

Updated 04/28/17

STATE PROJECT (Locally Administered)

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:

- a) Project is led by the Town, therefore an electronic bid is not allowed.
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 Town of Falmouth located at 271 Falmouth Road in Falmouth, ME 04105. Other means, such as U.S. Postal Service's Express Mail has proven not to be reliable.

If you need further information regarding Bid preparation, call Jay Reynolds at the Town of Falmouth at (207) 699-5374.

For complete bidding requirements, refer to Section 102 of the Maine Department of Transportation, Standard Specifications, November 2014 Edition.

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:

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, executors, administrators, successors and assigns, jointly and severally.

The condition of this obligation is that the Principal has submitted to the Maine Department of

Transportation, hereafter Department, a certain bid, attached hereto and incorporated as a

part herein, to enter into a written contract for the construction of _____

_____ and if the Department shall accept said bid

and the Principal shall execute and deliver a contract in the form attached hereto (properly

completed in accordance with said bid) and shall furnish bonds for this faithful performance of

said contract, and for the payment of all persons performing labor or furnishing material in

connection therewith, and shall in all other respects perform the agreement created by the

acceptance of said bid, then this obligation shall be null and void; otherwise it shall remain in full

force, and effect.

Signed and sealed this _____ day of _____ 20____

WITNESS:

WITNESS

PRINCIPAL:

By _____

By: _____

By: _____

SURETY:

By _____

By: _____

Name of Local Agency: _____

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 207-781-7465 or submitted via e-mail to jreynolds@falmouthme.org.

These are the only allowable mechanisms for answering Project specific questions. The Municipality 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.

Municipality of Falmouth

REQUEST FOR INFORMATION

Date: _____ Time: _____

Information Requested: WIN: 21784.00 & 21722.00 Town: Falmouth

Request by: _____ Phone: (_____) _____

Bid Date: _____ Fax: (_____) _____

Complete top portion of form and transmit to the number listed in the Notice to Contractors

RFI No: _____ RFI received: _____

Response: _____

Response By: _____ Date: _____

TOWN OF FALMOUTH NOTICE TO CONTRACTORS

Sealed paper bids addressed to the Municipality of Falmouth, 271 Falmouth Road, Falmouth, ME, 04105, and endorsed on the wrapper "Bids for Route 100/26 Reconstruction in the Municipality of Falmouth" will be received from contractors at the Town Hall (address above) front desk until 11 o'clock A.M. (prevailing time) on Tuesday, November 20, 2018. At that time the bids will be publicly opened and read in the Town Council Chambers at 271 Falmouth Road, Falmouth, ME. Bids will be accepted from all bidders. The lowest responsive bidder must have completed, or successfully complete, Maine DOT highway and bridge prequalifications to be considered for the award of this contract. It is permissible for a subcontractor performing the bridge construction work to be prequalified by Maine DOT in bridge construction while the general contractor is not prequalified in bridge construction. The basis of award will be to the lowest responsive and responsible bidder. The right is hereby reserved to the Municipality to reject any or all bids.

Bid documents are available for download at the Town's website under "Current Bids & RFPs" at:
<https://www.falmouthme.org/current-bids-rfps/pages/current-bids-rfps>

Description: Route 100/26 Reconstruction, WIN 21784.00 and 21722.00

Location: In Cumberland County, project is located along State Route 100/26

Outline of Work: Highway reconstruction, bridge rehabilitation, landscaping, utility, other incidental work.

For further information or questions regarding bidding and contracting procedures, construction plans, or the bid book, contact Jay Reynolds at jreynolds@falmouthme.org or (207) 699-5374. Questions received after noon of Friday prior to bid date will not be answered. Bidders shall not contact any other municipal staff for clarification of Contract provisions, and the Municipality will not be responsible for any interpretations so obtained.

There will be a mandatory pre-bid meeting at 10:00 am on Thursday, November 1, 2018 in the Town Council Chambers at 271 Falmouth Road, Falmouth, ME. For a general contractor's bid to be accepted there must be at least one representative present at this meeting. Representatives from subcontractors are welcome but are not required.

Each bid must contain the following items:

1. Acknowledge each bid amendment on the form in the bid package per Special Provision 102.7.3 – Acknowledgement of Bid Amendments.
2. A completed bid form with unit prices in ink for each pay item.
3. Authorized officers must sign the Contractor Agreement, Offer and Award form in ink.
4. 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 \$1000.00 payable to Municipality of Falmouth as a Bid guarantee.
5. See Maine DOT Standard Specification 102.11 for a list of non-curable bid defects.

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 and State Laws. All work shall be governed by "State of Maine, Department of Transportation, Standard Specifications, November 2014 Edition" and Maine DOT Standard Details. Maine DOT standards are available online at <http://www.maine.gov/mdot/contractors/publications/>

Falmouth, Maine
October 24, 2018

Mark Joseph Debowski, P.E.

Mark J. Debowski
10/23/2018



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)

BID FORM
PROJECT SCHEDULE OF ITEMS
WIN 21784.00 AND 21722.00

Note: This proposal shall be filled in by the Bidders, with the unit prices written in ink for each pay item. For complete information concerning these items, see the Maine DOT Standard Specifications and the project bid book.

Item No.	Quantity	Description and Unit Price	Unit	Amount (\$)
201.11	2	Clearing The Unit Price of \$ _____ Per Acre	AC	
201.23	69	Removing Single Tree Top Only The Unit Price of \$ _____ Per Each	Each	
201.24	69	Removing Stump The Unit Price of \$ _____ Per Each	Each	
202.12	10	Remove Existing Structural Concrete The Unit Price of \$ _____ Per Cubic Yard	C.Y.	
202.15	17	Removing Manhole or Catch Basin The Unit Price of \$ _____ Per Each	Each	
202.202	6730	Removing Pavement Surface The Unit Price of \$ _____ Per Square Yard	S.Y.	
203.20	25,000	Common Excavation The Unit Price of \$ _____ Per Cubic Yard	C.Y.	
203.21	500	Rock Excavation The Unit Price of \$ _____ Per Cubic Yard	C.Y.	
203.25	3300	Granular Borrow The Unit Price of \$ _____ Per Cubic Yard	C.Y.	
203.33	180	Special Fill The Unit Price of \$ _____ Per Cubic Yard	C.Y.	
206.061	50	Structural Earth Excavation - Dr & Minor St Bel Gd The Unit Price of \$ _____ Per Cubic Yard	C.Y.	
304.10	21,500	Aggregate Subbase Course - Gravel The Unit Price of \$ _____ Per Cubic Yard	C.Y.	
403.208	3180	Hot Mix Asphalt, 12.5mm HMA Surface The Unit Price of \$ _____ Per Ton	Ton	
403.209	1210	Hot Mix Asphalt, 9.5mm (Sidewalks, Drives, Incidentals) The Unit Price of \$ _____ Per Ton	Ton	

