusal with approved low-frequency vibratory pile driving hammers. Select piles shall be retapped (redriven) using a gravity drop hammer. The drop hammer ram shall be between 2,000 and 3,500 pounds and the height of drop shall not exceed 10 feet. All drop hammers shall be equipped with hammer guides to insure concentric impact on the drive head.

Under Section 501.042 Equipment for Driving Piles, replace the 1st, 2nd and 3rd paragraphs of Approval of Pile Driving Equipment, with the following:

All pile installation equipment shall be sized such that the specified piles can be installed to the required resistance and retapped, without damage, as indicated on the Plans. Approval of the pile driving equipment by the Department will be based on the wave equation analysis and a completed Pile Driving Equipment Data Form, as shown in the Standard Specification. Forms shall be provided for both a vibratory pile driving hammer and a drop hammer.

The wave equation analyses provided by the Department will include a minimum stopping criterion for the approved vibratory hammer system, which will include a minimum penetration rate in seconds for the final inch for the vibratory hammer. The wave equation analyses provided by the Department will also include a criterion for retapped test piles, where the minimum number of blows per inch, at a specified hammer drop weight and height, is clearly defined. The criteria that the Department will use to evaluate the installation equipment will be based on the wave equation analysis utilizing the information provided in the completed Pile Driving Equipment Data Form.

For the installation system to be acceptable, the target penetration rate for the vibratory hammer shall be in a range that can be visually confirmed by the Department or their agent during observation of the installation. For the retapping of test piles, the number of hammer blows at the required resistance indicated by the wave equation analysis shall be between 3 and 15 blows per inch, and the driving stresses shall not exceed 90% of the specified yield stress of the pile material. The stopping criteria used for pile operations shall be approved by the Department.

Under Section 501.043 Driving Procedures and Tolerances, replace the 5th and 6th paragraphs (Vibratory Hammers), with the following:

Piles may be installed with an approved low-frequency vibratory pile driving hammer. Piles shall be vibrated until achieving the target penetration rate that is developed through a test program of piles

installed by vibration and retapped with a drop hammer. If the required pile resistance is not achieved within less than two inches of penetration during the retap using the drop hammer, the Contractor shall provide an alternative target penetration rate or a method to seat the pile after completion of vibration. A static drop of the vibratory hammer with the clamps open after completion of vibratory installation is allowed for the purpose of seating the pile if it is shown to achieve the required pile resistance.

Under Section 501.046 Driven Pile Resistance, Pile Testing and Acceptance, amend with the following:

Vibratory Installed Pile Capacity – Wave Equation. The piles shall be vibrated to the required resistance using the approved stopping criteria. The pile acceptance will be based on obtaining the penetration rate from the approved stopping criteria at the required resistance, supplemented by additional seating procedures that may be required based on retapping results.

Test piles shall be installed at locations approved by the Department prior to production pile installation. Test piles may be installed at non-production locations at the option of the Contractor if approved by the Department. The piles shall be installed to the penetration rate developed in the wave equation analyses, at a minimum. A drop hammer shall then be utilized to retap the test piles to verify the resistance using pile dynamic analysis methods (PDA). The retap test shall show that the required resistance is developed within less than two inches of penetration. If the proposed vibratory installation procedure does not meet the required resistance based on retap results, additional test piles will be required based on alternative installation methods. The additional test piles must be installed a minimum of 5 feet away from the original test piles.

Under Section 501.05 Method of Measurement, amend paragraph a. Equipment Mobilization, with the following:

The lump sum price shall include vibratory equipment and drop hammer equipment required for installation and testing.

Under Section 501.05 Method of Measurement, replace 1st and 2nd paragraphs of c. Piles in Place, with the following:

The quantity of H-beam to the paid for will be the actual number of linear feet of H-pile installed and left in place in the completed and accepted work. Measurements will be made from the tip of the H-beam pile, steel pipe pile or casing to the cutoff elevation as shown on the Plans. Measurement will include the pile tips.

Payment will be made under Pay Items in accordance with the Standard Specification.

SPECIAL PROVISION
SECTION 502
STRUCTURAL CONCRETE
(QC/QA Acceptance Methods)

CLASS OF CONCRETE	ITEM NUMBER	DESCRIPTION	P	METHOD
A	502.219	Structural Concrete, Abutments and Retaining Walls	$400	A
A	502.26	Structural Concrete Roadway and Sidewalk Slab on Steel Bridges	$400	A
LP	502.49	Structural Concrete Curb and Sidewalks	-	C
A	518.50	Repair of Upward Facing Surfaces – to Reinforcing Steel < 8 inches	-	C
A	518.60	Repair of Vertical Surfaces < 8 inches	-	C
A	518.70	Repair of Overhead Surfaces < 8 inches	-	C
A	527.90	Movable Bridge Hybrid Warning and Resistance Gate	-	C
LP	626.43	30-Inch Diameter Foundation	-	C
LP	626.451	42-Inch Diameter Foundation	-	C

P Values listed above reflect the price per cubic yard (yd^3) for pay adjustment purposes.
Pay adjustments will be in accordance with the Standard Specification Section 502.195.

SPECIAL PROVISION
SECTION 502
STRUCTURAL CONCRETE
(Combined Aggregate Grading for Concrete)

502.03 Materials Add the following:

Combined Aggregate Grading for Concrete	**703.03**

502.1701 Quality Control, Method A and B Amend the paragraph before Table 4 as follows:

The Contractor shall maintain records of all QC tests and calculations. The gradation test data and results shall be reported to the Department before the placement they represent. The Contractor or supplier shall retain split samples of the most recent QC gradations for possible ~~Verification~~ testing by the Department. In addition, the Department will sample the aggregates at the plant monthly to determine ~~specification~~ **compliance with 703.03 Combined Aggregate Grading for Concrete. The Combined Aggregate Grading will be calculated by mathematically blending the individual aggregate gradations using the batch percentages from the approved mix design.** If the Department's gradation tests determine that the aggregate does not meet the specified gradation limits, corrective action shall be required before additional concrete may be supplied to the project. The compressive strength test results shall be reported to the Department by 10:00 A.M. of the first working day following the test. All QC test data shall be signed by the person who performed the test. The Contractor shall record all onsite QC test data and calculations at the time of the placement and present this information, on a form acceptable to the Department, to the Department by 10:00 A.M. of the first working day following the concrete placement. All Method A and B QC testing shall meet the minimum requirements found in Table 4.

SPECIAL PROVISION
SECTION 703
AGGREGATES
(Combined Aggregate Grading for Concrete)

SECTION 703 – AGGREGATES Add the following:

703.03 Combined Aggregate Grading for Concrete **The combined gradation of the fine and coarse aggregates when mathematically blended using the mix design percentages 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	85-100	
¾ inch	90-100	93 - 100	55-90	100
½ inch	55-78	60 - 90	45-75	90-100
⅜ inch	40-65	50 - 75	40-65	55-85
No. 4	35-50	35 - 50	35-55	30-60
No. 8	28-45	30 - 47	25-50	25-55
No. 16	18-35	19 - 37	15-40	18-50
No. 30	9-25	10 - 26	7-25	8-30
No. 50	4-14	4 - 14	3-14	3-15
No. 100	0-5	1 - 6	0-5	0-6
No. 200	0–3.0*	0 – 3.0*	0-3.0*	0 – 3.0*

***The percent passing the No. 200 sieve shall not exceed 5.0 percent for any fine aggregate. The percent passing the No. 200 sieve shall not exceed 1.5 percent for any single coarse aggregate.**

SPECIAL PROVISION
SECTION 502
STRUCTURAL CONCRETE
(Hydration Stabilizing Admixture)

502.07 Mixing and Delivery Replace the last sentence in paragraph "A" with the following:

"**An approved hydration stabilizing admixture may be used to increase the discharge time. Justification for the need for a hydration stabilizing admixture shall be provided in the QC Plan. When a hydration stabilizing admixture is used, the manufacturer, dosage rate and discharge time, from the time cement is added to the aggregate, shall be documented in the approved QC Plan. The proposed discharge time(s) shall be based on the manufacturer's written recommendations, the anticipated concrete temperatures and anticipated ambient conditions at the time of placement(s). Discharge time(s) shall be adjusted when conditions change or are not as anticipated as outlined in the approved QC Plan. The discharge time(s) approved by the Department shall be subject to change at any time, and discharge of concrete into the permanent Work shall cease immediately if the concrete is determined to have attained Accelerated Hydration Gain. Accelerated Hydration Gain being the condition where the fresh concrete has hydrated to the point where the workability and finishability is detrimental to the quality of the final product. Determination of when concrete has attained Accelerated Hydration Gain shall be made by the Contractor's Quality Control Technician(s) and shall be based on parameters proposed by the Contractor in the QC Plan, such as, but not limited to, loss of slump, plasticity, or workability, an increase in concrete temperature, or a change in the percentage of entrained air.**"

502.1701 Quality Control, Method A and B Under the list with the heading, "The QCP shall address all elements that affect the quality of the structural concrete including, but not limited to, the following:":

Revise "F" to read: "Mix and Transportation, including Time from Batching to Completion of Delivery**, as well as manufacturer, product name, proposed dosage(s) and discharge time(s) if a hydration stabilizing admixture is used.**"

Revise "H" to read: "Process QC Testing**, including monitoring for attainment of Accelerated Hydration Gain when a hydration stabilizing admixture is used.**"

502.1702 Quality Control, Method C Revise to read:

"The Contractor shall submit a QCP listing the mix design(s) to be used, the name and location of the production facility, a brief description of the placement and curing process and the name and qualifications of any QCT to be used. **When a hydration stabilizing admixture is proposed for use, the manufacturer, product name, dosage rate and discharge time, from the time cement is added to the aggregate, shall be included, as well as procedures for monitoring attainment of Accelerated Hydration Gain.** A QCT will be required. The Contractor shall provide a Certificate of Compliance for each truckload of concrete to the Department at the time of the load placement."

SPECIAL PROVISION
SECTION 506
SHOP APPLIED PROTECTIVE COATING – STEEL
(Field Painting, New and Existing Steel with Zinc Rich Paint)

Section 506 – Shop Applied Protective Coating – Steel, of the Standard Specifications is amended by adding the following:

506.60 Method of Measurement

Field Painting, New and Existing Steel with Zinc Rich Paint will be measured for payment as one lump sum, as work completed according to the Contract Plans and accepted.

506.61 Basis of Payment

Field Painting, New and Existing Steel with Zinc Rich Paint will be paid for at the contract lump sum price, complete and accepted which shall be full compensation for the work indicated on the plans and as called for in the contract, labor, equipment, and materials and other contract related incidentals necessary to complete the work.

Payment will be made under:

Pay Item		Pay Unit
506.1775	Field Painting, New and Existing Steel with Zinc Rich Paint	Lump Sum

SPECIAL PROVISION
SECTION 507
RAILINGS
(Temporary Bridge Rail)

The following is added to the Standard Specifications in accordance with Section 507:

Description: This work shall consist of fabrication, delivery, installation, relocation and removal of the temporary bridge rail where applicable. Work shall include the design of the temporary bridge rail and its attachments to the existing deck.

Materials:

a. Structural Steel

Structural Steel shall conform to Subsection 713.01 of the Standard Specifications.

b. High Strength Bolts

High strength bolts, nuts, and washers shall conform to the requirements of AASHTO M164 (ASTM F3125).

c. Anchor Bolts

Anchor bolts shall conform to the requirements of AASHTO M164 (ASTM F1554).

d. Epoxy Bonding Compound

All epoxy bonding compound shall conform to the requirements of AASHTO M235. The epoxy bonding compound is an irritant and should only be used in the methods set forth by the manufacturer.

e. Anchor Bolt Hole Patching Material

Material used to patch holes in the new deck shall be a product contained in the list of Prequalified Patching Materials. The material selected shall completely bond with the concrete in the new deck, shall be of equal or greater compressive strength as the concrete in the new deck and shall be a non-shrink patch material.

Construction Methods:

a. Steel Bridge Rail

The fabrication and erection of temporary steel bridge rail shall conform to the requirements of Section 504 of the Standard Specifications.

b. Temporary Concrete Barrier Transition Section

The temporary concrete barrier transition to temporary steel rail shall be designed to avoid snag points. The temporary concrete section adjacent to the temporary bridge rail shall be modified from Standard Detail 526. The modified barrier shall provide a smooth transition from a typical cross section of the concrete barrier to a section that completely obscures the steel rails at the point where the steel rail and concrete barrier connect.

Steel loops protruding from the ends of the temporary concrete barriers shall be joined with a steel bar to prevent independent movement of any one barrier section as shown in the Standard Details. Also, the rail end treatment shall be affixed with two steel loops to allow for the modified concrete barrier sections to attach to the steel rail in the same manner. If at any time during the project, the modified barrier section becomes damaged through handling, collision or any other manner, the modified section shall be replaced immediately with a newly made modified section. Payment for the modified barrier section shall be considered incidental to this item.

c. Patching of Anchor Bolt Holes

All anchor bolt holes in the new deck must be filled promptly after use.

Any damage to the structure caused by the attachment, use, or removal of the temporary bridge rail shall be repaired by the Contractor, at no cost to the Department.

Design Criteria:

The temporary bridge rail shall have a maximum width of 12 inches and shall be positively attached to the existing deck. The temporary bridge rail and its attachment to the deck shall be designed to meet the requirements of the AASHTO LRFD TL-2 loading condition. The temporary bridge rail and its attachments shall be designed and stamped by a Professional Engineer licensed in the State of Maine. Design, shop detail, installation, and other necessary drawings shall be prepared in accordance with Section 105.7 – Working Drawings, and shall be submitted to the Department for approval prior to fabrication.

Method of Measurement:

Temporary Bridge Rail shall be measured for payment per linear foot.

Basis of Payment:

The accepted quantity of Temporary Bridge Rail will be paid for at the contract unit price per linear foot, which payment will be full compensation for designing, furnishing, installing, maintaining, adjusting, and relocating the rail as well as all equipment, materials, incidentals, and labor necessary to complete the work as described herein and as shown on the Plans.

Payment will be made under:

Pay Item		Pay Unit
507.13	Temporary Bridge Rail	Linear Foot

SPECIAL PROVISION
SECTION 510
SPECIAL DETOURS
(Temporary Navigation Lighting)

Standard Specifications Section 510, Special Detours, is amended to include the following:

510.01 Description

This work shall also consist of furnishing, installing, maintaining, and removing temporary navigation lighting on all structures and in the navigation channels including, but not limited to, the temporary work platforms.

510.033 Lighting Requirements

Contractor shall coordinate specific lighting requirements with the local U.S. Coast Guard Station. White lights shall be placed along all temporary structures spaced at a maximum of 6 feet on center and placed at an elevation that is visible to vessels in the waterway. Red lights shall be placed on either side of the navigation channel opening at an elevation that is visible to vessels in the waterway.

510.09 Basis of Payment

No separate payment for the Temporary Navigation Lighting shall be made. Payment shall be considered incidental to the related Contract Pay Item 652.361, Maintenance of Traffic Control Devices.

SPECIAL PROVISION
SECTION 528
STRUCTURAL TIMBER
(Control House & Deck)

The following is added to Standard Specifications Section 528:

Description This work shall consist of furnishing and installing the structural timber for the Building: Control House in accordance with these specifications and as shown on the Plans.

Definitions

A. Boards or Strips: Lumber of less than 2 inches nominal (38 mm actual) size in least dimension.

B. Dimension Lumber: Lumber of 2 inches nominal (38 mm actual) size or greater but less than 5 inches nominal (114 mm actual) size in least dimension.

C. Exposed Framing: Framing not concealed by other construction.

D. OSB: Oriented strand board.

E. Timber: Lumber of 5 inches nominal (114 mm actual) size or greater in least dimension.

Materials

Wood Products, General

A. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, comply with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Grade lumber by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.
   1. Factory mark each piece of lumber with grade stamp of grading agency.
   2. Dress lumber, S4S, unless otherwise indicated.

B. Maximum Moisture Content of Lumber: 19 percent unless otherwise indicated.

C. Engineered Wood Products: Acceptable to authorities having jurisdiction and for which current model code research or evaluation reports exist that show compliance with building code in effect for Project.
   1. Allowable design stresses, as published by manufacturer, shall meet or exceed those indicated. Manufacturer's published values shall be determined from empirical data or by rational engineering analysis and demonstrated by comprehensive testing performed by a qualified independent testing agency.

D. Pressure Treated: Preservative Treatment by Pressure Process: AWPA U1; Use Category UC2 for interior construction not in contact with ground, Use Category UC3b for exterior construction not in contact with ground, and Use Category UC4a for items to be utilized as primary structural members supporting the Deck and Control House

1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium. Do not use inorganic boron (SBX) for sill plates.

E. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Do not use material that is warped or that does not comply with requirements for untreated material.

F. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.

G. Application: Treat items indicated on Drawings, and the following:

1. Wood cants, nailers, curbs, equipment support bases, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers, and waterproofing.

2. Wood sills, sleepers, blocking, furring, stripping, and similar concealed members in contact with masonry or concrete.

3. Wood framing and furring attached directly to the interior of below-grade exterior masonry or concrete walls.

4. Wood framing members that are less than 18 inches (460 mm) above the ground in crawlspaces or unexcavated areas.

5. Wood floor plates that are installed over building sub framing.

6. Framing for deck construction.

7. Decking

Dimension Lumber Framing

A. Wood species and grade as indicated on the drawings.

Cellular PVC (Plastic Simulated Wood)

A. Source Limitations: Obtain each Cellular PVC product from single source from a single manufacturer.

B. Colors: Gray painted with compatible paint system recommended by the manufacturer. The exterior color of the building shall match Federal Standard 595C, light green, color number: 14272.

C. Windows shall be vinyl clad or solid vinyl, color black.

D. PVC: Free foam cellular PVC materials with a small cell microstructure.

E. PVC Sheet board shall be smooth finish.

F. All Fasteners shall be stainless steel.

G. The Contractor shall submit documentation and samples for review and approval prior to ordering materials.

H. Performance and Physical properties shall be within 5% of the following material table properties.

Property	Units	Value	ASTM Method
Screw Hold	Lbf/in of penetration	680	D 1761
Staple Hold	Lbf/in of penetration	180	D 1761
Gardner Impact	in-lbs	103	D5420
Charpy Impact (@23°C)	ft-lbs	4.5	D256
THERMAL			
Coefficient of Linear Expansion	in/in/°F	3.2 x 10-5	D 696
Burning Rate	in/min	No burn when flame removed	D 635
Flame Spread Index	--	25	E 84
Heat Deflection Temp 264 psi	°F	150	D 648
Oil Canning (@140°F)	°F	Passed	D 648

Property	Units	Value	ASTM Method
PHYSICAL			
Density	g/cm3	0.55	D 792
Water Absorption	%	0.15	D 570
MECHANICAL			
Tensile Strength	psi	2256	D 638
Tensile Modulus	psi	144,000	D 638
Flexural Strength	psi	3329	D 790
Flexural Modulus	psi	144,219	D 790
Nail Hold	Lbf/in of penetration	35	D 1761

Composite Decking

A. Source Limitations: Obtain product from single source from a single manufacturer.

B. All Decking shall be solid capped four-sided shapes made from HDPE, PVC, polystyrene, or cellular PVC; with no cellulose fiber.

C. All Decking shall have a brushed texture finish or approved equal.

D. All decking shall conform to ICC-ES AC174 for this application.

E. All decking shall be gray in color.

F. All Fasteners shall be stainless steel.

G. The Contractor shall submit documentation and samples for review and approval prior to ordering materials.

Miscellaneous Lumber

A. General: Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including the following:

   1. Blocking.
   2. Nailers.
   3. Cants.
   4. Furring.
   5. Grounds.
   6. Utility shelving.

B. For blocking and nailers used for attachment of other construction, select and cut lumber to eliminate knots and other defects that will interfere with attachment of other work.

C. For furring strips for installing plywood or hardboard paneling, select boards with no knots capable of producing bent-over nails and damage to paneling.

Fasteners

A. General: Fasteners shall be of size and type indicated and shall comply with requirements specified in this article for material and manufacture.

   1. Where rough carpentry is exposed to weather, in ground contact, pressure-preservative treated, or in area of high relative humidity, provide fasteners with hot-dip zinc coating complying with ASTM A153/A153M.

B. Nails, Brads, and Staples: ASTM F1667.

C. Power-Driven Fasteners: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC70.

D. Post-Installed Anchors: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, as appropriate for the substrate.

   1. Material: Carbon-steel components, zinc plated to comply with ASTM B633, Class Fe/Zn 5.

Metal Framing Anchors

A. Allowable design loads, as published by manufacturer, shall meet or exceed those of basis-of-design products. Manufacturer's published values shall be determined from empirical data or by rational engineering analysis and demonstrated by comprehensive testing performed by a qualified independent testing agency. Framing anchors shall be punched for fasteners adequate to withstand same loads as framing anchors.

B. Galvanized-Steel Sheet: Hot-dip, zinc-coated steel sheet complying with ASTM A653/A653M, G60 (Z180) coating designation.

1. Use for interior locations unless otherwise indicated.

C. Hot-Dip, Heavy-Galvanized Steel Sheet: ASTM A653/A653M; structural steel (SS), high-strength low-alloy steel Type A (HSLAS Type A), or high-strength low-alloy steel Type B (HSLAS Type B); G185 (Z550) coating designation; and not less than 0.036 inch (0.9 mm) thick.

1. Use for wood-preservative-treated lumber and where indicated.

D. Joist Hangers: U-shaped joist hangers with 2-inch- (50-mm-) long seat and 1-1/4-inch- (32-mm) wide nailing flanges at least 85 percent of joist depth.

E. Bridging: Rigid, V-section, nailless type, 0.050 inch (1.3 mm) thick, length to suit joist size and spacing.

F. Post Bases: Adjustable-socket type for bolting in place with standoff plate to raise post 1 inch (25 mm) above base and with 2-inch- (50-mm-) minimum side cover, socket 0.062 inch (1.6 mm) thick, and standoff and adjustment plates 0.108 inch (2.8 mm) thick.

G. Rafter Tie-Downs (Hurricane or Seismic Ties): Bent strap tie for fastening rafters or roof trusses to wall studs below, 2-1/4 inches (57 mm) wide by 0.062 inch (1.6 mm) thick. Tie fits over top of rafter or truss and fastens to both sides of rafter or truss, face of top plates, and side of stud below.

Installation

General

A. Framing Standard: Comply with AF&PA's WCD 1, "Details for Conventional Wood Frame Construction," unless otherwise indicated.

B. Framing with Engineered Wood Products: Install engineered wood products to comply with manufacturer's written instructions.

C. Set rough carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit rough carpentry accurately to other construction. Locate nailers, blocking, grounds, and similar supports to comply with requirements for attaching other construction and equipment.

D. Install plywood backing panels by fastening to studs; coordinate locations with utilities requiring backing panels. Install fire-retardant-treated plywood backing panels with classification marking of testing agency exposed to view.

E. Install metal framing anchors to comply with manufacturer's written instructions. Install fasteners through each fastener hole.

F. Do not splice structural members between supports unless otherwise indicated.

G. Provide blocking and framing as indicated and as required to support facing materials, fixtures, specialty items, and trim.

1. Provide metal clips for fastening gypsum board or lath at corners and intersections where framing or blocking does not provide a surface for fastening edges of panels. Space clips not more than 16 inches (406 mm) o.c.

H. Provide fire blocking in furred spaces, stud spaces, and other concealed cavities as indicated and as follows:

1. Fire block furred spaces of walls, at each floor level, at ceiling, and at not more than 96 inches (2438 mm) o.c. with solid wood blocking or noncombustible materials accurately fitted to close furred spaces.

2. Fire block concealed spaces of wood-framed walls and partitions at each floor level, at ceiling line of top story, and at not more than 96 inches (2438 mm) o.c. Where fire blocking is not inherent in framing system used, provide closely fitted solid wood blocks of same width as framing members and 2-inch nominal (38-mm actual) thickness.

3. Fire block concealed spaces behind combustible cornices and exterior trim at not more than 20 feet (6 m) o.c.

I. Sort and select lumber so that natural characteristics do not interfere with installation or with fastening other materials to lumber. Do not use materials with defects that interfere with function of member or pieces that are too small to use with minimum number of joints or optimum joint arrangement.

J. Comply with AWPA M4 for applying field treatment to cut surfaces of preservative-treated lumber.

1. Use inorganic boron for items that are continuously protected from liquid water.

2. Use copper naphthenate for items not continuously protected from liquid water.

K. Securely attach rough carpentry work to substrate by anchoring and fastening as indicated, complying with the following:

1. Table 2304.9.1, "Fastening Schedule," in ICC's International Building Code (IBC).

2. ICC-ES evaluation report for fastener.

L. Use steel common nails unless otherwise indicated. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting wood. Drive nails snug but do not countersink nail heads unless otherwise indicated.

M. For exposed work, arrange fasteners in straight rows parallel with edges of members, with fasteners evenly spaced, and with adjacent rows staggered.

1. Comply with indicated fastener patterns where applicable.

2. Use common nails unless otherwise indicated. Drive nails snug but do not countersink nail heads.

Wood Blocking, and Nailer Installation

A. Install where indicated and where required for screeding or attaching other work. Form to shapes indicated and cut as required for true line and level of attached work. Coordinate locations with other work involved.

B. Attach items to substrates to support applied loading. Recess bolts and nuts flush with surfaces unless otherwise indicated.

C. Provide permanent grounds of dressed, pressure-preservative-treated, key-beveled lumber not less than 1-1/2 inches (38 mm) wide and of thickness required to bring face of ground to exact thickness of finish material. Remove temporary grounds when no longer required.

Wood Furring Installation

A. Install level and plumb with closure strips at edges and openings. Shim with wood as required for tolerance of finish work.

Wall and Partition Framing Installation

A. General: Provide single bottom pressure treated plate and double top plates using members of 2-inch nominal (38-mm actual) thickness whose widths equal that of studs, except single top plate may be used for non-load-bearing partitions. Fasten plates to supporting construction unless otherwise indicated.

   1. Provide continuous horizontal blocking at midheight of partitions more than 96 inches (2438 mm) high, using members of 2-inch nominal (38-mm actual) thickness and of same width as wall or partitions.

B. Construct corners and intersections with three or more studs, except that two studs may be used for interior non-load-bearing partitions.

C. Frame openings with multiple studs and headers. Provide nailed header members of thickness equal to width of studs. Support headers on jamb studs.

   1. For non-load-bearing partitions, provide double-jamb studs and headers not less than 4-inch nominal (89-mm actual) depth for openings 48 inches (1200 mm) and less in width, 6-inch nominal (140-mm actual) depth for openings 48 to 72 inches (1200 to 1800 mm) in width, 8-inch nominal (184-mm actual) depth for openings 72 to 120 inches (1800 to 3000 mm) in width, and not less than 10-inch nominal (235-mm actual) depth for openings 10 to 12 feet (3 to 3.6 m) in width.

   2. For load-bearing walls, provide double-jamb studs for openings 60 inches (1500 mm) and less in width, and triple-jamb studs for wider openings. Provide headers of depth indicated.

Ceiling Joist and Rafter Framing Installation

A. Ceiling Joists: Install with crown edge up. Face nail to ends of parallel rafters.

B. Rafters: Notch to fit exterior wall plates and use metal framing anchors. Double rafters to form headers and trimmers at openings in roof framing, if any, and support with

metal hangers. Where rafters abut at ridge, place directly opposite each other and nail to ridge member or use metal ridge hangers.

1. At valleys, provide double-valley rafters of size indicated or, if not indicated, of same thickness as regular rafters and 2 inches (50 mm) deeper. Bevel ends of jack rafters for full bearing against valley rafters.
2. At hips, provide hip rafter of size indicated or, if not indicated, of same thickness as regular rafters and 2 inches (50 mm) deeper. Bevel ends of jack rafters for full bearing against hip rafter.

C. Provide collar beams (ties) as indicated. Locate below ridge member, at end point of rafter span. Cut ends to fit roof slope and nail to rafters.

D. Provide special framing as indicated for eaves, overhangs, dormers, and similar conditions if any.

Protection

A. Protect rough carpentry from weather. If, despite protection, rough carpentry becomes wet enough that moisture content exceeds that specified, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

Submittals

Action Submittals

A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.

1. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Indicate type of preservative used and net amount of preservative retained.

Informational Submittals.

A. Material Certificates: For dimension lumber specified to comply with minimum allowable unit stresses. Indicate species and grade selected for each use and design values approved by the ALSC Board of Review.

B. Evaluation Reports: For the following, from ICC-ES:

1. Wood-preservative-treated wood.
2. Engineered wood products.
3. Power-driven fasteners.
4. Post-installed anchors.
5. Metal framing anchors.
6. Cellular PVC
7. Decking

Quality Assurance

A. Testing Agency Qualifications: For testing agency providing classification marking for fire-retardant treated material, an inspection agency acceptable to authorities having jurisdiction that periodically performs inspections to verify that the material bearing the classification marking is representative of the material tested.

Shipping and Storage

A. Stack wood products flat with spacers beneath and between each bundle to provide air circulation. Protect wood products from weather by covering with waterproof sheeting, securely anchored. Provide for air circulation around stacks and under coverings.

Basis of Payment The accepted Work specified herein shall not be paid for separately, but shall be considered incidental to Pay Item 815.00 - Building: Control House.

SPECIAL PROVISION
SECTION 528
STRUCTURAL TIMBER
(Fenders, Fender Walkways, and Sidewalk)

The following is added to Standard Specifications Section 528:

Description

This work shall consist of the fabrication, delivery, and installation of the structural timber for the fenders, fender walkways, and sidewalk in accordance with these specifications and as shown on the Plans.

Definitions:

A. Boards or Strips: Lumber of less than 2 inches nominal (38 mm actual) size in least dimension.

B. Dimension Lumber: Lumber of 2 inches nominal (38 mm actual) size or greater but less than 5 inches nominal (114 mm actual) size in least dimension.

C. Timber: Lumber of 5 inches nominal (114 mm actual) size or greater in least dimension.

Materials

Wood Products, General

A. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, comply with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Grade lumber by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.

   1. Factory mark each piece of lumber with grade stamp of grading agency.

   2. Dress lumber, S4S, unless otherwise indicated.

B. Maximum Moisture Content of Lumber: 19 percent unless otherwise indicated.

Wood-Preservative-Treated Lumber

A. Preservative Treatment:

   1. All Fender lumber: Treat with 2.5 pcf CCA or approved equal meeting AWPA Category UC5A.

   2. All Fender walkway and sidewalk lumber: Treat by Pressure Process: AWPA Category UC4B

B. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Do not use material that is warped or that does not comply with requirements for untreated material.

C. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.

Dimension Lumber and Timber Framing

A. Wood species and grade as indicated on the drawings.

Miscellaneous Lumber

A. General: Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including the following:

1. Blocking.
2. Nailers.
3. Cants.
4. Furring.
5. Grounds.

B. For blocking and nailers used for attachment of other construction, select and cut lumber to eliminate knots and other defects that will interfere with attachment of other work.

Fasteners

A. All fender system timbers and dimension lumber, including fenders, lateral bracing, cross bracing, and walkway support beams: 1" diameter bolts conforming to ASTM F1554, Grade 36 and hot-dip galvanized in accordance with ASTM A 153.

1. Where timber is connected to a steel member, a nylon washer shall be used between the steel washer and steel member.
2. Bolt heads located on the face of fenders shall be carriage bolt heads or fully countersunk into timber.

B. All walkway dimension lumber and decking and sidewalk decking: Pheinox RSS 305 or 316 stainless steel, 5/16" diameter, or approved equal. The contractor shall select appropriate length fasteners.

C. Sidewalk dimension lumber to bridge decking: Stainless steel threaded rods and hardware as indicated on the plans.

D. Nails, Brads, and Staples: ASTM F1667.

E. Post-Installed Anchors: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, as appropriate for the substrate.

1. Material: Carbon-steel components, zinc plated to comply with ASTM B633, Class Fe/Zn 5.

Structural Steel

A. General: Structural steel angles and plates for connections of fender timbers to piles and structural steel to piles shall conform to ASTM A709, Grade 36 or approved equal.

Installation

General

A. Framing Standard: Comply with AF&PA's WCD 1, "Details for Conventional Wood Frame Construction," unless otherwise indicated.

B. Framing with Engineered Wood Products: Install engineered wood products to comply with manufacturer's written instructions.

C. Set rough carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit rough carpentry accurately to other construction. Locate nailers, blocking, grounds, and similar supports to comply with requirements for attaching other construction.

D. Do not splice structural members between supports unless otherwise indicated.

E. Provide blocking and framing as indicated and as required to support facing materials.

F. Sort and select lumber so that natural characteristics do not interfere with installation or with fastening other materials to lumber. Do not use materials with defects that interfere with function of member or pieces that are too small to use with minimum number of joints or optimum joint arrangement.

G. Comply with AWPA M4 for applying field treatment to cut surfaces of preservative-treated lumber.

1. Use inorganic boron for items that are continuously protected from liquid water.

2. Use copper naphthenate for items not continuously protected from liquid water.

H. Securely attach rough carpentry work to substrate by anchoring and fastening as indicated, complying with the following:

1. Table 2304.9.1, "Fastening Schedule," in ICC's International Building Code (IBC).

2. ICC-ES evaluation report for fastener.

I. Make tight connections between members. Install fasteners without splitting wood.

J. For exposed work, arrange fasteners in straight rows parallel with edges of members, with fasteners evenly spaced, and with adjacent rows staggered.

1. Comply with indicated fastener patterns where applicable.

Wood Blocking and Nailer Installation

A. Install where indicated and where required for screeding or attaching other work. Form to shapes indicated and cut as required for true line and level of attached work. Coordinate locations with other work involved.

B. Attach items to substrates to support applied loading. Recess bolts and nuts flush with surfaces unless otherwise indicated.

C. Provide permanent grounds of dressed, pressure-preservative-treated, key-beveled lumber not less than 1-1/2 inches (38 mm) wide and of thickness required to bring face of ground to exact thickness of finish material. Remove temporary grounds when no longer required.

Submittals

Action Submittals

A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.

1. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Indicate type of preservative used and net amount of preservative retained.

Informational Submittals.

A. Material Certificates: For dimension lumber specified to comply with minimum allowable unit stresses. Indicate species and grade selected for each use and design values approved by the ALSC Board of Review.

B. Evaluation Reports: For the following, from ICC-ES:

1. Wood-preservative-treated wood.
2. Engineered wood products.
3. Power-driven fasteners.
4. Post-installed anchors.
5. Metal framing anchors.

Quality Assurance

A. Testing Agency Qualifications: For testing agency providing classification marking for fire-retardant treated material, an inspection agency acceptable to authorities having jurisdiction that periodically performs inspections to verify that the material bearing the classification marking is representative of the material tested.

Shipping and Storage

A. Stack wood products flat with spacers beneath and between each bundle to provide air circulation. Protect wood products from weather by covering with waterproof sheeting, securely anchored. Provide for air circulation around stacks and under coverings.

Method of Measurement

Structural Timber shall be measured as one lump sum complete and accepted, consisting of all timber materials in the fabricated and installed structures as shown on the Plans.

Basis of Payment

The accepted quantity of Structural Timber shall be paid for at the contract lump sum price for the respective contract items. Payment shall be full compensation for fabrication, delivery, labor, equipment, and materials for installation. Cost of transportation, storage and protection from damage shall be incidental. All connectors, connection plates and angles and related welds, and waterproof membrane shall be incidental.

Payment will be made under:

Pay Item	Pay Unit
528.01 Structural Timber, Fabrication and Delivery	LS
528.02 Structural Timber, Installation	LS

SPECIAL PROVISION
SECTION 530
PREFABRICATED DECK PANELS

530.1 Description

The contractor shall furnish, deliver, and install the prefabricated deck panels as shown in the contract drawings and in accordance with the manufacturer's recommendations.

530.2 Materials

The materials for this work shall meet the quality requirements of section 700 of the Standard Specifications unless the same are altered by any specific requirements under any Special Provision, or by notes shown on the contract drawings. Within 30 days after the contract is awarded, the contractor shall notify the Department of the name, address, telephone number, and contact person of the fabricator of all deck panels to be manufactured, supplied, and installed.

The steel grid deck system must be purchased from one of the following AISC certified fabricators and participating Bridge Grid Flooring Manufacturers Association (BGFMA) members:

Frontier Gratings, Tel. (256) 845-9556

LB Foster, Tel. (412) 928-3548

Further information may be obtained from:

BGFMA
Attn: Mike Riley
Tel: (724) 355-1878
bgfma@bgfma.org

The steel grating shall be fabricated using ASTM A709 Grade 50 steel and shall meet the requirements of Section 504 of the Standard Specifications. Welding shall be in conformance with established grid industry practice, including the permitted use of Gas Metal Arc Welding (MIG). Weld qualification and weld procedures in accordance with AWS D1.5 shall be approved prior to deck panel fabrication.

Unless otherwise specified, bolts, nuts, and washers shall conform to the specifications of ASTM A325, ASTM A563, and ASTM F436 respectively. All fasteners shall be galvanized in accordance with ASTM A153.

The fabricator shall develop a layout that meets the requirements of the Contract Drawings and detail it on the shop drawings.

After the attachment of all leveling devices, edge bars, and other components, the steel grid shall be galvanized in accordance with ASTM A123. Any defects in galvanizing shall be repaired as specified in ASTM A780.

Leveling bolts, nuts, and washers shall conform to the requirements of ASTM A307 or approved equal.

530.3 Construction Details and Field Installation

The steel grid deck shall be fabricated and installed to the dimensions and properties as shown on the plans, shop drawings, and in accordance with Section 504 of the Standard Specifications.

The steel grid deck shall be fastened to the truss floorbeams and stringers using clamping or fastener devices meeting the requirements of the Contract Drawings and designed and detailed by the manufacturer. The grid decking shall also be tack welded to the floorbeams and stringers in accordance with manufacturer's recommendations, except as indicated on the Contract Drawings. It shall be the contractor's responsibility to field verify all dimensions in order to make necessary changes prior to fabrication.

After the attachment of plates, and other components as described in the plans and specifications, the grid panels shall be galvanized in accordance with ASTM A123.

The steel grid deck panels shall be fabricated within the following tolerances:

Panel Length (L)	+0.25"[6.4mm] (in the direction of main bar)
Panel Width (W)	+0, -0.125" [-3.2mm] (in the direction of cross bar)
Squareness (Diagonals 'D1' and 'D2')	|D1-D2| < 0.5"[12.7mm]
Longitudinal Camber	0.003*L
Transverse Camber	0.004*W
Sweep (side bow) ('L' in feet, tolerance in inches) (See Note 1) ('L' in meters, tolerance in millimeters) (See Note 1)	0.025*L (for L < 40'-0") $0.00065*L^2$ (for L > 40'-0") [20.83*L (for L < 12.192m)] [0.178*L2 (for L > 12.192m)]
Main and Cross Bar Verticality,	0.04*H ('H' = full bar height) (See Note 2)
Bar Spacing (Main Bar & Cross Bar)	+0.125"[3.2mm] center to center (See Note 2)

Note 1: Sweep tolerances applicable for galvanized panels with standard puddle welds connecting components and diagonal grids less than 25' [7.62m] in length. Galvanized diagonal open grid panels not recommended over 25' [7.62m] in length.

Note 2: No more than 1% of all locations can violate specified tolerance.

Lifting locations and procedures shall be included on the shop drawing submission. Care shall be taken to avoid twisting of the panels or bending of the panels in the weak (perpendicular to main bar) direction. The use of multiple pick points is recommended. Steel grid panels must be properly blocked with wood (with due regard to built-in panel camber) during transportation and storage in order to avoid distortion or other damage.

Installation and installation tolerances shall be in accordance with this specification and the most recent version of BGFMA TS-02, "Installation Tolerances and Guidelines for Open Grid Decks," published by the Bridge Grid Flooring Manufacturers Association. BGFMA TS-04 (Rev 5) March 19, 2022 [Or]

Installation shall be in accordance with this specification and the most recent version of BGFMA TS-02, "Installation Tolerances and Guidelines for Open Grid Decks," published by the Bridge Grid Flooring Manufacturers Association. The steel grid deck panels shall be installed within the following tolerances:

1.) Alignment: Main bearing bar and cross bar misalignment between adjacent grid deck panels shall be no more than 1/4" [6.4mm].

2.) Gap: Distance between main bearing bars and cross bars between adjacent grid deck panels shall be between 0 and 1/2" [12.7mm]

Panels will be delivered to the job site free from any defects and bearing the proper identifying marks. Check the panels for defects and identification. Repair or replace the grid panels or metal forms damaged during shipment and storage, to the satisfaction of the Department.

Position panels on the beams and align with adjacent panels. Measure from fixed points to avoid cumulative error. Adjustment to proper elevation shall be made through the use shims or other means. Square up panels as necessary.

530.4 Method of Measurement

Prefabricated Deck Panels shall be measured as the total gross square footage of the grid deck panel installed and inspected in accordance with the plans and specifications. Measurements will be taken from the outside edge to outside edge of the grid panel in both directions. No deduction will be made for joints or openings. No field measurements or computations will be made unless the Department specifies, in writing, a change in the limits indicated on the plans.