Item No.	Quantity	Description and Unit Price	Unit	Amount (\$)
403.211	90	Hot Mix Asphalt, 9.5mm Nominal Maximum Size (Shimming)	Ton	
		The Unit Price of \$ _____ Per Ton		
403.213	4950	Hot Mix Asphalt, 12mm Base	Ton	
		The Unit Price of \$ _____ Per Ton		
409.15	1900	Bituminous Tack Coat - Applied	Gallon	
		The Unit Price of \$ _____ Per Gallon		
411.09	100	Untreated Aggregate Surface Course	C.Y.	
		The Unit Price of \$ _____ Per Cubic Yard		
502.49	10	Structural Concrete Curbs and Sidewalks	C.Y.	
		The Unit Price of \$ _____ Per Cubic Yard		
502.56	8	Concrete Fill	C.Y.	
		The Unit Price of \$ _____ Per Cubic Yard		
507.0821	100	Steel Bridge Railing, 3 Bar	L.F.	
		The Unit Price of \$ _____ Per Linear Foot		
508.13	1	Sheet Waterproofing Membrane	L.S.	
		The Unit Price of \$ _____ Per Lump Sum		
511.07	1	Cofferdam: Sta. 184+60 - Upstream	L.S.	
		The Unit Price of \$ _____ Per Lump Sum		
511.07	1	Cofferdam: Sta. 184+60 - Downstream	L.S.	
		The Unit Price of \$ _____ Per Lump Sum		
514.06	1	Curing Box for Concrete Cylinders	Each	
		The Unit Price of \$ _____ Per Each		
515.20	50	Protective Coating for Concrete Surfaces	S.Y.	
		The Unit Price of \$ _____ Per Square Yard		
518.60	40	Repair of Vertical Surfaces < 8 Inches	S.F.	
		The Unit Price of \$ _____ Per Square Foot		
518.70	40	Repair of Overhead Surfaces < 8 Inches	S.F.	
		The Unit Price of \$ _____ Per Square Foot		
526.301	280	Temporary Concrete Barrier, Type 1	L.F.	
		The Unit Price of \$ _____ Per Linear Foot		

Item No.	Quantity	Description and Unit Price	Unit	Amount (\$)
526.305	50	Temporary Concrete Barrier, Braced Type 1	L.F.	
		The Unit Price of \$ _____ Per Linear Foot		
526.34	4	Permanent Concrete Transition Barrier	Each	
		The Unit Price of \$ _____ Per Each		
527.34	4	Workzone Traffic Cushion	Unit	
		The Unit Price of \$ _____ Per Unit		
534.71	1	Precast Concrete Box Culvert: Sta. 184+60	L.S.	
		The Unit Price of \$ _____ Per Lump Sum		
603.155	328	12" RCP Class III	L.F.	
		The Unit Price of \$ _____ Per Linear Foot		
603.159	241	12" Culvert Pipe Option III	L.F.	
		The Unit Price of \$ _____ Per Linear Foot		
603.16	46	15" Culvert Pipe Option I	L.F.	
		The Unit Price of \$ _____ Per Linear Foot		
603.175	659	18" RCP Class III	L.F.	
		The Unit Price of \$ _____ Per Linear Foot		
603.179	85	18" Culvert Pipe Option III	L.F.	
		The Unit Price of \$ _____ Per Linear Foot		
603.195	116	24" RCP Class III	L.F.	
		The Unit Price of \$ _____ Per Linear Foot		
603.199	28	24" Culvert Pipe Option III	L.F.	
		The Unit Price of \$ _____ Per Linear Foot		
603.205	104	30" RCP Class III	L.F.	
		The Unit Price of \$ _____ Per Linear Foot		
603.275	184	72" RCP Class III	L.F.	
		The Unit Price of \$ _____ Per Linear Foot		
603.279	56	72" Culvert Pipe Option III	L.F.	
		The Unit Price of \$ _____ Per Linear Foot		
603.55	38	Concrete Pipe Ties	Group	
		The Unit Price of \$ _____ Per Group		
604.072	23	Catch Basin Type A1-C	Each	
		The Unit Price of \$ _____ Per Each		

Item No.	Quantity	Description and Unit Price	Unit	Amount (\$)
604.092	16	Catch Basin Type B1-C	Each	
		The Unit Price of \$ _____ Per Each		
604.16	1	Altering Catch Basin to Manhole	Each	
		The Unit Price of \$ _____ Per Each		
604.18	25	Adjusting Manhole or Catch Basin to Grade	Each	
		The Unit Price of \$ _____ Per Each		
604.182	16	Cleaning Existing Catch Basin and Manhole	Each	
		The Unit Price of \$ _____ Per Each		
604.246	1	Catch Basin Type F5	Each	
		The Unit Price of \$ _____ Per Each		
604.252	7	Catch Basin Type A5-C	Each	
		The Unit Price of \$ _____ Per Each		
605.09	8100	6 Inch Underdrain Type B	L.F.	
		The Unit Price of \$ _____ Per Linear Foot		
605.10	250	6 Inch Underdrain Outlet	L.F.	
		The Unit Price of \$ _____ Per Linear Foot		
605.11	670	12 Inch Underdrain Type C	L.F.	
		The Unit Price of \$ _____ Per Linear Foot		
605.12	250	15 Inch Underdrain Type C	L.F.	
		The Unit Price of \$ _____ Per Linear Foot		
605.13	2000	18 Inch Underdrain Type C	L.F.	
		The Unit Price of \$ _____ Per Linear Foot		
606.1301	2350	31" W-Beam Guardrail- Mid-Way Splice (Steel Post, 8" Off. Blocks, Single Faced)	L.F.	
		The Unit Price of \$ _____ Per Linear Foot		
606.1303	225	31" W-Beam Guardrail- Mid-Way Splice (Steel Post, 8" Off. Blocks, 15' R or Less)	L.F.	
		The Unit Price of \$ _____ Per Linear Foot		
606.1304	153	31" W-Beam Guardrail- Mid-Way Splice (Steel Post, 8" Off. Blocks, Over 15' Rad)	L.F.	
		The Unit Price of \$ _____ Per Linear Foot		
606.1305	3	31" W-Beam Guardrail - Mid-Way Splice Flared Terminal (31" Height)	Each	
		The Unit Price of \$ _____ Per Each		
606.1307	6	Bridge Transition (Asymmetrical) - Type 1	Each	
		The Unit Price of \$ _____ Per Each		