530.5 Basis of Payment

The accepted quantity of Prefabricated Deck Panels will be paid for at the contract unit price per square foot complete in place and accepted. Payment shall be full compensation for furnishing, and all labor, equipment, and materials for the installation. Cost of transportation, storage, and protection from damage shall be incidental to Prefabricated Deck Panels.

Payment will be made under:

Pay Item	**Pay Unit**
530.02 Prefabricated Deck Panels	SF

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 643
TRAFFIC SIGNALS
(Resistance Barrier Gates)

643.01 Traffic Signals and Gates, Movable Bridge Hybrid Warning and Resistance Gate
This item of work shall conform to this specification. This item shall consist of furnishing and installing a penetration-resistant hybrid warning gate and resistance gate (barrier gate) with flashing warning lights for use with a movable (swing) bridge including all necessary fittings, foundations, and mounting hardware at the locations shown on the plans or as indicated by the Engineer.

MATERIALS: The barrier gate shall include equipment meeting the following requirements:

1) General. Barrier gate equipment shall conform to the requirements of the current editions of the American Association of State Highway and Transportation Officials (AASHTO) LRFD Specifications for Movable Highway Bridges and the Federal Highway Administration (FHWA) Manual on Uniform Traffic Control Devices (MUTCD), except as may be otherwise provided herein.

   (a) The barrier gates shall be model VR6 or VT-6802 as manufactured by B&B Roadway or approved equivalent by FedTransit Safety Systems or Trinity Highway (Transpo Industries).

   (b) The barrier gate shall be designed for use as a penetration resistance barrier. The barrier gate shall be explicitly designed for traffic control that is typical on movable bridges, as required by AASHTO's Specifications for Movable Highway Bridge Design Specifications and shall be suitable for similar applications as well. A gate that allows vehicle penetration (such as a typical railroad gate or parking level arm) will not be accepted.

   (c) The barrier gate shall be crash tested in accordance with the Manual for Assessing Safety Hardware (MASH) to Test Level 2 (TL-2). The Contractor shall provide documentation of independent testing of the MASH TL-2 requirements.

   (d) Materials and construction shall conform to the requirements of the current local, state and National Electrical Codes and to any applicable local rules and ordinances. The Contractor shall obtain any required permits and approvals of all Departments or Agencies having jurisdiction prior to construction.

   (e) All equipment and materials shall be new.

   (f) If the Contractor has any objection to any feature of the equipment as specified, the Contractor shall state his objection in writing to the Department within seven days of discovery.

(g) Each piece of electrical equipment and apparatus shall have a corrosion-resisting metal nameplate, on which is stamped the name of the manufacturer and the rating or capacity of the equipment or apparatus, the catalog number, model number or part number, serial number, date of manufacture, voltage and phase, current, gear ratio, power (in hp), and enclosure type.

(h) All mounting hardware and all wire and cable terminals shall be vibration-resistant.

(i) All hardware and fasteners shall be Type 316 stainless steel where feasible. Galvanize all other hardware and fasteners that are not stainless steel.

(j) All mounting bolts shall include flat washers, lock washers and double nuts.

(k) All metal parts of the installation, except structural steel, shall be of corrosion-resisting material such as aluminum, bronze, or stainless steel. Cast-iron, malleable iron, or steel with a hot-dip galvanized finish shall be used where specified herein or permitted by the Resident.

(l) The barrier gate shall be capable of normal operations when installed behind the existing guardrail. If normal operations cannot be achieved with the guardrail in place, the Contractor shall propose a modification to the guardrail to allow for normal gate operations. Any guardrail modification shall be submitted to the Engineer for review and approval. The Contractor shall be responsible for all costs associated with the approved guardrail modification.

2) Painting. Electrical equipment which has a galvanized or stainless steel finish, and which normally are given a factory finish need not be shop painted. All other electrical equipment shall be given one shop coat. Paint color shall be determined by the Resident.

(a) Electrical equipment, which is normally given a factory painted finish suitable to MaineDOT, need not be field painted. All other electrical equipment shall be given two field coats of paint as specified under the requirements for painting structural steel.

(b) Before applying the two field coats, galvanized surfaces shall be cleaned free of all grease, oil, dirt, and foreign material and shall be etched with copper sulphate solution, after which the solution shall be applied.

3) Transmission

(a) The mechanism linkage shall be driven by a fully enclosed, heavy duty worm gear, double reduction speed reducer. The output shaft shall be 2-inch in diameter.

(b) Gear ratio used shall produce an operation time of approximately 15 seconds, +/- 5 seconds.

(c) A heavy duty torque limiter shall be provided to limit torque transmitted to the operating mechanism in the event of excessive winds or a physical obstruction to the arm.

(d) The variable torque limiter shall be capable of a range of 10,000 to 75,000 in-lbs torque. Each torque limiter shall be factory set for the load recommended by the manufacturer, based on installation requirements.

(e) The gate limit switch assembly shall be driven from the output side of the torque limiter so that slippage of the torque limiter will have no effect upon the limit settings.

4) Barrier Gate Motor

(a) Each barrier gate motor shall be controlled by a magnetic reversing contactor, electrically and mechanically interlocked, and shall be protected by a three-element, thermal overload relay, with manual reset.

(b) The motor shall be 208 VAC, three phase, 60 hz. The motor horsepower (hp) shall be as recommended by the barrier manufacturer to suit the installation, typically 1 hp.

(c) The motor shall be a C-face design and shall be mounted directly to the transmission.

(d) The motor shall be instantly reversing and overload protected.

(e) The motor shall be equipped with a solenoid-release, automatic brake. The brake shall have a manual release lever to permit manual operation of the barrier during setup or emergencies.

(f) The barrier limit switch assembly shall be a self-contained unit controlled by individually adjustable cams. The limit switch assembly design shall permit adjustment of all cams with the barrier in any position.

(g) The limit switch assembly shall have a removable cover to help prevent accidental contact with switch terminals.

(h) Shaft, cams, bushings and housing pieces shall be of non-ferrous corrosion resistant materials.

5) Barrier Gate Housing

a) All internal wiring for each barrier gate shall be brought to numbered terminal blocks inside the housing for the connection of external circuits.

b) The operating mechanism and main control components shall be contained in a weatherproof housing. The housing shall be stainless steel. All external fasteners ½”

and under shall be stainless steel. Fasteners over ½" shall be stainless steel, hot dip galvanized or mechanically galvanized.

c) The combination starter with circuit breaker shall be provided within the barrier gate housing.

d) Arm shaft openings shall incorporate O-ring seals.

e) Each barrier gate housing shall be furnished with removable doors. Doors shall be provided on the roadway and opposite side of the housing, large enough for convenient removal of the largest component of the operating mechanism. Each door shall be equipped with neoprene gaskets, two safety interlock switches, slip-off type strap hinges with stainless steel pins, stainless steel catches and bolts, and hasps suitable for a padlock.

f) A stop shall be mounted inside the door to secure the door from being raised off the hinges in the closed position.

g) Door latches, two per door, shall use a vise action to compress a neoprene bulb-type gasket to seal the door openings. Doors shall include hasps for locking with a padlock (padlock to be provided by MaineDOT).

h) The housing shall include a thermostatically controlled heater, LED service light that operates on a switch, and a duplex, 15 amp, 120-volt GFCI receptacle.

6) Barrier Arm and Cables

a) The main arm shaft shall be of 2.5" (63mm) diameter AISI 4150 with a minimum tensile strength of 140,000 psi.

b) The shaft shall be mounted in heavy duty sealed ball bearings with lubrication fittings.

c) The barrier arm design shall be double rail or trussed tri-rail aluminum tube. Arm length shall be measured from the centerline of the housing.

d) A pair of carbon steel rectangular tubes, hot dip galvanized after fabrication, painted aluminum, shall be rigidly affixed to the ends of the main arm shaft. The tubes shall be offset to locate the arm centerline at the height specified above the housing base.

e) The tubes and a steel cross-member shall provide a sturdy mount for the arm and counterweights. The tubes shall have provision for easily adjusting the counterweight offset so the arm can be properly balanced in all positions.

f) The arm end latch shall be equipped with an extended range proximity switch to indicate correct engagement of the end lock. The mechanism shall be mounted on the arm end lock and send a confirmation signal only when the end lock is properly

engaged. The mechanism shall be fully adjustable, preset at the factory but also field adjustable.

g) The end arm latch shall be installed to ensure that the arm alignment in the horizontal position sets the top of the gate arm at approximately four (4) feet above the pavement.

h) Stainless steel truss cables and a roadway type bumper rod shall be furnished with longer arms at the recommendation of the manufacturer.

i) Front and rear arm surfaces shall be covered with alternating red and white high intensity reflective sheeting. Stripes shall be vertical and 16 inches (406mm) wide. Remaining exposed surfaces shall be painted white.

j) The barrier arm shall utilize 6x19 or 6x25 construction, 300-series stainless steel, annealed energy absorption cables to assist in diffusing the kinetic energy of an impacting vehicle.

   i) Double rail aluminum tube arms shall have three 0.50 inch (12mm) cables, one inside each tube, with a third along the center of the arm.
   ii) Tapered arms shall have three 0.50 inch (12mm) cables, one inside the pole, one above the pole and one below the pole.
   iii) Tri-rail arms shall have three 0.50 inch (12mm) cables, one inside each tube facing traffic, with a third between these tubes.

k) The energy absorption cables shall be anchored at both ends of the span in the closed to traffic position. At the housing, heavy duty side arm locks shall be mechanically linked to the operating mechanism to automatically engage and lock the side arm tubes into a rigid configuration when the arm is lowered, to assist in transferring the load into the housing in the event of an impact. This will minimize the chance of damage to the internal operating mechanism.

l) The energy absorption cables shall be anchored at the tip end of the arm in the closed to traffic position. A passive end latch mounted on the arm tip shall engage a rigidly mounted and anchored socket on a post. End latches shall not require powered actuation for proper engagement.

m) The barrier arm shall be connected via a mechanical 4-bar linkage. The linkage shall utilize cranks keyed to the arm shaft and transmission shaft and an adjustable connecting rod between a pair of self-aligning rod ends.

n) The connecting rod shall be a minimum of 1.25” diameter AISI 4140 alloy steel.

7) Barrier Gate Warning Lights

a) The number of beacons on the barrier gate arms shall be as recommended by the manufacturer for a warning gate with an even number (minimum of four beacons).

b) Beacon signals shall conform to Section 718.01.

c) Each beacon shall be a weatherproof, two-way, cast-aluminum unit with red Fresnel lenses, front and back. The lights shall be interconnected and grounded with four-conductor portable cord using watertight connectors at the fixtures.

d) A red LED lamp shall be installed in each fixture. The beacons shall be connected so that adjacent units will flash alternately. Fuses for the beacons shall be installed in molded rubber connection kits.

e) The flasher shall be a 120 VAC solid state flasher having two alternately flashing circuits and one steady burn circuit.

f) The flasher shall be designed for heavy duty applications.

g) The flasher assembly shall include mounting hardware as required, solid-state flasher circuitry, a terminal block, and a transformer when required. The flasher assembly shall be fully wired at the factory.

h) The flasher base plate compound shall be anodized for corrosion protection.

i) The flash rate for the two alternately flashing circuits shall be 0.50 seconds on, 0.50 seconds off. An additional steady burn circuit shall be provided for the lamp farthest from the gate motor.

8) Warning Gong

a) Each barrier gate assembly shall include a warning gong.

b) The warning gong shell shall be bronze.

c) The warning gong shall produce sound at least 90 dB at 10 feet from the gong.

d) The gong assembly shall be installed in a heavy duty cast aluminum housing. The gong assembly shall be equipped with an aluminum mounting adapter for mounting to the side of the traffic signal pole. All gong wiring shall be enclosed in the housing.

e) The aluminum housing shall include a hinged and gasketed rear door. A cast aluminum guard shall be installed above the gong shell for weather protection.

f) The warning gong shall operate at 120 VAC, single phase.

9) Foundations - The Contractor shall design a concrete slab for the mounting of the barrier gate assembly and a 2’-0” thick by 8’-0” long concrete wall for the mounting of the end arm latch in accordance with Section 626 and the manufacturer’s recommendation. The

concrete slab and wall shall be designed to structurally integrate with the drilled shaft foundations per the Contract Documents. The Contractor shall coordinate and verify the top of drilled shaft elevations with the concrete pad and wall design. The concrete pad and wall shall be designed and detailed to transmit all barrier gate loads to the drilled shaft foundations in accordance with the manufacturer's specifications and all applicable AASHTO Specifications. The concrete wall shall also be designed for terminal end connections and possible vehicular impact loads on the wall or connected guardrail. Construction drawings, design calculations, and reinforcement shop drawings shall be submitted to the Department for review and approval at least 28 days prior to fabrication and construction. Design calculations shall be performed and stamped by a professional engineer registered in the state of Maine. If applicable, Construction drawings shall indicate adjustments to the top of drilled shaft foundation elevations indicated in the Contract Drawings.

All conduit necessary for the communications and electrical service for the barrier gate assembly and end arm latch shall be embedded into the foundation. Installation of the conduit after the foundation has been placed shall not be permitted.

10) Counterweight - Hot dip galvanized steel counterweights shall be mounted at the rear of the side arm tubes to balance the arm. Counterweights shall be sectional and shall be balanced at the factory for the gate arm length. The counterweight balance shall be field adjustable.

11) Miscellaneous Materials

a) Both a handcrank and a drill crank with all necessary adapters shall be provided with each barrier to facilitate manual operation.

b) The handcrank shall include a safety switch to prevent automatic actuation.

c) Door safety switches shall have a pull-to-override feature for test operation and shall automatically reset when doors are closed.

CONSTRUCTION. The Contractor shall be responsible for furnishing all labor, materials, tools, cables, connectors, training, testing, equipment, shipping and incidental items necessary to complete the installation and make the barrier gates fully operational.

1) Submittals The Contractor shall submit a complete package for the barrier gate. The submittal package shall include:

a) Assembly drawings of the barrier gate assembly, locating and identifying all apparatus and equipment inside. Arrangement and complete construction details of the gate operating machinery.

b) Detail drawings showing the construction of gate arms, including provisions for guying

and bracing.

c) Assembly drawings of the barrier gate housing, locating and identifying all apparatus and equipment inside.

d) Wiring diagrams of all gate's electrical equipment, including development diagrams for the gate limit switches. All wires shall be suitably numbered in accordance with the wire numbers on the control system vendors approved shop drawings.

e) Certified dimension prints of apparatus shall state in the certification the name of the job, the application of the apparatus, device designation, number required, right-hand or left-hand assembly, dimensions of the assembled gate system in both the raised and lowered positions with operating clearances/tolerances, electrical rating, number of poles or contacts, material, finish, and any other pertinent data to show that the apparatus meets the specified requirements. If the gate shall be installed over top of guardrail, the Contractor shall include clearance dimensions from the gate arm to the guardrail in both the raised and lowered positions.

f) Two copies (per gate) of the complete maintenance and servicing data for the barrier gates.

g) Foundation design calculations, drawings, and reinforcement shop drawings for the barrier gate assembly and arm end latch. Foundation drawings shall include all anchoring details and embedded conduits.

h) At the completion of construction and prior to testing, the Contractor shall provide as-built wiring diagrams and one copy of the complete maintenance manual in a weatherproof pouch inside the housing.

2) Barrier Gate Operations

a) Each barrier gate and its flashing beacons shall be operated from the Control House. The raise and lower circuitry shall include a kill switch that allows the gate operation to be stopped instantaneously.

b) The barrier arm shall pivot in the vertical plane via the mechanical 4-bar linkage.

c) An auxiliary crank shall be used, paired with the transmission crank, to reduce the load on the transmission and to better balance and stabilize the load on the housing and mounting structure. The auxiliary crank shall be mounted in a permanently lubricated bronze bearing.

d) The velocity of the arm shall follow a sinusoidal pattern to provide smooth operation. The arm shall begin and end its full motion path with zero velocity and accelerate smoothly to maximum velocity at mid-travel.

3) Power and Communications

a) Power shall be provided to each barrier gate motor in accordance with Section 643.09 Service Connection except that the service shall be 208VAC, three phase metered service. An independently mounted meter and disconnect switch shall be required at a location acceptable to the Utility Company and the Engineer.

b) The Contractor shall be responsible for paying all service connection fees and monthly electrical service charges until final approval of the barrier gate.

c) The Contractor shall bond all metallic conduits, equipment enclosures, frames, housing and all other metal parts of the electrical and motor systems to a common ground.

d) The Contractor shall install a minimum of two ground rods for each barrier gate. Bonding and grounding shall be provided in accordance with the NEC.

e) The Contractor shall connect the barrier gate operations to the Bridge Tender's Control Room as described in the Plans. All cables, connections, terminations, and grounding shall be the responsibility of the Contractor.

4) Installation

a) The Contractor shall install the hybrid barrier gate in accordance with the manufacturer's recommendations.

b) The barrier gate assembly and arm end latch shall be bolted to its foundation with a minimum of four anchor bolts. Anchor bolts shall be a minimum of 1 inch diameter.

c) The Contractor shall install all apparatus for controlling the barrier gate including all conduits, junction boxes, wiring, cables, and switches into the Operator's House.

d) The Contractor shall provide a manufacturer representative on-site during final assembly, counterweight balancing, and adjustment during the field acceptance testing.

5) Spare Parts. The Contractor shall furnish the following spare parts inventory with the project. The spare parts shall be furnished new and packed in suitable cartons for storage at the nearest MaineDOT maintenance facility. The spare parts inventory shall be delivered to the Resident prior to final project acceptance.

(1) One (1) barrier gate motor, complete with motor pinion.
(2) One (1) barrier gate rotary cam limit switch with operating mechanism.
(3) One (1) access door limit switch.
(4) Four (4) arm beacon fixtures complete with LED beacon lamps.
(5) Four (4) additional LED beacon lamps.
(6) One (1) barrier gate arm.

6) Warranty. The Contractor shall warranty the in-service working of the gate and gate control equipment. A warranty shall cover the barrier and related equipment against defective material and components for two (2) years from date of final project acceptance. Manufacturer shall furnish original replacement parts for a minimum of five (5) years. Replacement parts for most components shall normally be available within two working days.

7) Testing. The Contractor shall conduct testing in accordance with the Resident's direction and to the Resident's satisfaction.

   a) The Contractor shall provide a minimum of two weeks notice of factory and field testing/inspection so that the MaineDOT can send a representative to witness the testing as required.

   b) The Contractor shall submit factory test procedures for approval prior to testing. Factory testing shall include all normal operating sequencies documenting correct function of each sequence including:
      i) Full Open
      ii) Full Closed
      iii) Emergency Stop
      iv) Manual Open
      v) Manual Operation Electrical Interlocking
      vi) Manual Close

   c) In the event of a failed test, the Contractor shall make the appropriate adjustment or repair or replace the defective component(s) as required and re-test.

   d) The Contractor shall provide written test and inspection verification with the delivery of the barrier gate to the project.

   e) The Contractor shall conduct field tests as directed by the Engineer to demonstrate that the barrier gates, flashing beacons, and warning gong as installed are in working order and meet the specifications. Field testing shall include, at a minimum:
      i) Operator controlled full open and full close (minimum 3 cycles)
      ii) Manual controlled full open and full close (minimum 1 cycle)
      iii) Operator controlled emergency stop
      iv) Confirm correct setting of torque limiter
      v) Verify proper tightening of all fasteners, wire connections, and nuts
      vi) Verify gate and counterweight balance
      vii) Verify that off-vertical gate alignment triggers the traffic signal pre-emption cycle.

METHOD OF MEASUREMENT: The Movable Bridge Hybrid Warning and Resistance Gate will be measured for payment by the lump sum complete in place per site, satisfactorily installed, tested, operational and accepted.

BASIS OF PAYMENT: The Movable Bridge Hybrid Warning and Resistance Gate will be paid for at the contract lump sum price for each location. Such price will be full compensation for furnishing and installing all materials and equipment including but not limited to barrier gate arm, warning lights and cables, motor and transmission, housing, end arm latch, counterweights, spare parts inventory, foundations, warranty, and for making all electrical connections to power and to the Bridge Tenders Control Room. Payment will be full compensation for preparing the technical submittal and for furnishing, installing, transporting, handling, and testing the materials and equipment specified and for furnishing all labor, tools, equipment, and incidentals necessary to complete the work.

Payment will be made under the following:

Pay Item		Pay Unit
643.01	Traffic Signals and Gates, Movable Br Hybrid Warn and Resist Gate	Lump Sum

SPECIAL PROVISION
SECTION 643
TRAFFIC SIGNALS
(Flashing Beacon)

Standard Specification Section 643 shall apply with the following additions and modifications:

643.01 Description

The work shall consist of furnishing and installing all equipment necessary for erection and operation of advance flashing warning beacons where shown on the plans. Their installation shall be as described in this special provision.

643.025 Flashing Beacon

1. Beacon Dimensions and Placement in Sign Assembly:
    a. Each flashing beacon shall consist of two, one-way, 1-section, 12-inch traffic signal head yellow indications, with an LED-array above and below the warning sign.
    b. The two signal heads shall be aligned vertically.
    c. The edge of the beacon signal housing should be located no closer than 12 inches outside of the nearest edge of the sign.

2. Beacon Flashing Requirements:
    a. When activated, the two yellow indications in each beacon shall flash in an alternating pattern.
    b. The flash rate shall match the 2009 MUTCD Section 4L.01 requirements for the flash rate of beacons with a rate of not less than 50 or more than 60 times per minute. The illuminated period of each flash shall be a minimum of ½ and a maximum of 2/3 of the total cycle.

3. Beacon Operations:
    a. The beacon, normally dark, shall initiate operations only upon bridge tender actuation, and shall cease operations at a predetermined time after the bridge closure. The predetermined time shall be determined by the Resident and the Bridge Tender.
    b. All beacons associated with a given approach, shall, when activated, simultaneously commence operation of their alternating flashing indications and shall cease operations simultaneously.
    c. Support pole or post will be outfitted with a NEMA aluminum pole mount cabinet.

4. Beacon Actuation:
    a. The beacon system shall be capable of simultaneous actuation via active detection system.

b. The active detection system shall consist of actuation from the Bridge Tender Control Room.

5. Power Service:
   a. The Contractor shall establish power service for each beacon with the Utility Company. Service shall be 120 VAC, single phase, metered service.
   b. The Contractor shall be responsible for all service and connection charges until the beacons have achieved final approvals.

Each beacon shall be mounted on a 12-foot long 4-inch I.D. non-tapered Schedule 40 galvanized steel pole with pole cap. Poles shall have a 0.75" minimum thickness galvanized ASTM A36 steel base plate circumferentially welded to the pole shaft. Anchor bolts for attachment of base plates to foundations shall be 0.75" x 17" (minimum) x 3" threaded. Four anchor bolts shall be provided for each support pole. Otherwise each beacon can be mounted on a wood pole.

Signs for flashing beacons assemblies shall be sheet aluminum and meet requirements of Section 645 for Type II regulatory, warning and route marker assembly signage. The signage assemblies shall include a W3-6 Draw Bridge sign.

643.18 Method of Measurement

Flashing beacons installed with signs and equipment shown on the plans and details at each location shall constitute a single installation. Each installation will be measured for payment by the lump sum complete in place.

643.19 Basis of Payment

Flashing Beacon will be paid for at the contract lump sum price, which payment will be full compensation for furnishing and installing all materials including, but not limited to the LED beacon arrays, flasher, timer, lockable controller cabinet, wiring and power service, pole risers, communication devices and all appurtenances and incidentals required for a complete and functioning installation. Foundations and conduit will be paid under applicable Section 626 pay items. Pedestal pole and wood pole will be paid under 643.92 and 643.97 respectively.

Payment will be made under:

Pay Item	Pay Unit
643.60 Flashing Beacon at EB Approach (Southport)	Lump Sum
643.60 Flashing Beacon at WB Approach (Boothbay Harbor)	Lump Sum

SPECIAL PROVISION
SECTION 643
TRAFFIC SIGNALS
(Temporary Traffic Signal)

Standard Specifications Section 643, Traffic Signals, is amended by the addition of the following:

The Contractor shall install and maintain temporary traffic signals for the project duration. The work shall consist of:

> Furnishing and installing a temporary traffic control signal system for traffic control consisting of a one lane, two-way alternating traffic along a movable (swing) bridge at Southport Bridge over Townsend Gut, between the towns of Southport and Boothbay Harbor as specified herein.

Signal heads on Route 27 at each end of the bridge work area shall be mounted on a temporary structure supplied by the Contractor and approved by the Resident or may be mounted on the proposed final mast arms. Two heads shall face traffic on each approach. All signal heads shall have 12" R-Y-G circular LED indications with 5" backplates and 3-inch yellow retroreflective tape along all borders.

Temporary stop bars shall be provided for both approaches. Temporary stop lines shall be removed by the Contractor at the completion of the temporary signal operations. Stop bar detection shall be provided on each approach. The Contractor shall locate the stop lines based on the proposed bridge lane closures and the location shall be approved by the Resident. The Contractor shall determine the method of detection with the Resident's approval.

Pedestrian phasing shall be provided. Pedestrians shall cross the bridge after vehicle traffic has stopped in the travel lane. Pedestrian signals shall be mounted on a temporary structure supplied by the Contractor and approved by the Resident. All pedestrian signal heads shall provide hand/person/countdown timer indications. Countdown timers shall count down during the pedestrian clearance interval. The pedestrian signals shall be hardwired to provide power and shall be controlled by the traffic signal controller for the temporary traffic signal. Accessible pedestrian signals (APS) with locator tones and tactile arrow surface shall be provided on the temporary pedestrian signal support structure.

Clearance time calculations were based on a vehicle speed of 25 mph across the one lane bridge for a distance of 650 feet.

The Contractor shall initially program the signal controller with the following phasing and timing (in seconds):

	Ø1	Ø2	Ø3
Min. Green	10	10	10
Extension	3	3	3
Max 1	55	55	55
Max 2	55	55	55
Ped Walk			10
Ped Don't Walk			196
Vehicle Clear (Yellow)	4.0	4.0	3.0
Red Clear (All Red)	19.0	19.0	0.0
Recall	OFF	OFF	OFF

Ø1 – Route 27 eastbound
Ø2 – Route 27 westbound
Ø3 – Exclusive Pedestrian eastbound/westbound

Bridge Preemption

1. The bridge traffic signals shall be connected to the bridge operator house to provide all red phasing during movable bridge operations.

2. Minimum green and normal vehicle and pedestrian clearance times shall be provided on phases that are to be terminated by preemption demand.

3. Preemption shall be controlled by the bridge operator.

The specified signal timing may be adjusted by a Licensed Professional Engineer as operation requires. The Resident may increase All Red Clearance times as necessary for the safety of the traveling public. If the All Red Clearance time exceeds the controller's maximum allowable All Red time, the Contractor shall propose an active clearance phase between applicable vehicle and/or pedestrian phases such that the active clearance phase shall always be called when the preceding phase is called.

643.18 Method of Measurement Replace the third paragraph with the following:

Each stop bar detection system installed, connected to appropriate phases in the controller cabinet, furnishing and installing bridge preemption, complete and operational will not be measured for payment but will be considered incidental to the Temporary Traffic Signal Pay Item.

643.19 Basis of Payment Replace the fourth paragraph with the following:

The stop bar detection system and furnishing and installing preemption receivers will be considered incidental to the Temporary Traffic Signal, which will be full compensation for materials, labor, and equipment for each detection system installed, fully operational, and removed. If loop detectors are used as the stop bar detection system, loops may be abandoned in place.

Payment will be made under:

Pay Item		Pay Unit
643.72	Temporary Traffic Signal	Lump Sum

SPECIAL PROVISION
SECTION 643
TRAFFIC SIGNALS

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

643.01 Description The project will result in the installation of a modern traffic control signal for the movable (swing) bridge connecting the towns of Southport and Boothbay Harbor. Equipment includes, but is not limited to pole mounted cabinets, controllers, malfunction management units, new wood pole and span wire, mast arm poles, pedestal poles, concrete foundations, vehicular signal heads, light-emitting diode (LED) indications, retroreflective backplates on vehicle signal heads, wiring, signal cable, bridge preemption, and all appurtenances and incidentals required for complete functioning installation. In addition:

Backplates will be provided for all new vehicle signal heads. The backplates shall be a minimum of 5-inches with 3-inch fluorescent yellow retroreflective strips. New backplates shall provide louvers for one-way, three-section 12-inch signal heads.

643.211 Additional Materials Materials shall also meet the requirements in the following Special Provision to Section of Division 700 - Materials:

Messenger Wire	718.14
Emergency Vehicle Preemption System	718.15

643.12 Painting Unless otherwise directed by MaineDOT or through the Resident Engineer, all exterior parts of the listed equipment shall be delivered to the project finished as follows:

Vehicular Signal Heads – **black** housing with black doors.
Signal Backplates – **black** and louvered w/ fluorescent yellow retroreflective strip.
Controller Cabinets – **bare metal** aluminum.
Pedestal Posts and Bases – **bare metal** / aluminum.

643.19 Basis of Payment Traffic signal modifications (Item 643.71) will be paid for at the contract lump sum price for the installation, which payment will be full compensation for furnishing and installing all materials, including, but not limited to pole mounted cabinets, controllers, span wire and tether cable, risers, vehicular signal heads, retroreflective backplates, aerial disconnects, signal cable, light emitting diode (LED) lamps, emergency vehicle preemption and all appurtenances and incidentals required for complete functioning installations and for furnishing all tools and labor necessary for completing the installations.

The bridge pre-emption will be paid for under pay items 643.71, which price will be full compensation for furnishing and installing all materials, appurtenances, and incidentals required for a complete functioning installation and for furnishing all tools and labor necessary for completing the installation.

Pedestal poles (Item 643.92) will be paid for at the contract unit price each which payment shall be full compensation for furnishing and installing all pedestal posts, bases, anchor bolts, ancillary materials, tools and labor necessary to erect and install the structures.

Dual Purpose Poles (Item 643.94) will be paid for at the contract unit price each which payment shall be full compensation for furnishing and installing all mast arms, uprights with overhead extensions for lighting to match existing pole lighting heights, providing or resetting existing luminaires, bases, anchor bolts to be supplied by the manufacturer of the mast arm poles, ancillary materials, tools and labor necessary to erect and install the structures.

Wood pole with guys (Item 643.97) will be paid for at the contract unit price each which payment will be full compensation for furnishing and installing all materials, including, but not limited to wood pole with guy wires and anchors, and all appurtenances and incidentals required to erect and guy anchor the pole.

Payment will be made under the following:

Pay Item	Pay Unit
643.80 Traffic Signals at: Southport Bridge Route 27 over Townsend Gut	Lump Sum
643.92 Pedestal Pole	Each
643.94 Dual Purpose Pole, w/35’ Arm w/luminaire	Each
643.97 Wood Pole with Guys and Span Wire	Each

Highway Lighting Quality Control Checklist

Subsection 634.09 Field Testing

Project Pin # _____

Location (if multiple services, please be specific)- _____

Grounding Electrode Resistance at service _____

Number of Circuits _____

Hand-Off-Auto Switch? _____

Circuit #1

Open Circuit Resistance- (Ohm out both hot legs at the cabinet while they are shorted together at the last pole and the fuse holders are disconnected at each pole) _____

Megger Test- (Meg out both hot legs to ground at the cabinet while they are shorted together at the last pole and the fuse holders are disconnected at each pole) _____

Current draw- (during normal operation) Leg #1 _____ Leg #2 _____

Operating Voltage at last pole _____

Circuit #2

Open Circuit Resistance- (Ohm out both hot legs at the cabinet while they are shorted together at the last pole and the fuse holders are disconnected at each pole) _____

Megger Test- (Meg out both hot legs to ground at the cabinet while they are shorted together at the last pole and the fuse holders are disconnected at each pole) _____

Current draw- (during normal operation) Leg #1 _____ Leg #2 _____

Operating Voltage at last pole _____

I, _____, certify that this work was done in accordance with subsection 643.14 and current NEC _____ guidelines, and when tested, was functioning as intended.

(YEAR)

Electrician's Signature _____

Electrician's License # _____

Highway Lighting Quality Control Checklist

Subsection 634.09 Field Testing

Project Pin # _____

Location (if multiple services, please be specific)- _____

Grounding Electrode Resistance at service _____

Number of Circuits _____

Hand-Off-Auto Switch? _____

Circuit #3

Open Circuit Resistance- (Ohm out both hot legs at the cabinet while they are shorted together at the last pole and the fuse holders are disconnected at each pole) _____

Megger Test- (Meg out both hot legs to ground at the cabinet while they are shorted together at the last pole and the fuse holders are disconnected at each pole) _____

Current draw- (during normal operation) Leg #1 _____ Leg #2 _____

Operating Voltage at last pole _____

Circuit #4

Open Circuit Resistance- (Ohm out both hot legs at the cabinet while they are shorted together at the last pole and the fuse holders are disconnected at each pole) _____

Megger Test- (Meg out both hot legs to ground at the cabinet while they are shorted together at the last pole and the fuse holders are disconnected at each pole) _____

Current draw- (during normal operation) Leg #1 _____ Leg #2 _____

Operating Voltage at last pole _____

I, _____, certify that this work was done in accordance with subsection 643.14 and current NEC _____ guidelines, and when tested, was functioning as intended.

(YEAR)

Electrician's Signature _____

Electrician's License # _____

Traffic Signal Quality Control Checklist

Subsection 643.14 Field Testing

Project Pin # _____

Grounding Electrode Resistance at service _____

ID tags on loop amps / detector cards? _____

Location _____

Street Approach	_____		
Loop #	_____	**Resistance**	_____
Phase #	_____	**Meg to ground**	_____
L,C, or R Lane	_____	**Amount of bondo covering loop**	_____
Pulse or Presence	_____		

Street Approach	_____		
Loop #	_____	**Resistance**	_____
Phase #	_____	**Meg to ground**	_____
L,C, or R Lane	_____	**Amount of bondo covering loop**	_____
Pulse or Presence	_____		

Street Approach	_____		
Loop #	_____	**Resistance**	_____
Phase #	_____	**Meg to ground**	_____
L,C, or R Lane	_____	**Amount of bondo covering loop**	_____
Pulse or Presence	_____		

I, _____, certify that this work was done in accordance with subsection 643.14 and current NEC _____ guidelines, and when tested, was functioning as intended.

(YEAR)

Electrician's Signature _____

Electricain's License # _____

SPECIAL PROVISION
SECTION 655
ELECTRICAL WORK
(Bridge Control System)

PART 1 – GENERAL

1.01 Description.

A. This section includes general requirements for supply, delivery, storage, installation, testing and commissioning of a hard-wired relay Bridge Control System required under the scope of the contract.

B. Provide a complete hard-wired relay Bridge Control System fully assembled and programmed (control logic, operator interface, interlocking, bypassing, , etc.) and ready for proper operation of the movable bridge. The control system shall be complete and shall include all equipment necessary to guarantee the proper control of the bridge operation from the operator control console.

1.02 Related Sections. The requirements contained in other sections of project specification shall also apply for installation and coordination of work.

1.03 Quality Assurance.

A. The Control System that will be provided for the movable bridge control system shall comply with these special provisions and the latest revised applicable codes, specifications and standards here below listed:

1. National Electrical Manufacturer's Association (NEMA).

a. AB-1: Molded Case Circuit Breakers.

b. ICS-1: General Standards for Industrial Control and Systems.

c. ICS-2: Standards for Industrial Control Devices, Controllers and Assemblies.

d. ICS-4: Terminal Blocks for Industrial Use.

e. ICS-6: Enclosures for Industrial Controls and Systems.

2. ANSI/IEEE Standards.

a. ANSI/IEEE C37.90.1: Standard Surge Withstand Capability (SWC) Tests for Protection Relay Systems.

b. ANSI/IEEE C37.90.2: Trial Use Standard Withstand Capability of Relay Systems to Radiated Electromagnetic Interference from Trans-receivers.

3. AASHTO Standards.

a. AASHTO LRFD Movable Highway Bridge Design Specifications.

4. FWHA-MUTCD Manual on Uniform Traffic Control Devices.

B. The Contractor shall obtain any and all required permits and approvals of all Departments and Agencies having jurisdiction.

C. Equipment and Material Provisions.

1. Ensure all equipment and materials are new. Provide first class equipment, materials, and workmanship. Manufacture and erect to the satisfaction of the Department. Warrant the in-service working of the electrical installations for 2 years following Acceptance. If the contractor has any objection to any feature of the electrical equipment as designed and laid out, he must state his objection prior to bidding and in writing to the Department, otherwise his objection will be ignored if offered as a reason for malfunctioning of the equipment or for defective or broken apparatus.

2. Provide each piece of electrical equipment and apparatus with a corrosion-resistant metal nameplate on which is stamped the name of the manufacturer, catalog number, and the rating or capacity of the equipment or apparatus.

3. Provide corrosion-resistant material for all metal parts of the installation (except structural steel), such as aluminum, bronze, or stainless steel. Use cast-iron, malleable iron, or steel with a hot-dip galvanized finish as specified. Where aluminum surfaces come into contact with metals other than stainless steel or zinc, paint the dissimilar metals with a prime coat of zinc-chromate primer followed by one coat of a suitable protective coating, excluding those containing lead pigmentation.

4. Ensure all mounting hardware and all wire and cable terminals are vibration proof.

5. If any departures from the Plans or Special Provisions are deemed necessary, submit the details of such departures and the reasons for it to the Department. Do not start related work until approved by the Department.

1.04 Action and Informational Submittals.

A. Preconstruction Submittals.

1. Health and safety plan.

2. Work plan.

3. Quality Control (QC) plan.

4. Schedule of submittal items with dates.

B. Product Data.

1. Submit manufacturer's instructions, printed product literature and data sheets for all items described in these specifications and include product characteristics, performance criteria, physical size, finish and limitations.

2. Submit copies of Vendor, producer or manufacturer product data and system integration and/or engineered system shop drawings. These shall include design and installation shop drawings, catalog cuts, specifications, testing requirements, and installation and user instructions.

C. Product and System Data.

1. Submit manufacturer's instructions, printed product literature and product data which shall include as a minimum product characteristics, performance criteria, physical size, weights, arrangements of components, type of material used, type and characteristics of used electrical devices and the minimum space for the erection and maintenance.

2. The Contractor shall provide the following system data:

a. Schematic wiring diagrams.

b. Package control system architecture.

c. Material list.

d. General arrangement drawings showing all equipment in its final position.

e. Wiring Diagram: cross wiring diagrams from field terminal strip terminals to all external equipment (drawings and database format - Excel).

f. System wire and cable schedule(s) including wire and cable number, number of wire, wire size, etc.

g. Functional description all the equipment included in the package.

h. Specifications of all equipment included in the package.

i. Control logic diagrams (open and closed control loops, automatic sequences, functional groups, interlocks, bypasses, etc.) covering all the equipment included in the package.

j. Troubleshooting guides, tables and block diagrams and manual operation.

k. Manufacturer's Instructions: provide to indicate special handling criteria, installation sequence, cleaning procedures and maintenance information.

l. Factory Acceptance Test (FAT) Procedures.

m Site Acceptance Test (SAT) procedures.

n. Test Report.

o. Certificates.

p. Closeout Submittals Warranty.

q. Sustainable Design Submittals.

    1. Construction Waste Management. Submit project Waste Management Plan highlighting recycling and salvage requirements.

    2. Recycled Content. Submit listing of recycled content products used, including details of required percentages

or recycled content materials and products, showing their costs and percentages of post-industrial content, and total cost of materials for project.

1.05 CLOSEOUT SUBMITTALS

A. Provide data for each type and style of starter, relay and control device.

B. Provide service and maintenance information including preventive maintenance, assembly, and disassembly procedures. Include electrical drawings from electrical general sections. Submit additional information necessary to provide complete operation, repair, and maintenance information, detailed to the smallest replaceable unit.

C. Provide instructions on adjustments, troubleshooting, configuration, and modifying drive parameters.

D. Provide copies of as-built submittals.

E. Provide spare parts lists including renewal parts.

PART 2 – PRODUCTS

2.01 The following product specifications form a basis for the design of the Control System for the bridge.

A. Material.

1. Provide all apparatus, devices, circuits, appliances, material, or labor specifically mentioned or not, or included but that may be found necessary to complete the installation in a manner acceptable to the Department as if specifically included in these Special Provisions and without any extra cost to the Department.

B. Conformance.

1. Provide all electrical equipment and install according to the requirements of the latest revision of the AASHTO LRFD Movable Highway Bridge Design Specifications and as specified in these Special Provisions.

2. Provide materials and construct according to the requirements of the current National Electrical Code and to all applicable local rules and ordinances. Obtain all required permits and approvals of all Departments or Agencies having jurisdiction.

C. Bridge Control System Vendor.

1. Provide a control system manufacturer/Vendor and retain that Vendor through Acceptance and warrantee period. The control system Vendor is to have complete control system responsibility for the integration of all bridge operation and traffic control system components whether or not provided by that Vendor. Ensure the control system Vendor supervises the selection and installation of all bridge control equipment and associated components and CCTV systems.

2. Fabrication of the control equipment is to take place at a UL 508 (Underwriters Laboratory) certified facility.

3. Review and provide conformance and approval stamp for all electrical system working drawings of the electrical contractor, for component and interconnection compatibility, before submitting to the Department.

4. Conduct shop testing of the control system, in addition to field and final acceptance testing of the entire electrical bridge control system and traffic control system of the bridge, although not necessarily responsible for repairs of equipment not supplied nor installed by the Vendor. The Contractor is responsible overall.

5. Train the bridge operators and maintenance personnel and supervise all operations and testing.

6. Demonstrate competence in providing electrical control systems for at least 10 movable highway bridges of all types including swing spans. The Vendor is to demonstrate competence in at least 2 bridges with AC motor/digital vector drives. The Vendor is to identify the above required bridges, the owners, and a current contact familiar with the construction and operation of the bridge.

7. Supply field service staff with the capability of providing services for field coordination of construction and final adjustments, available to the electrical contractor and as directed by the Department, and capable of responding within 2 hours to an emergency at the bridge through the end of the warranty period.

8. Submit the name, qualifications, and current certified financial statement of the control system Vendor that the electrical contractor is proposing with the bid documents, which requires review and approval by the Department.

D. Electrical Items Covered in Other Sections. Brakes, end seat actuators, end jack actuators, barrier gates, warning gongs, traffic signals and advance warning beacons are covered and paid for in other sections of these Special Provisions.

E. Shop and Working Drawings. Submit for review within 120 days after the award of the Contract. The electrical work may not proceed without approved shop and working drawings. Any work performed before all required submissions being returned approved will be considered unauthorized and will be at the Contractor's risk of being rejected.

F. Applicable Standards and Publications. The electrical installation shall be in accordance with all applicable codes, standards, laws, and ordinances in effect at the construction site and the latest version of same at the time of the construction. The following codes and standards are applicable and are not considered all inclusive:

1. National Electric Code (NEC).
2. National Electrical Manufacturers Association (NEMA).
3. National Board of Fire Underwriters.
4. National Fire Protection Association (NFPA).
5. National Electrical Safety Code (NESC).
6. Board of Fire Underwriters.
7. American National Standards Institute (ANSI).
8. Environmental Protection Agency (EPA).
9. Illuminating Engineering Society (IES).
10. Insulated Cable Engineer’s Association (ICEA).
11. Joint Industrial Council (JIC).
12. Occupational Safety and Health Act (OSHA).
13. Underwriter’s Laboratories, Inc. (UL).
14. American wire gauge (AWG).
15. National Electric Testing Association (NETA).

16. American Association of State Highway Transportation Officials (AASHTO).

G. Permits. Receive approval from the USCG for all construction channel closures and temporary navigation lighting and any other permits required.

2.02 Span Drive Motors and Motor Encoders. The Span Drive System consists of a pair of normal span drive motors with encoders and hand crank extension, and AC Flux Vector Drive as follows:

A. The span drive motor construction has the following features: 7.5 horsepower; 900 rpm; NEMA Design B; 208VAC; vector duty; continuous duty rated; totally enclosed, non-ventilated; Class H insulation; extra-large conduit box; re-greaseable anti-friction bearings; 1.0 service factor; 1,000:1 speed range; 120 volt winding heaters; thermal switch (Klixon); suitable for 40º C ambient. Provide cast iron frame and size as required by the manufacturer. Coat with epoxy paint. The frame shown on the mechanical and electrical Plans is that of one manufacturer and is for illustration only. Modify the machinery platform, shaft dimensions with hand crank feature, conduit box location and all other equipment or machinery as necessary.

B. Provide F1 and F2 assemblies for proper equipment orientation. Provide drive end shaft extension in accordance with the requirements of the mechanical plans to accommodate the mounting of the brake wheel, brake wheel coupling or half coupling. Provide opposite drive end shaft in accordance with the requirements of the mechanical plans, to accommodate the encoder, hand crank and hand crank manual operation interlock.

C. Provide pancake type motor encoder mounted directly to the motor frame. Each span drive motor encoder shall be 1024 PPR minimum and shall have two sensors to allow the cable to be switched to the other connector in the event of one sensor failure. The span drive motor encoders shall be compatible with the Flux Vector Drives and shall be equal to Northstar RIM Tach or Department approved equal.

D. Provide Span Drive motor and Flux Vector Drive from a single source to ensure complete compatibility. Provide drive motor from Baldor, Reliance, Marathon, or approved equal.

2.03 Span Drive Motor Brakes and Machinery Brakes. Provide the span drive motor brake and machinery brake as specified in the mechanical specifications and pay for under the respective mechanical pay item.

2.04 End Seats. Provide end seats actuators as specified in the mechanical Special Provisions and paid for under the respective mechanical pay item.

2.05 End Jacks. Provide end jack actuators as specified in the mechanical Special Provisions and paid for under the respective mechanical pay item.

2.06 Circuit Breakers. Protect all branch circuits from the power buses by molded-case circuit breakers mounted in the power panel. Provide all breakers with quick-make and quick-break contacts and with a trip-free and trip-indicating mechanism. Provide frame sizes a minimum of 100 amperes or as shown on the Plans. Equip the breakers with thermal-magnetic trips or adjustable, instantaneous, magnetic trip units, with trip rating as required. Provide molded-case circuit breakers meeting the requirements of NEMA Publication No. ABI-1975. Ensure interrupting capacity is as shown on the Plans but not less than 42,000 AIC. All circuit breakers, except lighting breakers, shall be trip tested with the trip testing results submitted to the Department for review and acceptance. Breaker coordination calculations shall be submitted to the Department for review and approval.

2.07 Power Panel. Provide a power panel as shown on the plans and as follows:

A. Panelboard construction to meet the following requirements:

1. References. Provide a circuit breaker type panelboard with NEMA Type 1 enclosures to meet NEMA PB 1 and NEMA PB 1.1 General instructions for Proper Installation, Operation, and Maintenance of Panelboards Rated 600 Volts or Less.

2. Manufacturers. Provide panelboards as manufactured by; Square D, GE or Cutler Hammer.

3. Panelboard Bus. Copper current carrying components, ratings as indicated on Drawings. Furnish copper bus in each panelboard and insulated ground bus.

4. Short circuit rating shall be as shown on Panel Schedule in the Plans.

5. Molded Case Circuit Breakers. NEMA AB 1, bolt-on type thermal magnetic trip circuit breakers, with common trip handle for all pole, listed as SWD for lighting circuits, Type HACR for air conditioning equipment circuits, Class A ground fault interrupter circuit breakers as indicated on the Drawings. Do not use tandem circuit breakers.

6. Cabinet Front. Surface mount, as indicated on the Plans, with metal directory frame, and flush lock keyed; finished in manufacturer’s standard gray color.

7. The breaker panel shall be configured for 42 circuits with a 150 amp main circuit breaker.

8. Circuit breaker arrangement, number of poles and trip ratings shall be as shown on the Plans. The Contractor shall ensure all circuit breaker ratings are appropriate and resize as necessary for selected equipment loads.

B. Install panelboard as follows:

1. Install panelboards in accordance with NEMA PB 1.1, surface mounted on the wall, height 6 ft to top from the finished floor, filler plates for unused spaces, typed circuit directory, engraved plastic nameplates.

2. Provide typed circuit directory for each branch circuit panelboard. Revise directory to reflect circuiting changes to balance phase loads.

3. Ground and bond panelboard enclosures. Connect equipment ground bars of panels in accordance with NFPA 70.

4. Inspect and test panelboards in accordance with NETA ATS.

C. Perform circuit breaker inspections and tests listed in NETA ATS, Section 7.6.

2.08 Starters and Magnetic Contactors.

A. Ensure the continuous current rating of contactors and starters is adequate for the connected loads and no contactors/starters are smaller than NEMA size 1. Provide all contact poles with arc chutes and equip contactors rated 150 amperes and above with magnetic blowouts. Provide 3-element manual/automatic reset, overload relays for motor protection. Electrically and mechanically interlocked reversing contactors.

B. Provide all contactors, relays, and other devices of the required current-carrying and interrupting capacity. Provide all apparatus of substantial construction according to the requirements of NEMA standards publications ICS 1 and 2, 2010 and 2008 respectively, for industrial control devices.

2.09 Overload Relays. Provide manual reset overload relays to protect motors and wiring against overheating due to excessive current. Provide for all brake, end seat actuators, end jack actuators and all gate motors. Heater elements are to be selected based on motor full-load running current and be provided, according to the motor nameplate value, after system is installed. Electronic overload relays may be used.

Auxiliary overload relay contacts shall be provided and used as necessary in accordance with the schematic diagrams of the Plans.

2.10 Disconnect Switches.

A. Span Drive Motor Disconnect Switches. Install non-fused safety switches for use as disconnects within sight of each Span Drive Motor. Provide lockable, non-fusible, heavy-duty, safety switches, rated as shown on the Plans, and NEMA 4X 316 stainless steel enclosures. Provide each disconnect switch with a N.O./N.C. auxiliary contact for the control system and phenolic nameplate to identify corresponding motor.

B. Brake Disconnect Switches. Install non-fused safety switches for use as disconnects within sight of the Motor Brake and the Machinery Brake. Provide lockable, non-fusible, heavy-duty, safety switches, rated as shown on the Plans, and NEMA 4X 316 stainless steel enclosures. Provide each disconnect switches with a N.O./N.C. auxiliary contact for the control system and phenolic nameplate to identify corresponding brake.

C. End Jack and End Seat Disconnect Switches. Provide lockable non-fused, 3-phase, NEMA 4X manual motor starter switches for use as disconnect switches for each End Jack actuator and each End Seat actuator, rated as shown on the Pans, and located within sight of the associated actuator. Provide each manual motor starter switch with a N.O./N.C. auxiliary contact for the control system and phenolic nameplate to identify corresponding actuator.

2.11 Phase Monitor. Ensure this relay prevents energizing the bridge controls in the event of reversed phase sequence, phase loss, phase imbalance, over or under voltage. Tripping of this relay will disable the bridge control system which will disable the operation of all motors. The phase monitor shall have a selectable manual and automatic reset.

2.12 Power Monitor. The Motor Starter Cabinet door shall be provided with a data logging power and energy meter. The meter shall meet the requirements of ANSI C12.20 0.2 Accuracy Class and IEC 62053-22 0.2S Energy Measurements. It shall have 0.007 Hz Precision Frequency Measurements, programmable alarm limits, THD, and Harmonics Analysis, waveform recording of up to 512 samples per cycle, 170 events. It shall provide data logging with three historical logs of 64+ parameters each and keys to add functionality in the field. The power monitor shall be a Shark 200 or Department approved equal.

2.13 Motor Starter Cabinet and Drive Cabinet Terminal Blocks. Terminal blocks for conductors of Size No. 8 AWG and smaller shall be 1 piece blocks on phenolic material recognized under the UL Component Recognition program. Provide barriers at least 1/2 inch high by 1/8 inch thick and space 5.8 inch center-to-center.

Provide straps and screws of brass, nickel plated for use in highly corrosive atmospheres and rate for 50 amperes. Ensure the blocks provide a withstand voltage rating of 750 volts per IEEE switch gear standards. Ensure the terminal blocks provide strap screws suitable for use with ring tongue wire connectors. Provide corrosion resistant marking strips for conductor identification. Provide at least 10 percent spare terminals. Provide terminal blocks of Buchanan Type 2B112, General Electric Series CR 151B, Marathon series 1600, or Department approved equal.

2.14 Power Distribution Blocks. Provide power distribution blocks for all conductors larger than No. 8 AWG constructed from a single piece of hard-drawn copper, machined and electro-tinned. Mount all blocks on heavy duty phenolic material and provide with safety cover kits. Ensure number and size of primary and secondary wire openings are selected by the Contractor/Vendor and are approved equal to the 66000 series blocks as manufactured by Gould Shawmut or Series 145 by Marathon.

2.15 Bridge Control Cabinets. Provide lockable control panels enclosed in free-standing cabinets and install where shown on the Plans. Free standing cabinets shall be mounted on 1/2" stainless steel channel. Mount all circuit breakers, switches, contactors, starters, relays, regulating equipment, and other apparatus for control of the span and its auxiliaries on these enclosed panels.

A. Provide cabinet dimensions for review and approval by the Department using those shown in the contract plans for guidance.

B. Each device shall be front-connected, front-wired, and removable from the front. Arrange the equipment in all cabinets for ease of access and for safety and convenience of operation. Take special care to obtain a systematic and neat arrangement of the equipment. Suitably name each device and plainly mark by a laminated nameplate mounted near the device on the panel. Show an approved descriptive title for the apparatus together with the device designation appearing on the schematic wiring diagrams.

C. Provide a NEMA Type 12 enclosure constructed of 12 gauge minimum sheet-steel and reinforce with steel angles or channels so as to provide a rigid, free-standing structure. Provide the control cabinets with hinged doors. Ensure door panels are gasketed. Provide with 3-point, lockable vault-type latches. Provide corrosion resistant hardware. Provide each panel with suitable interior LED light fixtures operated from a door operated switch.

D. Each panel enclosure shall permit mounting in the available space along the walls of the room in which they are installed. If the final cabinet dimensions, as established by the manufacturer, should change, should necessitate rearrangement or modification of the equipment in order to fit in the available space, or both, make such rearrangements or modifications and at no extra

cost to the Department. The final arrangement of all equipment in the control house is subject to the approval of the Department.

E. Paint the inside of the control panel enclosures and all metal reinforcing with 2 coats and the outside with 3 coats consisting of 1 coat of primer followed by 1 coat of white enamel on the inside surfaces and 2 coats of gray enamel on the outside. Ensure the exterior finish coat is ANSI 61 light gray enamel.

F. Provide all contactors, relays, and other devices of the required current-carrying and interrupting capacity. Provide all apparatus of substantial construction according to the requirements of NEMA Standards Publications ICS 1 and 2, for industrial control devices.

G. Ensure all internal wiring between devices, terminal blocks, or both are flame-retardant, cross linked polyethylene insulated, switchboard wire, Type SIS or equal. Provide stranded copper conductors of 14 AWG minimum.

H. For each assembled control panel, connect all outgoing wire, No. 8 AWG or smaller to terminal blocks installed at the sides of the cabinet. Ensure the control panels also provide sufficient extra terminals to allow connections of all wires coming from limit switches and other devices that go on to the bridge control console and other locations as required even though these wires do not connect to apparatus on the control panels. Provide spare terminals at least 10 percent of those actually used. Identify each terminal per wire number shown on the Contractor's schematic wiring diagrams.

I. Arrange all panel wiring systematically so that circuits can be readily traced. Install the wiring in a network of troughs consisting of horizontal and vertical sections securely bolted to the panels. Fabricate the troughs from heavy duty Noryl plastic shaped into a channel cross-section. After installation of the wiring, snap an insulated flanged cover over the open side of each trough section.

J. Provide the floor areas in front of all power and control equipment rubber mats specifically designed for the application.

2.16 Control Console.

A. Provide a bridge control console and install in the operator's room of the control house as shown on the Plans.

B. Mount devices for controlling operation of the swing span and its auxiliaries on the control console. Ensure the console is of neat substantial construction. Fabricate from No. 10 gauge sheet-steel, properly formed and suitably reinforced to provide adequate strength. Fabricate the console top from No. 10 gauge, Type 316, stainless steel sheet with a non-glare, satin finish. Provide

removable doors in the front of the console, pivoted on 90 degree hinges and secured with flush type, 3-point vault type latches. Neatly fit up the console with close joints and ground off smoothly all rough edges or corners. Round off all projecting edges. Provide all metal hardware of substantial construction and having a satin-chrome plate finish. Provide all equipment mounting screws and bolts of 316 stainless steel.

C. Paint the inside of the sheet-steel portions of the console and all metal reinforcing with 2 coats and paint the outside with 3 coats of paint consisting of 1 coat of primer followed by 2 coats of enamel on the outside surfaces and 1 coat of white enamel on the inside. Provide the finish coat of ANSI 61 Gray. Do not paint the stainless steel console top.

D. Take special care throughout the construction to ensure that the stainless steel console top and the equipment mounted thereon are completely protected from damage or defacement at all times.

E. Suitably light the console interior and control by a switch mounted near the front doors. Lighting shall illuminate all components and wiring without shadow and clear visibility of all tags, mold markings and wire numbers.

F. Ensure the wiring within the control console is insulated switchboard wire Type SIS or equal. Ensure wire is not smaller than 14 AWG. Arrange the wiring systematically so that all circuits can be readily traced. Terminate all conductors on easily accessible terminal blocks mounted inside the console at the rear. Provide spare terminals totaling at least 10 percent of those actually used. Identify wiring at equipment terminals by using marking strips on the terminals with type written numbers.

G. Mount indicating lights on the control console to show that the various steps in the sequence of operation have taken place so that the operator may proceed to subsequent steps at the proper time. Ensure the functions to be indicated and the color of the lenses are as shown on the Plans.

2.17 Position Transmitter. Provide an absolute encoder type span position transmitter within the Span Limit Switch enclosure, as called out on the plans, connected to the operating machinery through gearing. Ensure the Position Transmitter is geared single-turn, heavy-duty, and mounted in a NEMA 4X enclosure. The Position Transmitter shall produce an analog output 4-20mA output to be calibrated with the Span Position Indicator to show span position in degrees. Provide calculations to the Department for approval. The Position Transmitter resolution shall be 0.1 degree or better. Provide the Span Limit Switch and position transmitter from a single source to ensure complete compatibility. Provide a 12 VDC power supply for the position transmitter as shown on the plans. The Position Transmitter shall be a Turck RI360 Encoder or Department approved equal.

2.18 Meter. Meter for displaying span angle, motor current, and motor speed shall display values using a 3.5" 7-segment LED display with red digits 0.56" high and a user-programmable decimal point. The meters shall be suitable for use with 120VAC power. The meters shall accept 4-20 mA analog input. The meters shall be suitable for operation in temperatures from 0 to 55 deg C. Noise rejection shall be 50dB, 50/60Hz. Analog to digital conversion shall be by dual slope integration with at least 3 samples per second, nominal. Bezel dimensions shall be 3.78" x 1.89" x 0.51". The meter shall be Simpson F35 series or approved equal. It shall be calibrated to indicate span position of 0 to 65 degrees for the output range of the Position Transmitter.

2.19 Limit Switches.

A. Fully Closed Limit Switch. Provide a single magnetic limit switch with magnetic targets as shown on the Plans. Coordinate the switch and target initial position such that it trips with the span is within 1" of contacting the hard stop and remains tripped as the Span Jacks raise and lower the span ends. Contractor to adjust switch and target positions in the field during testing. Provide a SEOOW cord with waterproof fittings connecting the switch to the terminal box as shown on the plans. The Fully Closed Limit Switch shall meet the following specifications: 316L stainless steel housing; fully potted and waterproof; end sensing; contain DPDT gold plated dry contacts rated at 10A/120VAC; operating temperature -50 deg C to 105 deg C; 1/4" ferrous metal sensing distance (3-7/8" sensing distance with magnetic target). shall be a TopWorx GO Switch Model 81 with Universal Mounting Bracket or Department approved equal. The targets shall be TopWorx GO Switch AMC5 magnetic targets or Department approved equal. All mounting brackets and hardware shall be fabricated from 316 stainless steel. Provide a deflector shield above the Fully Closed Limit Switch and Span Jacked Limit Switches to deflect water and debris from the switches.

B. Span Jacked Limit Switches. Provide a total of two magnetic limit switches as shown on the plans. Set and adjust the switches and targets to trip with the span jacked to a suitable height allowing end seats to drive with sufficient clearance. The Span Jacked Limit Switches, magnetic targets, mounting brackets shall meet the same specifications and be of the same type listed above for the Fully Closed Limit Switch or Department approved equal.

C. Gate Locked Limit Switches. Provide a total of two magnetic limit switches and magnetic targets to signal each barrier gate arm is locked in the receiver. Contractor to design limit switch configuration and adjustable mounts with the limit switch mounted on the gate arm tip and the target on the gate arm receiver. The contractor shall select an appropriate target to reliably trigger the limit switch. The Gate Locked Limit Switches shall meet the same

specifications and be of the same type listed above for the Fully Closed Limit Switch or Department approved equal.

D. Overtravel Limit Switch. Provide one heavy duty limit switch with rod type lever arm and trip plate in accordance with the Plans. Contractor to design trip plate and provide in the shop plans. The switch shall be installed and adjusted to trip at 70 degrees span position. The rod length and trip plate shall be coordinated allow the switch to trigger at the overtravel position at full speed and come to a complete stop while keeping the Overtravel Limit Switch triggered (lever arm does not travel beyond the trip plate and reset). The switch shall meet the following specifications: enclosure water, oil, and dust tight; NEMA 4; DPDT with contacts of corrosion resistant silver alloy; spring return; current rating 20A at 125VAC; operating temperature range -40 degrees C to +90 degrees C. The Overtravel Limit Switch shall be a NAMCO Series SL limit switch or Department approved equal.

E. Span Limit Switch. Provide a rotating cam limit switch in accordance with the Plans. The Span Limit Switch shall have 8 circuits with 8 DPDT switches individually, micro-adjustable and provisions for internal vernier adjustments. Ensure the limit switch allows for a + or – 1/4 degree contact operation repeatability. The DPDT switches shall be precision-type, snap action switches. Assemble each limit switch in a NEMA 4X enclosure. Provide a gear reducer coupled to the span drive speed reducer shaft extension with a 316 stainless steel zero-backlash flexible coupling. The gear reduction shall be of sufficient ratio to restrict the Span Limit Switch shaft rotation to less than 330 degrees with the span opened to 65 degrees travel. Cams and DPDT shall be adjusted in accordance with the settings shown in the Plans and adjusted in the field. The Position Transmitter shall be housed within the Span Limit Switch enclosure. The Span Limit Switch shall be suitable for vertical mounting. The Span Limit Switch shall be an AMETEK GEMCO 1980 Series rotating cam limit switch or Department approved equal.

F. End Seat and End Jack Limit Switches. The bridge control system shall use the limit switches provided with the end seat actuators and end jack actuators as shown in the control schematic section of the Plans. In addition to the end seat actuator control switches, each end seat shoe shall be provided with two magnetic limit switches two sense driven and pulled positions as shown in the plans. These shall meet the same specifications and be of the same type listed above for the Fully Closed Limit Switch or Department approved equal.

G. End Seat Manual Operation Safety Interlock Limit Switches. The bridge control system shall use the built-in manual operation safety interlock limit switches provided on the end seat actuators as shown in the control schematic section of the Plans. They shall prevent energization of the end seat actuators and protect personnel during manual operation and shall be failsafe.

H. End Jack Manual Operation Safety Interlock Limit Switches. The Contractor shall design and provide a manual operation safety interlock limit switch for each end seat actuator to prevent energization of the end jacks and protect personnel while an actuator is manually operated. The switch shall be coordinated with a removable cover that must be removed to access the hand wheel and require the limit switch to trigger and remain triggered (normally closed contact open) while the cover is removed. The limit switch shall be fail-safe and not rely on a spring return to hold it in the actuated position. The removable cover is a Mechanical pay item.

I. Span Drive Motor Manual Operation Safety Interlock Limit Switches. The Contractor shall design and provide a manual operation safety interlock limit switch for each span drive motor to disable the span drive system and protect personnel while manually operating the span drive motors from the opposite drive end (ODE) shaft extension. The switch shall be coordinated with a removable cover, requiring removal of the cover to access the manual operation shaft and requiring the limit switch to trigger and remain triggered (normally closed contact open) while an operating lever or wheel is installed. The limit switch shall be fail-safe and not rely on a spring return to hold it in the actuated position. The removable cover is a Mechanical pay item.

J. Brake Limit Switches. The motor brake and the machinery brake shall be provided with set, released, and hand-released limit switches. These switches shall be provided as part of each brake assembly and are a mechanical pay item. The bridge control system shall interface with the brake limit switches as shown in the Plans.

2.20 Swing Span Drag Cable. Power and control conductors from the pivot pier to the movable span shall be carried with multi-conductor cables specifically designed for flexibility and dragging over a rough concrete surface. The cables shall be provided with extra flexible conductors with Class K stranding. The conductor makeup of the cable shall be as called out on the electrical plans. The cable shall be provided with two layers of .235” arctic grade, weather and sunlight resistant heavy duty neoprene jacket reinforced with Kevlar.

2.21 Heating, Ventilation, and Air Conditioning (HVAC). Contractor shall design and install split HVAC system for the operators house similar to that shown on the Plans. The HVAC system be sized to provide suitable cooling and heating during all seasons. The indoor unit shall be a flush ceiling mount type that fits without modification to the control house framing. The outdoor unit shall be installed along the back side of the control house with sufficient clearance according the manufacturer's installation instructions. Provide a NEMA 4X disconnect switch on back side of operator's house next to the outdoor unit. The HVAC system shall be powered from the Power Panel with an appropriately sized circuit breaker. HVAC system shall be provided with wireless remote control.

2.22 Closed Circuit Television (CCTV). Contractor shall design and install a CCTV system in accordance with MaineDOT Standard Specifications Section 654.211 Closed Circuit Television (CCTV) System as it applies to this project. It shall be arranged similar to that shown on the Plans. A network video recorder (NVR) shall be provided that is capable of powering and operating a minimum of 6 IP cameras using Power over Ethernet (POE) CAT6 cables. The NVR internal memory shall allow a minimum of 48 hours of recording time for all cameras at 720P resolution. The NVR shall be capable of displaying any number of cameras on the two separate monitors. NVR settings should be easily adjustable and provided with a suitable controller (mouse or other). POE IP cameras shall be installed and directed at the stop bars of each approach, up and down the swing span, and perpendicular to the swing span directed toward approaching vessels. cameras directed toward the approach stop bars shall be varifocal with sufficient optical zoom to easily recognize vehicles at each approach stop bar (day and night). All cameras shall have electronic image stabilization. All cameras shall have low light capability (night vision). All cameras provided shall be weatherproof and capable of operating at -30 deg C to +50 deg C and include built-in heaters to prevent frost and icing. Contractor shall provide conduit to each camera to protect the CAT6 cables. The CCTV system shall be provided with a suitable WiFi router for wireless local area network access from the Tender's shack using a computer, tablet, or smart phone. Dual ceiling mounted monitors shall be provided which provide suitable image size for all cameras while minimizing the operator's view out the control house windows. The entire CCTV system shall be powered from the control house GFCI receptacles. Contractor shall provide suitable mount or shelf to contain the NVR and WiFi router.

2.23 Marine Navigation Lights.

A. Pier 2 (pivot pier) navigation lights shall have a red, 180 degree viewing angle lens and lamp life not less than 50,000 hours. Fender lights shall meet 33CFR Subpart 66 standards. The fender lights shall be manufactured from light stabilized polycarbonate. New fender tip lights shall be approved equal to the SUN4-PL as manufactured by McDermott Light and Signal. New fender axis lights shall be approved equal to PLAT-LED with BGSOL-FLAT-PLATE with 30' (min) power cord as manufactured by McDermott Light and Signal. Each light and solar panel shall be provided with bird spikes.

B. The existing red/green upper chord navigation lights, conduit and wiring shall be retained. Connections between existing wiring and the power panel shall be made using conductors sized to match the existing conductors. The existing red Pier 1 and Pier 3 navigation lights shall be retained. Conduit and wiring shall be replaced as shown in the plans. Connections to Pier 1 and Pier 3 navigation lights shall be made with three-conductor 12 AWG SEOOW cord. One conductor shall ground the light housing.

C. The contractor shall submit outline-dimensioned drawings of the new navigation lighting units, mounting details, and specification in the form of catalog cuts of proposed lights to be approved by the Department.

2.24 Span Drive Motor Drives.

A. The Contractor shall furnish Flux Vector Drives (FVDs) with operating voltages and minimum current ratings as shown in these special provisions. FVD systems shall be built in accordance with UL508a standards.

B. The FVD System shall be compatible with the squirrel-cage type, phasor-type construction, induction motor and shall be sized to ensure the motor full load amps (FLA) do not exceed the FVD continuous current rating. The flux vector drive shall meet the following criteria/specifications:

1. Overload capacity of 200% for 28 seconds (from cold).

2. FVD shall be capable of operating with a supply voltage range of 200 VAC to 240 VAC ±10%.

3. The maximum continuous output current rating of the drive shall be no less than 30 Amps.

4. The VFD shall be capable of providing 200% starting torque.

5. The VFD shall utilize contactorless reversing controls.

6. Speed regulation shall be 2% or better.

7. FVD shall utilize sinusoidal PWM output modulation using insulated gate bi-polar transistors. Carrier frequency adjustable approximately 1 to 6 kHz.

8. FVD shall utilize microprocessor-based control.

9. Programmable parameters and at least the last four faults shall be stored in non-volatile memory.

10. Operating modes fully programmable and selectable via external control inputs as required.

11. FVD shall include built-in digital communications capability including Ethernet/IP or Modbus to enable set-up, configuration, and monitoring to be carried out with a PC or controller. Provide a copy of software

(to be licensed to the Department along with all necessary cables, hardware, and manuals).

12. FVD shall include a frame mounted keypad with backlit LCD display, useable for drive status monitoring and adjustment of all parameters. The keypad shall have a battery-operated real-time clock for accurate time stamping of events.

C. Contractor shall provide a three-pole fuse block and fuses for each drive sized by the FVD manufacturer and installed in accordance with the Plans.

D. Contractor shall provide three phase input line reactors and output load reactors for each drive which are UL recognized and sized by FVD manufacturer.

E. Dynamic braking resistors sized by the drive manufacturer shall be provided. These shall provide braking torque of at least 150% rated motor full load torque on a 10% duty cycle (min). Resistors shall be mounted in a ventilated stainless steel enclosure and provided with a normally closed thermal switch wired to the control system to initiate an FVD external trip in the event of a resistor overheat. The dynamic braking resistors shall be installed according to the Plans and the manufacturer's installation instructions.

F. The FVDs shall load share in master/follower configuration with FVD 1 as the master and FVD 2 as the follower.

G. FVD programmable inputs and outputs shall be in accordance with the Plans.

H. FVDs shall be Unidrive M series drives as manufactured by Nidec or approved equal.

2.25 Barrier Gates. See Special Provision Section 527. The bridge control system shall interface with the barrier gates as shown in the Plans.

2.26 Warning Gong. See Special Provision Section 527. The bridge control system shall interface with the warning gongs as shown in the Plans.

2.27 Raceway/Wireways/Trough/Conduits.

A. Install all wiring in conduit or raceways.

B. Provide all conduits of standard weight, threaded, rigid steel conduit according to the requirements of ANSI Standard C80.1. Provide all conduits hot-dipped galvanized, inside and out, to meet the requirements of the above standard for protective coating. Make conduit couplings and fittings of

malleable iron or steel, hot-dipped galvanized. See Miscellaneous Construction of MaineDOT Standard Specifications Section 626.

C. Provide Electrical Metallic Tubing (EMT) hot-dipped and manufactured in accordance with U.L. 797 and to meet Federal Specifications WWC-563 (latest revision) and A.N.S.I. C80.3. Install in accordance with NEC Article 358.

D. All conduits installed in outdoor locations are to be polyvinyl-chloride coated galvanized rigid metallic conduit (PVC-RMC). All coating shall be factory applied and purchased as PVC-RMC. Ensure conduit fittings, including couplings, unions, elbows, expansion and deflection fittings, and other items are also plastic coated. Provide conduits and fittings which are to be plastic coated with a factory applied PVC coating in the following manner. Coat the exterior of the galvanized rigid steel conduit or fitting with an epoxy acrylic, heat polymerizing adhesive. Bond a PVC plastic coating, 0.035 inch to 0.045 inch thick, to the outside metal surface the full length of the pipe, except for the threads. Ensure the plastic coating has an 85+ Shore A Durometer rating and conforms to NEMA RNI 1986 (Type A), ASTM D746, and Federal Specifications LP406b, Method 2051, Amendment 1. Apply a 2-part red urethane, chemically cured coat to the interior of all conduit and fittings. Ensure this internal coating is a nominal 0.078 inch thickness and is sufficiently flexible so as to permit bending without cracking or flaking. Ensure the PVC coated, hot-dip galvanized steel conduit is UL labeled and listed.

E. Coat all boxes and fittings, which serve as part of the raceway, with the same exterior PVC coating and red interior urethane coating. Ensure the plastic exterior coating and the red interior urethane coating are factory applied by the same manufacturer who produces the hot-dip galvanized conduit. Install PVC coated conduit according to the manufacturer's installation manual and using the tools recommended by the manufacturer. Repair all damaged PVC coating using the manufacturer's recommended products.

F. Provide all installed conduit ends with insulated throat grounding hubs.

G. All unions to connect sections of conduit that cannot be joined to each other or to boxes in the regular manner are to be made of malleable iron or steel, hot-dipped galvanized, PVC coated.

H. Provide conduit (except for EMT) with a minimum of 1 inch diameter unless otherwise noted. Provide the interior surfaces having a smooth finish and free of burrs or projections which might cause injury to the cables. Ensure all conduits are free from blisters, cracks, or injurious defects. Ream conduits at each end after being threaded. Connect sections to each other with screw couplings made up so that the ends of both conduits will butt squarely against

each other inside of the coupling. Install conduits so as to be continuous and watertight between boxes or equipment. Always protect conduits at all times from the entrance of water or other foreign matter by being well-plugged overnight or when the work is temporarily suspended.

I. Make conduit bends and offsets by cold bending using Department approved methods and equipment. The use of a pipe tee or vise for bending conduit will not be permitted. Discard all conduit that have been crushed or in any way deformed.

J. All bends are to be long sweep, free from kinks, and of such easy curvatures as to permit the drawing of conductors without injury. Make conduit runs with as few couplings as standard lengths will permit. Ensure the total angle of all bends between any 2 boxes or cabinets does not exceed 3 quarter bends, unless otherwise approved by the Department. The radius of curvature of pipe bends shall not be less than 8 times the inside diameter of the applied conduit. Long running threads will not be permitted. Install pull boxes wherever necessary to facilitate the installation of the wire.

K. Exposed conduits are permissible within the control house but shall not interfere with placement of any equipment shown in the control house layout of the Plans, and shall not violate NEC working space requirements. Where conduits pass through the floors or walls of the house, provide with galvanized pipe sleeves for free passage of the conduits. After the conduits are installed, caulk the openings with an elastic compound and escutcheon plates provided on the interior walls, ceilings, and floors.

L. Securely clamp and support the conduits at intervals not exceeding 6 feet in length, as required by NEC based on conduit diameter, or both.

M. Securely clamp conduit runs exposed on the steel structure to the steel work. Ensure the clamps, in general, consist of clamps with back spacers attached to strut channel or structural steel supports bolted to the member. The minimum thickness of the structural supports shall be 3/8 inch. The use of J-bolts to fasten structural supports or to clamp conduits will not be permitted. Only PVC coated fasteners and supports provided by the conduit manufacturer shall be used in direct contact PVC-RMC.

N. At any point where a conduit crosses an expansion joint longitudinally and/or laterally or where movement between adjacent sections of conduit can be expected, install conduit expansion/deflection fittings. Provide bronze expansion fittings with flexible bonding jumpers to maintain the electrical continuity across the joints. Ensure the fittings permit a total conduit movement of 4 inches and shall be AX/DX type by O.Z./Gedney, Spring City, or Crouse-Hinds, or approved equal.

O. Make the flexible conduits for the connections between the rigid conduit system, all motors, and limit switches with sections of PVC coated, flexible, metallic, liquid tight conduit using a minimum length of 18 inches.

P. Completely encase all conduit embedded in concrete, insofar as possible, with concrete at least 3 inches, measured in any direction, and hold securely in place during pouring and construction operations. Hold in place a group of conduits terminating together by template.

Q. Assemble the conduit hand-tight and then using appropriate tools provided by or recommended by the conduit manufacturer, tighten 2 more turns. Touch up wrench marks or chuck marks with the manufacturer's provided touch-up compound. Perform all cuttings and threading as recommended by the conduit manufacturer. Mechanically join together all conduit enclosures and fittings to form a continuous electrical conductor to provide effective electrical continuity. Coat all exposed threads with conduit manufacturer's supplied coating material.

R. Cap the ends of conduits under installation, spare conduits, empty conduits, and stubs during and after construction. Assure that no moisture or other matter is in or enters the conduits.

S. Pitch all exterior conduits a minimum of 1 inch in 10 feet. Where conduits cannot be drained to pull boxes, install a drain "T" with drain fitting at the low point. Provide stainless steel drain fittings capable of passing 1.52 cubic inches of water per minute.

T. Provide the ends of all conduits projecting into boxes and equipment enclosures with bronze insulated grounding bushings. Ensure the insulated portion is of molded phenolic compound, and each fitting has a screw type combination lug for bonding. Insulated bushings are to be O.Z./Gedney Type RBLG, Spring City Type GB, or approved equal. Bond together all bushings in all boxes or enclosures with No. 8 AWG bare copper wire.

U. Carefully clean all conduits both before and after installation. Upon completion of the conduit and box installation, clear each conduit by snaking with a steel band and attach to it an approved tube cleaner equipped with a mandrel of a diameter at least 85 percent of the nominal inside diameter of the conduit and with a wire brush of the same diameter as the conduit. Then draw in the cables.

V. Provide both ends of each conduit run, e.g. entry into enclosures, boxes, equipment fixtures, etc., with a brass tag having the same number stamped thereon according to the conduit diagrams. Securely fasten these tags to the conduit ends with No. 20 AWG brass wire.

W. The wiring trough shall be NEMA 12, constructed of No. 12 gauge sheet steel with No. 10 gauge flanges suitably reinforced with structural steel angles, and welded continuously at all seams. Provide a gasketed removable cover on the front side to provide access to the interior. Secure covers by stainless steel screw clamps spaced no more than 8 inches apart. Support wíreways and troughs every 5 feet. Provide details for hanging units as shown on the Plans.

X. Paint the inside and outside of the wiring trough with 1 coat of primer followed by 1 coat of white enamel on the inside surfaces and 2 coats of gray enamel on the outside. Ensure the finish coat is ANSI 61 Light Gray. Support wireways from adjacent ceilings using stainless steel hanger rods and angles or as shown on the Plans.

Y. Electrically connect all sections of each wireway and trough to form an electrical bond tied to the Bridge Grounding System.

2.28 Boxes.

A. Provide terminal boxes of sufficient size to provide ample room for the terminal blocks, interior wiring, the installation of conduit terminations, and multiconductor cable fittings. Provide interior mounting buttons with tapped holes for mounting the terminal blocks.

B. Stainless Steel Box. Ensure junction and terminal boxes and cabinets are NEMA 4X, 14-gauge, Type 316 stainless steel enclosures with hinged, 12-gauge stainless steel doors supported by a continuous stainless steel hinge with removable pin. Continuously weld seams and ground smooth. Provide each enclosure with stainless steel fast operating door clamp assemblies and oil-resistant gasket to ensure a watertight seal. Provide all boxes with breathers and drains. Ensure boxes and cabinets are Bulletin A51S and A4S with clamp assemblies A-L23SS as manufactured by Hoffman Engineering Company or a Department approved equal.

C. Provide surface mounted interior and exterior boxes with external mounting lugs. Do not drill box for more conduits or cables than actually enter it. Provide exterior boxes with 1/2 inch combination drain and breather fittings.

D. Provide terminal blocks in each terminal box for the connection of all conductors including spare conductors entering the box plus at least 10 percent spare terminals. Mount all terminal blocks and boards on suitable straps or structural steel brackets in such a manner as to permit routing the conductors behind the terminal blocks. Provide terminal blocks of 1 piece blocks suitable for use in highly corrosive atmospheres.

E. Include power terminal blocks for wires No. 8 AWG and larger in each terminal box as required for such conductors. Provide each terminal consisting of a 1-piece power distribution block of molded phenolic compound. Provide a safety cover of insulting material for each block.

F. Provide all exterior terminal and junction boxes with breathers, drains.

2.29 Submarine Cable Supports.

A. The existing submarine cables shall be provided with a supporting and cabinet entry system specifically designed for armored cable of this type. The support shall be specifically designed to support armored submarine cable. It shall be fabricated from hot dipped galvanized malleable iron with multi-plate armor wrap. It shall be OZ Gedney type FS.

B. The submarine cable cabinet entry fittings shall be hot dipped galvanized malleable or ductile iron designed to support and seal a single submarine cable. They shall be supplied with a locknut, a neoprene sealing ring specifically sized for the cable it is sealing, a lay-in-lug grounding lug, hot dipped galvanized locking collar with pressure disc. It shall be OZ Gedney type GPE.

2.30 Hardware and Supports.

A. Fabricate supports for conduits, cables, boxes, cabinets, disconnect switches, limit switches, and other separately mounted items of electrical equipment from structural steel a minimum of 3/8 inch thick. Include clip angles and other supporting members which are fabricated from structural steel plates and shapes and bolted to the structural members with the structural steel. Include all other supporting members under the electrical work.

B. Provide structural steel brackets, boxes, and other equipment mounted on concrete surfaces with a full neoprene gasket at least 1/16 inch thick between the equipment and the surface of the concrete.