Item No.	Quantity	Description and Unit Price	Unit	Amount (\$)
606.1308	2	Buried In-Slope Guardrail End, Mid-Way Splice	Each	
		The Unit Price of \$ _____ Per Each		
606.265	12	Terminal End - Single Rail - Galvanized Steel	Each	
		The Unit Price of \$ _____ Per Each		
606.353	66	Reflectorized Flexible Guardrail Marker	Each	
		The Unit Price of \$ _____ Per Each		
606.356	18	Underdrain Delineator Post	Each	
		The Unit Price of \$ _____ Per Each		
606.521	95	Mailbox and Post	Each	
		The Unit Price of \$ _____ Per Each		
606.81	5	Tangent Guardrail Terminal - Energy Absorbing	Each	
		The Unit Price of \$ _____ Per Each		
608.26	315	Curb Ramp Detectable Warning Field	S.F.	
		The Unit Price of \$ _____ Per Square Foot		
609.11	7200	Vertical Curb Type 1	L.F.	
		The Unit Price of \$ _____ Per Linear Foot		
609.111	300	Special Granite Curb - 24"	L.F.	
		The Unit Price of \$ _____ Per Linear Foot		
609.12	720	Vertical Curb Type 1 - Circular	L.F.	
		The Unit Price of \$ _____ Per Linear Foot		
609.234	74	Terminal Curb Type 1 - 4 Foot	Each	
		The Unit Price of \$ _____ Per Each		
609.2341	12	Terminal Curb Type 1 - 4 Foot Circular	Each	
		The Unit Price of \$ _____ Per Each		
609.238	38	Terminal Curb Type 1 - 8 Foot	Each	
		The Unit Price of \$ _____ Per Each		
609.2381	10	Terminal Curb Type 1 - 8 Foot Circular	Each	
		The Unit Price of \$ _____ Per Each		
609.31	3476	Curb Type 3	L.F.	
		The Unit Price of \$ _____ Per Linear Foot		

Item No.	Quantity	Description and Unit Price	Unit	Amount (\$)
609.34	900	Curb Type 5	L.F.	
		The Unit Price of \$ _____ Per Linear Foot		
609.35	20	Curb Type 5 - Circular	L.F.	
		The Unit Price of \$ _____ Per Linear Foot		
609.38	480	Reset Curb Type 1	L.F.	
		The Unit Price of \$ _____ Per Linear Foot		
609.40	20	Reset Curb Type 5	L.F.	
		The Unit Price of \$ _____ Per Linear Foot		
610.08	710	Plain Riprap	C.Y.	
		The Unit Price of \$ _____ Per Cubic Yard		
610.18	50	Stone Ditch Protection	C.Y.	
		The Unit Price of \$ _____ Per Cubic Yard		
612.06	20	Bituminous Sealing - Black	S.Y.	
		The Unit Price of \$ _____ Per Square Yard		
613.319	6600	Erosion Control Blanket	S.Y.	
		The Unit Price of \$ _____ Per Square Yard		
615.07	2300	Loam	C.Y.	
		The Unit Price of \$ _____ Per Cubic Yard		
615.086	250	Loam/Compost Mix	C.Y.	
		The Unit Price of \$ _____ Per Cubic Yard		
618.13	110	Seeding Method Number 1	Unit	
		The Unit Price of \$ _____ Per Unit		
618.14	80	Seeding Method Number 2	Unit	
		The Unit Price of \$ _____ Per Unit		
619.1201	200	Mulch	Unit	
		The Unit Price of \$ _____ Per Unit		
619.1301	35	Bark Mulch	C.Y.	
		The Unit Price of \$ _____ Per Cubic Yard		
620.54	200	Stabilization/Reinforcement Geotextile	S.Y.	
		The Unit Price of \$ _____ Per Square Yard		
620.56	600	Drainage Geotextile	S.Y.	
		The Unit Price of \$ _____ Per Square Yard		

Item No.	Quantity	Description and Unit Price	Unit	Amount (\$)
620.58	1600	Erosion Control Geotextile	S.Y.	
		The Unit Price of \$ _____ Per Square Yard		
621.129	9	SM Decid Tree (6'-8') Multi Stem Clump GP B	Each	
		The Unit Price of \$ _____ Per Each		
621.145	10	SM Decid Tree (2" - 2.5" CAL) GP B	Each	
		The Unit Price of \$ _____ Per Each		
621.28	46	LG Decid Tree (2.5" - 3" CAL) GP B	Each	
		The Unit Price of \$ _____ Per Each		
621.541	74	Decid Shrubs (18" - 24") GP B	Each	
		The Unit Price of \$ _____ Per Each		
621.711	512	Herbaceous Perennials GP B	Each	
		The Unit Price of \$ _____ Per Each		
624.05	35	Tree Protection	Each	
		The Unit Price of \$ _____ Per Each		
625.01	1	Water Line System - Temporary	L.S.	
		The Unit Price of \$ _____ Per Lump Sum		
626.11	13	Precast Concrete Junction Box	Each	
		The Unit Price of \$ _____ Per Each		
626.21	30	Metallic Conduit	L.F.	
		The Unit Price of \$ _____ Per Linear Foot		
626.22	6290	Non-Metallic Conduit	L.F.	
		The Unit Price of \$ _____ Per Linear Foot		
626.31	8	18" Diameter Foundation	Each	
		The Unit Price of \$ _____ Per Each		
626.32	59	24" Foundation	Each	
		The Unit Price of \$ _____ Per Each		
626.332	22	30-Inch Diameter Greater Than 8-Feet Long, and All 36-Inch and 42-Inch Diameter Foundations	C.Y.	
		The Unit Price of \$ _____ Per Cubic Yard		
626.333	12	48-Inch Diameter, 54-Inch Diameter, 60-Inch Diameter Foundation	C.Y.	
		The Unit Price of \$ _____ Per Cubic Yard		
626.35	3	Controller Cabinet Foundation	Each	
		The Unit Price of \$ _____ Per Each		

Item No.	Quantity	Description and Unit Price	Unit	Amount (\$)
627.733	77,000	4" White or Yellow Painted Pavement Marking Line	L.F.	
		The Unit Price of \$ _____ Per Linear Foot		
627.75	3400	White or Yellow Pavement & Curb Marking	S.F.	
		The Unit Price of \$ _____ Per Square Foot		
627.77	1300	Removing Pavement Markings	S.F.	
		The Unit Price of \$ _____ Per Square Foot		
627.78	33,000	Temp. Pavement Marking Line, White or Yellow	L.F.	
		The Unit Price of \$ _____ Per Linear Foot		
629.05	200	Hand Labor	Hour	
		The Unit Price of \$ _____ Per Hour		
631.12	200	All Purpose Excavator (Including Operator)	Hour	
		The Unit Price of \$ _____ Per Hour		
631.172	200	Truck-Large (Including Operator)	Hour	
		The Unit Price of \$ _____ Per Hour		
631.180	20	Chain Saw Rental (Including Operator)	Hour	
		The Unit Price of \$ _____ Per Hour		
631.20	20	Stump Chipper (Including Operator)	Hour	
		The Unit Price of \$ _____ Per Hour		
631.22	30	Front End Loader (Including Operator)	Hour	
		The Unit Price of \$ _____ Per Hour		
631.32	50	Culvert Cleaner (Including Operators)	Hour	
		The Unit Price of \$ _____ Per Hour		
634.16	1	Highway Lighting	L.S.	
		The Unit Price of \$ _____ Per Lump Sum		
634.70	59	Ornamental Lighting	Each	
		The Unit Price of \$ _____ Per Each		
639.18	1	Field Office Type A	Each	
		The Unit Price of \$ _____ Per Each		
643.62	4	Rectangular Rapid Flashing Beacon	Each	
		The Unit Price of \$ _____ Per Each		

Item No.	Quantity	Description and Unit Price	Unit	Amount (\$)
643.80	1	Traffic Signals at Route 100 at Leighton Road The Unit Price of \$ _____ Per Lump Sum	L.S.	
643.80	1	Traffic Signals at Route 100 Falmouth Road The Unit Price of \$ _____ Per Lump Sum	L.S.	
643.83	2	Video Detection System The Unit Price of \$ _____ Per Lump Sum	L.S.	
643.86	16	Traffic Signal Loop Detector The Unit Price of \$ _____ Per Each	Each	
643.91	2	Mast Arm Pole - 30' Mast Arm The Unit Price of \$ _____ Per Each	Each	
643.91	2	Mast Arm Pole - 35' Mast Arm The Unit Price of \$ _____ Per Each	Each	
643.91	1	Mast Arm Pole - 40' Mast Arm The Unit Price of \$ _____ Per Each	Each	
643.91	1	Mast Arm Pole - 50' Mast Arm The Unit Price of \$ _____ Per Each	Each	
643.92	4	Pedestal Pole The Unit Price of \$ _____ Per Each	Each	
645.103	4	Demount Guide Sign The Unit Price of \$ _____ Per Each	Each	
645.106	31	Demount Reg., War., Confirm, & Rte Marker Assbly. Sign The Unit Price of \$ _____ Per Each	Each	
645.113	4	Reinstall Guide Sign The Unit Price of \$ _____ Per Each	Each	
645.116	11	Reinstall Reg., War., Confirm, & Rte. Marker Assbly. Sign The Unit Price of \$ _____ Per Each	Each	
645.291	13	Roadside Guide Signs Type II The Unit Price of \$ _____ Per Square Foot	S.F.	
645.292	417	Reg., Warn., Conf. and Rte Mrker Assly Signs Type II The Unit Price of \$ _____ Per Square Foot	S.F.	

Item No.	Quantity	Description and Unit Price	Unit	Amount (\$)
652.33	200	Drum	Each	
		The Unit Price of \$ _____ Per Each		
652.34	300	Cone	Each	
		The Unit Price of \$ _____ Per Each		
652.35	1000	Construction Signs	S.F.	
		The Unit Price of \$ _____ Per Square Foot		
652.36	370	Maintenance of Traffic Control Devices	C.D.	
		The Unit Price of \$ _____ Per Calendar Day		
652.38	13,000	Flagger	Hour	
		The Unit Price of \$ _____ Per Hour		
652.381	1300	Traffic Officer	Hour	
		The Unit Price of \$ _____ Per Hour		
652.41	6	Portable Changeable Message Sign	Each	
		The Unit Price of \$ _____ Per Each		
653.22	250	2" Extruded Polystyrene Insulation	Each	
		The Unit Price of \$ _____ Per Each		
656.75	1	Temp Soil Erosion and Water Pollution Control	L.S.	
		The Unit Price of \$ _____ Per Lump Sum		
659.10	1	Mobilization	L.S.	
		The Unit Price of \$ _____ Per Lump Sum		
661.01	203	Esplanade Biofilter	S.F.	
		The Unit Price of \$ _____ Per Square Foot		
662.01	8	Precast Curblin 90 Degree Turn Pretreatment Unit	Each	
		The Unit Price of \$ _____ Per Each		
663.01	8	Domed PVC Overflow Riser with Filter Insert	Each	
		The Unit Price of \$ _____ Per Each		
673.10	727	Wet Cast Small Landscape Block Wall	S.F.	
		The Unit Price of \$ _____ Per Square Foot		
723.10	150	Granite Cobble Surface	S.Y.	
		The Unit Price of \$ _____ Per Square Yard		

Item No.	Quantity	Description and Unit Price	Unit	Amount (\$)
801.031	8	1.25" HDPE-CTS LPFM Lot Service Assembly The Unit Price of \$ _____ Per Each	Each	
801.0312	2	2" PVC LPFM Curb Stop/Gate Valve The Unit Price of \$ _____ Per Each	Each	
801.04	25	LPFM Wrap Around Pipe Insulation at Culverts The Unit Price of \$ _____ Per Linear Foot	L.F.	
801.132	1250	2" HDPE-CTS LPFM Pipe The Unit Price of \$ _____ Per Linear Foot	L.F.	
801.1321	2	2" X 2" X 2" HDPE-CTS LPFM Tee The Unit Price of \$ _____ Per Each	Each	
801.1322	140	1.25" HDPE-CTS LPFM Pipe The Unit Price of \$ _____ Per Linear Foot	L.F.	
801.1323	8	2" X 2" X 1.25" HDPE-CTS LPFM Tee The Unit Price of \$ _____ Per Each	Each	
801.141	75	4" PVC Sanitary Sewer The Unit Price of \$ _____ Per Linear Foot	L.F.	
801.16	300	6" PVC Gravity Sewer Pipe The Unit Price of \$ _____ Per Linear Foot	L.F.	
801.161	2	6" PVC Sewer Service Chimney The Unit Price of \$ _____ Per Each	Each	
801.17	930	8" PVC Sewer Main Pipe - SDR35 The Unit Price of \$ _____ Per Linear Foot	L.F.	
801.172	330	8" PVC Gravity Sewer Main Pipe - SDR35 - Over 10 FT Depth The Unit Price of \$ _____ Per Linear Foot	L.F.	
801.175	310	10" PVC Gravity Sewer Main Pipe - SDR35 The Unit Price of \$ _____ Per Linear Foot	L.F.	
803.01	23	Test Pit The Unit Price of \$ _____ Per Each	Each	
803.1722	2	5 FT Dia. Concrete LPFM Sewer Manhole Cleanout with Fittings The Unit Price of \$ _____ Per Each	Each	
803.173	11	4 Foot Diameter Concrete Sewer Manhole The Unit Price of \$ _____ Per Each	Each	

Item No.	Quantity	Description and Unit Price	Unit	Amount (\$)
812.164	3	Rebuilding Sewer Manhole	Each	
		The Unit Price of \$ _____ Per Each		
822.3605	950	12" CL 52 Di Pipe Push On Joint Pipe	L.F.	
		The Unit Price of \$ _____ Per Linear Foot		
822.3606	240	12" DR 11 HDPE Pipe	L.F.	
		The Unit Price of \$ _____ Per Linear Foot		
823.31	3	12" Gate Valve	Each	
		The Unit Price of \$ _____ Per Each		
823.3101	18	12" Gate Valve Cut-In & 12" Cut-In Offset Water Main	Each	
		The Unit Price of \$ _____ Per Each		
823.325	1	8" Cut-In Offset Fire Service	Each	
		The Unit Price of \$ _____ Per Each		
823.331	1	6" Cut-In Offset Fire Service	Each	
		The Unit Price of \$ _____ Per Each		
823.341	7	Air Release Valve-1"	Each	
		The Unit Price of \$ _____ Per Each		
823.421	7	6" PVC Gravity Sewer Service Wye	Each	
		The Unit Price of \$ _____ Per Each		
824.3	2	Fire Hydrant Assembly	Each	
		The Unit Price of \$ _____ Per Each		
824.31	2	Remove Fire Hydrant	Each	
		The Unit Price of \$ _____ Per Each		
824.32	7	Relocate Hydrant	Each	
		The Unit Price of \$ _____ Per Each		
825.334	27	1-IN Copper Service - Long Side	Each	
		The Unit Price of \$ _____ Per Each		
825.335	22	1-IN Copper Service - Short Side	Each	
		The Unit Price of \$ _____ Per Each		
825.57	3	Reconnect 1" Copper Service	Each	
		The Unit Price of \$ _____ Per Each		
825.571	1	Retire 1" Water Service	Each	
		The Unit Price of \$ _____ Per Each		