C. Provide expansion anchors for fastening equipment or brackets to concrete surfaces of wedge type anchor bolts locked in place by an expansion wedge as the nut is tightened. Ensure all parts of the expansion anchors are of Type 316 stainless steel. Drill holes for the anchors to the size and depth recommended by the manufacturer using carbide tipped masonry drills.

D. Provide stainless steel mounting bolts, nuts, washers, and other detail parts used for fastening boxes, disconnect switches, small limit switches, conduit clamps, cable supports, brackets, and other electrical equipment according to the requirements of ASTM Designation A276, Type 316. Provide hexagonal bolt heads and nuts with medium series lock washers. Do not use bolts smaller

than 1/2 inch in diameter except as may be necessary to fit the mounting holes in small limit switches, boxes, and similar standard devices.

E. Preformed metal framing channels, such as Kindorf, Unistrut, Superstrut, etc., used for mounting or supporting electrical equipment, conduits, or boxes shall be 316 stainless steel.

2.31 Wiring and Cables.

A. Multiconductor cables shall be comprised of conductors listed below and containing a sunlight resistant and oil resistant jacket rated 90º C per UL Standard 1277 with minimum Flame-Spread Rating of 10-15 or higher, Class 1 in accordance with ASTM E84.

B. Ensure all wires and their insulation and covering are of a nationally recognized brand with brand marks for identifying it. Individual conductors shall be provided with XHHW-2 insulation.

C. Provide all wiring and cables according to the requirements of NEMA Publication No. WC 70. Before wire and cable orders are placed with any manufacturer, submit typical published test data for the type of insulation proposed showing that it meets the requirements of NEMA Publication No. WC7. Ensure all materials used to fabricate insulated wiring and cables are certified to be from stock not more than 1 year old.

D. Provide all conductors consisting of stranded copper large enough to carry safely the maximum currents required without injurious heating or serious voltage drop. Ensure conductors for all motors and power circuits are not smaller than No. 12 AWG. Ensure all conductors are soft-annealed copper wire according to the requirements of NEMA Publication No. WC7. Ensure all conductors have Class B concentric stranding except for those in flexible cables.

E. Provide a chemically cross-linked, polyethylene compound insulation according to the requirements of Part 3.7 of NEMA Publication No. WC7 with a thickness as required for 600 volts rated circuit voltage listed under Column B of Table 3-1.

F. Provide bare, stranded, tin coated copper equipment ground conductors according to the requirements of NEMA Publication No. WC7, Part 2.

G. Carry the circuits from the swing span to the pivot pier (Pier 2) with multiconductor bridge drag cables as shown on the Plans. The conductor sizes and number of wires shown on the Plans are the minimum permissible. Provide wiring and cables of sufficient size and number as may be required

for the installation according to the wiring diagrams or approved working drawings.

H. Do not install wiring in any conduit before all joints are made up tightly and the conduits rigidly secured in place.

I. Draw the cables into conduits without injury to the wires or their insulation or covering. Leave sufficient slack in all cables to permit proper connections in boxes, cabinets, and enclosures.

J. Permanently and clearly tag both ends of every single length of conductor according to the same numbers or designations appearing on the approved wiring diagrams.

K. Neatly form conductors inside terminal boxes, the control console, and control panels into cables and lace with approved cable ties with the individual conductors leaving the cable at their respective terminal points. Loop these conductors to allow a minimum of 3 inches of free conductor when disconnected. Hold the formed cables securely away from the terminals and from contact with the enclosure by means of approved insulating supports.

L. Permanently mark each terminal of all terminal blocks to show the same number or designation as appears on the wire connected thereto.

M. Splicing of wires will not be permitted except for wiring to service lighting fixtures and receptacles. Wherever it becomes necessary to join or branch conductors, use terminal blocks and clearly tag wires and terminal blocks.

N. Secure multiconductor cables supported as shown on the Plans. Multiconductor cables not shown on the plans shall be supported on the steel work by bent plate cable clamps spaced not more than 5 feet on centers. Fabricate the cable clamps from galvanized steel or stainless steel plates bent to suit the cables outside diameters. In general, fasten the clamps to structural brackets bolted to the steel work.

O. Where multiconductor cables enter cabinets or boxes, provide with watertight cable terminators. Ensure each cable terminator provides a watertight seal by compressing a tapered neoprene sealing ring around the outer jacket of the cable. Make cable terminator parts of bronze and be approved equal to the Series SF-327OB Watertight Cable Entrance Seals.

P. Traffic signal wiring shall be in accordance with MaineDOT Standard Specifications Section 643.

2.32 Painting.

A. Ensure the requirements for painting structural steel also applies to painting electrical equipment supports.

B. Shop Painting. Electrical equipment such as conduits, boxes, supports, and other devices which have a galvanized finish and equipment such as motors, control desk, and control panel frames and enclosures which normally are given a factory finish need not be shop painted. Ensure all other electrical equipment is given one shop coat.

C. Field Painting. Electrical equipment which is normally given a factory painted finish suitable to the Department need not be field painted. Ensure all other uncoated electrical equipment such as boxes, device enclosures, supporting clips and brackets, festoon cable connections, and other devices, is given 2 field coats of paint as specified under the requirements for painting structural steel. Before applying the 2 field coats, clean galvanized surfaces free of all grease, oil, dirt, and foreign material and etch with copper sulphate solution after which ensure the solution is applied. In lieu of etching and a coat of shop paint, use galvanizing primer as a first coat for galvanized surfaces. Ensure the final field coat on electrical equipment is ANSI 61 Light Grey color.

2.33 Signal Horns. Contractor shall provide 2 resonator type signal horns with suitable mounts on the right side and left side of the control house as shown in the plans. The horns shall be powered with 120VAC from a dedicated circuit breaker on the power panel. The horns shall produce at least 105 dBA at 10', shall be UL certified, corrosion resistant, weatherproof, water and dust tight. The horns shall have operating temperatures of -37 deg C to 66 deg C. The signal horns shall be Federal Signal Model 55 or Department approved equal. The horn shall be controlled from a pushbutton on the Control Console as shown in the Plans.

2.34 Marine Radio – Communication with marine traffic will be by marine radio. The radio will be provided by the Department and is not in the Contractor's scope of supply.

2.35 Panel Factory Wiring.

A. Control Power wire.

1. Rating: 600V, 90ºC, cross-linked polyethylene, Type SIS.

2. Conductors: Stranded copper, 14 AWG.

B. Analog signal cable.

1. Configuration: Twisted pair, shielded, and jacketed.

2. Insulation: 300V, 60ºC, PVC, color-coded to permit identification of each conductor.

3. Conductors: Stranded copper, 18 AWG.

4. Shield: Metalized foil or tinned copper braid providing 100% coverage against noise together with 20 AWG stranded tinned drain wire.

C. Discrete signal wire.

1. Rating: 600V, 90ºC, cross-linked polyethylene, Type SIS.

2. Conductors: Stranded copper, 18 AWG.

D. Encoder Cable.

1. To be provided by the encoder manufacturer.

2. Encoder cable shall be terminated at the encoder and at the FVD encoder terminals with no intermediate terminations.

3. Encoder shields shall be terminated at the FVD only.

E. Wires and cables shall be grouped and routed from terminal blocks to panel mounted instruments in separate raceway as follows:

1. Low-voltage/low current dc analog signals (30V/50mA or lower).

2. High-voltage dc alarm signals (48V or greater).

3. Low-voltage ac control signals (120V or lower).

4. High-voltage ac power signals (greater than 120V).

F. Terminal block requirements:

1. Type: High-density.

2. Voltage: 600V.

3. Wire range: 30 AWG to 12 AWG.

4. Mounting: Rail-mounted with end anchors and barriers. All terminal strips shall be tagged with Multi-cable Tag Number, and each terminal shall be individually identified with a progressive number.

5. Spare: Provide greater amount of 20% or 6 terminals per terminal strip.

6. Install power distribution blocks to parallel feed to power control devices. Parallel wiring from instrument to instrument is not acceptable.

G. Provide plug-in strip for ac supply power to devices requiring ac power via power cord.

H. Circuit protection.

1. Install individual circuit breakers for protection of control panel power supply circuits as shown in the Plans.

2. Group circuit breakers on separate terminal strip away from low voltage instrumentation circuitry.

3. Provide fuses for protection of individual instrumentation circuits. Instrumentation circuits for field-mounted instruments may be combined in logical groupings of no more than 10 devices/signals.

4. Provide 8 AWG internal copper grounding bus for ground connections.

5. Wire tags.

a. Type: Embossed, heat-shrink tubing. Fiber tape or any adhesive type tagging will not be accepted.

b. Color: White with black lettering.

c. Identify both ends of wires and/or cables with permanent wire marker.

2.36 Service Lighting.

A. General. Assemble the service lighting fixtures listed in the material section of this specification for the bridge where required. Wire and install lighting fixtures, supports, brackets, and accessories as shown on the Plans.

1. Methods of Wiring: Perform wiring as specified previously in this specification.

2. Ground light fixtures according to the requirements of NEC Article 410.E.

B. Recessed Fixtures. Support recessed fixtures from structural elements.

1. Use mounting yokes provided with the fixtures. Use supports where required.

2. Locate fixtures in center of panel where installed in modular tile ceilings, unless indicated otherwise. Refer to Reflected Ceiling Plan.

3. Install suitable sealing gaskets where light leaks occur through gaps between the recessed fixture trim and adjacent surface.

C. Exposed Fixtures. Install surface mounted and exposed fixtures as shown on the Plans.

1. Hang suspended fixtures plumb, with continuous rows of fixtures in alignment.

2. Mount suspended fixtures in each room or area at the same height regardless of varying clear height conditions or as shown on the Plans.

3. Install surface mounted fixtures drawn up tight against the substrate to eliminate gaps, except where NEC or local code restrictions require a separation between fixtures and substrate.

D. Exterior Fixtures. Install exterior surface mounted and exposed fixtures as shown on the Plans. Ensure fixtures are factory equipped with waterproof gaskets and anodized aluminum frames or as shown on the Plans. Design to be completely waterproof, UL listed for wet locations.

1. Brackets: Match color to the light fixture. Provide outlet boxes, neoprene gaskets, and stainless steel hardware to render installation waterproof.

E. Exit Sign/Emergency Lighting. Provide a UL 924 listed illuminated exit sign with emergency lights in the vicinity of the control house doorway. Exit sign shall be powered by 120VAC and have a battery backup providing exit sign and emergency light illumination for a minimum of 90 minutes. Exit sign shall have an AC indicator and test switch. Exit Sign/Emergency Light shall be powered from the power panel control house lighting circuit.

2.37 Surge Protective Device. The incoming power shall be protected with a surge protective device. It shall be a Type 2. It shall be mounted to or immediately next

to the power panel. It shall be rated 120 to 600 VAC, 3 phase, 50 kA, in a NEMA 4X enclosure. It shall be Eaton Bussmann Catalog # BSPA050208Y85P or equal.

2.38 Nameplates. Provide nameplates for all devices and make of laminated phenolic plastic with white front and back and black core and not less than 0.094 inches thick. Etch lettering through the front layer to show black engraved letters on a white background. Provide lettering at least 1/4 inch high. Securely fasten nameplates to the equipment with stainless steel screws.

2.39 Equipment Signs. Provide all electrical devices, disconnect switches or cabinet equipment with a sign affixed to each unit. Provide the sign similar in construction to the aforementioned nameplates. Provide each sign of suitable size and letter characteristics. Ensure text indicates name and function of each item and also indicates if multiple power sources are present in the panel with instructions on where to turn them off. Securely attach signs using stainless steel screws. Submit to the Department all signs with size, location, and text.

2.40 Control Apparatus and Miscellaneous Equipment.

A. Provide control apparatus according to the applicable requirements of NEMA, latest revision, Industrial Control and Systems, rated as shown on the Plans or as required, testing in accordance with NETA certification requirements for the control and miscellaneous apparatus.

B. General Purpose Control and Power Switching Relays. General purpose control relays and relays for switching power circuits shall be UL listed NEMA type control relays. Relay contacts shall be field reversible cartridge type, number as required, plus at least one spare contact. Contacts shall be rated at least 10A at 300VAC. Relays shall include an LED indicator light, neon indicator light, or mechanical flag indicator for indicating when the relay is energized. General purpose control relays and power switching relays shall be Eaton-Cutler Hammer D26 Type M or Department approved equal.

C. Time Delay Relays. Time delay relays shall be UL listed electronic time delay relays. Adjustment knobs shall be 1.5" diameter or larger, accurately time-calibrated, with high resolution markings. Time delays shall be as indicated on the Plans. Each timing relay shall be selected with a timing range such that the anticipated setting will be within 40%-60% of the full range. Relay identification information, screw terminals, and terminal markings shall be located on the front of the relay. Relays shall be of modular construction, with field replaceable coils and contacts. Coils shall be 120VAC, or as otherwise required. Contacts shall be rated at least 5A at 120VAC or higher as required by the application. Relays requiring sockets shall be provided with retainer clips. Time delay relays shall be Eaton-Cutler Hammer D26 Type M or Department approved equal.

D. Selector Switches and Pushbuttons. Selector switches and pushbuttons shall be UL listed, size 30.5 millimeter, with operation as indicated on the Plans. Switches shall be of die cast metallic construction with corrosion resistant plating, rated NEMA 4X. Contact blocks shall be screw down stackable type. Contacts shall be rated 10A at 120VAC. Terminals shall be corrosion resistant screw type. Legend plates shall be as indicated on the Plans. The Emergency Stop pushbutton shall be a mushroom head push-pull maintained button. All other pushbuttons shall be momentary. Selector switches and pushbuttons shall be Square D 9001K series or Department approved equal.

E. Pilot Lights. Pilot lights shall be UL listed and as indicated on the Plans. Pilot lights shall be 30.5 millimeter, NEMA 4X rated. Pilot lights shall be dual input remote test with LED lamps. Lenses shall be interchangeable rugged Lexan type. Legend plates shall be as indicated on the plans. Pilot lights shall be Square D 9001K series or Department approved equal.

2.41 Spare Parts. Provide the following spare parts:

A. Span motor vector drive.

B. 2 packages of 6 fuses of each kind and size installed.

C. For rotary limit switches, provide a total of 8 contact assemblies. For limit switches without replaceable contacts, provide a complete switch.

D. One set of contacts and contact fingers for each type of contactor and starter installed. Provide an additional set for every 5 of each type. Note: For units that do not incorporate replaceable contacts provide a complete unit with coil.

E. 1 coil for every 5 or less of each size relay/contactor and motor starter installed.

F. 1 complete relay, timer, contactor, and starter for each unit or fractional unit of 5 or less of each kind and size installed.

G. 3 heaters for overload relays of each size installed.

H. 1 complete navigation light of each type supplied.

I. For the control console:

1. 12 indicating lamps for each type and voltage.

2. 1 package of 6 meter lamps of each kind installed.

3. 2 lens caps of each color.

4. 1 lens for each console unit.

5. One complete unit for each type of indicating light and pushbutton used.

J. 1 of each size and type of service lighting fixture installed.

K. 1 position transmitter of each type used.

L. 1 of each size and type of service lighting fixture installed, 1 of each type lens.

M. 1 LED dimmer switch for the operator's house light.

N. 1 span drive motor encoder.

PART 3 – EXECUTION

3.01 Submittals.

A. Shop and Working Drawings. Submit for review within 120 days after the award of the Contract. The electrical work may not proceed without approved shop and working drawings. Any work performed before all required submissions being returned approved will be considered unauthorized and will be at the Contractor's risk of being rejected. Shop and working drawings shall consist of, but are not limited to, the following:

1. Certified dimension prints of all motors, limit switches, and other electrical apparatus external to the control console, control panel, panelboards, etc.

2. A complete schematic wiring diagram including all power, control, lighting and convenience connections. Identify both electrical devices and each wire between devices by an individual unique designation of letters, numbers, or a combination of both. Use such designations wherever the devices or wires appear on other drawings. Include a complete set of fully edited catalog cuts for materials provided for review at the time of schematic submittal. Editing shall remove or strike through all material that is not relevant.

3. At the time of schematic submittal, submit a complete set of fully edited catalog cuts for review of materials provided.

4. Circuit breaker coordination charts, fault calculations, and frame and trip size calculations.

5. Layout drawings and internal connection diagrams of the control console, control panels, lighting, heating, communication, and alarm equipment.

6. A schedule of electrical apparatus which lists each electrical device by its designation as shown on the schematic wiring diagram and states for each device its rating, number of poles or contacts, function, catalog number, and location.

7. A complete interconnection diagram(s) for all electrical apparatus and equipment, lighting, heating, communication, and alarm equipment. Provide diagram(s) that show the external connections of all devices and equipment. Computer-generated interconnection lists will not be acceptable in lieu of a true interconnection diagram.

8. Layouts and calculations of the braking resistors for the span drive motors, together with load calculations and construction details.

9. Outline drawings of all electrical components and cabinets.

10. A complete schematic conduit and cable diagram of all devices and equipment, including conduit wireway, drag cables, submarine cables and junction boxes, and showing all multiconductor cables for all lighting, heating. Show the size of each wireway and conduit, and identifications, the wire number of each conductor in the conduit including multiconductor cables on the diagrams.

11. A complete set of layout and installation drawings for the electrical work showing the location and installation, including support and mounting details, of all electrical and control apparatus and equipment, lighting, heating, communication, and alarm equipment, etc. including conduit physical layouts. Ensure these drawings are made to scale and show the exact location of all conduits, cables, wiring ducts, boxes, motors, brakes, limit switches, disconnect switches, and other electrical equipment as well as the method of supporting them on the structure.

12. Construction drawings of all multiconductor cables, including the sizes of conductors, type, and thickness of insulation, jackets, and other components, and giving the outer diameter of each finished cable.

13. Complete detail and procedures for the re-termination of the submarine cables.

14. Outline drawings and mounting details of all navigation aids including, but not limited span lights, fender lights and air horns.

15. Catalog cuts of lighting fixtures, switches, outlets, and electric heating equipment.

16. Arrangement of service and maintenance light wiring and fixtures, including service outlets, showing all conduits, boxes (including their support), and wiring.

17. Arrangement of conduits, wiring, and equipment for the electric heating and air conditioning units for the control house.

18. Detail drawings showing the construction and mounting details of all wiring troughs and raceways.

19. A complete list of all spare parts provided as part of the contract. The list shall be fully documented with manufacturer, model or item number, what installed items are replaced or renewed by each item and any additional information which may be needed to fully identify the component.

20. Details and catalog cuts of the fire alarm system including detectors, annunciators, and alarms.

21. All other drawings which, in the opinion of the Department, are necessary to show the electrical work.

22. All layout and installation drawings for the electrical work before the submission of pertinent working drawings for the structure so that provision for mounting of conduits, cables, and other electrical equipment, where required, can be shown on the structural working drawings.

23. Certified dimension prints of the apparatus state in the certification the name of the job, the application of the apparatus, device designation, number required, right-hand or left-hand assembly, electrical rating, number of poles or contacts, material, finish, and all other pertinent data to show that the apparatus meets the specified requirements.

24. Upon completion of the work, correct all working drawings, including all working drawings submitted by the electrical system Vendor, to show the work as constructed. In addition, submit all as-built working drawings submitted by the electrical system Vendor, including all electrical schematics, ladder diagrams, system documentation,

dimension drawings of equipment, and devices, in a computerized file form as well as PDF and Microstation files.

25. For inspection and test, if directed by the Department, samples of all apparatus or devices which are proposed to be used as part of the electrical installation.

26. Interconnection diagrams between equipment assemblies, and external interfaces, including power and control conductors. Include for enclosures and external devices.

27. Installation drawings with FVD and motors indicated. Indicate ventilation requirements, adequate clearances, and cable routes.

28. Schedule of equipment supplied. Schedule shall provide a cross reference between manufacturer data and identifiers indicated in shop drawings. For complete assemblies, such as FVD, provide the serial numbers of each assembly, and a sub-schedule of components within the assembly. Show circuits and device elements for each replaceable module.

29. Recommended spare parts listing for each assembly or component.

30. Installation instructions issued by the manufacturer of the equipment, including notes and recommendations, prior to shipment to the site. Provide operation instructions prior to acceptance testing.

31. Factory Test Plan and Test Reports. Submit within 7 working days of delivery to the project site.

32. Operation and Maintenance information and Data.

33. Complete technical product description including bill of materials, software, and a complete list of options provided with the drives.

34. Outline dimensions, conduit entry locations and weight.

35. Schematic and wiring diagrams.

36. Parameter programming.

37. Data indicating compatibility with motors being driven.

38. Manufacturer’s Installation instructions.

39. Provide service and maintenance information including preventive maintenance, assembly, and disassembly procedures. Include electrical drawings from electrical general sections. Submit additional information necessary to provide complete operation, repair, and maintenance information, detailed to the smallest replaceable unit.

40. Copies of as-built submittals.

41. Routine preventative maintenance instructions, and equipment required.

42. Instructions on how to adjustment, trouble-shooting, configuration, modify program settings, and modify the control program.

43 FVD Specific Shop Drawings. The FVD shall be manufactured by a company with at least ten (10) years of experience in the production of this type of equipment. The manufacturing facility shall be ISO 9001 and ISO 14001 certified. All printed circuit boards shall be completely tested before being assembled into the complete FVD. The FVD shall be subjected to a functional test and load test. The load test shall be at full rated load.

    A. Submit complete wiring diagrams, dimensional drawings transformer data and connection diagrams.

    B. Customer connection and power wiring diagrams.

    C. Compliance to IEEE 519 B harmonic analysis for particular jobsite including total harmonic voltage distortion and total harmonic current distortion (TDD). The FVD manufacturer shall provide calculations; specific to this installation, showing total harmonic voltage distortion is less than 5%. Input line filters shall be sized and provided as required by the FVD manufacturer to ensure compliance with IEEE standard 519.

3.02 Examination.

A. Verification of Conditions. Verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for installation in accordance with manufacturer's written instructions.

B. Visually inspect substrate in presence of a Department representative.

C. Inform Department of unacceptable conditions immediately upon discovery.

D. Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Department representative.

3.03 Installation.

A. Delivery and Storage. Equipment delivered and placed in storage shall be stored with protection from the weather, humidity and temperature variations, dirt and dust, or other contaminants.

B. The electrical work shall be installed as indicated on the Plans and in accordance with approved shop drawings and manufacturer's recommendations.

C. All associated construction and installation work shall be installed using good installation judgement and in accordance with all prevailing national and local codes and ordinances.

3.04 Tests, Inspections, and Verifications (Bridge Control System).

A. Factory Inspection and Testing (General).

1. Ensure the control cabinets, control console, and other apparatus fabricated or assembled by the control system Vendor are subject to shop inspection to demonstrate compliance with all specified requirements. The inspection is intended as a means of facilitating the work and avoiding errors. It is expressly understood that the inspection will not relieve the Contractor of responsibility for imperfect material or workmanship. The assembled system may be subject to multiple witnessed tests as required by the Department.

2. Assemble all of the control cabinets, control console, motor drives, actual bridge motors with all required interfacing equipment, limit and cam switches and resolvers, simulated traffic control equipment, and temporarily interconnect for operational testing at the shop of the control system Vendor. Ensure the testing demonstrates proper operation of all bridge controls, drives, and auxiliary equipment according to specified requirements for system functioning. If necessary, provide portable generator to power the span drive motors.

3. Provide the testing plan including testing forms, acceptance criteria and equipment included in the testing to the Department for review and acceptance. The Department and/or Department's representative will witness all tests and special tests required.

4. Do not ship any equipment from the factory until it has been released for shipment by the Department. Provide notification a minimum of 21 day notice in advance of the date of the tests so that arrangements can be made for the Department to be present at the tests.

5. During the witnessed inspection also check for conformity all nameplate legends, conductor identifications, instrument scales, escutcheon plate engraving, and all other details of construction.

B. Manufacturer's Field Start-Up Service.

1. Provide all necessary field supervisory start-up time by the manufacturer's service engineering department to facilitate proper adjustment of all lighting, heating, communication, alarm equipment, and the bridge controls equipment so as to achieve satisfactory functioning of the drives.

2. Ensure the manufacturer’s field service engineering personnel are experienced in the adjustment and functioning of all control equipment. Ensure the personnel are capable of locating and correcting faults or defects and of obtaining from the manufacturer, without delay, new parts or replacements for apparatus that, in the opinion of the Department, does not perform satisfactorily.

C. The Vendor shall be responsible for all the necessary tests of the electrical and control system, both Factory Acceptance Test (FAT) and the Site Acceptance Test (SAT). Testing shall include both hardware and software items included in its scope of supply.

D. Testing shall include all system hardware and any other external device. Testing shall also include complete integrated testing of the interfaces including field devices, relay panel(s), machinery control equipment, and operator control console.

E. Testing shall include functional tests of all logic blocks, including all associated interfaces with the operator console. All testing is to be carried out to show that the system operates correctly and in compliance with the provided logic drawings, ladder logics, block diagrams.

F. In the event testing is interrupted for repairs or modification of the Bridge Control System, the Contractor / Department may require testing be restarted completely.

G. Vendor shall provide all necessary test equipment and software including any special software or hardware required for a complete functional test of the system.

H. Vendor shall clear and Contractor shall re-test and approve all punch list items before the Bridge Control System may be released for shipping. In presence of any pending punch list, the advanced shipping may be authorized by the Contractor only with the approval of the Department.

I. The Vendor shall provide the necessary assistance to co-ordinate the field tests, to supervise the commissioning and start-up activities, to perform the training activities applicable for the package.

J. Department and Contractor may attend all of the tests. Any limitation on time required for the tests is not accepted: any test is considered ended if and only if completed in every part as determined by the Department.

3.05 Factory Acceptance Tests (FAT).

A. The electrical testing shall consist of factory testing of the major items of variable frequency drives, span drive motors, control panels, and simulated field devices as an integrated system. These tests shall be conducted by the equipment manufacturer and witnessed by the Department as specified herein. The manufacturer shall submit test certificates and supporting data corroborating that the testing was performed and successfully completed in accordance with this specification. The testing shall be conducted at the manufacturer's plant or as elsewhere approved by the Department. The manufacturer shall submit his test procedures to the Department for approval prior to conducting the tests that would constitute acceptance of the manufactured equipment.

B. The following separate items of equipment shall be factory tested in the presence of the Department:

1. Span motor and variable frequency drive controller tested under load at either the motor manufacturer or the drive manufacturer's facility or some of the third-party independent testing companies' facility to be approved by the Department. The load testing shall conform to that described herein and include dynamometer testing.

C. The factory testing of each system shall consist of completely wiring and cabling the systems as defined on the approved shop drawings in preparation for the tests.

D. Performing complete functional tests shall be in accordance with Contractor provided, Department approved test procedure with test forms.

E. The control system functional tests shall verify the bridge operating sequences for all modes of operation and prove the relay logic is in accordance with the specified sequence and the correct functionality of all control system permissive interlocks.

F. The motor/drive combination shall be factory tested to verify and document that the combination meets all operating loads and duty cycle specified.

1. The tests shall also include the determination of the variation in speed and motor currents with motor torques from zero to the maximum designed torque for the drive system. The speed-current-torque curve shall also be determined for overhauling torque and include the effects of the motor control equipment on imposed overhauling loads. None of these curves developed by the manufacturer's computer program simulation will be accepted in lieu of actual load tests. Note all tests shall be performed using the integrated motor and variable frequency drive controller combination and drive system shall be tested and coupled to dynamometers to simulate the load of the bridge and also to simulate out of balance conditions to prove the integrity of the proposed load sharing control. These tests shall, in every respect, prove the ability of the combination to achieve the herein drive motor performance.

2. These tests shall be witnessed by the Department and the Department shall be given at least three (3) weeks advanced notice of the scheduled tests.

G. The FAT will include all the equipment and developed software within Vendor scope of supply, as well as the integration with other subsystem supplied by different Vendors.

H. Schedule and testing procedures shall be submitted to the Contractor/Department as early in the design as possible, but not less than 30 days prior to test. After schedule approval, at least 4 weeks prior to the start of testing, the Vendor shall provide the following documentation:

1. Detailed FAT procedure with test forms.

2. Full documentation concerning hardware.

3. Full documentation concerning drive parameter configuration complete with relevant comments.

4. Records of all tests previously performed by the Vendor.

6. Records of power-up of all Relay Control System components.

I. This documentation, even if not issued as final review, shall be completed and detailed.

J. Department may ask to postpone the starting date of FAT if any material omissions or relevant errors in the documentation are not corrected.

K. Prior to the FAT all the necessary equipment shall be fully assembled, wired and connected in order to test all the functionality of the supply.

L. The Vendor shall organize the testing activities and make available all the assistance and equipment necessary so that the testing activity proceeds as quickly as possible. Location, staff and equipment to perform the test are completely at Vendor's expense.

M. During the test, all the mentioned documents shall be available.

N. The control system shall be installed in its final configuration and mainly the following items shall be tested:

1. Hardware components and power supply.

2. Visual check in order to verify the equipment quantities and conformity to drawings and contractual characteristics, identification tags, safety coverings, cable run, interconnection between panels, etc.

3. Project documentation check.

4. Insulation resistance and dielectric test of components.

5. Redundancy systems test.

7. Test of loss of power and subsequent power up.

8. Relay Control System diagnostic.

9. Application software.

O. As a general statement, 100% of hardware (spares included) and application software shall be tested. In order to facilitate the tests, the Vendor shall provide all the needed equipment to simulate digital/analogue inputs, to check the status of digital/analogue outputs and to simulate serial link communication.

P. All the anomalies, defects or changes will be reported and corrected by the Vendor before the end of testing or, at least with the Department approval,

before shipment. Contractor shall re-test and approve all punch list items before the Bridge Control System may be released for shipping. If during the test activity problems occur so that it will be difficult to continue, in the opinion of the Department's personnel, the testing will be interrupted until the Vendor remedies to these problems. In the event testing is interrupted for repairs or modification of the Bridge Control System, the Department or Contractor may require testing to be restarted from the beginning.

Q. A check list shall be issued during the FAT at Vendor's workshop. Detailed check list shall be prepared by the Vendor and included in the FAT procedure. Other tests can be required according to the project needs and will be defined by the Department.

R. Positive result in the test does not release the Vendor from his responsibilities to provide a system completely working and to perform all the modification, which could be necessary to assure system correct working in the field.

S. After successful completion of the FAT, the FAT completion report shall be signed by the Vendor and Contractor/Department.

T. A final report shall be issued at the end of FAT, highlighting possible reservation as far the Contractor/Department are concerned; shipment authorization will be generally issued by the Contractor only after the complete solution for the pending reservation.

U. FVD Test (FAT and SAT).

1. A proposed test plan shall be submitted to the Department at least 28 calendar days prior to proposed testing for approval. The Department and/or Department's representative reserves the right to witness all tests and review any documentation. The contractor shall inform the Department and/or Department's representative at least 14 working days prior to the dates of testing.

2. Performance Verification Tests (FAT and SAT)

    a. Performance Verification Test plan shall be provided by the Control System Vendor at least 60 days prior to the planned testing. It shall provide the step-by-step procedure required to establish formal verification of the performance of the FVD. Compliance with the specification requirements shall be verified by inspections, review of critical data, demonstrations, and tests. The Test Plan may be modified by the Department with the revised testing performed at no additional cost to the Department.

b. The Department and/or Department's representative(s) reserves the right to witness all tests, review data, and request other such additional inspections and repeat tests as necessary to ensure that the system and provided services conform to the stated requirements. The contractor shall inform the Department and/or Department's representative(s) at least 14 calendar days prior to the date the test is to be conducted.

V. Span Motor Tests (FAT and SAT).

1. Both span motors are to be subject to a complete test and include determination of efficiency and power factor at 50, 75, 100, 150, and 175 percent of full load in addition to breakdown load. In addition, determine complete speed-torque-current curves by test over the same torque range and in both motoring and braking modes.

2. In addition to the complete testing, test the motors to determine the power input in kw versus the output torque in pound foot for intervals from no-load to full-load torque (0, 25, 50, 75, and 100 percent).

3. Prepare a complete set of speed-torque-current curves for each span motor and submit to the Department. Ensure the curves cover the interval from 200 percent braking torque to breakdown driving torque, referred to full-load motor torque.

4. Include an insulation resistance test for both span motors. Include insulation resistance values, test voltage, temperature and humidity on the test report. Test between each lead and ground.

5. Report tests on the standard forms for induction motors of the National Electric Manufacturers Association and IEEE. In addition to any other format as necessary to provide complete information. Certify all test reports and curve sheets and submit 7 copies of each. Do not ship motors from the plant of the manufacturer until the test reports have been approved by the Department.

6. Both motors to be given a full load heat run with the complete IEEE test with speed/torque/current curves submitted with all test results for approval. Submit motor outline drawing, specification, and test results before shipping. Ensure testing is witnessed by the Department or a representative of the Department.

3.06 Site Acceptance Test (SAT) and Commissioning Assistance. Prior to the full Bridge Control System Site Acceptance test, all control house mounted bridge control equipment shall be completely inter-wired, powered and pre-tested to the maximum

extent possible before the house is hoisted prior to being set in place. The testing procedure shall be sent to the Department for review at least 30 days prior to starting the work.

A. The Site Acceptance Test is intended to verify that the system, as accepted at FAT completion, will still perform on site as per specification after the shipment. This test will be performed after erection and wiring.

B. It shall fully cover all the functionalities of the Bridge Control System, Traffic Control System and all the auxiliary systems.

C. The other checks shall be repeated as "Sample", with an extent suitable to demonstrate that the system has been properly restarted and the configuration correctly reloaded as required and accepted by the Department.

D. Vendor's technicians shall be on site during field test to perform the test and solve any problem that could arise.

E. Before performing the test, Vendor is asked to issue and submit for Contractor/Department approval, a Site Acceptance Test Procedure complete with check-lists identifying each test to be performed. It shall be submitted at least 30 days prior.

F. The Vendor's minimum responsibilities for tests, startup, and commissioning activities are as follows:

    1. Check of installed equipment (quantity, quality).

    2. Check of insulation of cables and equipment.

    3 Check of cables for continuity and conformity to drawings.

    4. Switch on operating voltage to equipment after checking protection settings.

    5. Calibration of all adjustable monitoring equipment.

    6. Calibration and proper operation checkout of all field equipment: controls, local commands indicators and actuators.

    7. No load tests (with the machines energized).

    8. Check of direction of rotation of the machines.

    9. Check of machine power consumption and protection settings.

10. Calibration and check the proper operation of the electrical controls, which are possible only when the equipment is running.

11. Complete operation of every system, sequence, interlock, bypass and manual operation of individual systems and the complete system.

G. Vendor shall have at their disposal all the necessary equipment for testing and put the system into service.

H. The commissioning and system tests include the download of the final hardware/parameter configuration.

I. Any drive parameter change required by Contractor on site and implemented by Vendor personnel shall be considered part of the Site Acceptance Test scope of work.

J. Delivery and Storage. Equipment delivered and placed in storage shall be stored with protection from the weather, humidity and temperature variations, dirt and dust, or other contaminants.

3.07 Maintenance and Warranty.

A. Maintenance.

1. Support during the warranty period - The Contractor shall provide on-site, on-call maintenance services by Contractor personnel on the following basis:

a. The service shall be on a per-call basis with 8-hour response. Contractor shall support the maintenance of all hardware and software of the system. Various personnel of different expertise shall be sent on-site depending on the nature of the maintenance service required.

b. Costs shall include travel, local transportation, living expenses, and labor rates of the service personnel while responding to the service request.

c. The provisions of this Section are not in lieu of, nor relieve the Contractor of, warranty responsibilities covered in this specification. Should the result of the service request be the uncovering of a system defect covered under the warranty provisions, all costs for the call, including the labor necessary to identify the defect, shall be borne by the Contractor.

B. Warranty. The complete system shall be warranted by the manufacturer for a period of two years from bridge final acceptance, or the contracted period of any extended warrantee agreed upon by the contractor and the Department, after successful completion and the Department's acceptance of the acceptance test results. Any component failing to perform its function as specified and documented shall be repaired or replaced by the contractor at no additional cost to the Department.

C. Performance warranty.

1. If a failure of performance achievement occurs, the Vendor shall provide all the necessary action to satisfy with this specification requirements including addition or replacement of system components, system reconfiguration, etc.

2. Provide extended warranty for controller equipment, software and firmware supplied. Warranty shall provide replacement parts and software and firmware maintenance for installed system to Department for period extending through start-up and acceptance period of the project and for period of 2 additional years.

3.08 Training. Vendor shall provide training course to instruct the operator and maintenance personnel on the main operation and maintenance. The Vendor shall submit the courses contents to the Contractor and the Department for approval prior to the training courses being held. The training shall include all aspects of the equipment and control of the bridge systems including technical knowledge of all systems and troubleshooting of all systems.

A. Maintenance Personnel Training.

1. Coordinate training requirements with the Department for up to 8 maintenance personnel.

2. Provide the services of competent instructors who will give full instruction to designated personnel in operation, maintenance, calibration, configuration, and programming of the complete control system. Orient the training specifically to the system installed.

3. Instructors shall be thoroughly familiar with the subject matter they are to teach.

4. The number of training days of instruction furnished shall be 4 but not necessarily contingent. A training day is defined as eight hours of instruction, including two 15-minute breaks and excluding lunch time; Monday through Friday.

5. Provide a training manual for each student at each training phase which describes in detail the material included in each training program. Provide one additional copy for archiving.

6. Provide equipment and materials required for training. Unused copies of training manuals shall be turned over to the Department at the end of last training session.

7. Contractor shall provide video recordings, if available, of all training provided to the Department for subsequent use in training new personnel. All training aids, texts, and expendable support material for a self-sufficient presentation shall be provided.

B. Operating Personnel Training Program.

1. Provide one 4-hour training session at the site at a time and place mutually agreeable between the Contractor and the Department.

2. Provide session to train 4 operation personnel in the functional operations of the system and the procedures that personnel will follow in system operation. This training shall include:

a. System overview.

b. General theory of operation.

c. System operation.

d. Faults.

e. Failure recovery procedures.

f. Troubleshooting.

3.09 Cleaning.

A. Progress Cleaning. Leave work area clean at end of each day.

B. Final Cleaning. Upon completion remove surplus materials, rubbish, tools and equipment.

C. Waste Management: Separate waste materials for reuse and recycling. Remove recycling containers and bins from site and dispose of materials at appropriate facility.

Part 4 - MEASUREMENT AND PAYMENT

4.01 Method of Measurement and Payment.

A. The Contract Lump Sum (LS) Amount shall include all costs associated with the control system demolition, procurement, installation, testing, commissioning, training, warranties, and documenting as required per the control system design requirements and as specified herein.

B. Payment will be under the Contract Lump Sum Amount and such payment shall be full compensation of all labor, equipment and materials necessary to complete the work.

4.02 Items of Payment. Items of payment are broken as follows:

Bid Item	Description of Item	Unit
655.3002	BRIDGE CONTROL SYSTEM	LS

END OF SECTION

SPECIAL PROVISION
SECTION 652
MAINTENANCE OF TRAFFIC
Portable/Temporary Traffic Signals
Automated Flagging Assistance Devices (AFADs)

652.01 Description Portable/Temporary Traffic Signals or Remotely Controlled Automated Flagging Assistant Devices (AFADs) may be used in conformance with this Special Provision at the option of the Contractor in lieu of Flaggers and as approved by the Department.

Portable/Temporary Traffic Signals shall conform to Part 4H.02 of the latest edition of the Manual on Uniform Traffic Control Devices (MUTCD) and shall be the Dolly Type (SQ2) or the Trailor Mounted Type (SQ3). AFADs shall conform to Part 6E.04 of the latest edition of the Manual on Uniform Traffic Control Devices (MUTCD).

Portable/Temporary Traffic Signals and AFADs must satisfy applicable crashworthiness standards based on device weight which shall be in accordance with National Cooperative Highway Research Program (NCHRP) Report 350 and the American Associated for State Highway and Transportation Officials (AASHTO) Manual for Assessing Safety Hardware. The use of Portable/Temporary Traffic Signals may be suspended at any time at the discretion of the Resident.

652.02 Portable/Temporary Traffic Signals Operation

The Contractor shall submit a Traffic Control Plan to the Resident for approval which shall detail Portable/Temporary Traffic Signals operation.

Portable/Temporary Traffic Signals may be used during daytime or nighttime operations; however, Dolly Types (SQ2) shall not be in operation when the work site is unattended.

Work zones utilizing Portable/Temporary Traffic Signals shall add A Signal Ahead symbol (W3-3) sign that will replace the Flagger symbol sign. An 18-inch-wide removable stop line with a STOP HERE ON RED (R10-6) sign shall be installed at the intended stopping point.

The Resident may waive the requirement for a stop line if the roadway is unpaved or it is otherwise impractical to install a stop line and the STOP HERE ON RED sign is in place.

The distance between Portable/Temporary Traffic Signals units shall not exceed the phase timing and distances as designed by a Professional Engineer, registered in the state of Maine, or as designated on the Charts provided in this specification.

When the work no longer necessitates use of the Portable/Temporary Traffic Signals, the units shall be removed or turned off and moved out of view from the traveled way.

652.03 Automated Flagging Assistance Devices (AFADs)

AFADs shall be used only for short-term or intermediate-term lane closures in situations where there is one lane of approaching traffic that needs to be controlled. AFAD use is acceptable in either of the following cases: The first case employs an AFAD unit at each end of the work zone while the second case employs an AFAD unit at one end and a flagger at the other end. Utilizing an AFAD, a single flagger may remotely control two or more AFAD units provided that the flagger has a clear view of each unit, and of approaching traffic in both directions. Other cases may be used as approved by the Resident.

AFAD use is permitted during daytime or nighttime operations; but, if used at night, the AFADs must be illuminated in accordance with Section 6E.08 of the latest edition of the MUTCD.

AFADs are not traffic control signals, they should not be used to replace traffic signals or other continuously operating traffic control devices.

A competent, certified flagger, who has been trained on the operation of the AFADs shall operate and not leave the AFADs unattended at any time. The flagger shall have an unobstructed view of the AFADs and approaching traffic in both directions at all times. The distance between AFAD units shall not exceed one-half mile.

Work zones utilizing AFADs shall comply with the Standard Sheet for flagger operation on a 2-lane 2-way roadway, where an AFAD unit, or units, is used in lieu of a flagger a BE PREPARED TO STOP sign (W3-4) is to be used in lieu of the Flagger symbol sign. Red/Yellow lens AFADs shall have a STOP HERE ON RED (R10-6) sign installed on the right-hand shoulder at least 8 feet in advance of the RCRYLS unit where vehicles are expected to stop and Stop/Slow AFADs shall have WAIT ON STOP (R1-7) and GO ON SLOW (R1-8) signs immediately adjacent to the AFAD.

The Contractor's Traffic Control Plan shall detail AFAD operation including a list of competent, certified flaggers trained to operate the AFADs. When the work no longer necessitates use of the AFADs, units shall be moved out of view from the traveled way.

652.04 General Operation

Portable/Temporary Traffic Signal and AFAD units shall be placed in the shoulder on the right-hand side of the road with a sight distance as designated in the Minimum Sight Distance for Signal Visibility chart provided in this specification.

If the shoulder is not adequate, the Portable/Temporary Traffic Signals or AFADs may encroach on the travel lane provided that the appropriate sight distance is available and as approved by the Resident. Re-positioning of the Portable/Temporary Traffic Signals or AFADs shall need the approval of the Resident.

Appropriate flagger apparel and equipment shall be maintained near each Portable/Temporary Traffic Signal or AFAD unit to facilitate flagging in the event of a malfunction or operational need due to frequent disruptions of traffic flow. The Contractor shall immediately provide traffic control with flaggers if a Portable/Temporary Traffic Signal or AFAD unit malfunctions; fails to properly or adequately control traffic; creates congestion, queues or gridlock which cannot be remedied by timely on-site adjustments to the signal operation; or is otherwise inadequate; all of which shall be determined by the Resident.

When Flaggers are being utilized, Portable/Temporary Traffic Signals shall not be in operation.

Portable/Temporary Traffic Signals or AFADs shall not be located within 200 feet of a grade crossing unless the temporary traffic control signal is provided with preemption in accordance with MUTCD Section 4D.27, or unless a uniformed officer or flagger is provided at the crossing to prevent vehicles from stopping within the crossing.

652.05 Method of Measurement Portable/Temporary Traffic Signals or AFADs shall be measured by the hour for each approach that are in place and operating.

652.06 Basis of Payment Portable/Temporary Traffic Signals shall be paid at the Flagger Hourly Rate for each approach in operation.

AFADs shall be paid at the Flagger Hourly Rate for each unit in operation and for the operator.

(1st Example: One set of AFADs (one unit), plus operator, would be paid as 2 X Flagger hourly rate X hours in use.)

(2nd Example: One set of AFADs (two units), plus operator, would be paid as 3 X Flagger hourly rate X hours in use.)

Payment will be made under:

Item Number	Description	Unit
652.38	Flagger	Hour

Minimum Sight Distance for Signal Visibility

Posted Speed Limit (mph)	Minimum Sight Distance (ft)
25	270
30	325
35	390
40	460
45	540
50	625
55	715

Example of Dolly type or SQ2

Example of Trailer Mounted type or SQ3

Example of an AFAD

All red Clearance Intervals
Less Than 40 mph
Assumed Travel Speed 15 mph

Posted Speed Limit	**Distance Between Stop Bars**		**Minimum All red Clearance Time**
	Yards	Feet	Seconds
25, 30 & 35	33	100	4.6
	50	150	6.9
	67	200	9.1
	83	250	11.4
	100	300	13.7
	117	350	16.0
	133	400	18.2
	150	450	20.5
	167	500	22.8
	183	550	25.0
	200	600	27.3
	217	650	29.6
	233	700	31.9
	250	750	34.1
	267	800	36.4
	283	850	38.7
	300	900	41.0
	333	1000	45.5
	350	1050	47.8
	367	1100	50.0
	383	1150	52.3
	400	1200	54.6
	417	1250	56.9
	433	1300	59.1
	450	1350	61.4
	467	1400	63.7
	483	1450	66.0
	500	1500	68.2
	517	1550	70.5

All red Clearance Intervals
40 mph and Above
Assumed Travel Speed 25 mph

Posted Speed Limit	**Distance Between Stop Bars**		**Minimum All red Clearance Time**
	Yards	Feet	Seconds
40,45,50 & 55	33	100	3.5
	50	150	5.2
	67	200	6.9
	83	250	8.6
	100	300	10.3
	117	350	12.0
	133	400	13.7
	150	450	15.4
	167	500	17.1
	183	550	18.8
	200	600	20.5
	217	650	22.2
	233	700	23.9
	250	750	25.6
	267	800	27.3
	283	850	29.0
	300	900	30.7
	317	950	32.4
	333	1000	34.1
	350	1050	35.8
	367	1100	37.5
	383	1150	39.2
	400	1200	40.9
	417	1250	42.7
	433	1300	44.4
	450	1350	46.1
	467	1400	47.8
	483	1450	49.5
	500	1500	51.2
	517	1550	52.9

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.

September 09, 2013

SPECIAL PROVISION
SECTION 717
ROADSIDE IMPROVEMENT MATERIALS
(Seed)

717.03 Seed Revise this Sub Section by removing the material property tables for "Method #1 - Park Mixture" and "Method #2 - Roadside Mixture #2" and replace with the following:

Seed Mixtures shall consist of seed proportioned percent by weight as follows:

Method #1 – Park Mixture	
Specification	**Property**
Turf Type Tall fescue	40% +/- 2%
85/80 Kentucky Bluegrass	25% +/-2%
Perennial Rye Grass	20% +/-2%
Annual Ryegrass	15% +/- 2%

Method #2 – Roadside Mixture #2	
Specification	**Property**
Turf Type Tall fescue	60% +/-2%
White Clover	5% +/-2%
Perennial Rye Grass	15% +/-2%
Annual Ryegrass	20% +/-2%

This special provision is temporary while supplies are limited and may be Modified to the Seed Mix in the March 2020 Standard Specification Book when supplies are available again.

SPECIAL PROVISION
SECTION 815
BUILDINGS

Description

The work shall consist of the furnishing and construction of the Building: Control House. All work shall be completed in accordance with these contract documents.

Materials

All materials and components shall be as detailed, noted, and specified on the Contract Plans and Special Provisions.

Services

The Contractor shall be responsible for portable toilets and drinking water for their crews. The Department shall be responsible for the removal and replacement of the existing onsite portable toilet. See Special Provision Section 202 Building Removal for more information.

Construction

The Department will provide the Contractor with horizontal and vertical control and conceptual slab layout. The Contractor shall provide the additional layout necessary to complete the work.

All work shall meet the requirements of governmental agencies having jurisdiction and comply with applicable standards and codes. The Contractor shall submit two (2) copies of shop drawings to the Department for review at least fifteen (15) days prior to starting the work.

Roof, siding, and paint colors shall be selected by the Department from manufacturer's standard colors to closely resemble the existing structure.

Variations from Materials Specified

Whenever and wherever items have been identified by describing a proprietary product, such identification is intended to be descriptive, but not restrictive, and is used to indicate the quality and characteristics of products that are satisfactory. Bids shall be considered as offering the item specified in the Invitation for Bid. The Department will consider all alternates submitted by the Contractor, but is not bound to accept any which, in its opinion, is not in the Department's best interest and are determined by the Department to be of equal value in all material respects to the proprietary items specified. The evaluation of and determination as to equality of the product offered shall be the responsibility of the Department and will be based on information furnished by the Contractor, as well as information reasonably available to the purchasing activity.

Quality and Standards

Materials and manufactured products incorporated into the work shall be new unless otherwise specified, free from defect, and in conformity with the contract. When material is fabricated or treated with another material or where any combination of materials is assembled to form a finished product, any or all of which are covered by specifications, the Department may reject the finished product if any of the components do not comply with the specifications. The Department may reject materials not conforming to the Specifications at any time, and the Contractor shall remove them immediately from the project site unless otherwise instructed by the Department. The Contractor shall not store or use rejected materials on any Department project.

If there is no applicable standard set forth in this contract for particular Work, then the Contractor shall perform that Work in accordance with industry standards prevailing at the time of bid. If the Department determines that Work is non-conforming, the Contractor shall remove, replace, or otherwise correct all unacceptable work as directed by the Department at the expense of the Contractor, without cost or liability to the Department.

Submittals

The Contractor shall submit manufacturers' specifications, product data and installation instructions for all items furnished. The Contractor shall not be relieved of responsibility for any deviation from the requirements of the specifications unless the Contractor has specifically informed the owner in writing of such deviation at the time of submission and the owner has given written approval to the specific deviation. The Contractor shall not be relieved from responsibility for errors or omissions. No portion of the work shall be commenced until the Department has approved the submittal.

Delivery, Storage, and Handling

- Store materials off the ground and protected from the weather.
- Deliver products in manufacturers' original containers, dry, undamaged, with seals and labels intact

Installation

- Installation, handling, and storage of all materials shall comply with manufacturer's instructions and recommendations
- The Contractor shall make provisions to allow safe access to the work for the Department in order to inspect the work, facilitate ongoing inspection of the work and to measure work for payment purposes
- Complete installation to provide weather tight service
- Completed installation for the roof shall conform to all applicable National, State and local codes

If the Department determines that non-conforming work substantially conforms to the Contract, the Department may accept the non-conforming work, provided that the Department

may require a credit to the Department to be deducted from amounts otherwise due the Contractor. If the Department and Contractor cannot agree to the amount of the credit, the work shall be unacceptable work. The Contractor shall remove, replace, or otherwise correct all unacceptable work as directed by the Department at the expense of the Contractor, without cost or liability to the Department.

Responsibility for Existing Structure Removal of existing materials shall be accomplished without damage to the portion of the structure that is to remain. The Contractor shall be responsible for all damage to the existing structure resulting from an act, omission, neglect, or misconduct of the Contractor until Final Acceptance. The Contractor shall, at its sole expense, rebuild, repair, restore, or replace such damage property of otherwise make any good losses that arise from such damage.

Environmental Requirements and Waste Materials

All waste materials shall be removed and disposed of in accordance with all federal, state, and local laws and regulations.

All materials removed from the site shall be the property of the Contractor. Sale of these materials on site, and removal by persons other than the Contractor or his personnel, shall be at the risk of the Contractor. Once the contract is signed, responsibility for the safety of the public within the confines of the project shall be the responsibility of the Contractor. The Contractor shall be responsible for any and all materials dropped from his trucks distant from the project. The Contractor shall make his own arrangement for disposal of materials taken from the site, and there will be no burning of materials on or adjacent to the site.

Closeout Procedures

The Contractor shall make final changeover of permanent locks and deliver keys to Department, and complete final cleaning requirements, including touchup painting, touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.

Final Cleaning

The Contractor shall clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program and comply with manufacturer's written instructions.

1. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
2. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
3. Remove tools, construction equipment, machinery, and surplus material from the Project site.
4. Remove snow and ice to provide safe access to building.

5. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
6. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
7. Sweep concrete floors broom clean in unoccupied spaces.
8. Remove labels that are not permanent.
9. Touch up and otherwise repair and restore marred, exposed finishes and surfaces.
10. Replace finishes and surfaces that cannot be satisfactorily repaired or restored or that already show evidence of repair or restoration.
11. Do not paint over "UL" and similar labels, including mechanical and electrical nameplates.
12. Wipe surfaces of mechanical and electrical equipment, and similar equipment.
13. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
14. Replace parts subject to unusual operating conditions.

Closeout Documentation

The following documents shall be added to the required list of closeout documentation:

- Project Record Drawings
- Warranties

Warranty

The Contractor shall guarantee work for one (1) year from date of Final Acceptance by the Department. The Physical Work must be Complete and in Conformity with the Contract and the Closeout Documentation, exclusive of the All Bills Paid and Request for Final Payment Letters, in order for the Department to finally “accept” the Project. All defects, including leaks occurring during guarantee period, shall be corrected without cost to the Owner. The Contractor unconditionally warrants and guarantees to the owner that all work will be of good quality, free from faults and defects, and in conformance with the specification. All work not conforming to these requirements, including substitutions not properly approved and authorized, may be considered defective. If required by the owner, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment. If the Department discovers any warranty defects during the warranty period, the Contractor agrees to perform all remedial work, at no additional cost or liability to the Department. Remedial Work will be completed within two weeks unless a more immediate response is required for safety or convenience, as determined by the Department.

The Contractor agrees that the warranty obligations provided by this Contract shall be reported as an outstanding obligation in the event of bankruptcy, dissolution, or the sale, merger, or cessation of operations of the Contractor.

Method of Measurement

The Building: Control House will be measured for payment as one lump sum, complete in place and accepted.

Basis of Payment

The Building: Control House will be paid for at the contract lump sum price, complete and accepted which shall be full compensation for the work indicated on the plans and as called for in the contract, removal of existing, framing, labor, equipment, and materials for building construction and other contract related incidentals necessary to complete the work.

The light fixtures, switches, receptacles, and all associated hardware, wiring, and accessories found in or on the Control House shall be considered incidental to this Pay Item.

Payment will be made under:

Pay Item	Pay Unit
815.00 Building: Control House	Lump Sum

SPECIAL PROVISION
SECTION 860
Mechanical Work for Swing Bridge Rehabilitation

860. GENERAL

860.1. **Description of Mechanical Work**. Under the item “Mechanical Work" the Contractor shall remove existing machinery items; shall furnish, install, and place in operating condition new machinery systems to include span drive motors and brakes, live load roller assemblies, end support machinery (comprising the end jack assemblies and the end seat assemblies), and a fully closed end stop; as detailed on the Contract Plans and as specified in these Special Provisions. The Contractor shall be responsible for the coordination of the mechanical work with all other work items as necessary to produce completed systems which meet the requirements of the Contract Documents.

860.2. **Limits of Mechanical Work**. The limits of the work included for Mechanical Work shall be as indicated on the Contract Plans sheet M1 through M24 and as specified herein.

860.3. **Governing Standard**. The governing standard for all new mechanical work shall be the AASHTO Load and Resistance Factor Design (LRFD) Movable Highway Bridge Design Specification, 2007 and all interim revisions. All discrepancies between the Contract Plans, the Special Provisions and the AASHTO Standard shall be brought to the immediate attention of the Fabrication Engineer for review and clarification.

860.4. **Standards**. Standards referred to in these Special Provisions and on the Contract Plans are published by the following organizations and are directly applicable to the material and workmanship required for this work.

- ASTM - American Society for Testing and Materials
- ANSI - American National Standards Institute
- AASHTO - American Association of State Highway and Transportation Officials
- SAE - Society of Automotive Engineers
- AGMA - American Gear Manufacturers Association
- AWS - American Welding Society
- NEMA - National Electrical Manufacturers Association
- Society for Protective Coatings (SSPC)

860.5. **Substitutions**. Items specified by manufacturer name or part number on the Contract Plans may be replaced by an equivalent item by another manufacturer, subject to approval by the Fabrication Engineer, with the understanding that all changes required by the substitution shall be made by the Contractor at no additional cost to the Department. Item equivalency shall be determined at the sole discretion of the Fabrication Engineer and may be based on one or more of the following: quality, function, ease of maintenance, physical size,

reliability, value, load capacity (static and dynamic), durability, availability and other criteria as deemed appropriate by the Fabrication Engineer.

860.6. **General Quality Assurance**. The Department reserves the right to inspect all machinery at the point of manufacture prior to shipping and on site throughout construction. No items shall be fabricated, machined, welded, cast or forged without a minimum of 3 weeks advance notification to the Department to permit scheduling of inspection by the Department's designated representative. The Contractor shall furnish all facilities and provide for free access at the plant, shop or site for the inspection of materials and workmanship, and to witness shop tests. Inspection and testing shall conform to the following requirements.

The Department shall base all inspections on the requirements of the Contract Plans, the Special Provisions, any referenced codes or standards and the Contractor's approved submittal documents. The Inspector shall have the authority to recommend to the Fabrication Engineer rejection of material or workmanship that does not satisfy contract requirements. The Fabrication Engineer shall make the final decision for rejection. The Contractor shall replace or repair to the satisfaction of the Department any such rejected items. All such replacements or repairs shall be made at no cost to the Department.

The Department will make inspections or equipment and machinery throughout the construction period. Any defects, deficiencies or deviations from the Contract Plans or Special Provisions discovered during such inspections shall be corrected at no cost to the Department. Shop approval of machinery does not relieve the Contractor from making such repairs to or replacement of parts which are found to be deficient at a later time (regardless of prior inspection or approval) as directed by the Department.

Unless otherwise provided, the Contractor shall furnish without charge, test specimens required herein, and all labor, testing machines, tools and equipment necessary to prepare the specimens and to make the physical tests and chemical analyses. Copies of test reports and various tests shall be submitted to the Department. The Contractor shall furnish the Department with the number of unpriced copies of purchase orders as may be required for scheduling tests as outlined in these Special Provisions.

860.7. **General Materials and Workmanship**. All materials for machinery parts shall be new unless otherwise indicated and shall meet the minimum requirements of the standards indicated on the Contract Plans and as specified herein. All materials shall be supplied by manufacturers who have supplied similar materials for similar applications for a period of not less than ten years. This requirement shall apply to all items furnished under the item Mechanical Work.

860.7.1. **Anchor Bolts.** All anchors for securing live load clevises, end seat pedestals, end jack strike plates and end stop bumpers to their piers shall be ASTM F1554 Grade 55 unless otherwise specified on the Contract Plans.

860.7.2. **Bronze Bearing Bushings**. Material for bronze bushings shall be as indicated on the Contract Plans and shall meet the requirements for Castings. Bronze bushings shall be provided with double spiral grease grooves unless otherwise indicated on the Contract Plans. The grease grooves shall have smooth edges that blend smoothly in the bearing surface. The entry hole from the grease fitting must intersect and lie completely within the grooves. All grease grooves shall be machine cut. Hand cutting of grease grooves is not acceptable.

860.7.3. **Castings**. Castings shall be free of defects such as sand and slag inclusions, cracks, cold shuts, shrink holes, blow holes, porosity, free of loose scale and sand, fins, seams, gates, risers and irregularities. Unfinished edges shall be neatly cast with rounded corners and inside angles shall have ample fillets.

Unless otherwise indicated on the Contract Plans, perform visual surface examinations of steel castings per ASTM A802, liquid-penetrant exams in accordance with ASTM E165, or magnetic particle exams in accordance with ASTM E709 in the manufacturer's shop, for each casting.

Unless otherwise indicated in the Contract Plans, perform visual surface examinations of bronze castings per MIL-STD-271F, or liquid-penetrant exams in accordance with ASTM E165 in the manufacturer's shop, for each casting.

Identify and remove unacceptable surface discontinuities in accordance with ASTM A802. Obtain approval from the Department before making any necessary major weld repairs (as defined in ASTM A781 S16 Weld Repair Charts). Perform radiographic examination of welds per ASTM E94. Any aberrant indications must be brought to the Department's attention for review and may result in rejection of the weld repair.

860.7.4. **Couplings and Coupling Guards**. Couplings shall be grid type couplings unless specified otherwise. All couplings shall be oil tight under all operating conditions. Coupling halves shall be bored and provided with keyways by the coupling manufacturer. All couplings shall have a minimum service factor of 2.0 for the torque produced at the respective coupling location from motor full load torque while the motor is rotating at full speed. All fits and finishes shall comply with AASHTO 6.7.8. Coupling arrangement relative to the mating machinery shall be such that inspection of the internal wearing components is possible without removal of the coupling hub from the shaft on which it is mounted.

The high-speed motor couplings for the span drive machinery shall be provided with safety guards. Guards shall be fabricated from expanded metal and structural shapes necessary to construct a rigid cover that will withstand a load of 300 lbs. applied vertically, without any permanent deformations in the cover. The covers are to be bolted to the machinery supports, adjacent structural steel or supporting concrete as necessary. The coupling guards are not shown on the Contract Plans. The Contractor shall provide complete details of all coupling guards and any required supports on the shop drawings.

860.7.5. **Fasteners**. All bolts 1 1/2" or smaller shall be high strength heavy hex bolts made from material equal to ASTM A325 Type 3 or ASTM A449 unless otherwise specified on the Contract Plans. All bolts greater than 1 1/2" shall be made from material equal to ASTM A449. All bolts shall conform to the Unified Thread Standards, coarse thread series, for threads on bolts, nuts and cap screws with a Class 2A tolerance for bolts and Class 2B tolerance for nuts, in accordance with ANSI B1.1, unless otherwise specified. Bolt head and nut bearing surfaces must be flat and square with the axis of the bolt holes; spot face nut bearing surfaces as necessary to produce firm bearing around the entire perimeter of the contact surface.

Turned bolts are called out by nominal thread diameter on the Contract Plans. The bodies of turned bolts shall be 63 microinch finish or finer. Body diameter shall be 1/16" larger than thread diameter. Bolt heads shall be standard hex for bolts of the next nominal size larger than the thread diameter or heavy hex for nominal thread diameter. Unless otherwise noted, bolt holes in machinery parts required for connecting to supporting steel may be subdrilled (in the shop) smaller than the turned bolt diameter and shall be reamed together with supporting structural steel either during assembly or at erection to provide an ANSI LC6 fit, after the parts are correctly assembled and aligned.

Finished high-strength bolts shall meet the requirements of ASTM A449. High-strength bolts shall have finished bodies and regular hexagonal heads. Holes for high-strength bolts shall be not more than 0.010 inch larger than the actual diameter of individual bolts, and shall be drilled to match the tolerances for each bolt. The clearance shall be checked with 0.011 inch diameter wire. The hole shall be considered too large if the wire can be inserted into the hole together with the bolt.

Hole size for all bolts not identified as turned bolts or finished bolts are to be 1/32" larger than the body diameter for bolts up to 1" diameter and 1/16" larger than body diameter for bolts over 1" diameter.

Positive type lock nuts and hardened washers shall be furnished for all bolts and for all cap screws used as bolts. Double heavy hex nuts conforming to ASTM A563 are required unless indicated otherwise on the Contract Plans. All hardened steel washers shall conform to ASTM F436. Where specified, provide lock washers with cap screws. Lock washers to be in accordance with ANSI B18.2.1. Where safety wire is specified for securing fasteners, the safety wire shall conform to ASTM A580 and the wire shall have a minimum diameter of 0.031".

All items called out as hex head cap screws shall be in accordance with ASTM A449. All hexagon socket head cap screws shall be ASTM A574.

All hex socket flat countersunk head cap screws shall conform to ANSI B18.3.5. Where utilized as turned bolts, hex socket flat countersunk head cap screws shall be manufactured from ASTM F835 with turned body dimensions meeting the requirements for turned bolt

dimensions provided above. Where called out as bronze, hex socket flat countersunk head cap screws shall be manufactured from ASTM F468 Alloy Cu651.

All fastener threads shall be coated with anti-seize prior to assembly and shall be tightened to provide a tension of 50 percent of the bolt's ultimate tensile strength unless noted otherwise on the Contract Plans or in these Special Provisions.

All bronze hex socket flat countersunk head cap screws shall be tightened to 50 percent of the screw's yield strength. Apply Loctite 243 or approved equal to the threads of all screws that secure bronze bushings to plain bearings or wedge wear strips to their respective guide/base immediately prior to final tensioning.

The method of tightening and verifying the tension in all bolts shall be determined by the Contractor and shall be provided on the Shop Drawings for approval by the Department.

860.7.6. **Forgings**. Forgings shall be reduced to size from a single bloom or ingot until perfect homogeneity is obtained. Blooms and ingots shall have a cross section area equal to at least three times the required size. Forging shall be done at no less than red heat.

Forged rounds for shafts and pins shall be true, straight and free from all injurious flaws such as piping, laps, seams or cracks. Finished ends of shafts and pins shall have a 60-degree lathe center with clearance hole at the exact center of the shaft. Shafts with bored holes shall have the ends prepared for a device equivalent to the lathe centering device furnished as part of the work. Stepped shafts shall have fillets finished smoothly to adjacent surfaces without tool marks or scratches. Surface finish for fillets shall have a maximum roughness of 63 microinch according to ANSI Standard B46.1 unless a finer finish is required.

All forgings shall be subjected to ultrasonic examination in accordance with ASTM A388. Any indications (loss of back reflection) using the straight beam method, which cannot be readily explained by the geometry of the piece, will be cause for rejection. Any forgings which are rejected shall be replaced at no cost to the Department.

Where ASTM A668 forgings are used in weldments with plate steel, the Contractor shall ensure that the forgings meet ASTM A668 supplemental requirements S4 for low carbon steel.

860.7.7. **Hardness Requirements**. Brinell or Rockwell hardness tests shall be made and results included on inspection reports for all materials for which hardness values are required on the Contract Plans, in the material specifications, or specified herein.

860.7.8. **Keys and Keyways**. Keys and keyways shall conform to dimensions and tolerances in accordance with ANSI B17.1 including keyseat radii and key chamfers shall meet ANSI Class 2 fit requirements unless otherwise indicated in the Contract Plans. Keys shall be effectively held in place by closed end keyways milled into the shaft except as noted on

the Contract Plans. Ends of keyways shall be rounded to a half circle with a diameter equal to the width of the key. Where more than one key is required, keys shall be located 120 degrees apart. Keys shall be machined from ASTM A668 Class G forgings or equal, unless noted otherwise on the Contract Plans.

860.7.9. **Lubrication Fittings and Piping**. Size of grease lubricating fittings shall be standardized and shall be of the giant button head type, except as noted on the Contract Plans or unless the location of the fitting requires the use of a fitting that is smaller than the giant button head fitting. Under no circumstance shall the use of more than 2 different types of grease fittings be permitted. Fittings shall have a minimum rating of 10,000 psi and shall be equipped with a steel check valve that will receive grease and close against backpressure.

Fittings shall be located in a protected and conveniently accessible position for use and shall be connected to the points requiring lubrication by pipe extensions where necessary. All piping necessary to provide access for lubrication shall be clearly indicated on the shop drawings and all pipe components listed in the bill of materials. Pipe material shall be stainless steel meeting ASTM A312 Type 304 or 316 and shall conform to the following:

Pipe nipples shall meet the requirements of ASTM B687.

Pipe fittings shall meet the requirements of ASTM B584.

Pipe shall meet the requirements of ASTM B43.

The Contractor shall provide a battery powered grease gun with adequate pressure to lubricate all necessary items. The gun shall have a 2 lb. capacity and a minimum 6 ft. hose.

Pipe all fittings for commonly lubricated components on the movable span to a common manifold(s) accessible from sidewalk level. Final installation location shall be coordinated with Maine DOT Maintenance Staff and confirmed by the Department. Pipe runs and manifold layout shall be detailed on the shop drawings and included in the Maintenance Manual.

860.7.10. **Lubrication**. For the duration of the project, the Contractor shall lubricate all rotating and sliding parts of the machinery with lubricant as indicated on the approved charts or as recommended by the component manufacturer. Maintaining proper lubrication shall be considered incidental to the mechanical work and will not be paid for as a separate Pay Item. The surfaces of components that will rotate or slide relative to one another once assembled shall be lubricated prior to assembly. All clearance fits involving mating steel components shall be installed with a marine duty anti-seize compound prior to assembly.

The following information applies to lubricants for the various machinery components:

1. Enclosed Gear Reducers: Lubricant shall be per the existing O&M Manual recommendations or current Maine DOT practice for these components.

2. Sleeve Bearings: The lubricant chosen shall be approved for use in sleeve bearings by the lubricant manufacturer. Recommended Lubricant: NLGI No. 2 grease with rust and oxidation inhibiting additives, 280 Worked Penetration at 77° F [25° C], 340°F [171°□C] (or higher) ASTM Drop Point, SUS 900 @ 100°F, water resistant, anti-wear/extreme pressure.

3. Couplings (Motor): Coupling lubricant and its maintenance shall be specified by the coupling manufacturer. The selected lubricant shall resist sling-off for high-speed motor couplings.

4. Couplings (Others): Lubricant shall be per the existing O&M Manual recommendations or current Maine DOT practice for these components.

5. Open Gearing: Lubricant shall be per the existing O&M Manual recommendations or current Maine DOT practice for these components.

6. End Seats: Lubricant for the end seat sliding surfaces must bond strongly to the end seat to maintain a continuous film on the contact surface. The lubricant shall contain an EP (Extreme Pressure) additive, repel water and resist wash-off, maintain consistency over wide temperature variations, and allow for ease in application and removal. See the Contract Plans for application methods and locations.

7. Center Bearing: Lubricant shall be per the existing O&M Manual recommendations or current Maine DOT practice for these components.

8. Proprietary units will use lubricants approved by the manufacturer.

The Contractor shall furnish the Department with copies of letters from the machinery and/or lubricant manufacturers endorsing the lubricants that have been selected. Lubricants shall be selected for year-round exposure at the bridge. Lubricants shall be selected to be compatible with lubricants currently in use by the Department, where applicable.

The Contractor shall furnish an additional supply of the approved lubricant for future maintenance use to include, as a minimum, a 1-year supply per the existing and revised O&M Manuals. In no case shall the additional supply be less than that required for one, complete change of the lubricant. Examples of these items may include brake thrustor oil gear reducer oil and center pivot bearing oil. All lubricant shall be provided in the original manufacturer's sealed container to prevent contamination. Contractor shall maintain lubrication of all items requiring lubrication for the duration of the construction up to and through final acceptance. Contractor shall protect all stored lubricants used during construction from contamination.

860.7.11. **Painting**. Painting requirements encompass shop painting, field painting and field touch-up of machinery components and associated support surfaces. All machinery, including supports and fasteners, shall be painted in their entirety except for machined contact

surfaces (e.g. brakewheel friction surfaces, shaft journals, gear teeth, etc.). Stainless steel surfaces shall not be painted.

All painting shall be in accordance with this Special Provision and with the paint manufacturer's most stringent specification for surface preparation. If there is a conflict between them the most stringent specification will govern. Caution shall be exercised during cleaning and painting operations to prevent cleaning and painting materials from entering machinery components and coming into contact with sliding surfaces on components such as bearings, seals, gears, couplings, and other components which would be damaged by such intrusion. Nameplates shall be clean and kept free of paint. Detailed instructions for painting, including paint manufacture information and surface preparation of the machinery, shall be provided on the Shop Drawings for review by the Department

All paints shall be listed on the NEPCOAT list.

Shop painting shall be three (3) coat painting consisting of an inorganic zinc-rich primer, an intermediate coat of epoxy-based paint, and a final coat of polyurethane paint, used per manufacturer's requirements for protection from corrosion. A modified aluminum epoxy mastic primer shall be used for all machined surfaces that require paint (e.g., couplings, shafts, and all other machined surfaces that cannot be blast cleaned). All three coats of paint shall be applied in the shop All paint surfaces damaged during shipment and/or field installation shall be cleaned and receive a touch-up coat of primer, first coat and final coat in the field after the machinery has been installed and successfully testing.

The third (top) coat of paint shall color code the machinery to identify fixed and moving parts. in accordance with OSHA and County requirements. Color for the final coat shall be safety orange (Federal Id No. 12300 or 12246) for all moving parts including shafts, couplings, brakewheel hubs, and any other moving part. Color for the final coat shall be safety green (Federal Id. No. 14120 or 14260) for all stationary parts including machinery supports and any other stationary part.

Written endorsement from the paint manufacturer shall be submitted to Department for Contractors proposed field preparation and painting methods for span drive enclosed gear reducers.

860.7.12. **Shafts and Pins**. Rolled shafts shall meet the requirements of ASTM A675. Shafts shall be finished accurately finished, round, smooth and straight. Straightness tolerances shall be 0.003 inches per foot. Forged shafts and pins shall meet the requirements for forgings.

860.7.13. **Shims**. Shims required for leveling and alignment of machinery and equipment shall be brass or stainless steel, neatly trimmed to the dimensions of the assembled part and drilled for all bolts that pass through the shims. Sufficient shims shall be furnished to provide for a total thickness of not less than two times the dimensions given as "nominal shims", with one shim equal to the nominal thickness. Shims shall be provided to allow adjustments of 0.003" for machinery parts. Shims shall be placed to provide full contact between the feet

of the components and machinery supports. Shims shall be shown in detail on the shop drawings.

The Contractor shall make every effort to use full size shims and achieve full contact between the shims and the mating components to achieve the specified alignment requirements. In some cases, full contact between the shims and the mating components and achieving the alignment requirements may be mutually exclusive. In these cases, the use of partial or custom machined tapered shims may be required to achieve the alignment requirements. Partial shims shall only be used when the gaps produced between mating parts by the use of partial shims is less than 1/64". At least one (1) bolt shall pass through any partial shim that is used. In cases where partials shims would produce a gap greater than or equal to 1/64", a custom machined tapered shim shall be used. The cost of any partial or custom shims including materials, manufacturing, engineering, shipping, field measurements, etc. is considered incidental to the work and no additional compensation will be made for providing partial or custom shims. Any gaps that exist between shims and mating surfaces shall be sealed with silicone caulk to prevent moisture infiltration prior to painting.

Shims shall be provided in a substantial, weather proof crate so that unused shims can be stored without deterioration for future usage. A laminated index sheet shall be provided with the crate listing all shim contents, and each shim set shall be given a unique identification mark and cross referenced to its part.

860.7.14. **Spare Parts**. The Contractor shall supply the following spare parts for the mechanical machinery:

- One (1) hygroscopic breather for each of the speed reducers (2 total)
- One (1) set of brake shoes for the span drive thrustor brakes (2 total)
- One (1) grid for the span drive motor couplings (2 total)

860.7.15. **Tools**. The Contractor shall supply the Department with a complete set of wrenches and associated tools to facilitate the maintenance, adjustment, installation, and removal of all machinery items installed as part of this Contract. The tool set shall be provided in a suitable high-quality weatherproof tool box, complete with lock. All tools shall be new and shall be of standard manufacture.

The Contractor shall submit a list of all bolt, screw and nut sizes along with the name, size, type and manufacturer of the corresponding wrenches to be provided for approval by the Department. A wrench shall be provided for each size and type of bolt, screw, or nut, including any special hardware (including a dead blow hammer and safety wire pliers) which may be required as part of this contract. Adjustable wrenches which fit more than one size bolt, screw, nut or other item of hardware are not acceptable.

860.7.16. **Welding and Weldments**. Welding required for the work and weld inspection shall be done in accordance with the requirements of the AASHTO/AWS D1.5 and all interim

revisions unless otherwise specified. Welding required for stainless steel shall be done in accordance with AWS D1.6. Treat all machinery and weldment that support machinery as main members and all welds as joining primary components, unless otherwise specified in the Contract Documents. Do not perform field welding unless specified in the Contract Documents.

Welding joint sizes and details shall be shown on working drawings. Under no circumstances shall open ended welds be acceptable. All welded machinery parts or supports shall be stress relieved by heat prior to machining. The Contractor shall include welding and stress relieving procedures with the shop drawings for parts that require welding. The Contractor shall ensure that all weld procedures are appropriate for the materials identified in the Contract Plans.

Weldments are detailed in the contract plans to indicate finished dimensions; the Contractor shall take the necessary steps to account for material removal during machining to produce the indicated dimensions at the completion of all machining operations.

Where fillet welds are used for main support webs or stiffeners, the components shall be milled to bear to ensure that loading is transferred through the steel, not the fillet. Complete weld and milling details shall be provided int eh Shop Drawings for review.

All welds shall be 100% inspected by non-destructive methods. Inspector qualifications, inspection methods and acceptance criteria shall be that described in AWS D1.5.

860.8. **Non-Shrink Grout.** Provide non-shrink grout for use under machinery components. Minimum compressive strength: 15,000 psi per ASTM C579-01(2006). Linear shrinkage: less than 0.0001 in./in. Store and use grout in strict accordance with the manufacturer's recommendations.

860.9. **Span Drive Machinery**. Two (2) mechanical span drive rehabilitations shall be performed for the swing span. The drive rehabilitation shall be as shown on the Contract Plans. The drives are designed to jointly rotate the span 65° in 53 seconds under the conditions described in paragraph 5.4 of the AASHTO LRFD Movable Highway Bridge Design Specification, 2007. This operating time provides for a uniform 10 second acceleration period upon starting to open and a uniform 10 second deceleration period prior to reaching the fully open position, but does not provide for creep speed. The actual operating time will be greater than this theoretical time due to creep speed adjustments at both limits of travel.

Span drive machinery components subject to stipulations not detailed on the Contract Plans or addressed under the General Materials section are as follows:

860.9.1. **Motor**. Two (2) required. Motor procurement, installation and payment falls under Electrical work. The following mechanical requirements shall also apply. The key and keyway requirements provided in this mechanical Special Provision shall also apply to the motors. The driving shaft extension shall be custom and shall conform to the Contract Plans

and suit the other mechanical and electrical components to be installed. The back end of each motor shaft shall be extended beyond the motor housing and thrustor brakewheel and shall be machined to a hex to facilitate the checking of brake torques as well as permit manual operation. A cover separate from and in addition to the thrustor brake cover shall be provided to guard the shaft extension. The cover shall be limit switch protected to de-energize the motor when the cover is not secure in its intended protective location.

860.9.2. **Motor Coupling**. Two (2) required. The motor couplings shall be flexible grid type, with a horizontally split cover. The coupling shall be rated for a minimum of 3,850 lb-in and shall meet the coupling manufacturer's requirements for acceptable bore size. Each coupling hub shall be secured to its mating shaft with an FN2 fit and one key.

860.9.3. **Brakes**. Two (2) required. There brakes shall be thrustor operated shoe type brakes and installed as part of the rehabilitated span drive machinery. The brakes are identical in manufacture but serve different functions. The motor brake shall be installed as part of the Southport span drive machinery and the machinery brake shall be installed as part of Boothbay Harbor span drive machinery.

Each thrustor brake shall be mounted on their support channels at the rear shaft of their respective span drive motors.

Each thrustor brake shall have the following features:

- Stepless, externally adjustable time delay for setting the brake.
- Stepless, externally adjustable time delay for releasing the brake.
- Stainless steel brake wheel.
- External torque spring with brake torque scale (English units).
- Shoes to be provided with special high torque molded non-asbestos linings.
- Latching hand release. Hand release to be interchangeable for left or right hand operation. Force required to manually release the brake shall not exceed 50 lbs.
- Three limit switches. One switch shall indicate when the brake is fully set, one shall indicate when the brake is fully released, and one shall indicate when the brake is hand released.
- Stainless steel pins and related hardware.
- All items to be coated with the 3-coat paint system specified for the machinery under Materials. The manufacturer may submit an alternate coating system that is suitable for a corrosive high-humidity environment with supporting information documenting demonstrated performance on at least three (3) comparable installations. If such alternate system is not approved by the Department, the specified 3-coat paint system shall be used.
- NEMA 3R Enclosure. The enclosure shall be aluminum and shall be vertically split to facilitate removal without lifting over the brake mechanism so that it is

practical to install and remove in its' final location on the bridge. The cover shall not impede operation of the hand release mechanism when installed. The cover shall be bolted to the same support as the brake

- Space heater: Thermostatically controlled with enclosed heating element. Rated for continuous duty.
- The thrustor brake wheel shall be mounted on the reducer input shaft with an FN2 fit and key.

Each thrustor brake shall have a stainless steel or brass nameplate be permanently affixed to its frame and be stamped with, but not limited to, the following information:

- Manufacturer
- Model number
- Maximum Brake Torque
- Recommended Brake Torque
- Brake lining material.

Each thrustor brake actuating device shall have a stainless steel or brass nameplate permanently affixed to its body and be stamped with, but not limited to, the following information :

- Manufacturer
- Model number
- Push capacity of the actuator
- Recommended reserve stroke of the actuator
- Volts, phase, Hz, watts
- Type of fluid required in the reservoir.