CONTRACT AGREEMENT, OFFER & AWARD

AGREEMENT is made on the date last signed below, by and between the Municipality of Falmouth, a body corporate and politic with its principal administrative offices at 271 Falmouth Road, Falmouth, ME ("the Municipality"), and _____ a corporation or other legal entity organized under the laws of the State of _____, with its principal place of business located at _____

The Municipality 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, Project **WIN 21784.00 and 21722.00, for Route 100/26 Reconstruction in the Municipality of Falmouth, County of Cumberland, 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 Municipality 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 **September 1, 2020** with the completion of the Route 100/26 base layer paving on or before **November 15, 2019**. Further, the Municipality may deduct from money 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, Revision of November 2014, 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 Design Plans, Maine Department of Transportation Standard Specifications (Revision of November 2014), Maine Department of Transportation Standard Details (Revision of November 2014), 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, 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 Design Plans, the Maine Department of Transportation's Standard Specifications (Revision of November 2014) as updated through advertisement, Supplemental Specifications, Special Provisions, Contract Agreement; and Contract Bonds contained herein for construction of:

WIN 21784.00 and 21722.00: Route 100/26 Reconstruction in the Town of Falmouth, County of Cumberland,

State of Maine, on which bids will be received until the time specified in the "Notice to Contractors" does 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 Municipality 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 Project Resident for the Municipality, and to accept as full compensation the amount determined upon a "Force Account" basis as provided Section 109.7.5 of the Maine Department of Transportation Standard Specifications, Revision of November 2014, 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 Municipality of Falmouth 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 Maine Department of Transportation's Standard Specifications, Revision of November 2014, and complete the Work within the time limits given in the Special Provisions of this Contract.

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

Fifth: 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 Municipality.

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 Contractor)

Witness

(Name and Title Printed)

G. Award.

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

MUNICIPALITY OF Falmouth

Date

By: Nathan Poore, Town Manager

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:

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, PDN No. **1224.00**, 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, November 2014 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, November 2014 Edition, Standard Details November 2014 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.

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 November 2014 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, November 2014 Edition, Standard Details November 2014 Edition, Supplemental Specifications, Special Provisions, Contract Agreement; and Contract Bonds contained herein for construction of:

PIN 1234.00 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.

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, November 2014 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 November 2014 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.

Date

(Witness Sign Here)
Witness

CONTRACTOR
(Sign Here)
(Signature of Legally Authorized Representative
of the Contractor)

(Print Name Here)
(Name and Title Printed)

G. Award.

Your offer is hereby accepted.
documents referenced herein.

This award consummates the Contract, and the

MAINE DEPARTMENT OF TRANSPORTATION

Date

By: David Bernhardt, 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:

Signature.....
Print Name Legibly

Signature

Print Name Legibly

SURETY ADDRESS:

.....
.....
.....

TELEPHONE.....

SIGNATURES:

CONTRACTOR:

Print Name Legibly

SURETY:

Print Name Legibly

NAME OF LOCAL AGENCY:

ADDRESS

.....
.....

.....

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

SURETY:

Signature.....

Print Name Legibly

SURETY ADDRESS:

NAME OF LOCAL AGENCY:

ADDRESS

TELEPHONE

Town: **Falmouth**
Project: **WIN 21784.00**
Date: **July 10, 2018**

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.

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:

Utility/Railroad	Aerial	Underground
Central Maine Power	X	X
Charter Communications	X	X
Consolidated Communications (Fair Point)	X	X
Portland Water District		X
Summit Natural Gas		X
Falmouth Sanitary District		X

Town: **Falmouth**
Project: **WIN 21784.00**
Date: **July 10, 2018**

Utility Contact Information		
Utility/Railroad	Contact Person	Contact Phone
Central Maine Power	Tim Laney	207-629-5816 Timothy.Laney@cmpco.com
Charter Communications	Mark Pelletier	207-253-2324 mark.pelletier@charter.com
Consolidated Communications (Fair Point)	Martin Pease	martin.pease@consolidated.com 207-272-7993
Portland Water District	Roger Paradis	207-774-5961 ext 3321 rparadis@pwd.org
Summit Natural Gas	Joe Parent	207-232-3851 jparent@pwd.org
Town of Falmouth (sewer)	Peter Clark	207-781-5253 pclark@town.falmouth.me.us

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.

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

Clearing and tree removal which is a part of this contract in areas where utilities are involved must be completed by the Contractor before the utilities can relocate their facilities. Any tree removal or tree trimming must be done by a licensed arborist. The arborist is responsible for overseeing the work and must abide by all applicable OSHA standards including but not limited to those involving working within 10-20 feet of electrical hazards.

New Traffic Signals will be installed as part of this project. These bases, poles and masts will be installed close to existing wires. Limited right-of-way does not allow above ground utilities to be relocated. The Contractor shall discuss these signals, with the Resident, prior to ordering and installation to make adjustments to the base locations so not to conflict wires. Vertical

adjustments may be made to the communication cables if needed and wires may run under the mast arm if other options are not available.

Depending on the method of slope construction the Contractor may be working next to, or under the existing wires. The contractor is encouraged to visit the site, prior to bid, to determine how to construct safely. Temporary utility adjustments are not anticipated. If the Contractor feels temporary relocation is necessary, the contractor shall notify the affected utilities. Any cost for temporary relocations shall be the responsibility of the Contractor. The Contractor shall not have any claims against the department if the existing lines become a construction issue. Sufficient time will need to be allowed prior to the construction for all required temporary relocation.

The Contractor shall not excavate around any pole, guy anchor or street light to a depth that compromises the stability of the pole. Central Maine Power is the pole owner and will hold a pole if requested by the Contractor.

The Contractor shall provide the utilities access to the new pole locations. Construction of any spot cuts or fills more than 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.

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

The Contractor will provide an initial layout (stakes/nails) of the pole locations based on the pole list that is in the project proposal/specification book (below). The Utility will then place their own stakes and minor alignment changes may be needed. Once staked the poles should be checked by the Contractors GPS for any possible conflicts with curb or drainage. The Contractor is then responsible for maintaining and or replacing the pole location stakes/nails until the poles are set by the respective utilities. The Contractor shall employ or retain competent Engineering and/or surveying personnel to fulfill these responsibilities. The Contractor must notify the Department of any errors or inconsistencies regarding the data and layout provided by the utilities.