The thrustor brake on the Southport side shall act as the motor brake, and the thrustor brake on the Boothbay Harbor side shall act as the machinery brake for the span drive machinery. Accordingly, the brake sequence shall be as follows:

- Southport motor brake to set with 0.75 to 1.5 second time delay.
- Boothbay Harbor machinery brake to set with a 2.25 to 3.0 second time delay (unless dictated otherwise by system behavior during initial startup and testing)

The torque for each brake shall be set in the shop, verified with a torque wrench (or comparable method approved by the Department) and adjusted to within 10% of the required setting; the brake torque shall be rechecked at installation in the field per the approved method and adjusted as required. The pressure on the rubbing surface of the brake may not exceed 30 psi, and the product of the pressure on the rubbing surface times the velocity of the brake wheel surface in feet per minute (fpm) may not exceed 90,000 psi-fpm. The brake torque shall be as follows:

- Southport motor brake set to 30 ft-lb.
- Boothbay Harbor machinery brake set to 40 ft-lb.

Information in regard to electrical requirements for the brake and the limit switches is provided in the electrical section of the Special Provisions.

860.9.4. **Enclosed Gear Reducers.** Two (2) existing. The existing span drive speed reducers shall have the following work performed on them prior to draining, flushing and filling:

- Cleaned all over in accordance with SSPC-SP3 Power Tool Cleaning Standards unless otherwise specified in the Contract Plans.
- Clean top of housing in accordance with SSPC-SP11 Power Tool Cleaning to Bare Metal Standards.
- Replace all bolts on top of housing in-kind and per the manufacturer's written recommendations.
- Permanently remove abandoned gear from top shaft extension of Boothbay Harbor side speed reducer.
- Paint (exterior) in accordance with the contract requirements for new machinery.
- Furnish and install a hygroscopic breather. Any piping needed to place the breather in a convenient location and orientation for maintenance and replacement shall be considered incidental to the work and meet the satisfaction of the Department.

The existing span drive speed reducers shall have a new brass or stainless-steel nameplate permanently fastened to the housing stating the following:

- AGMA symbol
- Manufacturer's name and address
- Type of reducer
- Model and size
- Service Horsepower
- High speed shaft rpm
- Service factor
- Gear reduction ratio
- Lubrication specifications, including AGMA lubricant number and viscosity in SSU at 100°F. The lubricant shall be suitable for year round exposure at the bridge site. They shall be lubricated with the grease specified in the O&M Manuals or as approved by the Department.

860.9.5. **Open Gearing (Rack and Pinions)**. One (1) Rack and two (2) Pinions existing. The tooth faces of the existing rack and pinions shall be thoroughly cleaned of all grease and

corrosion. They shall be lubricated with the grease specified in the O&M Manuals or as approved by the Department.

Rack Pinion Bearings. Two (2) existing. The rack pinion bearing cap bolts are to be replaced in-kind. Contractor to obtain and submit written recommendation and certification from the manufacturer of the following for approval:

- Material properties.
- Recommended tightening torque.
- Tolerance dimensions for length and diameter:

Not more than one cap bolt may be removed from a bearing assembly at any time. The swing span shall not be operated with any cap bolts removed.

860.9.6. **Motor Support**. Two (2) required. The motor support plates support the motors as detailed in the Contract Plans. The motors shall be mounted to their baseplates in the shop using subdrilled holes. Subsequently, the motors shall be aligned with their reducers, motor couplings and thrustor brakes and then secured using turned bolts.

860.9.7. **Brake Mount**. Two (2) required. The brake mounting channels support their thrustor brakes as detailed in the Contract Plans. There are existing brake supports that are being removed as part of the rehabilitation work. The new thrustor brake mounting channels shall be saw cut to provide the nominal mounting heights shown in the Contract Plans. The base bolt holes for the thrustor brakes shall be field drilled from the solid after installation of their mounting channels, and their span drive motors and alignment with their brakewheels. For the Southport motor brake the existing support beams are W6x25. For the Boothbay Harbor machinery brake the existing support beams are W12x40. Subdrilled holes with subsized bolts shall be used for preliminary alignment of the thrustor brakes. After final alignment has been inspected and approved, the thrustor brakes shall be secured to their mounting channels using turned bolts.

860.10. **Center Pivot.** One (1) existing. The center pivot shall be drained, flushed and then filled with the oil specified in the O&M Manuals or as approved by the Department

860.11. **Balance Wheel Machinery.** Six (6) existing. The clearance between the balance wheels and track shall be measured after all work that affects the balance condition of the movable swing span has been completed, including rebalancing of the swing span. The balance wheels shall be shimmed to provide a clearance of 1/16” between each wheel and the track.

860.12. **Live Load Rollers.** Two (2) required. The live load roller components shall be provided as indicated on the Contract Plans. They are serving the function previously provided by the center wedges.

860.13. **End Jack Machinery.** Four (4) mechanical end jacks shall be provided, one to elevate each corner of the swing span for the purpose of retracting and driving the end seat shoes. The end jacks shall be as shown on the Contract Plans. Each end jack is designed to impart

a nominal reaction of 40 kips into the structure at each end jack location under normal service conditions. This load is based on producing a calculated deflection of 1/4" from the fully seated position. The drive consists of screw jacks to raise and lower the ends of the swing span in conjunction with electro-mechanical actuator driven end seats that are inserted between the swing span and the pier to support the dead load reaction and the live load at the end of the swing span.

The end jack shall be an electric motor operated screw jack. The screw jack shall provide a nominal 35-ton capacity with a 6" stroke. Each screw jack shall be set at the elevation shown on the Contract Plans, and shall use 3 3/4" of stroke during operation to provide the 1/4" nominal clearance between the end seats and their pedestals for retraction of the end seats. The jack screw shall be keyed to prevent rotation and shall be equipped with a bellows to protect the screw. The screw jack shall use a 10.67:1 worm/screw ratio in sequence with a 15.42:1 ratio reducer. Lifting speed of the jack shall be a minimum of 7.0 in/min. The electric motor shall be a 7.5HP, 1770 RPM unit. The motor shall be outfitted with an integral, solenoid operated disk brake. Both the motor and disc brake shall operate on 208V power. The brake shall be equipped with a manually operated latching hand release mechanism. Provision shall be made for manual hand operation of the end jack via a hand wheel on the end of the motor. Manual operation shall be interlocked with limit switches and covers such that electrical operation of the end jack is prevented when the cover is removed for manual operation of the equipment.

The end jack shall include a top plate with bellows boot. The top plate, worm screw and worn shall be stainless steel. Low temperature grease shall be used for the worm drive as recommended by the manufacturer. The end jack assembly, including the jack, reducer and motor, shall be painted Federal Safety Green.

860.14. **End Seat Actuator.** Four (4) required. The end seat actuators shall be an electric motor operated linear actuator with a spherical rod eye and trunnion brackets. The spherical rod eye shall have an angular misalignment capacity of at least 14 degrees in the direction perpendicular to the rod travel. A pin shall be provided based on the rod eye diameter with a length to suit the clevis connection on the end seat shoe; each pin shall be slotted for a keep plate which shall be mounted to the outboard face on one clevis ear. Each actuator shall have a nominal 2,200 lb. capacity with a 15" stroke; the actuator shall operate through a functional range of 14" so as to have 1/2" reserve stroke at each end of travel as indicated on the Contract Plans. The motor shall be outfitted with an integral, solenoid operated disk brake, and include thrust overload protection circuitry. The thrust overload shall be set to 3,300 lb. The brake shall be equipped with a manually operated latching hand release mechanism. Provision shall be made for manual hand operation of the end seat. Manual operation shall be interlocked with limit switches such that electrical operation of the end jack is prevented when the manual operating equipment is engaged.

860.15. **Keeper Plates.** Keeper plates for all pinned connections shall be secured with cap screws, the heads of which shall be predrilled for and tied together with stainless steel safety tie wire after installation.

860.16. **Fully Closed End Stops.** A full closed stop assembly shall be provided to absorb energy of the span at the fully closed position, as depicted on the Contract Plans. The stop assembly will assist the control system in centering the span at the fully closed position and provide resistance to wind-up the machinery before setting the thrustor brakes.

Two (2) polyurethane bumpers suitable for absorption of high energy impacts shall be installed as a pair shown on the Contract Plans. Each of the bumpers shall be capable of absorbing 5,300 pounds at 1.0 m/sec, providing a total of 10,600 pounds of energy absorption at 1.0 m/sec.

The bumper supports shall be fabricated and installed as shown on the Structural Plans. The polyurethane bumpers shall be aligned with the strike plate on the swing span such that firm contact is present with the swing span at its fully closed position and seated on all four end seats and two live load rollers. The variation of the gap between the polyurethane bumpers and the strike plate shall be less than 1/16" at the mating surfaces when the swing span is at its nearly closed position, prior to making contact between the polyurethane bumpers and the strike plate.

861. SUBMITTALS

861.1. **General Requirements.** Shop drawings, erection drawings, final record drawings, machinery removal and installation procedures, shop assembly procedures, operating, maintenance and lubrication manuals, lubrication charts and other submittals specified herein are required as part of this work and shall provide complete details, classification of materials, schedules for fabrication, shop assembly procedures, and diagrams showing sequence and details for erection. All submittals shall be subject to review and comment by the Department. Submittals that do not meet the minimum requirements identified below will be considered non-responsive and will be returned without review. Submittals that have not been approved or require correction shall be resubmitted until such time as they are acceptable to the Department, and such procedure shall not be considered caused for delay. The Contractor shall bear all costs for damages which may result from ordering or fabrication of any materials prior to acceptance of Shop Drawings. The Contractor may request in writing from the Department approval to order raw materials of the correct type for later fabrication from approved Shop Drawings after they have been accepted. Such approval by the Department shall be in writing.

No disassembly or removal of existing machinery, or installation and assembly of new mechanical components shall commence without approved demolition, installation and/or alignment procedures and supporting Assembly or Erection Drawings.

Any deviations from the work depicted on the Contract Plans or alterations proposed by the Contractor which affect the integrity or capacity of the machinery shall be detailed in

drawing submittal(s) with accompanying calculations which shall be signed and sealed by a Professional Engineer licensed in the state of Maine. Acceptance of the proposed deviations shall be at the discretion of the Fabrication Engineer.

All submittals shall be sequentially numbered. Resubmittals shall be numbered with original submittal number and an alphabetic suffix.

861.2. **Submittal Schedule.** The Contractor shall provide a detailed submittal schedule to the Department within 30 days of the "Notice of Contract Award". The schedule shall address material submittals, shop drawing submittals, disassembly, demolition, assembly and installation procedure submittals, maintenance manual submittals, and any other required information.

861.3. **Material Submittals.** The Contractor shall submit copies of producer or manufacturer data. These shall include specifications, tests and installation instructions for the following items, but not excluding other items or materials not specifically mentioned.

- Mill reports and physical tests of all metals
- Bolts, nuts, washers and other fasteners
- Paint
- Lubricants
- Standard stocked items
- Brakes
- Couplings
- Bumpers
- Rod assembly rod ends

861.4. **Dimensional Verification.** Dimensions indicated on the Contract Plans are nominal and intended for information. The Contractor must coordinate the interface of the mechanical systems with the structure and piers, and verify all dimensions in the preparation of the shop, assembly and erection drawings.

861.5. **Certified Drawings.** The dimensions indicated on the Contract Plans for standard manufactured products have been obtained from information provided by various machinery manufacturers. The dimensions have not been obtained from certified drawings (certified drawings are drawings certified by the manufacturer to be dimensionally accurate and which contain sufficient details to determine if the requirements of the contract documents have been satisfied). The Contractor shall obtain certified drawings for all manufactured products and utilize the certified dimensions in the preparation of the shop and erection drawings. The certified drawing shall be submitted in support of the shop drawings. The Contractor shall notify the Fabrication Engineer of any dimensional deviations from the Contract Plans.

861.6. **Shop, Assembly and Erection Drawings.** Working drawings, including shop, assembly and erection drawings, shall be prepared to depict all work to be performed as part of this Contract. Shop and assembly drawings shall be submitted for all components that are custom built for this project. Under no circumstance shall machinery be fabricated, assembled or erected from the Contract Plans. Working Drawings which are reproductions of the Contact Drawings, either in part or in their entirety, shall be considered non-responsive and shall be returned without review.

Working Drawings shall conform to the following requirements:

1. All drawings shall be drawn to scale. All details of a given part shall be clearly visible at the scale selected for that part with the exception that enlarged views of small details within a part may be used to improve clarity and prevent excessively large drawings.
2. Separate details shall be provided for all opposite hand components.
3. Drawings shall be prepared using the English system of units. This shall apply to all dimensions, surface finishes and fits between mating components. The Contractor may include metric units parenthetically if so desired.
4. All field-verified dimensions shall be clearly identified and distinguished from other dimension on the Shop Drawings.
5. Surface finish for machined surfaces and tolerances for each dimension for which a specific fit is required.
6. Tolerances shall be provided for all drawing dimensions, either directly or via a standard tolerance block.
7. Parts shall be dimensioned with appropriate tolerances to ensure that components of a common purpose that are fabricated from the same detail are interchangeable.
8. Materials for each item shall be identified using reference to accepted standards published by the organizations called under section 1.4 of these Special Provisions.
9. Instructions for painting the machinery.
10. All appropriate weld symbols along with stress relieving process for weldments. Proprietary parts shall be shown in outline on the drawings with sufficient dimensions and data to determine the clearances required for installation and operation.
11. Certified dimension prints from equipment manufacturers shall state pertinent ratings of the equipment, and shall indicate, when applicable, provisions for adding, draining, and checking the lubricant, method of lubrication, amount and type of lubricant required and type of fittings, the location of inspection openings and the location and type of venting devices.
12. Complete shop bills of materials shall be included for all machinery parts. The computed shipping and operating weights of each piece of machinery shall be stated on the shop drawing upon which it is detailed.

13. Complete assembly and erection drawings shall be furnished. These drawings shall be given identifying marks and essential dimensions for locating each part or assembled unit with respect to the bridge or equipment foundation. Every part shall be cross referenced to the sheet on which it is detailed.
14. The type of tightening, type of wrench and the value of torque or other pertinent information of all connection bolts for all items and machinery.
15. Complete details of all piping required to lubricate the machinery shall be provided. Details shall include pipe size and material and any connections to the structure or machinery parts that may be required.

861.7. **Final Record Drawings ("As Built" Drawings).** . A complete set of the final drawings for all materials as fabricated shall be submitted electronically in PDF format following fabrication. Any deviations from the approved shop drawings shall be clearly indicated. These drawings shall be marked "As Built" in red lettering, immediately above the title block.

861.8. **Machinery Installation Procedures.** The Contractor shall submit a detailed written installation procedure for all machinery components. The procedure shall include sequence of installation, alignment methods, alignment tolerances, bolt tightening methods and torque values for all bolts. Resumes for all supervising Engineers and millwrights associated with machinery installation and alignment shall be included with the written installation procedure.

The installation procedure must demonstrate to the Fabrication Engineer that the Contractor has full knowledge of machinery connections and alignment procedures and that the work will be performed by qualified millwrights. Installation of the machinery shall not begin until a procedure and resumes have been submitted by the Contractor that are satisfactory in the sole opinion of the Fabrication Engineer. The Contractor shall correct and resubmit the procedure and/or submit resumes for alternate personnel as necessary to the satisfaction of the Fabrication Engineer. This resubmission procedure, if required, shall not be considered cause for delay.

This item shall also encompass procedures for shop assembly of items which are to be shipped to the field as an assembled unit.

861.9. **Operating, Maintenance, and Lubrication Manuals.** The Contractor shall provide an Operating, Maintenance and Lubrication Manual for all new components meeting the following requirements:

- 3 preliminary copies of the Manual shall be submitted prior to shipment of machinery to the site. The preliminary manual shall be complete in all respects with regard to material content, organization and legibility for review by the Fabrication Engineer. Preliminary copies need not comply with presentation requirements

including paper weight, paper reinforcement and protection including oil, moisture and wear resistant covers, and copy method.

- 6 final copies of the Manual shall be submitted after the machinery is in operation. The final manual shall incorporate all of the Fabrication Engineer's comments on the preliminary manual and all field changes made during construction and installation. Final copies shall comply with all presentation requirements to ensure permanence of the manuals.
- Manufacturer's operating and maintenance manuals shall be included giving complete instructions relative to assembly, installation, operation, adjustment, lubrication, and maintenance, and carrying complete parts lists for every item of equipment furnished by the Contractor.
- Manuals may be manufacturer's standard publications provided that they comply with specified requirements relative to quantity and quality of information and data.
- Manuals shall be in hard or flexible covers. Illustrations shall be clear. Printed matter, including dimensions and lettering on drawings, shall be easily legible. If reduced drawings are incorporated into the manuals, the original lines and letters shall be darkened if necessary to retain their legibility after reduction. Larger drawings (not to exceed 11" x 17") may be folded into manuals to page size.

Contents of Manuals.

- Table of contents, in numerical order.
- Index, in alphabetical order.
- Manufacturer's literature describing each piece of equipment and giving manufacturer's model number and drawing number.
- Span operation instructions, including step by step details for preparation for opening, opening procedures, closing procedures, conclusion procedures, and emergency procedures.
- Sequence of operation and how each component and interlock affects the operation of other components.
- Schematics that show all components of the entire operating machinery system that require lubrication. Include also on the charts, the type and frequency of lubrication.
- Copies of all approved machinery installation procedures.
- Copies of all assembly, erection and shop drawings. These drawings shall be included "as built" in the final version of the manual.
- Complete details and procedures for adjusting all items that have adjustments to compensate for wear.
- Steps for cursory inspection that should be carried out annually.
- Steps for semi-in-depth inspection that should be carried out every 2 years.

- Steps for in-depth inspection that should be carried out every 5 years.
- List of parts and suppliers that are to be furnished as part of the Contract.
- List of nearest local suppliers of all equipment parts.
- Name, address and telephone number of the local manufacturer's representative and service company for each piece of equipment so that prices or spare parts can easily be obtained.

The arrangement of the Manual and method of binding shall be submitted to the Fabrication Engineer for approval prior to submittal of the preliminary copy.

The covers and title page shall be neatly imprinted with a descriptive title and shall contain the name of the bridge, owner, and location. The title page shall also contain the names of the Fabrication Engineer, the Contractor, and the date of issue. Divider pages with tabs shall separate the various sections which comprise the Manual. All parts and supplier information shall be correct for the equipment provided under this Contract. If standard parts drawings are used, they shall be modified to be suitable, and irrelevant material shall be blocked out. All general information used as text shall be modified where necessary to show pertinence to the equipment furnished under this Contract, and irrelevant material shall be removed.

The approved lubrication diagram(s) used in the manual shall be reproduced to a size not to exceed 11 in. by 17 in. and shall be complete and legible in all respects. The diagrams shall be made on white paper and vacuum sealed in transparent plastic material impervious to moisture and oil, and resistant to abrasion. Other formats which are equal in clarity, sharpness, durability and permanence will be considered.

Materials for Manual. The Manual shall be prepared from the following materials:

- Loose leaf, minimum 20 lb. punched paper with plastic reinforcement strips.
- Page size, 8-1/2 inches by 11 inches.
- 11”x17” fold out diagrams and illustrations shall be provided as needed, at the sole discretion of the Department.
- Reproducible by dry copy xerography method.
- Oil, moisture and wear resistant, D-ring binders. Binder thickness shall be appropriate for the amount of material contained within.
- A complete copy of the O&M manual shall also be submitted as an electronic copy to the Department for review and approval. The submittal shall be an assembled PDF (or multiple files, depending on the size).

862. CONSTRUCTION REQUIREMENTS

862.1. **Construction Details.** The Contractor shall supply all apparatus, tools, devices, materials and labor to manufacture, ship, install, erect, align, adjust, lubricate, test, and paint, the

new span drive machinery, live load rollers, end jack machinery, end seat machinery, and fully closed end stop as provided herein and on the Contract Plans. Any apparatus, tools, devices, materials and labor incidental to the work, but not specifically stated or included, which may be necessary for the work, shall be furnished by the Contractor at no additional cost to the Department. The Contractor shall coordinate and schedule work to suit requirements of the Department and the Coast Guard, as directed and approved by the Department.

All construction work shall be subject to inspection per the requirements of General Quality Assurance identified in section 1.6 of this Special Specification.

862.2. **Delivery, Storage, and Handling.** All machinery, materials, and items related to the mechanical work shall be properly protected for shipment and storage, and shall meet the following minimum requirements.

All finished metal surfaces and unpainted metal surfaces that would be damaged by corrosion, shall be coated as soon as practical after finishing with a protective coating. This coating shall be removed from all surfaces prior to lubrication for operation and from all surfaces prior to painting after erection.

The Contractor shall inspect and maintain the exposed unpainted metal surfaces on a minimum of a monthly basis or more frequently as warranted. This shall include manually operating components that have internal lubrication to ensure redistribution and application of the lubricant to the internal components.

Assembled units shall be mounted on skids or otherwise crated for protection from weather, dirt and all other injurious conditions during shipment and storage as approved by the machinery manufacturer. The Contractor shall submit advance information as to methods and materials that will be used for protection for approval by the Department.

After shipment form the manufacturer, all machinery items shall be stored at a location to be designated by the Contractor and shall be arranged to permit easy access for inspection and identification. Material shall be stored in a building in a manner that will cause no distortion or damage. No outdoor storage of machinery components shall be used regardless of the methods of protection provided.

Any damage that occurs to the machinery components as a result of improper protection during shipment or storage shall be corrected by the Contractor to the satisfaction of the Department and at no additional cost to the Department.

862.3. **Workforce Qualifications.** Only individuals of high competence shall be utilized to perform the work required by this Contract. Competence shall be evaluated through the following criteria:

Supervising Personnel. The installation and adjustment of all mechanical work shall be supervised and directed by foremen and supervising engineers who shall be on-site on a daily basis while work is on-going. Personnel proposed for this role shall have a minimum installation experience of two (2) movable bridge machinery projects. Evidence of experience shall be submitted in resume format to the Department for approval and shall include the following:

1. Description of movable bridge machinery projects to include the type of bridge and type and size of mechanical machinery drives associated with the project.
2. Duration of each project including start and completion dates.
3. Position held for each project.
4. Location of each project.
5. References, including names and current contact information for each project.

Workforce. The installation and adjustment of all mechanical work shall be performed by millwrights experienced in this class of work. The installation and alignment of machinery shall not be done by workers of any trade other than the millwright trade. The millwrights shall have a minimum of five (5) years of experience in the wide range of skills typically associated with the millwright profession. The workers' experience shall include disassembly, installation, and precise alignment of bearings, shafts, gearing and other mechanical machinery of similar size to the machinery to be worked on or supplied under this Contract. In addition, the workers shall have demonstrated experience with the tools and equipment typically associated with this type of work. Evidence of experience shall be submitted in resume format to the Department for approval and shall include the following:

1. Description of applicable projects over a five (5) year period, to include types and size of mechanical machinery associated with the project.
2. Duration of each project including start and completion dates.
3. Position held for each project.
4. Location of each project.
5. References, including names and current contact information for each project.

Any evidence indicating that the relevant aspects of the work for one (1) or more of the projects submitted as experience was not performed by the candidate or that the work was not performed to the satisfaction of the owner/reference will be cause for rejection. The mechanical work shall be conducted only by personnel who have been approved by the Department.

862.4. **Machinery Demolition.** All existing mechanical and hydraulic machinery that is removed shall be removed and disposed of except where provided otherwise on the Contract Plans. It is the contractor's responsibility to dispose of machinery and associated items in accordance with applicable laws and regulations.

Refer to the Contract Plans for additional information related to the existing mechanical and hydraulic machinery systems and components that are to be removed. This will include but not be limited to:

- Existing span drive motors, brakes and their support mounts.
- Existing center wedge machinery system in its entirety.
- Existing end wedge machinery system in its entirety.
- Existing end jack machinery system in its entirety.
- Existing hydraulic system and controls used to operate and control the existing center wedges, end wedges and end jacks in its entirety. The Contractor is being made aware that many of the control system components are located in the control house on top of the swing span.

862.5. **Machinery Installation.** Installation work shall not commence until all required components have been manufactured and approved for installation, all required procedures and schedules have been approved and preparations by others where required have been satisfactorily completed.

During installation, the Contractor shall lubricate all rotating and sliding parts of the new and existing machinery systems for the purposes of maintaining them in an operating condition and to prevent corrosion of the components. This will include but not be limited to:

- Existing span drive machinery.
- Existing center wedge and end wedge machinery and hydraulics.
- Existing end jack machinery and hydraulics.
- Existing center pivot.
- Existing balance wheel and track system.
- Existing open gearing (rack and pinions).
- New span drive machinery.
- New live load rollers.
- New end jack machinery.
- New end seat machinery.

For existing components, use lubricants as called for in the bridge's O&M Manuals. For new components, use lubricants recommended by the component manufacturer. Provide written manufacturer's recommendation for each new component lubricant for review and approval by the Department. The surfaces of all components that will rotate or slide relative to one another once assembled shall be lubricated prior to assembly. Any corrosion which should occur on machinery during the construction/installation period shall be removed and the surface returned to bare metal prior to applying fresh lubricant. Machinery disassembly may be required to facilitate this repair work if so directed by the Department. Where corrosion is extensive and cannot be removed without marring the base surface, or

where the machinery surface is marred by corrosive pitting, the component shall be returned to the shop for repair.

All mechanical components shall be erected, located, adjusted, leveled and plumbed to the position and tolerances as shown on the Contract Plans and in the approved construction submittals. Any mechanical components not erected to the specified tolerance will be rejected. Rejection shall be due cause for the Department to stop future work, which would be constructed using or with reference to these parts until such parts are properly aligned.

Final reaming of holes for turned bolts shall occur only after the Department's approval of the field alignment unless indicated otherwise on the Contract Plans.

862.6. **Machinery Alignment.** All components of standard manufacture (i.e., couplings, brakes, etcetera) shall be aligned to the tolerances specified by the manufacturer of that component. The manufacturer's recommended alignment tolerances for a new installation shall be the basis for alignment and shall be included in the relevant procedures.

All components of custom manufacture shall be aligned to the tolerances provided in these Contract Documents.

862.7. **Coordination.** The Contractor shall be responsible for the coordination of the machinery installation with all other aspects of the construction project. This coordination relates to the sequencing of work so that all machinery can be installed in a safe and effective manner. Certain sequences of installation may be required in order to ensure that all items can be installed on the bridge. The sequences of installation shall be included in the Contractor's written installation procedures for the machinery components.

863. SPECIFIC MACHINERY INSTALLATION REQUIREMENTS

863.1. **General.** This section addresses machinery installation requirements that are not covered elsewhere in these Special Provisions.

863.1.1. **Operation.** The machinery shall not be operated with any new span drive machinery at full speed until the installation alignment requirements identified in this section, or in the manufacturer's literature for components not listed in this section, are met. The machinery shall be operated via manual operation, or at motor creep speed pending approval of the Department.

863.1.2. **Rack and Rack Pinion.** The alignment of the rack and rack pinion shall not be altered or changed without written approval from the Department. This restricts removal or relocation of the existing speed reducers.

863.1.3. **Plain Bearings.** Plain bearings will be considered properly aligned when the clearance is within the range of the fit required by the Contract Plans and the maximum taper between the bearing journal and bearing bushing is less than 0.001" across the length of the journal.

If bearing clearance measurements are not accessible, the bearings will be considered properly aligned when the bearing contact indicated by bluing the bearing journal is 80% or better.

863.1.4. **End Jacks.** The end jacks and their strike plates shall be installed and aligned so that the line of contact from the center of jack through the strike plate coincides with the web and stiffener tube of the support steel secured to the swing span. The components shall be installed to induce a nominal reaction of 40 kips plus any load induced by a temperature differential between the top chord and bottom chord of the truss. The calculated deflection to produce this load is 1/4" above the span's seated position at the end shoe location. The actual deflection to produce the 40 kip load shall be field verified prior to installation of the supports with calibrated jacks and/or load cells. The field measured values shall be reported to the Department for review along with the calibration certifications of the test equipment. If there is no appreciable deviation from the calculated value, the end seat, base and strike plate shall be installed to provide firm contact at all contact surfaces under this load. The end jacks shall be verified to exhibit firm contact with their strike plates around the full perimeter of their jack shoes under load. The end jacks and strike plates shall be installed to provide the specified clearance gap with the jack fully retracted and the swing span supported on its end seats and live load rollers.

863.1.5. **End Seats.** The end seat supports may be preliminarily positioned and installed at the Contractor's discretion. Final shimming and grouting of the end seat components shall not be performed until the final balance condition has been achieved and approved.

The end seat shoes, when driven and ready for roadway traffic, shall be located at the intersection of the end floor beams and the main trusses for each corner of the swing span, as shown on the Contract Plans. The vertical alignment of the roadway joint between the swing span and approach span shall not vary by more than 1/8" across the width of the roadway surface.

863.1.6. **Balance Wheels and Track.** After approval of the final balance condition, the balance wheels shall be adjusted to meet the following requirements: With the span properly balanced in the closed position, and the span free hanging (free of jacks and seats), the gap between each balance wheel and the track shall be 1/16". The variation in the clearance across the width of each balance wheel shall be 1/64" or less. Note that custom machined tapered shims may be necessary at the balance wheel support to achieve these requirements. Document the balance wheel clearances with the end seats in both the retracted and driven position as part of the documentation of the alignment.

863.1.7. **Live Load Rollers.** The live load rollers and strike plates shall be aligned so that the line of contact from the center of roller through the strike plate coincides with the center of the pivot girder web within 1/16". Scribe lines are to be provided on the strike plate and clevis to facilitate this alignment. The live load rollers shall be installed to produce firm contact

with their strike plates when the bridge is closed (to marine traffic) and the ends of the span are supported on their end shoes. The rollers shall exhibit contact across their full width. Document the contact between the live load rollers and strike plates for this condition.

863.1.8. **Fully Closed End Stop.** The span fully closed end stop is provided to guard against overtravel of the span during closing and to position the span at its fully closed position. The polyurethane bumpers shall be installed to contact the strike plate when the span is at its fully closed position. The control system will seat the bridge bumpers firmly against the strike plate during closed alignment of the span and wind-up of the span drive machinery. See the Electrical Special Provisions for additional information related to the bridge closing requirements. The vertical alignment of the strike plate with the bumpers as shown in the Contract Plans assumes that the span is balanced and not tilting in any direction. The clearance between the bumpers and the strike plate shall be shimmed to provide uniform contact across the full surface area of bumpers. The variation of the gap between the polyurethane bumpers and the strike plate shall be less than 1/16" at the mating surfaces when the swing span is at its nearly closed position, prior to making contact between the polyurethane bumpers and the strike plate.

864. FUNCTIONAL TESTING

864.1. **Prerequisites for testing.** Field testing shall be performed to demonstrate the functional performance of the machinery systems. Testing shall not commence until Contractor has demonstrated proper alignment of all machinery components to the Fabrication Engineer as indicated in these Special Provisions. The Contractor shall prepare and submit a functional testing procedure in accordance with the requirements of this Article to the Fabrication Engineer for approval.

864.2. **Span Drive Brakes.** Prior to operating the leaf after installation of the span drive machinery, the span drive brakes shall be electrically tested to verify proper function. The proper torque setting of the thrustor brake shall be physically verified with a calibrated torque wrench. Time delay settings for thrustor brakes shall be verified. The function of the limit switches and electrical interlocks shall be tested for proper function.

864.3. **Manual Operation.** Demonstrate proper mechanical functioning of the bridge in its fully constructed state by manually operating each of the end jack assemblies, end seat assemblies and the span drive machinery through one complete cycle.

864.4. **Electric Motor Operational Testing.** After meeting all of the requirements of the Contract Plans and the Special Provisions with regard to machinery installation, alignment, and bridge balance, the swing span shall be operated through no less than five (5) consecutive opening cycles to demonstrate proper mechanical functioning of the bridge in its fully constructed state. Each opening cycle shall comprise operation of the swing span from the fully closed position with the span supported on the end seats to the fully open position and back to the fully closed position with the span supported on the end seats; operations shall be conducted at normal operating speed. Throughout this testing all mechanical

components shall be monitored for any abnormal movement, vibration, noise or heating. Any noted deficiencies shall be corrected by the Contractor to the satisfaction of the Fabrication Engineer at no cost to the Department. Any such deficiencies shall be cause to re-initiate the Functional Testing following the correction of such deficiencies.

864.5. **Emergency Stop Testing.** Emergency stop tests shall be performed with the span moving at 25%, 50%, 75% and 100% of full speed. Throughout this testing all mechanical components shall be monitored for any abnormal movement, vibration, noise or heating. Strain gage testing (as noted below) shall be performed as part of the emergency stop testing. Any noted deficiencies shall be corrected by the Contractor to the satisfaction of the Fabrication Engineer at no cost to the Department. Any such deficiencies shall be cause to re-initiate the Functional Testing following the correction of such deficiencies.

864.6. **Strain Gage Testing.** Strain gage testing of the span drive machinery shall be performed in conjunction with the start-up and commissioning of the drive machinery. The testing shall be required a minimum of two times: once at the initial operation of the bridge via the rehabilitated span drive machinery and control system start-up, and a second time at the commissioning of the bridge with the electric drive at which time the emergency stop testing shall also be performed. The objective of the testing is to ensure that the mechanical machinery is not experiencing high or abnormal loading during operation, to document the friction at the center bearing, to confirm acceptable control of the span via the electric drive, and to provide a baseline recording of the system loads in their as-accepted state for future reference. Any loading that cannot be readily explained through the normal operating principle of the bridge (whether due to excessive friction, localized load spikes, fluctuating loads produced by the electric drive, etc.) shall be investigated and corrected, and shall require additional testing to verify the repairs.

864.6.1. **Strain Gage Test Qualifications**. Strain gage testing shall be performed under the direct supervision of a Professional Engineer licensed in the State of Maine who has prior hands-on experience with strain gage testing of movable bridges, as demonstrated by successful completion of operational testing at a minimum of six (6) movable bridges at least two (2) of which are swing span bridges.

Two (2) strain gages shall be mounted on each speed reducer output shaft. The gages shall be mounted back-to-back (i.e. spaced 180 degrees circumferentially on the shaft) and wired in a Wheatstone bridge configuration so as to measure torsion only. After the gages are installed they shall be protected in accordance with the strain gage manufacturer's recommendations.

The gages shall be connected to a recording device capable of providing real time display as well as a permanent record of the strain in the shaft versus span position. The span position shall also be monitored and recorded to an accuracy of at least one (1) degree of rotation of the swing span. The output for the span position shall be recorded simultaneously and on the same device with the operating strain. Data shall be recorded for three (3) complete bridge operations for each test period as well as for each of the four (4) emergency stop tests.

The data acquisition equipment shall have an active real-time display and shall be set up to display strain as a percentage of full load motor torque. The operating loads shall be actively monitored in the field throughout the two specified testing periods to ensure that there are no sustained loads in excess of full load motor torque. Sustained loads in excess of full load motor torque will be basis for halting the testing and investigating the source of the loads.

Using the recorded strain data, prepare calculations to determine the coefficient of friction for the center bearing.

864.6.2. **Strain Gage Test Procedure Requirements**. A complete test procedure along with the resume of the Engineer conducting the tests shall be submitted for approval prior to the testing. The test procedure shall include the following:

1. Prior strain gage test experience
2. Test method
3. List of equipment to be used
4. Gage protection endorsed by gage manufacturer for long term protection of the gage installation
5. Calculations for relating strain in the instrumented shaft to 100% full load torque of the drive motor and for determining center bearing friction coefficient.
6. A figure depicting the location of the strain gages
7. Report format

864.6.3. **Strain Gage Test Report Requirements**. After completion of each strain gage test, the Contractor shall submit a formal report signed and sealed by the Professional Engineer who conducted the tests. The report shall include the following:

1. Introduction
2. Test procedure and equipment
3. Method of analyzing recorded data
4. Presentation of operating loads relative to full load motor torque and discussion of any notable events during the testing
5. Presentation of center bearing friction calculation results
6. Strip charts of the raw strain data and span position against a time-based scale for each of the three (3) test runs for each test period, as well as for each of the four (4) emergency stop tests when performed.
7. Strip charts of the data presented as a percentage of full load motor torque against a time-based scale for each of the three (3) test runs for each test period, as well as for each of the four (4) emergency stop tests when performed.
8. The raw data files in electronic format. The files shall be annotated to identify the appropriate channels and units of measure.

865. WARRANTIES

865.1. **Assignment of Other Warranties.** Contractor hereby assigns to the Department any and all manufacturer's or other seller's warranties that come with any products, material or supplies which are incorporated into or are consumed in the project in any way. To the extent that any such warranties do not extend to subsequent purchasers or owners or such warranties contain a limitation on assignment, Contractor agrees that Contractor purchased the products, materials and supplies on behalf of the Department with the intent that the Department be the intended recipient of any warranties. All documents associated with or describing any such warranties shall be delivered to the Department along with the other project final acceptance documents and shall be deemed to be a part of the required final acceptance documentation. Contractor shall not take any action or fail to act in any way which voids any such warranties. All subcontracts shall contain a similar provision which requires subcontractors to assign any such warranties to the Department.

865.2. **General Warranty Provision.** In addition to any warranties implied by law and to any manufacturer's or distributor's warranties assigned to the Department, the Contractor hereby warrants that all work identified in these Special Provisions and the associated Contract Plans shall conform to all samples and shop drawings provided and shall be free from defects in materials and workmanship for a period of 1 year following the date of final acceptance.

This warranty shall apply to each component of any assembly and to any assembly as a whole. In the event a defect, malfunction or other failure not caused by misuse or third-party acts not contemplated occurs during the warranty period, Contractor shall repair the warranted item if repair can be made on site within a reasonable time from receipt of notice of the occurrence. If repair cannot be made within a reasonable time frame from receipt of notice of the occurrence, Contractor shall replace the warranted item on site within a reasonable time from receipt of notice of the occurrence. In determining a reasonable time for repair or replacement, matters unique to the Contractor, such as office location or availability of personnel, shall not be considered. In the event that The Department determines that public health, safety, or welfare requires temporary measures to continue safe functioning of the facility of which the warranted item is a part, Contractor shall provide temporary items or take other temporary measures as the Department deems necessary. All repairs, replacements, and temporary measures shall be at the sole cost and expense of the Contractor, without any charge to the Department. If the Contractor fails to comply with Contractor's obligations under this warranty, Contractor shall be liable to The Department for all damages associated with the Contractor's breach hereof and damages associated with the initial occurrence from the date of the occurrence. Damages shall include, but shall not necessarily be limited to, costs incurred in repairing or replacing warranted items, as well as incidental and consequential damages suffered by the Department.

866. METHOD OF MEASUREMENT

This Item will be measured by the Lump Sum for the various items of work listed.

867. BASIS OF PAYMENT

The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid at the unit price bid for the following Items of work. The bid price for each item shall be full compensation for supplying, testing and installing each Item and furnishing all labor, equipment, tools, and incidentals to complete the work.

The progress of payments and payment percentage shall be made in accordance with the Department standards.

Payment will be made under:

Pay Item		Pay Unit
202.27	Existing Machinery Removal and Demolition	Lump Sum
860.231	Span Drive Machinery	Lump Sum
860.1851	Live Load Rollers	Lump Sum
860.1863	End Jack Assemblies	Lump Sum
860.1864	End Seat Assemblies	Lump Sum
860.1865	Fully Closed Stops	Lump Sum
860.187	Miscellaneous Mechanical Repairs	Lump Sum
860.30	Functional Testing	Lump Sum

SPECIAL PROVISION
SECTION 880
Bridge Balancing

880.1. **Description.** The Contractor shall perform all work necessary to balance the swing span as described herein. This work shall comprise developing complete balance calculations, balance testing and making balance adjustments of the swing span.

880.2. **Balance Calculations.** The Contractor shall submit balance calculations as specified herein to the Department for review and approval. A Professional Engineer licensed in the State of Maine shall perform the balance calculations and shall sign and seal the calculation submittal.

Balance calculations shall be prepared prior to any work being performed that affects the balance condition of the movable span. The balance calculations shall include all materials and components that are removed or installed, that affect the balance condition of the movable swing span. Balance calculations for removed items and components shall be based on existing as-built plans and shop drawings. The calculations shall be updated using field verified weights for the existing roadway grating. Balance calculations for new components shall be based on approved shop drawings and material tests.

The balance calculations shall account for distribution in the longitudinal and transverse directions. Compute weights of individual components to the nearest 0.1 lb. accuracy. Summarize weights of assemblies to the nearest 1.0 lb. accuracy. Summarize swing span weight to the nearest 0.1 kip accuracy. Compute the quantity and location of balance material required to meet the specified balance requirements. The balance calculations shall be summarized in a functional balance spreadsheet in MS Excel format that shall be used to monitor the movable balance throughout construction.

A narrative shall be included with the outline of the proposed phasing, the duration of the imbalance condition, and all other aspects of the work in accordance with the approved construction schedule. The spreadsheet shall be organized into logical groupings that follow the Construction Staging.

The balance calculations shall provide discrete inputs for each component and subcomponent and shall summarize the overall balance in both the longitudinal and transverse directions for comparison to the balance acceptance criterion provided herein.

The balance calculations and spreadsheet shall be updated by the Contractor throughout construction and shall be submitted to the Department for each Construction Stage and upon request by the Department. It shall be the Contractor’s responsibility to provide temporary bracing and supports and/or temporary balance material as required to stabilize the swing span during construction. Review of the balance calculations, counterweight details, and quantity and location of balance material does not relieve the Contractor from

making such changes in the counterweight and balance material as deemed necessary to safely balance the movable span. All changes shall be submitted to the Department for approval.