Town: **Falmouth**
Project: **WIN 21784.00**
Date: **July 10, 2018**

Utility	Pole Set	Trans. Wires/ Cables	Remove Poles	Estimated Working Days
Central Maine Power	30 days	40 days	20 days	90 days
Charter Communications		36 days		36 days
Consolidated Communications (Fair Point)		90 days		90 days

Pole List:

CMP Pole #	Tel. Pole #	Existing Station	Left or Right	Existing Offset (ft)	Proposed Station	Left or Right	Proposed Offset	Comments
Route 100/26, Gray Road								
3		101 + 98.	R	20				OK @ existing location. Replace in place if condition/clearance warrants.
6		104 + 38.	R	19.5	104 + 40.	R	26	Set @ new station & offset. (Actual station TBD in field to line up with UG primary.) No poles 4 & 6 (Set 0.5' deeper)
7		105 + 98.5	R	20	105 + 95.5	R	26	Set @ new station & offset. (3 Phase ends) (Set 1.0' deeper)
7.1		105 + 99.	L	29				OK @ existing location. Replace in place if condition/clearance warrants.
8		107 + 62.	R	31				OK @ existing location. Replace in place if condition/clearance warrants.
8S		107 + 67.	L	32				OK @ existing location. Replace in place if condition/clearance warrants.
33		139 + 98.7	L	42.7				OK @ existing location. Replace in place if condition/clearance warrants.
34	155	142 + 24.8	L	30.9	142 + 05.	L	34.0	Set @ new station & offset. (Road Xing, Junction pole)(Pull is for Leighton Rd. 3 phase.)
?		142 + 54.3	R	33.4				MDOT pole
?		143 + 25.3	R	32.0				MDOT pole
35	55	143 + 52.	L	29.1	Existing	L	35.5	Set back to new offset @ existing station. (Set 1.5' deeper)
36	52	144 + 78.5	L	24.9	144 + 65.	L	33.0	Set @ new station & offset. (Road Xing) (4.2' spot cut needed)
37	151	146 + 42.2	L	21.6	146 + 33.	R	22.0	Move to right and set @ new station & offset. (Road Xing) (Set 1' deeper)
38HS	149	148 + 03.	R	17.7				Eliminate & Remove
38H	149	148 + 13.	L	16.9	147 + 98.	R	22.5	Move to right and set @ new station & offset.
40.1		149 + 21.5	R	18.3	150 + 31.	L	27.0	Move to left and set @ new station & offset.
40	148	150 + 16.8	L	18.0	149 + 79.5	R	24.5	Move to right and set @ new station & offset. (No CMP pole 39)

Town: **Falmouth**
Project: **WIN 21784.00**
Date: **July 10, 2018**

CMP Pole #	Tel. Pole #	Existing Station	Left or Right	Existing Offset (ft)	Proposed Station	Left or Right	Proposed Offset	Comments
42	147	151 + 62.4	R	15.3	Existing	R	23.0	Set back to new offset @ existing station. (No CMP pole 41) (Set 1.0' shallow)
42S					151 + 62.5	L	27.0	New stub pole to hold reverse corner @ CMP 42 (3.4' spot fill needed)
43	146	152 + 88.3	R	20.5	Existing	R	23.0	Set back to new offset @ existing station. (Set 1.0' deeper)
43S					152 + 88.	L	27.0	New stub pole to hold reverse corner @ CMP 43 (Set 1.0' deeper)
44	145	154 + 36.9	R	19.8	154 + 35.	R	23.0	Set @ new station & offset.
45.1		155 + 35.7	L	24.8	155 + 39.	L	28.0	Set @ new station & offset. (Set 1.0' deeper)
45	144	155 + 74.5	R	20.2	155 + 80.	R	23.0	Set @ new station & offset.
46		157 + 42.5	R	21.5	157 + 37.	R	24.0	Set @ new station & offset.
46.1		157 + 43.5	L	102.0				OK @ existing location. Replace in place if condition/clearance warrants.
47	142	158 + 71.6	R	18.5	158 + 81.	R	24.0	Set @ new station & offset. (Set 1.5' deeper)
48.1		160 + 10.7	L	58.9				OK @ existing location. Replace in place if condition/clearance warrants.
48	141	160 + 27.4	R	18.7	160 + 28.5	R	23.0	Set @ new station & offset.
49	172	161 + 75.6	R	15.8	162 + 03.	R	23.0	Set @ new station & offset.
49.1		161 + 77.3	L	24.1	161 + 73.	L	28.0	Set @ new station & offset. (Set 2.0' deeper)
49S					162 + 03.5	L	30.0	New stub pole to hold reverse corner @ CMP 49 (2.2' spot cut needed)
50	139	163 + 27.2	R	19.9	164 + 08.5	R	24.5	Set @ new station & offset.
51	138	164 + 74.2	R	19.6				Eliminate & Remove
52	137	166 + 09.4	R	16.7	166 + 11.5	R	23.0	Set @ new station & offset. (Align with U.G. serv.) (Set 0.5' shallow)
53	136	167 + 72.7	R	18.1	167 + 69.5	R	23.0	Set @ new station & offset.
54	135	169 + 25.5	R	22.2	169 + 05.	R	23.0	Set @ new station & offset. (Set 1.5' deeper)
55	134	170 + 74.4	R	14.7	170 + 40.	R	23.0	Set @ new station & offset. (Set 1.0' deeper)
56	131	171 + 88.6	R	19.1	172 + 22.	R	27.0	Set @ new station & offset. (Set 1.5' deeper)
57	130	172 + 89.	R	21.6	173 + 27.	R	30.0	Set @ new station & offset.
57S					173 + 79.	L	31.0	New stub pole to hold take off from CMP 57 (Field locate for exact location for alignment.)
58	129	174 + 43.9	R	16.4	Existing	R	28.0	Set back to new offset @ existing station.
59	128	175 + 67.9	R	19.3	175 + 65.	R	28.0	Set @ new station & offset.
60	127	176 + 92.1	R	22.7	Existing	R	28.0	Set back to new offset @ existing station.
61	126	177 + 87.9	R	24.9	Existing	R	28.0	Set back to new offset @ existing station.
62	125	179 + 09.3	R	28.1				OK @ existing location. Replace in place if condition/clearance warrants.
62.1	125.1	179 + 39.	L	20.5	179 + 54.5	L	28.0	Set @ new station & offset.
63		181 + 36.2	L	38.2	181 + 09.5	R	33.5	Move to right and set @ new station & offset. (Road Xing)

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CMP Pole #	Tel. Pole #	Existing Station	Left or Right	Existing Offset (ft)	Proposed Station	Left or Right	Proposed Offset	Comments
213					181 + 46.	L	41.5	New CMP pole 213 for takeoff up Mountain Rd. (Road Xing)
63S - 63HS					182 + 01.	L	29.0	New stub pole to hold take off from CMP 63 & reverse corner @ CMP 63H.
63H					182 + 05.	R	28.0	New half pole to provide service to house.
64	123	183 + 35.9	R	13.1	Existing	R	28.0	Set @ new offset @ existing station. (Actual station will have to be determined in field to align with U.G. primary.)(Set 1' shallow)
65	122	184 + 63.5	R	8.5	184 + 57.	R	25.5	Set @ new station & offset.
66	121	185 + 80.1	R	8.0	Existing	R	23.0	Set back to new offset @ existing station.
66.1		186 + 42.2	L	42.3				OK @ existing location. Replace in place if condition/clearance warrants.
67		187 + 34.3	R	12.7	187 + 32.	R	23.0	Set @ new station & offset.
68S		188 + 84.5	L	25.2				Pole not there.
68	119	188 + 78.	R	18.4	188 + 83.	R	23.0	Set @ new station & offset. (Pole not shown on plans)
70	118	190 + 39.8	R	23.4				OK @ existing location. Replace in place if condition/clearance or cut warrants. (No CMP pole 69) (Check set depth)
70.1		190 + 47.	L	27.6				OK @ existing location. Replace in place if condition/clearance warrants.
71	11	191 + 80.1	R	25.6				OK @ existing location. Replace in place if condition/clearance or cut warrants. (Check set depth)
72.1		193 + 23.9	L	23.2				OK @ existing location. Replace in place if condition/clearance warrants.
72		193 + 24.4	R	22.8				OK @ existing location. Replace in place if condition/clearance warrants.
73		194 + 70.2	R	21.8				OK @ existing location. Replace in place if condition/clearance warrants.
74		195 + 75.	R	21.4				OK @ existing location. Replace in place if condition/clearance warrants.
75.1	113D	197 + 13.8	L	37.3				OK @ existing location. Replace in place if condition/clearance warrants.
75	113	197 + 28.	R	20.1	Existing	R	23.0	Set back to new offset @ existing station.
76	112	198 + 65.4	R	20.2	Existing	R	22.0	Set back to new offset @ existing station.
77S	110S	199 + 81.8	L	24.2				OK @ existing location. Replace in place if condition/clearance warrants.
77		199 + 84.1	R	19.3	Existing	R	23.0	Set back to new offset @ existing station.
78		201 + 45.4	R	27.9				OK @ existing location. Replace in place if condition/clearance warrants.

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CMP Pole #	Tel. Pole #	Existing Station	Left or Right	Existing Offset (ft)	Proposed Station	Left or Right	Proposed Offset	Comments
78.1		201 + 52.4	L	30.6				OK @ existing location. Replace in place if condition/clearance warrants.
Falmouth Road								
211.1		58 + 09.4	L	23.1	58 + 06.5	L	27.0	Set @ new station & offset.
211		58 + 56.8	R	20.9	58 + 48.5	R	28.0	Set @ new station & offset. (Road Xing) (Span from CMP 63 = 164')
210		60 + 23.5	R	20.1	60 + 19.	R	23.0	Set @ new station & offset. (3.4' spot cut needed)
208		61 + 24.5	R	22.9				OK @ existing location. Replace in place if condition/clearance or cut warrants. (Road Xing) (Align with U.G. serv.) (No CMP pole 209) (Check set depth)
?		62 + 75.4	R	19.2				Unknown pole, OK @ existing location. Replace in place if condition/clearance or cut warrants or remove if not needed.
207		62 + 83.1	L	38.1				OK @ existing location. Replace in place if condition/clearance warrants. (Road Xing)
206		64 + 95.5	L	34.0				OK @ existing location. Replace in place if condition/clearance warrants. (Road Xing)
205		66 + 21.	R	18.8	Existing	R	23.0	Set back to new offset @ existing station. (Road Xing)
Leighton Road								
1		11 + 30.5	L	16.5				OK @ existing location. Replace in place if condition/clearance warrants.
2		12 + 65.	L	18.0				OK @ existing location. Replace in place if condition/clearance warrants.
3		14 + 31.5	L	17.5				OK @ existing location. Replace in place if condition/clearance warrants.
4		15 + 65.	L	18.5				OK @ existing location. Replace in place if condition/clearance warrants.
5		16 + 87.	L	18.5				OK @ existing location. Replace in place if condition/clearance warrants. (Road Xing)
6		18 + 28.	R	18.5	18 + 25.	R	20.0	Set @ new station & offset. (Road Xing)
7		19 + 97.	R	17.0	Existing	R	20.0	Set back to new offset @ existing station. (Road Xing)
8		21 + 78.5	L	22.5				OK @ existing location. Replace in place if condition/clearance warrants. (Turnpike Xing)
9		24 + 46.5	L	26.0				OK @ existing location. Replace in place if condition/clearance warrants. (Turnpike Xing)(Road Xing)
10		25 + 79.	R	19.5				OK @ existing location. Replace in place if condition/clearance warrants. (Road Xing)

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CMP Pole #	Tel. Pole #	Existing Station	Left or Right	Existing Offset (ft)	Proposed Station	Left or Right	Proposed Offset	Comments
13		27 + 21.5	R	19.5				OK @ existing location. Replace in place if condition/clearance warrants. (No poles 11 & 12)
14		28 + 62.	R	19.5				OK @ existing location. Replace in place if condition/clearance warrants.
15		30 + 14.	R	19.0				OK @ existing location. Replace in place if condition/clearance warrants.
16		31 + 47.	R	19.0				OK @ existing location. Replace in place if condition/clearance warrants.
17		32 + 86.	R	19.5				OK @ existing location. Replace in place if condition/clearance warrants.
18		34 + 00.	R	20.5	Existing	R	23.0	Set back to new offset @ existing station.
19		35 + 49.	R	34.0				OK @ existing location. Replace in place if condition/clearance warrants.
19S					35 + 57.	L	19.0	New stub pole to hold reverse corner @ CMP 19 (Eliminate if CMP 19H & 19HS used.)
19H					36 + 50.5	R	33.5	New pole if needed because of R/W issues. (Does not completely eliminate R/W issues.)
19HS					36 + 77.5	L	22.0	New stub pole to hold reverse corner @ CMP 19H.
20S					37 + 94.	L	22.0	New stub pole to hold reverse corner @ new CMP 20
20					38 + 00.	R	32.0	New pole if needed because of R/W issues. (Does not completely eliminate R/W issues.)
20		39 + 03.	R	21.5	38 + 87.	R	32.0	Set @ new station & offset. (Road Xing) (Renumber to 20H if new CMP 20 is used.)
20		39 + 05.	R	19.5				Stub, eliminate & remove
21		40 + 55.5	L	18.5				OK @ existing location. Replace in place if condition/clearance warrants. (Check anchor alignment)
Mountain Road								
215		53 + 37.8	R	17.6				OK @ existing location. Replace in place if condition/clearance warrants.
214		54 + 86.4	R	16.2				OK @ existing location. Replace in place if condition/clearance warrants. (Road Xing)
214.1		55 + 63.3	R	17.0	Existing	R	24.0	Set back to new offset @ existing station. (Road Xing) (Set 0.5' deeper)
213					56 + 19.	L	35.0	New CMP pole for takeoff up Mountain Rd. (Road Xing)

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SUBSURFACE

Utility	Summary of Work	Estimated Working Days
Central Maine Power	Relocating underground electric	10 days
Consolidated Communications	Relocating underground telephone	10 days
Portland Water District	Water service replacements, water main offsets, water main replacement, directional drill water main, hydrant relocations, hydrant installs, hydrant retire.	45 days
Summit Natural Gas	Install New Natural Gas Distribution Main Within the Limits of the Project. Install Service lines to New Contracts and Sleeves Under New Roadway for Long Side Services. Work would be performed by SNG contractor.	50 days total (15 days – main in roadway cut; 25 days – main outside of roadway cut; 10 days – sleeves and services)
Total:		115 days

Portland Water District

The Portland Water District has water mains and services in the project area. The Portland Water District has entered into an agreement with the Department to provide water main installation and adjust items, in the bid documents. The Portland Water District and the Contractor shall communicate directly and share item totals with the Resident at the end of each day. The Contractor will notify the District at least 48 hours prior to any water related items. The Portland Water District will oversee and document all installation of water related items with the Department oversight on backfill. The contact for the Portland Water District is Joseph Parent at 774-5961.