880.3. **Balance Testing.** The Contractor shall perform balance testing of the swing span longitudinally and transversely about the center pivot at least five (5) times using hydraulic jacks. Those times are:

1. Baseline Balance Testing: This test shall be performed prior to any work being performed that affects the balance condition of the existing movable span.
2. Stage 1 Construction: This test shall be performed after the completion of the Stage 1 Construction activities (removal of north side roadway grating and sidewalk, installation of north side roadway grating and temporary stringers).
3. Stage 2 Construction: This test shall be performed after the completion of the Stage 2 Construction activities (removal and replacement of south side roadway grating.
4. Stage 3 Construction: This test shall be performed after the completion of the Stage 3 Construction activities (removal of temporary stringers, installation of sidewalk).
5. Final Balance Testing: This test shall be performed after the completion of all construction activities which affect the balance condition of the rehabilitated movable span.

There will also be an operational balance test after Final Balance Testing has been performed and completed to visually confirm smooth operation of the movable span. The movable span shall be considered operationally balanced if it travels from its fully closed, to fully open and back to fully closed position with no balance wheel(s) coming into consistent contact with the balance track for more than one third of the movable span's rotation in either direction of operation.

A detailed balance procedure sealed by a Professional Engineer licensed in the State of Maine shall be submitted to the Department for review at least six weeks prior to performing the Baseline Balance testing of the movable span. The following procedure is offered for the Contractor's consideration. The Contractor is advised that the procedure offered below demonstrates a method of balancing the bridge but is not complete in all respects. The Contractor's procedure shall include a complete description of all equipment and methods to be employed. The Contractor may submit an alternate procedure for review. Alternate procedures will be reviewed and accepted or rejected at the sole discretion of the Department.

The Contractor is solely responsible to build up members and provide any temporary stiffeners needed for balance jack testing in order to not damage any existing structural members or components. Any damage to existing structural members or components shall be repaired to the satisfaction of the Department and at no additional cost to the Department.

880.3.1. **Longitudinal Balance Jack Test Procedure.** The following procedure may be used to determine the longitudinal balance:

1. Allow the center pivot to be the sole supporter of the swing span by removing any blocking that is in place, removing the shoes for the live load roller strike plates (if installed) and withdrawing the end shoes (if they have been installed). As the supports are released observe the span to note which direction it tilts.
2. Jack the bridge using two hydraulic jacks on the north or south side of the center pivot, whichever side has the least clearance at the balance wheels. The jacks should be the same distance from the center pivot. Connect the two jacks so that the pressure to each jack is the same. Jacks shall be equipped with load cell indicators or calibrated pressure gauges. If the jacks are placed on the rest piers (Pier No. 1 and Pier No. 3), the accuracy resolution shall be +/-25 pounds or better at each jack. If the jacks are placed on the center pier (Pier No. 2), the accuracy resolution shall be +/-150 pounds or better at each jack.
3. Jack the bridge until one of the balance wheels on the opposite side of the center pivot from the jacks just contacts the balance wheel track. Dial indicators may be used to monitor movement.
4. Release the pressure in the jacks and determine if the bridge remains in the jacked position or returns to the position prior to jacking.
5. If the bridge returns to the position prior to jacking then the span is out of balance in the longitudinal direction. If the span does not return to its original position proceed to Step 9.
6. Drive the end seat shoes, or install blocking to secure bridge for the purpose of adding weight to the bridge.
7. Add weight at the side of the bridge opposite from the jacks. Weights may be placed on the deck in-line with the end floor beams for testing purposes.
8. Repeat Steps 1 through 7 until the span does not return to its original position after jacking. For every successive cycle, use additional weight to the weight used in previous cycle. Total weight shall be added permanently in the new balance pockets at the appropriate corner(s) of the movable span per the Balance Engineer's recommendation and as approved by the Department.
9. Jack the bridge from the low side (side with balance wheel in contact) with a dial indicator positioned to indicate movement of the pivot girder in the vicinity of the existing center wedges or new live load rollers on the opposite side of the center pivot from the jacks. Dial indicator to be on longitudinal centerline of the bridge. Determine the force required to initiate movement. Record this value as F_{east} or F_{west} accordingly.
10. Jack the bridge until the balance wheels opposite the jacks just contact the balance wheel track.
11. Jack the bridge from the opposite side with a dial indicator positioned to indicate movement of the pivot top casting of the opposite side of the center pivot from the

jacks. Dial indicator to be on longitudinal centerline of the bridge. Determine the force required to initiate movement of the pivot top casting. Record this value as F_{east} or F_{west} accordingly.

12. Determine the imbalance force at the east side using the following equation:

$$F_{ie} = F_{west} - \left(\frac{F_{east} + F_{west}}{2} \right)$$

13. Determine the required weight change at the east side of the bridge using the following equation:

$$W_{east} = \frac{F_{ie} \cdot d}{D}$$

Where,

F_{ie} = Imbalance force east (from Step 12).

d = Distance to jacks along longitudinal axis of bridge.

D = Distance to added weight along longitudinal axis of bridge.

W_{east} = Weight change at east end of bridge. If W_{east} is negative, remove weight from east end of bridge or add weight to west end of bridge. If W_{east} is positive, add weight to east end of bridge or remove weight from west end of bridge.

880.3.2. **Transverse Balance Jack Test Procedure.** The following procedure may be used to determine the longitudinal balance:

1. Allow the center pivot to be the sole supporter of the swing span by removing any blocking that is in place, removing the shoes for the center live load support (if installed) and withdrawing the end lifts (if they have been installed). As the supports are released observe the span to note which direction it tilts.
2. Jack the bridge using two hydraulic jacks on the east or west side of the center pivot, whichever side has the least clearance at the balance wheels. The jacks should be the same distance from the center pivot and located on the center pier (Pier No. 2). Identify the proposed jack location in the procedure for review. Connect the two jacks so that the pressure to each jack is the same. Jacks shall be equipped with load cell indicators or calibrated pressure gauges. If the jacks are placed on the rest piers (Pier No. 1 and Pier No. 3), the accuracy resolution shall be +/-25 pounds or better at each jack. If the jacks are placed on the center pier (Pier No. 2), the accuracy resolution shall be +/-150 pounds or better at each jack .
3. Jack the bridge until one of the balance wheels on the opposite side of the center pivot from the jacks just contacts the balance wheel track.
4. Release the pressure in the jacks and determine if the bridge remains in the jacked position or returns to the position prior to jacking.

5. If the bridge returns to the position prior to jacking then the span is out of balance in the transverse direction. If the span does not return to its original position proceed to Step 9.
6. Drive the end seat shoes, or install blocking to secure bridge for the purpose of adding weight to the bridge.
7. Add 3000 lb. weight at the side of the bridge opposite from the jacks. Weights may be placed on the deck in-line or adjacent to the truss.
8. Repeat Steps 1 through 7 until the span does not return to its original position after jacking. For every successive cycle, use 1500 lb. additional weight to the weight used in previous cycle. Total weight shall be added permanently at that side of the bridge as directed by the Balance Engineer.
9. Jack the bridge from the low side (side with balance wheel in contact) with a dial indicator positioned to indicate movement of the pivot top casting on the opposite side of the center pivot from the jacks. Dial indicator to be on transverse centerline of the bridge. Determine the force required to initiate movement. Record this value as F_{north} or F_{south} accordingly.
10. Jack the bridge until the balance wheels opposite the jacks just contact the balance wheel track.
11. Jack the bridge from the opposite side with a dial indicator positioned to indicate movement of the pivot top casting of the opposite side of the center pivot from the jacks. Dial indicator to be on transverse centerline of the bridge. Determine the force required to initiate movement of the pivot top casting. Record this value as F_{north} or F_{south} accordingly.
12. Determine the imbalance force at the south end using the following equation:

$$F_{is} = F_{north} - \left(\frac{F_{south} + F_{north}}{2} \right)$$

13. Determine the required weight change at the south end of the bridge using the following equation:

$$W_{south} = \frac{F_{is} \cdot d}{D}$$

Where,

F_{is} = Imbalance force south (from Step 13).

d = Distance to jacks along transverse axis of bridge.

D = Distance to added weight along transverse axis of bridge.

W_{south} = Weight change at south end of bridge. If W_{south} is negative, remove weight from south end of bridge or add weight to north end of bridge. If W_{south} is positive, add weight to south end of bridge or remove weight from north end of bridge.

880.3.3. **Target Imbalance.** The final balance condition of the swing span shall provide an imbalance condition that produces an imbalance load less than 2500 lbs. per balance wheel at all angles of operation, from fully closed, to fully open, and back to fully closed. Additionally, no balance wheel shall be in contact with the balance track for more than one third of the movable span operational cycle.

880.3.4. **Construction Imbalance.** The intent of the balance calculations is to ensure that the imbalance load at the balance wheels is less than 2500 lbs. per balance wheel during construction. The results of the balance testing shall be used to calculate the adjustments needed to maintain the movable span within the imbalance within the limits of system friction.

Balance measurements and weight changes shall be repeated until the balance target has been met. The swing span shall be rotated for one complete operation, from fully closed, to fully open, and back to fully closed between successive weight changes in order for the effect of the weight change to manifest itself. Therefore, the balance testing will be an iterative process.

880.3.5. **Temporary Balance Conditions.** The Contractor shall maintain an operational balance condition at all times during which the swing span is required to be operational for the passage of marine traffic, and during any other time for which the movable span is required to be operated. At times for which the movable span is not required to be operational, the Contractor shall maintain a balance condition that secures and supports the swing span for the safe passage of vehicular roadway traffic, with no damage to the movable span. Any damage that occurs to the swing span due to an over-stressed or other condition shall be corrected by the Contractor to the satisfaction of the Department, at no additional cost to the Department. Intermediate Balance Calculations shall be submitted for review by the Department for any balance condition for which the Contractor operates the movable span.

The Contractor shall provide, install, and remove any balance materials required to maintain the specified balance conditions. As a minimum, temporary balance materials will be required during the period for which the temporary stringers are installed.

880.3.6. **Operational Balance.** Once the span can be operated, an operational balance test shall be performed which shall consist of observing the span during operation to determine if there is a tendency for the span to tilt in one direction for the range of movement. If this is the case, additional weight shall be added until the span does not tilt (i.e. there is only intermittent contact at the balance wheels) when the span drive rack pinion is unloaded. In the event that the center pivot friction is small and it is difficult to obtain this condition, it is also acceptable to demonstrate that a small amount of imbalance will cause the span to tilt in the opposite direction.

880.3.7. **Balance Blocks.** 6,000 pounds of new steel counterweight blocks are to be furnished as part of the balance work. Balance blocks shall conform to existing balance block dimensions, weights and materials. Alternate balance materials may be proposed for review by the Department. In no case shall an individual balance block weigh less than 35

pounds or more than 50 pounds. All balance materials not installed shall become the property of the Department. The Contractor shall deliver all uninstalled balance blocks to the Maine DOT maintenance garage located at 386 Rockland Rd., Washington, ME 04574.

880.3.8. **Balance Pocket Grating.** The Contractor shall furnish and install open steel grating for balance blocks as shown on Structural Plans. Grating shall be the standard product of an established manufacturer and shall utilize a minimum of 1-1/2" x 3/16" main bars. The grating shall be secured to the bottom flanges of the roadway stringers through the use of four (4) bolts and clips. No welding of the grating or stringers will be permitted. Grating and hardware shall be galvanized. Submit grating and method of securing grating to stringers to the Department for review and approval. The grating procurement, fabrication and installation work shall be considered incidental to Pay Item 880.031 "Balance Block Steel".

880.4. **Method of Measurement.** This item will be measured by the Lump Sum for the various items of work indicated.

880.5. **Basis of Payment**

The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid at the unit price bid for the following Items of work. The bid price for each item shall be full compensation for supplying, testing and installing each Item and furnishing all labor, equipment, tools, and incidentals to complete the work.

The progress of payments and payment percentage shall be made in accordance with the Department.

Payment will be made under:

Pay Item		Pay Unit
880.02	Bridge Balancing	Lump Sum
880.031	Balance Block - Steel	Lump Sum

SPECIAL PROVISION
SECTION 910 – Special Work
STAFF GAUGES

910.01 Description

This item shall include furnishing and installing aluminum sign panels and gauges and structural supports as shown on the Contract Plans. The Contractor shall verify and confirm the actual clearance of the bridge in accordance with the United States Coast Guard Bridge Permit Application Guide (COMDTPUB P16591.3B), Chapter 2, Section I "Clearance Gauges".

The "Nominal Day Visibility" shall be 500 to 750 feet.

910.02 Materials

Reflective Sheeting shall meet the requirements of section 719.01.

Black Numerals and Footmarks meeting the requirements of USCG COMDTPUB P16591.3B.

The aluminum sheets shall meet the requirements of section 719.03.

All bolts, nuts and washers shall be stainless steel.

The 10x10 posts shall be composite marine timber, and shall be manufactured from a recycled plastic matrix with glass fiber reinforcement bars, and shall be non-polluting. The 1010 section shall have a height and width of 10", shall contain 4 reinforcing bars, shall have a yield strength in each direction of 3440 psi and a weight no greater than 35 plf. The color shall be black or as approved by the Resident.

910.03 Construction Methods

The Staff Gauges shall be fabricated as shown on the Plans. Show Drawing shall be provided in accordance with Section 105.7. The clearance gauges shall be visible to mariner at the locations shown on the Plans. After attachment to the pile, the gauge shall be adjusted vertically to properly indicate the clearance to the "low steel" as slated in USCG COMDTPUB P16591.3B.

910.04 Method of Measurement

The work will be measured by the lump sum and shall be payment for all materials, labor, and equipment needed to furnish and install item "Special Work – Staff Gauges".

Pay Item	Pay Unit
910.301 Special Work – Staff Gauges	LS

July 08, 2022
Supersedes June 10, 2022

2020 STANDARD DETAIL UPDATES

Standard Details and Standard Detail updates are available at:
http://maine.gov/mdot/contractors/publications/standarddetail/

Detail #	Description	Revision Date
502(19)	Bridge Drains	12/08/2021
507(20)	Steel Approach Railing 3-Bar	2/11/2021
507(21)	Steel Approach Railing 3-Bar	2/11/2021
507(22)	Steel Approach Railing 3-Bar	2/11/2021
507(23)	Steel Approach Railing 3-Bar	2/11/2021
507(27)	Steel Approach Railing	2/11/2021
526(01)	Portable Concrete Barrier	1/14/2021
526(01A)	Portable Concrete Barrier	1/14/2021
526(01B)	Portable Concrete Barrier	1/14/2021
526(02)	Portable Concrete Barrier	1/14/2021
526(02A)	Portable Concrete Barrier	1/14/2021
526(03)	Portable Concrete Barrier	1/14/2021
526(04)	Portable Concrete Barrier	1/14/2021
526(04A)	Portable Concrete Barrier	1/14/2021
526(04B)	Portable Concrete Barrier	1/14/2021
603(10)	Concrete Pipe Ties	6/10/2021
605(01)	Underdrain	7/8/2022
605(01)	Underdrain Notes	7/8/2022
606(17)	Midway Splice Guardrail Transition	6/10/2022
606(23)	Standard Bridge Transition – Type “1”	2/11/2021
606(24)	Standard Bridge Transition – Type “1A”	2/11/2021
608(02)	Detectable Warnings	6/10/2021
609(09)	Precast Concrete Vertical Curb	2/11/2021
627(07)	Crosswalk	2/22/2022
627(08)	Crosswalk	2/22/2022
643(11)	ATCC Cabinet	12/14/2020
801(11)	Pedestrian Ramp Notes	6/10/2021
801(12)	Pedestrian Ramp Requirements	8/13/2021
801(13)	Ramp Length Table	6/10/2021

801(14)	Parallel Pedestrian Ramp	6/10/2021
801(15)	Perpendicular Pedestrian Ramp – Option 1	6/10/2021
801(16)	Parallel Pedestrian Ramp – Option 2A	6/10/2021
801(17)	Perpendicular Pedestrian Ramp – Option 2A	6/10/2021
801(18)	Parallel Pedestrian Ramp – Option 2B	6/10/2021
801(19)	Perpendicular Pedestrian Ramp – Option 2B	6/10/2021
801(20)	Parallel Pedestrian Ramp – Option 3	6/10/2021
801(21)	Perpendicular Pedestrian Ramp – Option 3	6/10/2021
801(22)	Side Street Pedestrian Ramp	6/10/2021
801(23)	Parallel Pedestrian Ramp – Esplanade	6/10/2021
801(24)	Perpendicular Pedestrian Ramp – Esplanade	6/10/2021
801(25)	Island Crossings	6/10/2021
801(26)	Blended Transition	6/10/2021
801(27)	Pedestrian Ramp Adjacent to Driveway or Entrance	6/10/2021
802(05)	Roadway Culvert End Slope Treatment	1/03/2017

SUPPLEMENTAL SPECIFICATIONS
(Corrections, Additions, & Revisions to Standard Specifications – March 2020)

SECTION 101
CONTRACT INTERPRETATION

101.2 Definitions

Holidays Amend this paragraph by adding "**Juneteenth**" between 'Memorial Day' and 'Independence Day'.

SECTION 102
BIDDING

102.11 Bid Responsiveness Revise the paragraph that states
"The Bid is not signed by a duly authorized representative of the Bidder." So that it reads:

"**The Bid is not signed by a duly authorized representative of the Bidder.**
- **Properly submitted electronic bids meet this requirement.**
- **Paper bids must include at least one signed copy of the Contract Agreement Offer & Award form**."

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 105
GENERAL SCOPE OF WORK

105.10.2 Requirements Applicable to All Contracts Under section A, number 2, in the first sentence of the first paragraph, revise this Section by replacing the word "handicap" in two places with the word "disability" so it now reads:

"2) The Contractor will, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, State that all qualified applicants will receive consideration for employment without regard to race, color, sexual orientation, religious creed, sex, national origin, ancestry, age, physical disability, or mental disability."

SECTION 106
QUALITY

106.6 Acceptance Revise this Subsection by replacing the paragraph beginning with "Acceptance of Hot Mix Asphalt Pavement will be based" with:

"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 removing it and 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"

SECTION 107
TIME

107.3.1 General Amend this paragraph by adding "**Juneteenth**" between 'Patriot's Day' and 'the Friday after Thanksgiving'.

SECTION 108
PAYMENT

108.4.1 Price Adjustment for Hot Mix Asphalt Revise the first paragraph of this section by replacing the first sentence with the following:

"**For each Contract, a price adjustment for performance graded binder will be made for the following pay items, when the total quantity of Hot Mix Asphalt included in these items is in excess of 500 tons, based on the estimated quantities of these items at the time of bid."**

Amend this section by adding "**Item 461.2101 Polymer Modified 9.5 mm**" to the list of Pay Items that are eligible for a price adjustment. Also add "**Item 461.2101 - 6.4%**" to the list of Asphalt percentages.

SECTION 110
INDEMNIFICATION, BONDING, AND INSURANCE

110.3.9 Administrative & General Provisions Amend this subsection by adding "**Automobile Liability**" under letter A) Additional Insured to the list of exceptions.

SECTION 206
STRUCTURAL EXCAVATION

206.01 Description – *Structural Earth Excavation, Below Grade* delete the entire sentence and replace with "**shall consist of the removal of excavation required for unknown or unanticipated subsurface condition. See 206.04 – Method of Measurement for pay limits**."

206.04 Method of Measurement – Drainage and Minor Structures Paragraph 1, sentence 2, delete the remainder of the sentence beginning with "….provided the maximum allowable…"

And replace with: **"….in accordance with the following limits:"**

- **Vertical pay limits:**
  - **Below a plane parallel with and 12 inches below the bottom of the drainage or minor structure or**
  - **Below the excavation limits shown in the Bid Documents; whichever is greater.**

- **Horizontal pay limits – The maximum allowable horizontal dimensions shall not exceed those bounded by vertical surfaces 18 inches outside the base, or extreme limits of, the structure, and to the vertical neat lines of underdrain trenches, as shown in the Contract Documents.**

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: "

Section 502.1701, Quality Control, Revise Table 4 of this Subsection by removing it in its entirety and replacing it with:

TABLE 4
METHOD A & B MINIMUM QUALITY CONTROL TESTING REQUIREMENTS *

TEST	TEST METHOD	SAMPLING LOCATION	FREQUENCY
Gradation	AASHTO T-27 & T-11	Stockpile	One set per proposed grading before production. One set every 100 yd^3 (Min. 1 set per month)
Organic Impurities	AASHTO T-21	Stockpile	**Once per fine aggregate per year ****
% Absorption	AASHTO T-84 & T-85	Stockpile	Once per aggregate per year
Specific Gravity	AASHTO T-84 & T-85	Stockpile	Once per aggregate per year
Total Moisture in Aggregate	AASHTO T-255	Stockpile	One set per day's production
Free Water and Aggregate Wt.	N/A		One per day's production
% Entrained Air	AASHTO T-152	On Project	On first two loads and every third load thereafter provided consistent results are achieved
Compressive Strength	AASHTO T-22	On Project	One set per sublot
Compressive Strength	AASHTO T-22 @ 7days	On Project	One set per sublot

* Additional QC testing will be required any time a process change occurs during a placement, including changes in type or dosage of admixture. Additional testing shall include, but is not limited to, entrained air testing.

**** If the color produced is a laboratory designation Plate III, then the fine aggregate shall be tested once per month.**

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."**
(Also see 535.24 and 535.25 for related changes)

SECTION 503
REINFORCING STEEL

Section 503.07 Splicing Revise this section by removing the table and following footnote and replacing them with:

Minimum Lap Splice Length (inches)									
	Bar Size								
Bar Type	#3	#4	#5	#6	#7	#8	#9	#10	#11
Plain or Galvanized	16	20	24	29	38	47	59	72	85
Epoxy or Dual Coated	17	24	36	43	56	71	88	107	128
Stainless	19	24	30	36	47	59	73	89	107
Low-carbon Chromium	24	32	39	47	63	78	97	119	142

"**The minimum lap splice lengths in the table above are based on the parameters below. When any of these parameters are altered, appropriate minimum lap splice lengths will be as shown on the Plans.**

- **Normal weight concrete**
- **Minimum 28-day concrete compressive strength from 4,000 psi to 10,000 psi**
- **Class B tension lap splice**
- **Minimum center-to-center spacing between bars of 6 inches**
- **Minimum clear cover of 2 inches**
- **Nominal reinforcing steel yield strengths**
  - **Low-carbon Chromium = 100 ksi**
  - **Stainless = 75 ksi**
  - **All others = 60 ksi**
- **Reinforcement with yield strengths greater than 75 ksi shall have beam transverse reinforcement and column ties provided over the required lap splice length in accordancewith the current edition of the AASHTO LRFD Bridge Design Specifications**

When lap splices are placed horizontally in an element where the concrete depth below the splice will be 12 inches, or more, the indicated lap splice lengths shall be multiplied by a factor of 1.3."

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

523.051 Protective Coating Revise this subsection by removing the paragraph beginning with "Anchor rods shall be galvanized…" and replacing with:

"**Anchor rods shall be galvanized. When anchor rods are designated to secure bare unpainted steel or painted steel, a dielectric coating (epoxy or bituminous type coatings are acceptable) shall be applied to the anchor rod and/or adjacent steel to prevent contact between galvanized surfaces and painted or unpainted steel."**

523.22 Fabrication Amend this subsection by adding the following: "**Elastomeric Bearings shall be fabricated in accordance with AASHTO M251."**

SECTION 526
CONCRETE BARRIER

Amend this section by deleting it in its entirety and replacing it with:

"**526.01 Description This work shall consist of the furnishing, constructing, erecting, setting, resetting, and removal of concrete barrier and associated elements in accordance with these specifications, the Standard Details, and the lines and grades shown on the Plans or established by the Resident.**

The types of concrete barrier are designated as follows:

Portable Concrete Barrier Type I Double faced removable barrier in accordance with the Standard Details.

Permanent Concrete Barrier Type II Double faced barrier as shown on the Plans.

Permanent Concrete Barrier Type IIIa Single faced barrier 32 inches high in accordance with the Standard Details or as shown on the Plans.

Permanent Concrete Barrier Type IIIb Single faced barrier 42 inches high in accordance with the Standard Details or as shown on the Plans.

Permanent Concrete Transition Barrier Barrier of various heights joining steel bridge rail to steel guardrail in accordance with the Standard Details or as shown on the Plans.

Permanent Texas Classic Rail Barrier Traffic rail or sidewalk rail, in accordance with the Standard Details or as shown on the Plans.

526.02 Materials

a. Concrete Concrete for barriers, both permanent and portable, shall have a design strength of 5,000 psi.

For cast-in-place barrier: The concrete shall be Class LP, in accordance with Standard Specification Section 502, Structural Concrete.

For precast barrier: The concrete shall meet the requirements of Standard Specification 712.061, Structural Precast Concrete Units, except that the stripping strength for precast barriers is 4,000 psi.

b. Reinforcing Steel Reinforcing steel shall meet the requirements of Section 503, Reinforcing Steel.

c. Structural Steel Plates and barrier connections shall meet the requirements specified in Standard Specification 504 - Structural Steel and shall be hot dip galvanized after fabrication in accordance with Standard Specification 506, Shop Applied Protective Coating – Steel

d. Bolts Bolts shall meet the requirements specified in Section 713.02, High Strength Bolts.

e. Connecting Pins for Portable Concrete Barrier Portable concrete barriers must be connected using a 1- inch diameter pin. The connecting pin must be smooth, not deformed, i.e., reinforcing bar may not be used, and shall meet the strength requirements of ASTM A449 steel. Materials with greater strength may be used with the approval of the Department.

f. Anchor Pins for Portable Concrete Barrier Anchoring to concrete or asphalt will be required when specified on the Plans. When required, portable concrete barriers must be anchored using a 1 ½ - inch diameter anchor pin. The anchor pin must be smooth, not deformed, i.e., reinforcing bar may not be used, and shall meet the strength requirements of ASTM A36 steel. Materials with greater strength may be used with the approval of the Department.

g. Device Crashworthiness MaineDOT is transitioning to MASH2016 criteria for Portable Concrete Barrier on the following schedule:

New Portable Concrete Barrier shall be crash tested and/or evaluated to MASH2016 criteria.

Current Portable Concrete Barrier in useful serviceable condition that is successfully tested to NCHRP Report 350 or MASH2009 criteria may be utilized through December 31, 2029.

Other current Portable Concrete Barrier that is deemed acceptable by the Department may be utilized on projects off the National Highway System through December 31, 2024.

526.03 Construction Requirements

Cast-in-place barriers shall be fabricated in accordance with Standard Specification Section 502, Structural Concrete. Precast barriers shall be fabricated in accordance with Standard Specification 534, Precast Structural Concrete.

Concrete finish for permanent barrier shall be rubbed as defined in Standard Specification Section 502, Structural Concrete, 502.13 D2 or an approved equal.

Portable concrete barrier shall be generally free from fins and porous areas and shall present a neat and uniform appearance.

Permanent barrier shall have a protective coating applied in accordance with Standard Specification Section 515, Protective Coating for Concrete Surfaces.

Reflective delineators for concrete median barrier shall meet the requirements of Special Provision 645, Highway Signing.

Preformed Joint Filler shall meet the requirements specified in Subsection 705.01, Preformed Expansion Joint Filler.

Permissible dimensional tolerances for all concrete barriers shall be as follows:

a. Cross-sectional dimensions shall not vary from design dimensions by more than ¼ inch. The vertical centerline shall not be out of plumb by more than ¼ inch.

b. Longitudinal dimensions shall not vary from the design dimensions by more than ¼ inch per 10 feet of barrier section and shall not exceed ¾ inches per section.

c. Location of anchoring holes shall not vary by more than ½ inch from the dimensions shown in the concrete barrier details on the Plans.

d. Surface straightness shall not vary more than ¼ inch under a 10-foot straightedge.

e. The barrier shall have no significant cracking. Significant cracking is defined as fractures or cracks passing through the section, or any continuous crack extending for a length of 12 inches or more, regardless of position in the section.

526.04 Method of Measurement Permanent Concrete Barrier Type II, IIIa, IIIb, Texas Classic Rail, and Precast Median Barrier will be measured for payment by lump sum, complete in place.

Portable concrete barrier, both anchored and unanchored will be measured for payment by lump sum. Lump sum measurement will include verification of the installation and removal of all portable concrete at the completion of the Contractor's operations.

The Contractor shall replace sections of portable concrete barrier, including anchored barrier damaged by the traveling public when directed by the Resident. Replacement

sections will be measured for payment in accordance with Standard Specification 109.7, Equitable Adjustments to Compensation and Time.

Transition barrier will be measured by each, complete in place.

526.05 Basis of Payment The accepted quantities of Concrete Barrier Type II, IIIa, IIIb, Texas Classic Rail, and Precast Median Barrier will be paid for at the Contract lump sum price for the type specified, complete in place.

The accepted quantities of Portable Concrete Barrier Type I, both anchored and unanchored will be paid for at the Contract lump sum price. Such payment shall be full compensation for furnishing all materials, assembling, moving, resetting, transporting, temporarily storing, removing barrier, furnishing new parts as necessary, and all incidentals necessary to complete the work.

Portable barrier shall become the property of the Contractor upon completion of the use of the barrier on the project and shall be removed from the project site by the Contractor.

Transition barrier will be paid for at the Contract price each, complete in place.

The accepted quantity of all types of concrete barrier, whether portable or permanent, will be paid for at the lump sum or per each price, as applicable, which payment shall be full compensation for all materials, including reinforcing steel, protective coating, reflective delineators, steel plates and hardware, equipment, labor and incidentals required, as necessary, to complete the work.

Payment will be made under:

	Pay Item	Pay Unit
526.301	Portable Concrete Barrier, Type I	Lump Sum
526.304	Portable Concrete Barrier, Anchored Type I	Lump Sum
526.312	Permanent Concrete Barrier Type II	Lump Sum
526.321	Permanent Concrete Barrier Type IIIa	Lump Sum
526.323	Texas Classic Rail	Lump Sum
526.331	Permanent Concrete Barrier Type IIIb	Lump Sum
526.34	Permanent Concrete Transition Barrier	Each
526.502	Precast Concrete Median Barrier	Lump Sum”

527.02 Materials Amend this section by deleting it in its entirety and replacing it with:

"**MaineDOT is transitioning to MASH2016 criteria for Work Zone Traffic Control Devices on the following schedule:**

Portable Crash Cushions will be crash tested and/or evaluated to MASH2016 criteria by January 1, 2030. Current Category 3 devices in useful serviceable condition that are successfully tested to NCHRP Report 350 or MASH2009 criteria may be utilized through December 31, 2029.

Work Zone Crash Cushions shall be selected from the Department's Qualified Products List of Crash Cushions/Impact Attenuators or approved equal."

SECTION 535
PRECAST, PRESTRESSED CONCRETE SUPERSTRUCTURE

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 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 reflectors shall be mounted on all "w" beam guardrail and shall be either the "butterfly" type or linear delineation system panels. "Butterfly" or linear delineation panels shall be installed at approximately 62.5 foot intervals on tangents (after every tenth post) and 31.25 feet on curves (after every fifth post), and shall be centered on the guardrail beam. On Divided highways, the left-hand delineators shall be yellow and the right-hand delineators shall be silver/ white. On two-way directional highways, the right-hand side will have silver / white reflectors and no reflectorized delineator used on the left. Delineators shall have reflective sheeting that meets or exceeds the requirements of Section 719.01.

"Butterfly" reflectors shall be fabricated from high-impact, ultraviolet & weather resistant thermoplastic. Aluminum, galvanized metal or other materials shall not be used. Reflective sheeting will be applied to only one side of the delineator facing the direction of traffic and shall be centered vertically on the guardrail beam as shown in the Standard Detail 606(7).

Linear delineation system panels shall be 1.5 inches wide by approximately 11 inches nominal length, with a minimum of 5 raised lateral ridges spaced at approximately 2.25 inches. The height of each ridge shall be 0.34 inches with a 45 degree profile and a 0.28 inches radius at the top. Sheeting shall be laminated to thin gauge aluminum with a pre-applied adhesive tape on the back. Panels shall not be installed over seams or bolt heads and shall be centered horizontally on the guardrail beam; linear delineation panels shall be attached to only one guardrail beam. The guardrail beam surface shall be cleaned and prepared according to the manufacturer's instructions. Air temperature and guardrail surface temperature must be a minimum of 50 degrees F (10 C) with rising temperature at the time of installation.

Exact locations of the either the "butterfly" type or the linear delineation panels shall be approved by the Resident prior to installation.

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.

Reflectorized beam guardrail reflectors (“butterfly” type or linear delineation system panels) when identified by pay item, will be measured for payment by each.

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.

Reflectorized beam guardrail reflectors ("butterfly" type and the linear delineation panels) will not be paid for directly but will be considered incidental to all new guardrail items. The Contractor shall furnish and install either the "butterfly" type or linear delineation panels, at its discretion, for new guardrail items.

Reflectorized beam guardrail reflectors (either "butterfly" type or linear delineation system panels) will be paid for under the applicable pay items for installation in conjunction with Adjust, Modify, Remove and Reset, Remove Modify and Reset guardrail items. The accepted quantity of "butterfly" type or linear delineation system panels will be paid for at the contract unit price each for all work and materials furnished to install, complete in place, including all incidentals necessary to complete the work.

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
606.352	Reflectorized Beam Guardrail Delineators ("Butterfly" type)	Each
606.3521	Linear Delineation System Panel	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
606.3671	Replace Unusable Offset Blocks	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 608
SIDEWALKS

Section 608.022Detectable Warning Materials Standard Revise this section by removing the last sentence of this section beginning with "Concrete…" and replacing it with "**Concrete shall meet the requirements of Section 608.021, Sidewalk Materials, of this specification or may be a prepackaged concrete mix from the Department's Qualified Products List (QPL)."**

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**."
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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. The Contractor shall submit a concrete design for the Portland Cement Concrete, with a minimum designated compressive strength of 3000 PSI meeting the requirements of Class S or Class Fill Concrete. The Contractor may elect to choose a Prepackaged Concrete Mix from the Department's Qualified Products list (QPL). Concrete backfill shall be completed in conformance with a Department supplied concrete backfill detail."**

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 619
MULCH

619.03 General Amend this Section by adding the following sentence to the end: **"Straw mulch shall be used in all wetland areas."**

SECTION 626
FOUNDATIONS, CONDUIT, AND JUNCTION BOXES FOR HIGHWAY SIGNING, LIGHTING, AND SIGNALS

Section 626.021 Miscellaneous Materials Revise this section by removing the fourth paragraph beginning with " All Concrete for concrete encasement…" and replace it with "**All concrete for concrete encasement of conduit shall be Class S or Class Fill concrete in accordance with the**

applicable requirements of Section 502 – Structural Concrete, or a Prepackaged Concrete Mix from the Department's Qualified Products List (QPL)."

Section 626.031Conduit Revise the fifth paragraph beginning with "After the trench has been…" by removing the last sentence beginning with "Where concrete encasement…" and replacing it with **"Where concrete encasement is required around the conduit, the concrete shall meet Class S, Class Fill in accordance with the applicable requirements of Section 502 – Structural Concrete, or a Prepackaged Concrete Mix from the Department's Qualified Products List (QPL)."**

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**."

626.036 Precast Foundations Revise the last sentence of paragraph one so that it reads: "**Construction of precast foundations shall conform to the Standard Details and all requirements of 712.061**."

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."

Revise this subsection by replacing the paragraph beginning with " If the final reflectivety values are less…" with the following:

The final reflectivity will be acceptable if 90 percent or more of the painted pavement lines and markings meet the specified minimum value. If less than 90 percent of the painted pavement lines and markings meet the specified minimum final reflectivity values, the Contractor shall repaint those areas not meeting required reflectivity at no cost to the Department.

If, after repainting, analysis of the final reflectivity values results in the need for a second repainting, the Contractor will submit in writing a plan of action to meet the reflectivity

minimums prior to continuing any work. Once the plan has been reviewed and approved by the Department, the Contractor shall reapply at no cost to the Department.

SECTION 643
TRAFFIC SIGNALS

643.021 Materials Amend this subsection by adding the following at the end:

"**MaineDOT is transitioning to MASH2016 criteria for Work Zone Traffic Control Devices on the following schedule:**

Temporary Traffic Control Signals will be crash tested and/or evaluated to MASH2016 criteria by January 1, 2030. Current Category 4 devices in useful serviceable condition that are successfully tested to NCHRP Report 350 or MASH2009 criteria may be utilized through December 31, 2029."

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

Amend this Section by adding the following new subsection:

"**652.2.6 Device Crashworthiness MaineDOT is transitioning to MASH2016 criteria for Work Zone Traffic Control Devices on the following schedule:**

Category 1 (Cones, Drums, Tubular Markers, Flexible Delineators, and similar devices that have little chance if causing windshield penetration, tire damage, or other significant effect on the control or trajectory of a vehicle) – All Category 1 devices will be manufacturer self-certified as MASH2016 by January 1, 2025. Current Category 1 devices in useful serviceable condition that are not self-certified as MASH2016 compliant may be utilized through December 31, 2024.

Category 2 (Barricades, Portable Sign Supports, Category 1 devices with attachments, and similar devices that are not expected to produce significant vehicular velocity change but may be otherwise hazardous) – All Category 2 devices will be crash tested and/or evaluated to MASH2016 criteria by January 1, 2025. Current Category 2 devices in useful serviceable condition that are successfully tested to NCHRP Report 350 or MASH2009 criteria may be utilized through December 31, 2024.

Category 3 (Portable Concrete Barrier, Portable Crash Cushions, Truck Mounted Attenuators, Category 2 devices weighing more than 100 pounds, and similar devices that are expected to produce significant vehicular velocity change or other harmful reactions) – All Category 3 devices will be crash tested and/or evaluated to MASH2016 criteria by January 1, 2030. Current Category 3 devices in useful serviceable condition that are successfully tested to NCHRP Report 350 or MASH2009 criteria may be utilized through December 31, 2029. (See Standard Specification 526 for additional Portable Concrete Barrier information).

Category 4 (Trailer Mounted Devices: Arrow Boards, Temporary Traffic Control Signals, Area Lighting, Portable Changeable Message Sign, and other similar devices.) – All Category 4 devices will be crash tested and/or evaluated to MASH2016 criteria by January 1, 2030. Current Category 4 devices in useful serviceable condition that are successfully tested to NCHRP Report 350 or MASH2009 criteria may be utilized through December 31, 2029."

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 701
STRUCTURAL CONCRETE RELATED MATERIAL

701.01 Portland Cement and Portland Pozzolan Cement Amend the first sentence of Paragraph 3 by adding "**or Type 1L Portland Limestone cement**" so that it reads:
"**A Type IP (MS) Portland-pozzolan cement (blended hydraulic cement with moderate sulfate resistance) or Type 1L Portland Limestone cement meeting the requirements of AASHTO M 240, may be used instead of Type II or where Type I Portland cement, meeting the requirements of AASHTO M 85, is allowed**."

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 value of 25.0 or less as determined by AASHTO T 327. If the Micro- Deval value exceeds 25.0, the Washington State Degradation DOT Test Method T113, Method of Test for Determination of Degradation Value (January 2009 version) shall be performed, except that the test shall be performed on the 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 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.

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 709
REINFORCING STEEL AND WELDED STEEL WIRE FABRIC

709.01 Reinforcing Steel Remove the second paragraph of Section 709.01 of the standard specification beginning with “Low-Carbon, Chromium,…” and replace with the following:

“ Low-carbon, chromium, reinforcing steel shall be deformed bars conforming to the requirements of ASTM A1035. Bars shall be Grade 100 and alloy Type CS unless otherwise specified on the Plans. “

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.

710.08 Guardrail Hardware Revise this subsection by replacing "**AASHTO M 298**" with "**ASTM B965**"

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 713
STRUCTURAL STEEL AND RELATED MATERIAL

Section 713.02 High Strength Bolts
Revise the second sentence of this subsection so that it reads "**Nuts shall meet the requirement ofASTM A563**". Revise the third sentence of this subsection so that it reads "**Circular and beveled washers shall conform to the requirement of ASTM F436**".

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 C30A1N 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

SECTION 720
STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS

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."

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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.

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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.

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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

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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.

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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."

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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

APPENDIX A

To

2022 Title VI Implementation Plan

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

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 fundingsource:

> "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 C and G of this Assurance in every contract or agreement subject to the Acts and the Regulations.

4. The Recipient will insert the clauses of Appendix E 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 D and Appendix F 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.

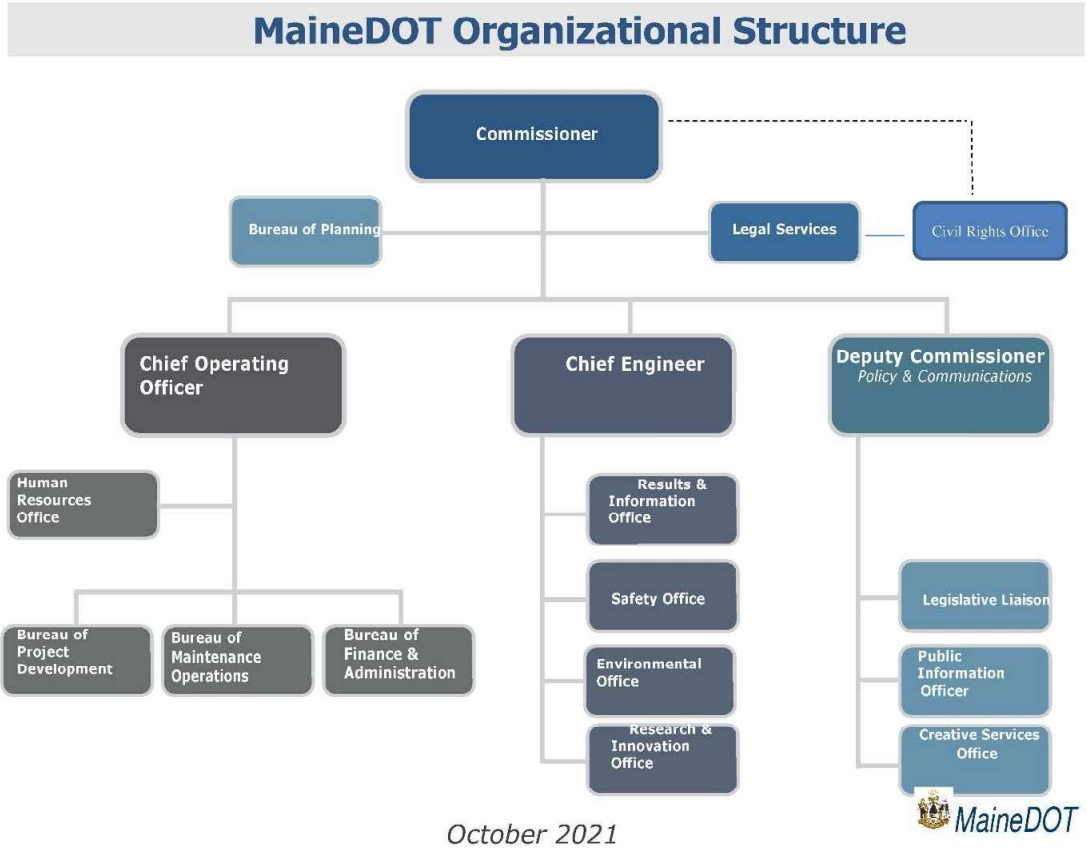
The ***Maine Department of Transportation*** gives this ASSURANCE in consideration of and for obtaining any Federal grants, loans, contracts, agreements, property, and/or discounts, or other Federal-aid and Federal financial assistance extended after the date hereof to the recipients by the U.S. Department of Transportation under the ***Federal Aid Highway Program***. This ASSURANCE is binding on ***Maine,*** 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 Sept. 13, 2021

APPENDIX B


MaineDOT Organizational Structure
Commissioner
Bureau of Planning
Legal Services
Civil Rights Office
Chief Operating Officer
Chief Engineer
Deputy Commissioner
Policy & Communications
Human Resources Office
Bureau of Project Development
Bureau of Maintenance Operations
Bureau of Finance & Administration
Results & Information Office
Safety Office
Environmental Office
Research & Innovation Office
Legislative Liaison
Public Information Officer
Creative Services Office
October 2021
MaineDOT

APPENDIX C

Performance Requirements

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 Nondiscrimination 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 D

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 IJ.S. Code 5 107, 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. S 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 l,] [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, US. 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 [i 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 E

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 Nondiscrimination 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 F

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 Nondiscrimination 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 Nondiscrimination 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 G

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 nondiscrimination 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. 5 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.Ce 5 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. 5 324 et seq.), (prohibits discrimination on the basis of sex);
- Section 504 of the Rehabilitation Act of 1973, (29 U.S.C. S 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. 5 6101 et seq.), (prohibits discrimination on the basis of age);
- Airport and Airway Improvement Act of 1982, (49 USC 5 471, 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. 55 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. 5 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).

APPENDIX H

FEDERAL HIGHWAY ADMINISTRATION CIVIL RIGHTS ASSURANCE

The Maine Department of Transportation HEREBY CERTIFIES THAT, as a condition of receiving Federal financial assistance under the Federal Transit Act of 1964, as amended, it will ensure that:

1. No person on the basis of race, color or national origin will be subjected to discrimination in the level and quality of transportation services and transportation-related benefits.

2. The Maine Department of Transportation will compile, maintain, and submit in a timely manner Title VI information required in compliance with the Department of Transportation's Title VI regulation, 49 CFR Part 21.9.

3. The Maine Department of Transportation will make it known to the public that those person or persons alleging discrimination on the basis of race, color or national origin as it relates to the provision of transportation services and transportation-related benefits may file a complaint with the Federal Highway Administration and/or the U.S. Department of Transportation.

The person or persons whose signature appears below is authorized to sign this assurance on behalf of the grant applicant or recipient.

DATE: 7/23/21

Bruce A. Van Note, Commissioner
Maine Department of Transportation

APPENDIX I

TITLE VI/NONDISCRIMINATION POLICY STATEMENT

The Commissioner of the Maine Department of Transportation (MaineDOT) is ultimately responsible for and committed to the effective implementation of the Title VI Program to achieve compliance with Title VI of the Civil Rights Act of 1964, as amended, the Civil Rights Restoration Act of 1987, and related statutes and regulations in all Federal programs and activities. Understanding that the Commissioner will not be performing any day-to-day implementation duties, the MaineDOT conducts its Title VI/Environmental Justice Program in a team approach by involving personnel from all program areas, with guidance from the Title VI Coordinator. Responsibility for the day to day administration of the Program will be delegated to the Title VI Program Coordinator who is currently the Director of the Civil Rights Office. The Title VI Program Coordinator has been delegated sufficient authority and responsibility to effectively carry out her duties.

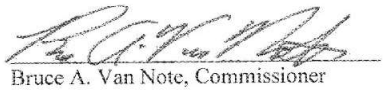
The Title VI Program Coordinator ensures MaineDOT's compliance with Title VI/Environmental Justice implementing regulations. Bureau Directors are responsible for Program implementation in their Bureaus and shall identify and delegate Title VI/Nondiscrimination Federal Program Area Liaisons to perform the routine data collection/data analysis and process reviews.

Inquiries concerning the MaineDOT's policies, investigations, complaints, compliance with applicable laws, regulations, and concerns regarding compliance with Title VI/Environmental Justice may be directed to:

Maine Department of Transportation
16 State House Station
Augusta, Maine 04333-1116
Telephone (207) 624-3066 | TTY users Dial Relay: 711
sherry.tompkins@maine.gov

MaineDOT is committed to ensuring that the fundamental principles of equal opportunity are upheld in all decisions involving our employees and contractors/consultants, and to ensuring that the public-at-large is afforded access to all of our programs and services whether those programs and activities are federally funded or not.

This Policy Statement will be circulated throughout the MaineDOT, made available to the public, and be included by reference in all contracts, agreements, programs and services administered by the Department of Transportation.



Date: 7/23/21

Bruce A. Van Note, Commissioner

APPENDIX J

SAMPLE QUESTIONS FOR PROGRAM AREA REVIEWS

Bureau of Planning

- What measures do you take to ensure that a cross-section of people representative of the populations affected by the Department's projects, including identifying and proactively reaching out to various and diverse social, economic and ethnic groups, participate in the Department's Public Involvement Process?
- How do you ensure that appropriate accommodations are made for persons with Limited English Proficiency (LEP) (persons who have difficulty speaking, reading, writing and/or understanding English)? Were interpreters available when needed to assist with LEP needs?
- How do you collect and analyze statistical data on race, color and national origin of populations in all areas impacted by the Department's programs or services?

Bureau of Project Development

Property Office

- What mechanisms are used to identify what communities (minority, LEP) are represented in the negotiation phase of property acquisition?
- How do you ensure that Property Office staff who have direct contact with persons affected by the Department's acquisition of property needed for projects, including compliance with the Uniform Relocation Act of 1970?
- Have you received any complaints related to discrimination on the basis of race, color or national origin? How many and how did you process them?

Multimodal Program

- How do you ensure that Local Public Agencies (LPA) provide the Department with signed Title VI assurances (Form 1050.2A), including Appendices A and K, annually?
- How do you ensure that LPAs include in their subcontracts FHWA Form 1273 and Title VI Assurances, including Appendices A and K?
- Have you received any complaints related to discrimination on the basis of race, color or national origin? How many and how did you process them?
- How do ensure that public meetings and notices related to LPA projects comply with Title VI?

Bureau of Maintenance and Operations

- How do you ensure that the Bureau's activities comply with Title VI requirements of nondiscrimination on the basis of race, color or national origin?
- Have you received any complaints related to discrimination on the basis of race, color or national origin? How many and how did you handle them?

APPENDIX K

Subrecipient Reviewed: _____ Date(s) of Desk Audit _____

Reviewer(s) _____

- ☐ Title VI/Nondiscrimination Policy Statement
- ☐ Title VI/Nondiscrimination Assurances
- ☐ Name and position of Title VI/Nondiscrimination Coordinator
- ☐ Title VI/Nondiscrimination Plan
- ☐ Procedures for processing external discrimination complaints
- ☐ A list of external discrimination complaints and lawsuits
- ☐ Any Accommodations for Limited English Proficient Persons
- ☐ Addressing Environmental Justice in minority populations and low-income populations
- ☐ Ensuring nondiscrimination in the public participation process
- ☐ Collecting and analyzing data to ensure nondiscrimination in programs and activities
- ☐ Process for ensuring that solicitations for bid/requests for proposals contain the Title VI/Nondiscrimination Assurance paragraph
- ☐ Process for ensuring subcontracts contain the appropriate contract provisions and language from the Title VI Assurances
- ☐ Process for Ensuring nondiscrimination in the award of contracts
- ☐ Developing a Title VI/Nondiscrimination Annual Work Plan & Accomplishment Report

APPENDIX L

SUB-RECIPIENT TITLE VI COMPLIANCE ASSESSMENT TOOL

23 Code of Federal Regulations (CFR) Part 200.9 (b)(7) requires that the Maine Department of Transportation (MaineDOT) conduct periodic reviews of cities, planning agencies and other recipients of federal-aid highway funds, including locally public agencies, to ensure that they are complying with Title VI of the Civil Rights Act of 1964. Title VI states that "no person in the United States shall be excluded from participation, denied the benefits of, or be subjected to discrimination in any Federally-funded program, policy or activity on the basis of race, color or national origin."

MaineDOT has developed this assessment as a means of determining sub-recipient compliance; helping sub-recipients understand their Title VI responsibilities; and assisting MaineDOT in planning future training and technical assistance.

This assessment is part of MaineDOT's Title VI review process and has been designed to take only a few minutes of your time. Please fax (207-624-3021) or mail (16 State House Station, Augusta, ME 04333-0016) the completed questionnaire with attachments to: Sherry Tompkins, Director of Civil Rights, no later than August 30, 2021

Questions or concerns may be emailed to: sherry.tompkins@maine.gov or you may reach Sherry by phone at (207) 624-3066.

Baseline Questionnaire

1. Name of your Agency: _____

2. Number of full-time and part-time employees: F/T _____ P/T _____

3. Has your agency provided written Title VI Assurances to MaineDOT? If not, please attach a copy. _____

4. Does your agency physically include the Civil Right Special Provisions (FHWA-Form 1273) in all contracts and ensure that they are included in all sub-contracts, including third-tier contracts? _____
_____

5. Who is the Title VI contract person for your agency? _____.
Does this person accept complaints from the public? _____ If not, who does?_____.
Please include title, email and telephone number for each person listed. _____
_____

6. In the past three years, has your agency been named in a discrimination complaint or lawsuit? _____. If so, when and what was the nature of the complaint or lawsuit and the outcome. _____

_____

_____

_____

7. Does your agency have a written discrimination complaint process? If so, please attach a copy. _____

8. Has your agency made the public aware of the right to file a complaint? _____ If so, by what mechanism _____

_____. Please attach a copy.

9. Does your agency provide free translation services for persons with Limited English Proficiency (LEP)? _____. Please explain _____

_____

_____

_____

10. In the past twelve (12) months, what has your agency done to receive and consider input from all citizen groups, especially minority, low income, disabled and transit-dependent? Please describe, if applicable. _____

_____

_____

_____

11. Does your agency have a method to collect racial and ethnic data on citizens impacted by your projects? _____. If so, please describe. _____

_____

_____

_____

12. Does your agency include the required Disadvantaged Business Enterprise (DBE) assurance language at 49 CFR 26.13(a) and (b) verbatim in all financial agreements, contracts and sub-contracts? (Please see DBE Assurance language below.) _____

****

§26.13 What assurances must recipients and contractors make?

(a) Each financial assistance agreement you sign with DOT operating administration (or a primary recipient) must include the following assurance:

The recipient shall not discriminate on the basis of race, color, national origin or sex in the award and performance of any DOT-assisted contract or in the administration of its DBE program or the requirements of 49 CFR Part 26. The recipient shall take all necessary and reasonable steps under 49 CFR Part 26 to ensure nondiscrimination in the award and administration of DOT assisted contracts. The recipient's DBE program, as required, by 49 CFR Part 26 and as approved by DOT, is incorporated by reference in this agreement. Implementation of this program is a legal obligation and failure to carry out its terms shall be treated as a violation of this agreement. Upon notification to the recipient of its failure to carry out its approved program, the Department may impose sanctions as provided for under Part 26 and may, in appropriate cases, refer the matter for enforcement under 18 U.S.C. 1001 and/or the Program Fraud Civil Remedies Act of 1986 (31 U.S. C. 3801 et seq.).

(b) Each contract you sign with a contractor (and each sub-contract the prime contractor signs with a sub-contract) must include the following assurance:

The contractor, sub recipient or sub-contractor shall not discriminate on the basis of race, color, national origin or sex in the performance of this contract. The contactor 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 breach of this contract, which may result in the termination of this contract or such other remedy as the recipient deems appropriate.

****

13. Does your agency monitor DBEs on construction projects to ensure they are performing a commercially useful function (CUF)? _____. If so, where is this documented? _____.
If a DBE is not performing a CUF, what actions for steps have you taken? _____

_____

_____

Who do you notify? _____

14. Do you have any questions regarding this assessment or Title VI? _____ Please include them here along with your email address and/or phone number and a MaineDOT representative will respond. _____

15. Would your agency like Title VI training or other Civil Rights technical assistance from MaineDOT? _____. If yes, please explain. _____

Does your agency have teleconferencing ability? _____

16. Please provide the name, title and contact information of the person who completed this baseline assessment. _____

17. Provide an annual report on Title VI accomplishments for the previous year and goals for the next year. _____

APPENDIX M

Maine Department of Transportation
External Discrimination Complaint Form

(Title VI/Nondiscrimination and ADA/Section 504 Complaints)

Name	**Phone**	**Name of Person(s) That Discriminated Against You**
Address	**Location and Position of Person (If Known)**	
City, State, Zip	**City, State, Zip**	
Agency involved		**Date of Alleged Incident**
Discrimination Because of: ☐ Race ☐ Color ☐ National Origin ☐ Sex ☐ Age ☐ Disability		**What Remedy are you requesting?**
Explain As Briefly And Clearly As Possible What Happened And How You Were Discriminated Against. Indicate Who Was Involved. Be Sure To Include How Other Persons Were Treated Differently Than You. Also Attach Any Written Material Pertaining To Your Case.		
Signature	**Date**	

Please Mail Complaint to:

Maine Department of Transportation
Civil Rights Office
 # 16 State House Station
Augusta, Maine 04333-0016
Or Call (207) 624- 3066 or TYY Relay 711

APPENDIX N

MaineDOT

Integrity • Competence • Service

NON-DISCRIMINATION/TITLE VI POSTER

Title VI and Nondiscrimination Commitment to all USDOT funded programs:
Pursuant to Title VI of the Civil Rights Act of 1964 and related laws and regulations, MaineDOT will not exclude from participation in, deny the benefits of, or subject to discrimination anyone on the grounds of race, color, national origin, sex, age or disability.

Complaint Procedures:
MaineDOT has established a discrimination complaint procedure and will take prompt and reasonable action to investigate and eliminate discrimination when found. Any person who believes that he or she has been aggrieved by an unlawful discriminatory practice under Title VI has a right to file a formal complaint with MaineDOT. Any such complaint must be in writing and filed with the MaineDOT Title VI Coordinator within one hundred eighty (180) calendar days following the date of the alleged discriminatory occurrence. For more information, please contact the MaineDOT's Title VI Coordinator.

ADA/504 Statement:
Pursuant to Section 504 of the Rehabilitation Act of 1973 (Section 504), the Americans with Disabilities Act of 1990 (ADA) and related federal and state laws and regulations, MaineDOT will make every effort to ensure that its facilities, programs, services, and activities are accessible to those with disabilities. MaineDOT will provide reasonable accommodation to disabled individuals who wish to participate in public involvement events or who require special assistance to access MaineDOT facilities, programs, services or activities. Because providing reasonable accommodation may require outside assistance, organization or resources, MaineDOT asks that requests be made at least five (5) calendar days prior to the need for accommodation. Questions, concerns, comments or requests for accommodation should be made to MaineDOT's ADA Coordinator.

Services are provided free without charge for individuals with special needs with disabilities. Any fees will be paid by the recipient or subrecipient. The public will have access to translators, "I Speak Cards", TTY/TDD services and vital documents translated when requested.

MaineDOT Title VI

Sherry Y. Tompkins, Director
Civil Rights Office
Maine Department of Transportation
16 State House Station
Augusta, Maine 04333
Office Phone: (207) 624-3066
Cell Phone: (207) 592-0686
TYY: Users Dial MAINE RELAY 711

Call Us with Questions

If you believe that you have been discriminated against because of your race, color, national origin, sex, age, disability or income level, or because you have difficulty with the English language, call us at 207-624-3056. MaineDOT's Civil Rights Office will explain the process for filing a complaint. Complaint forms are on our website.

mainedot.gov/civilrights/title-vi

Language translation services available upon request.

Services de traduction de langue disponibles sur demande.

Servicios de traducción disponibles bajo petición.

要求提供的 语言翻译服务。

Lugha ya tafsiri huduma inapatikana juu ya ombi.
Ladenan panarjamahan Basa aya kana paménta.

خدمات الترجمة اللغة متاحة عند الطلب

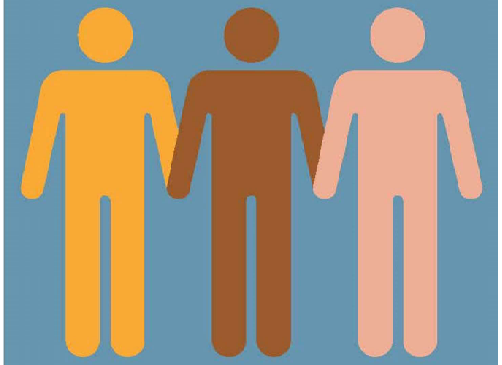
Có các dịch vụ phiên dịch khi quý vị yêu cầu.

MaineDOT

Maine Department of Transportation
Civil Rights Office
16 State House Station
Augusta, Maine 04333-0016
Phone: 207-624-3056
TTY Users Dial Maine Relay 711

mainedot.gov

Know YOUR Rights



MaineDOT
Civil Rights Office

TITLE VI PROGRAM *of the Civil Rights Act*

MaineDOT's mission is to provide the people of Maine with a safe, efficient and effective transportation system. Our work is intended to serve the transportation needs of all people in Maine, regardless of race, color, national origin, sex, age, disability, income level or limited English proficiency.

MaineDOT is committed to assuring that none of its activities or programs encourage discrimination. We manage our programs without regard to race, color, national origin, sex, age, disability, income level, or the ability to speak or understand English.

MaineDOT will not allow discrimination by a MaineDOT employee or by recipients of federal-aid funds such as cities, counties, contractors, or planning agencies. MaineDOT prohibits all discriminatory practices which may result in:

- Unfair denial of any service, financial aid or benefit provided by the federally funded program;
- Different standards or requirements for participation in programs;
- Segregation or separate treatment within our programs;
- Differences in the quality, quantity or way in which a benefit is provided;
- Discrimination in any activities in a facility built with federal funds.

To ensure compliance with Title VI, and other related laws, MaineDOT:

- Avoids or reduces harmful health and environmental impacts which programs or activities might have on minority and low-income populations;
- Ensures the full and fair participation by all communities in its decision-making process;
- Prevents the denial, reduction or delay of benefits for minority and low-income populations;
- Provides language interpreters to people who have difficulty understanding English.

How to File a Complaint

If you believe you have been discriminated against, you will need to file a written complaint. The complaint must be submitted within 180 days of the alleged discrimination. The complaint form is on our website for you to download.

Be prepared to fill in:

- Your name, address and phone number;
- The name and address of the organization you believe discriminated against you;
- Details of the alleged discrimination and any other relevant information; and
- The names of anyone we could contact regarding the alleged discrimination.

Once you have filled in the form, mail it to us:

MaineDOT Civil Rights Office

16 State House Station
Augusta, Maine 04333-0016

207-624-3056

DEPARTMENT OF THE ARMY
NEW ENGLAND DISTRICT, CORPS OF ENGINEERS
696 VIRGINIA ROAD
CONCORD, MASSACHUSETTS 01742-2751

REPLY TO
ATTENTION OF

August 25, 2022

Regulatory Division
NAE-2022-01848

Andrea Brady
Maine Department of Transportation
16 State House Station
Augusta, Maine 04333

Dear Mr. Brady:

We have determined that a Department of the Army permit is not required for your proposed project. Our determination is based on the information described in your application and on the enclosed plans. The work involves the rehabilitation of an existing bridge in Townsend Gut between Southport and Boothbay, Maine as shown on the attached plans entitled "MaineDOT WIN 21751.01," "Southport-Boothbay Harbor," both undated, and "Southport Bridge Route 27" dated July 30, 2021

Our regulatory jurisdiction encompasses all work in or affecting navigable waters of the United States under Section 10 of the Rivers and Harbors Act of 1899 and the discharge of dredged or fill material into all waters of the United States, including adjacent wetlands, as well as the excavation and grading within those waters, under Section 404 of the Clean Water Act. Since your proposal does not include any of the aforementioned activities, a Department of the Army permit is not required.

The construction of bridges and causeways in navigable waters comes under Section 9 of the Rivers and Harbors Act of 1899 but the authority to approve bridges and causeways was transferred to the Secretary of Transportation under the Department of Transportation Act of 1966. You may be required to obtain a permit from the United States Coast Guard for your proposed project. Point of contact at the U.S. Coast Guard is Commander (dpb), First Coast Guard District, One South Street-Battery Park Building, New York, NY 10004-1466 or phone (212) 668-7021.

Our Corps of Engineers permit process does not supersede any other agency's jurisdiction. Therefore, if other Federal, State, and/or local agencies have jurisdiction over your proposed activity, you must receive all other applicable permits before you can begin work. **A reminder, no filling of waters of the United States (wetlands or waterways) or placing structures (permanent or temporary) seaward of the ordinary high water is authorized without written approval from the Corps.** Please note that performing work within our jurisdiction without a Corps of Engineers permit can result in prosecution by the U.S. Government.

If you have any questions concerning this matter, please contact Jana Jacobson of my staff at (978) 318-8496 or jana.l.jacobson@usace.army.mil at our Augusta, Maine Project Office.

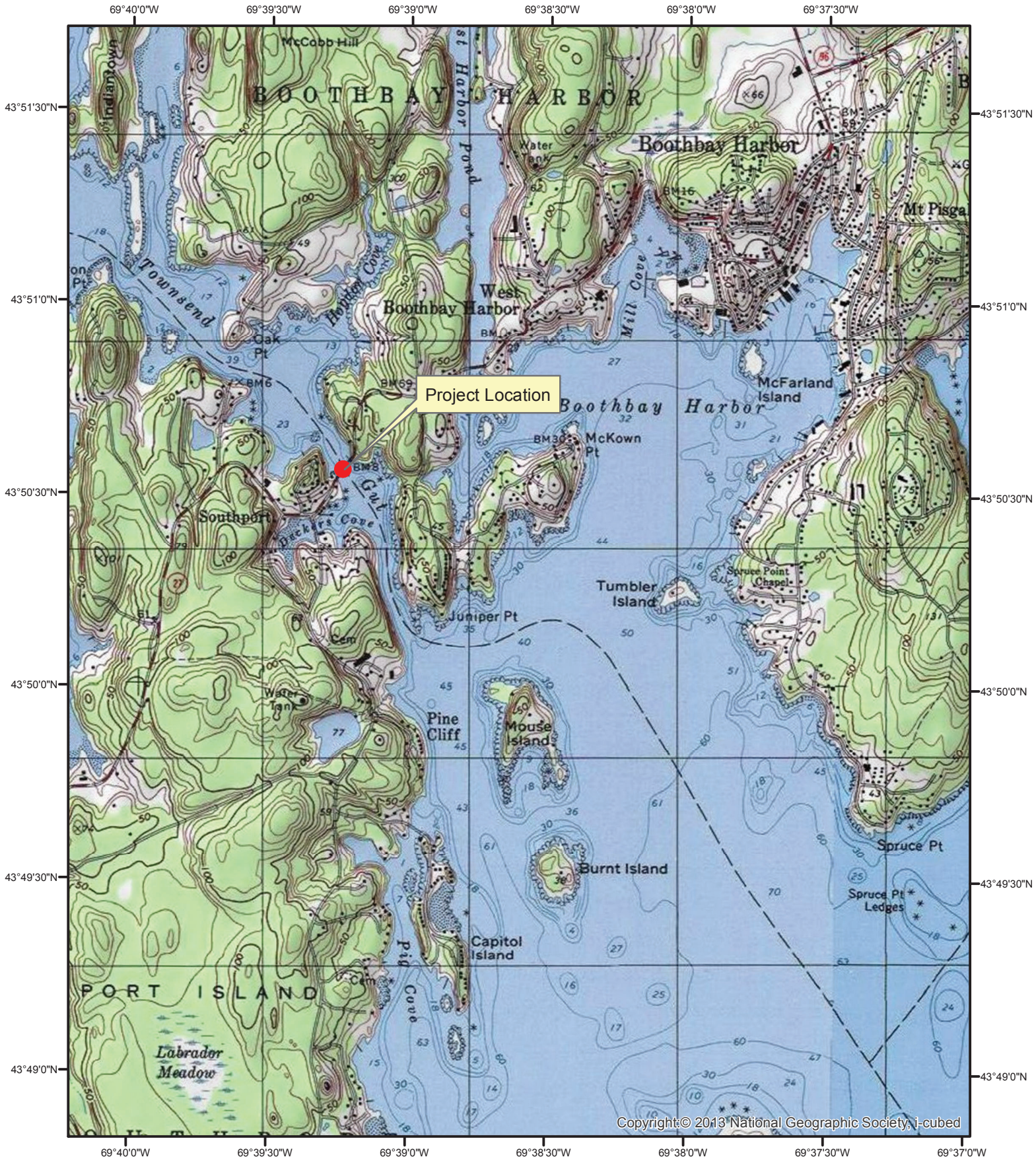
Good luck with your project.

Sincerely,

SHAWN B. MAHANEY

Digitally signed by SHAWN B. MAHANEY
Date: 2022.08.25 12:19:39 -04'00'

For: Frank J. Del Giudice
Chief, Permits & Enforcement Branch
Regulatory Division



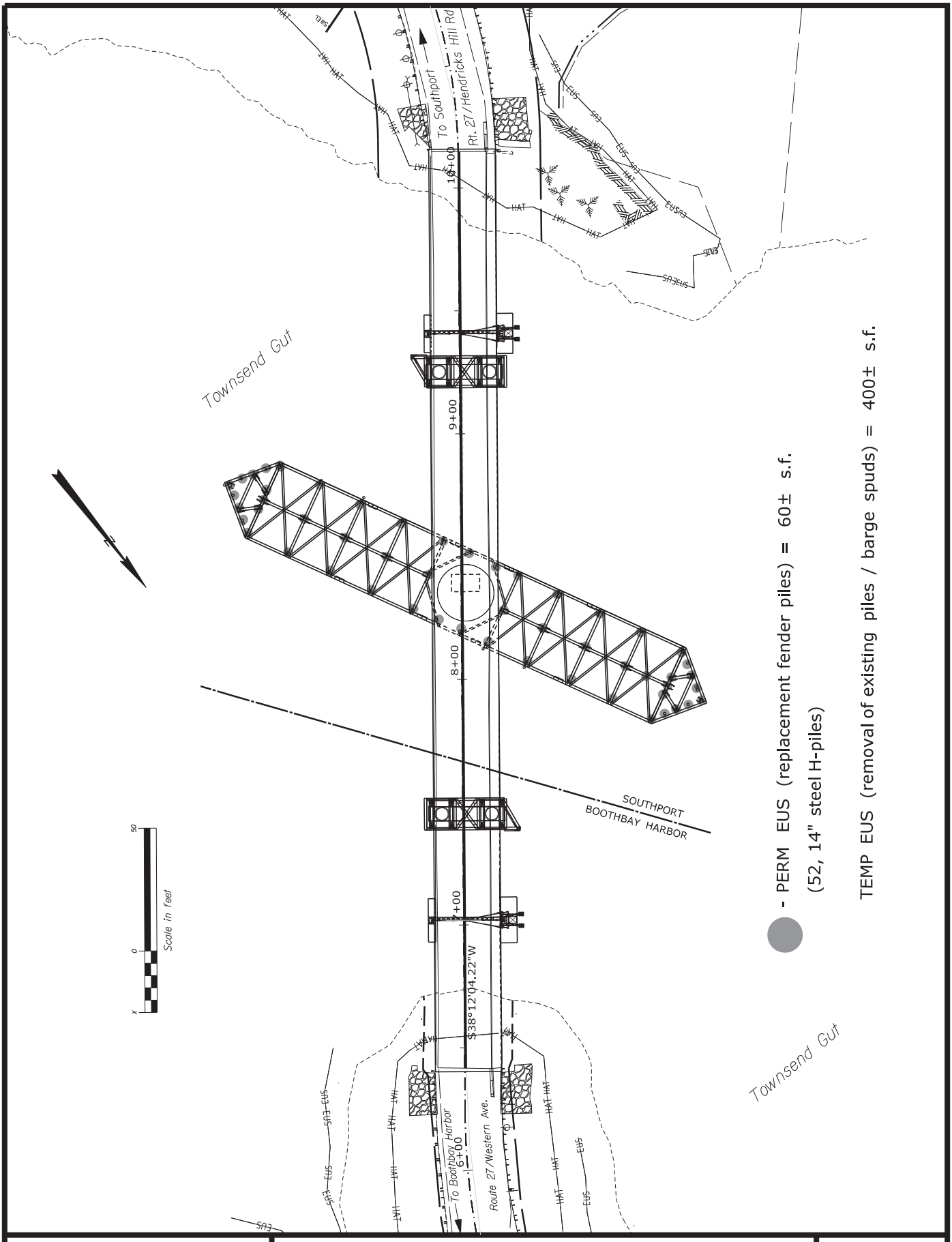
MaineDOT WIN 21751.01
Southport - Boothbay Harbor- Route 27 - Bridge Rehab.
Townsend Gut Bridge #2789 overTownsend Gut
2021 USGS Boothbay Harbor, ME Quad 24K
43.842583, -69.654091

N

0 0.1 0.2 0.4 Miles

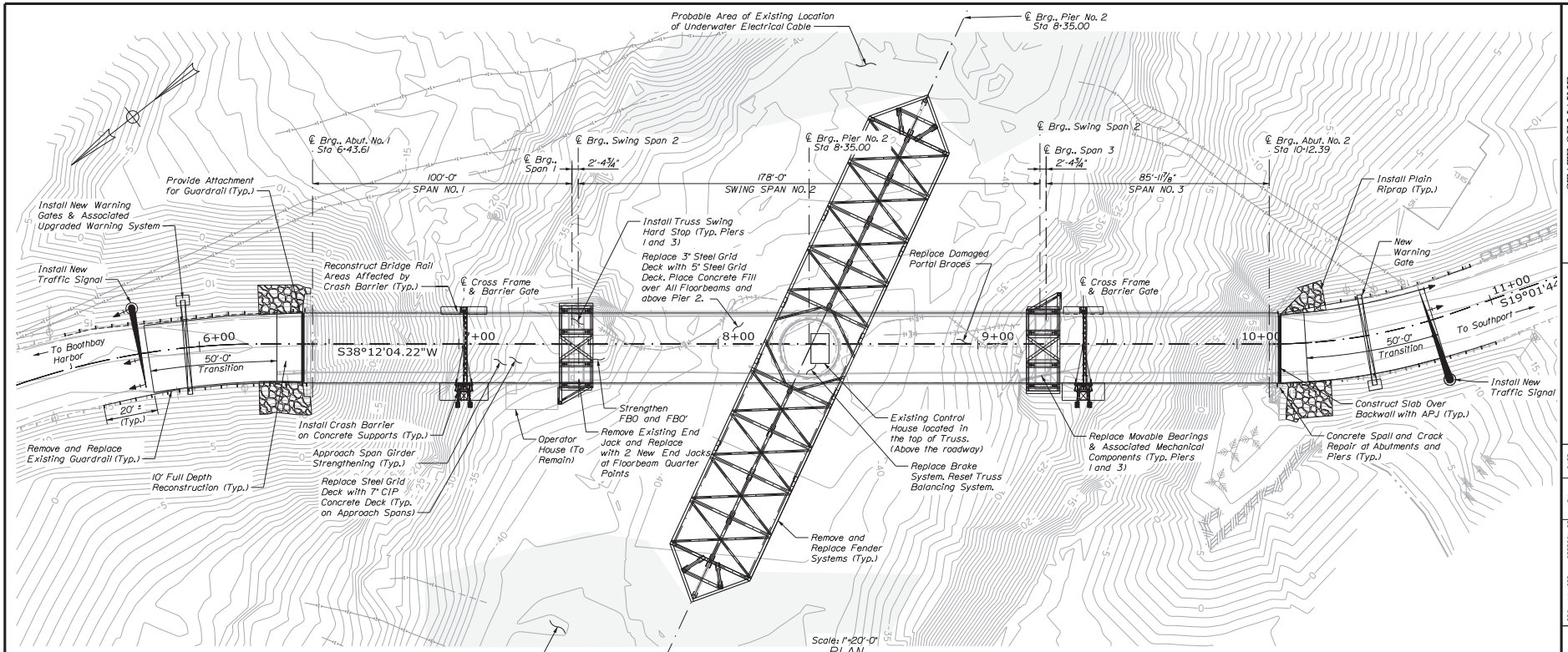
362

NAE-2022-01848



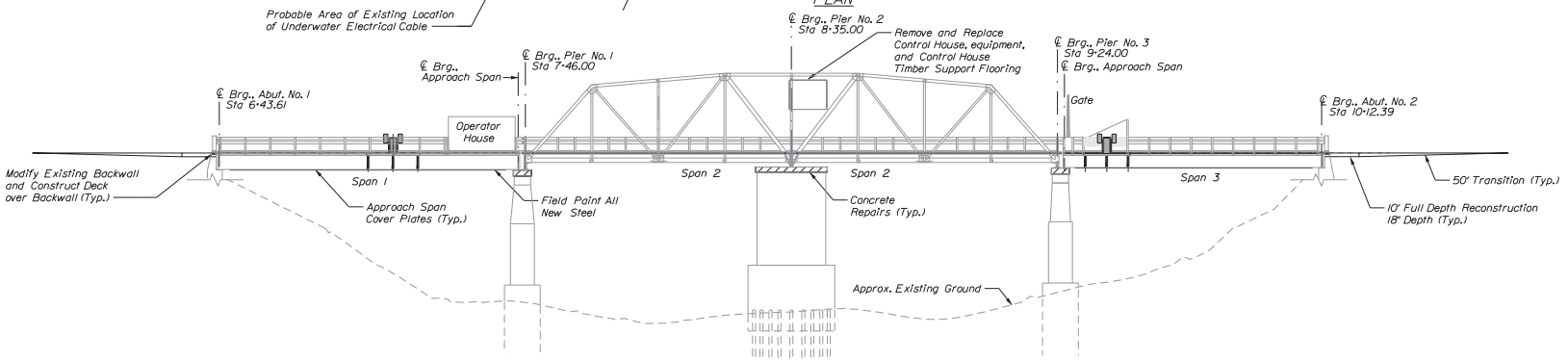
NAE-2022-01848

STATE OF MAINE DEPARTMENT OF TRANSPORTATION	SOUTHPORT-BOOTHBAY HARBOR HANCOCK COUNTY - ROUTE 27	SHEET NUMBER 1
21751.01	PLANS	OF 363



Scale: 1"=20'-0"

PLAN



ELEVATION

Scale: 1"=20'-0"

(Fender not shown for clarity)

Note:
Plan orientation matches original bridge plans

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

STP-2175(100)

WIN 21751.00

BRIDGE NO. 2789

BRIDGE PLANS

PRELIMINARY
NOT FOR CONSTRUCTION
10/12/2021

PROJ. MANAGER	J. STETSON, PE	BY	DATE
DESIGN-DETAILED	BKP	DPD	7/30/2021
CHECKED-REVIEWED	GME/GTA	TSB/RSB/LMT	7/30/2021
DESIGN-DETAILED2			
DESIGN-DETAILED3			
REVISIONS 1			
REVISIONS 2			
REVISIONS 3			
REVISIONS 4			
FIELD CHANGES			

SOUTHPORT BRIDGE ROUTE 27
OVER TOWNSEND GUT
SOUTHPORT & BOOTHBAY HARBOR ME LINCOLN COUNTY

BRIDGE PLAN AND ELEVATION

SHEET NUMBER

2

OF 15

Filename: ...\MSTA\002_PLAN_ELEV_01.dgn Division: HIGHWAY Username: bdarrah Date:10/12/2021

364

NAE-2022-01848

Filename: ...\008_Existing_Fender_Sys.dgn Division: HIGHWAY Username: bdorroh Date:10/12/2021

Environmental Summary Sheet

WIN: 21751.01 **Date Submitted: 9/13/2022**
Town: Southport-Boothbay
CPD Team Leader: Andrea Brady
ENV Field Contact: Valerie Derosier

NEPA Complete: Programmatic Categorical Exclusion (CE) 23 CFR 771.117.c.28 issued on 8/17/2022

☒ **Section 106**
SHPO Concurrence-No adverse effect 4/27/2022
Section 106 Resources: Southport Bridge #2781 is NR Eligible.

☐ **Section 4(f) and 6(f)**

Section 4(f)	Section 6(f)
No Use	No properties

☒ **Maine Department of Inland Fisheries and Wildlife & Migratory Bird Treaty Act**
Osprey are known to nest on the bridge. Osprey are protected by the U.S. Migratory Bird Treaty Act. Osprey nesting period is approximately April 1 – September 1. Once the birds lay an egg in a nest, the nest cannot be disturbed by construction activity and cannot be removed. The nest will need to be removed outside of the breeding season and the contractor will need to preclude birds from nesting on the bridge to allow construction activities between April 1 and September 1. **See Special Provision 105.**

☒ **Section 7**
Species of Concern: Atlantic Salmon - Within DPS and Critical Habitat – Not Likely to Adversely Affect.
Comments/References: Informal Programmatic Consultation with NMFS GARFO signed 7/12/2022.
Special Conditions apply. See Special Provision 105

Species of Concern: Atlantic/Shortnose Sturgeon - Within DPS –Not Likely to Adversely Affect
Comments/References: Informal Programmatic Consultation with NMFS GARFO signed 7/12/2022.
Special Conditions apply. See Special Provision 105.
In-Water Work Window 11/15 – 3/14

Species of Concern: Roseate Tern – No effect
Comments/References:

Species of Concern: Northern Long-Eared Bat – No effect
Comments/References: No tree clearing needed

☒ **Essential Fish Habitat**
Species of Concern: Coastal Multi-Species EFH – Adverse Effect – Not Substantial. Approved 6/22/2022
Comments/References: Special Conditions apply. See Special Provision 105

☐ **Maine Department of Conservation/Public Lands, Submerged Land Lease**
Not applicable

☐ **Maine Land Use Planning Commission**
Not Applicable

☐ **Maine Department of Environmental Protection**
Exempt from Permitting 38 M.R.S.A. Sect. 480-Q2d
**Applicable Standards and Permits are included with the contract*

☐ **U.S. Army Corps of Engineers: Section 10 of the Rivers and Harbors Act and Section 404 of the Clean Water Act.**
No permit required per ACOE NAE-2022-01848 8/25/2022 (letter included in contract package)

☐ **Stormwater Review**
Not Applicable

☒ **Special Provisions Required**

Special Provision 105-Environmental Requirements	N/A☐	Applicable☒
Special Provision 656-Minor Soil Disturbance	N/A☒	Applicable☐
Standard Specification 656-Erosion Control Plan	N/A☐	Applicable☒
Special Provision 203-Dredge Material	N/A☒	Applicable☐
General Note for Hazardous Waste	N/A☐	Applicable☒

**All permits and approvals based on plans/scope as of: 8/2/2022*