Summit Natural Gas of Maine

Summit Gas Co will be installing a new Gas Main within the project limits. The Contractor will need to work with Summit and allow space and time within their work zone and protect Summit during this process. When Summit performs work outside of the Contractor's work zone Summit will provide their own traffic control. Summit Gas will install 2" sleeves at a 30" depth to allow for future access of services on the opposite side of the main installation. These sleeves will be installed provided and installed by Gas Company as the contractor is performing subgrade work. Coordination will be required between Summit and the Contractor. The Contractor shall provide line and grade for Summit's gas main based on the plans and cross sections. Summit and the Contractor shall communicate directly after pre-construction. Before construction starts, the Contractor shall have a separate meeting on-site to discuss a work plan and schedule. Summit can only support 2 operations at the same time during construction unless other arrangements are made and agreed upon. Summit anticipates installing 200-400 feet of gas main per day. Proposed main that falls within 15' of centerline shall take place in conjunction with roadway common excavation and aggregate placement. If the scope of work changes, the Contractor must contact Summit before executing the change. Payment for coordination and layout work for Summit shall be considered incidental to the mobilization item. The Contact for Summit is Bryan Foster at 207-465-6400.

Town of Falmouth Sanitary Sewer

The Town of Falmouth wants to install sewer facilities in the project area. Falmouth has entered into an agreement with the Department to provide sewer mains, manholes and adjust items, in the bid documents. The Town Sewer Department and the Contractor shall communicate directly and share item totals with the Resident at the end of each day. The Contractor will notify the District at least 48 hours prior to any sewer related items. The Town will oversee and document all installation of sewer related items with the Department oversight on backfill. The contact for the Town of Falmouth Sewer is Peter Clark at 207-781-5253.

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 105

GENERAL SCOPE OF WORK

(Limitations of Operations)

No weekday lane closures between the hours of 7:00am to 9:00am and 3:00pm to 6:00pm.

SPECIAL PROVISION
SECTION 105
GENERAL SCOPE OF WORK
(Environmental Requirements)

In-Water work consists of any activity conducted below the normal high water mark of a river, stream, brook, lake, pond or “Coastal Wetland” areas that are subject to tidal action during the highest tide level for the year which an activity is proposed as identified in the tide tables published by the National Ocean Service. <http://www.oceanservice.noaa.gov/> For the full definition of “Coastal Wetlands”, please refer to 38 MRSA 480-B(2)

I. The following activities are prohibited below the ordinary high water line (OHW) of the Piscataqua River:

1. Temporary and permanent fill placement. Fill is defined by regulation as any material used for the primary purpose of replacing an aquatic area with dry land or changing the bottom elevation of a water body. This includes but is not limited to crane mats, rock temporary fill roads, riprap, and sandbags.
2. Disturbance of river substrate.

II. The following activities are permitted below the ordinary high water line (OHW) at any time:

1. Temporary bracing for staging platforms for worker access and/or debris containment.
2. Work from float(s)/barge(s).

SPECIAL PROVISION
SECTION 107
PROSECUTION AND PROGRESS
(Contract Time)

The Contractor may begin work Anytime in accordance with Standard Specification 104.4.2 and upon approval of all required submittals. The Contract Completion Date will be no later than **(September 1, 2020)**

At least 21 calendar days prior to the desired Begin Construction Date, the Contractor shall submit an **electronic copy of their signed request to begin work and the Begin Construction Date**. This signed request shall be sent read receipt through email with their **Schedule of Work**, in accordance with Standard Specification 107.4.2, to Shawn.Smith@Maine.gov, Emory.Lovely@Maine.gov, Scott.Bickford@Maine.gov, jreynolds@falmouthme.org, and Mark.Debowski@stantec.com. The Contractor shall notify all utility contacts listed in the 104 Special Provision and provide the utility contacts the submitted schedule of work within 2 calendar days of the schedule of work submittal. **A penalty in the amount of \$500/day will be assessed for each calendar day or partial calendar day beyond the signed request to begin work is received that the schedule of work is not received.** Upon receipt of the schedule of work, a pre-construction meeting will be scheduled. A Contract Modification will be executed to document the new Contract Completion Date based upon the Begin Construction Date. The modified Contract Completion Date shall not exceed the Contract Completion Date specified in this special provision.

The Contractor may request to adjust the submitted schedule of work and Begin Construction Date once after the initial submittal. The Department will allow adjustments in the Begin Construction Date of up to seven calendar days if the request is made at least 21 calendar days prior to the updated Begin Construction Date. This signed request shall be sent read receipt through email with their **Schedule of Work**, in accordance with Standard Specification 107.4.2, to Shawn.Smith@Maine.gov, Emory.Lovely@Maine.gov, and Scott.Bickford@Maine.gov, jreynolds@falmouthme.org, and Mark.Debowski@stantec.com. The Contractor shall notify all utility contacts listed in the 104 Special Provision and provide the utility contacts the updated schedule of work within 2 calendar days of the request to adjust the Begin Construction Date.

SPECIAL PROVISION
SECTION 108
PAYMENT
(Asphalt Escalator)

108.4.1 Price Adjustment for Hot Mix Asphalt: For all contracts with hot mix asphalt in excess of 500 tons total, a price adjustment for performance graded binder will be made for the following pay items:

- Item 403.102 Hot Mix Asphalt – Special Areas
- Item 403.206 Hot Mix Asphalt - 25 mm
- Item 403.207 Hot Mix Asphalt - 19 mm
- Item 403.2071 Hot Mix Asphalt - 19 mm (Polymer Modified)
- Item 403.2072 Hot Mix Asphalt - 19 mm (Asphalt Rich Base)
- Item 403.2073 Warm Mix Asphalt - 19 mm
- Item 403.208 Hot Mix Asphalt - 12.5 mm
- Item 403.2081 Hot Mix Asphalt - 12.5 mm (Polymer Modified)
- Item 403.20813 Warm Mix Asphalt - 12.5 mm (Polymer Modified)
- Item 403.2083 Warm Mix Asphalt - 12.5 mm
- Item 403.209 Hot Mix Asphalt - 9.5 mm (sidewalks, drives, & incidentals)
- Item 403.210 Hot Mix Asphalt - 9.5 mm
- Item 403.2101 Hot Mix Asphalt - 9.5 mm (Polymer Modified)
- Item 403.2102 Hot Mix Asphalt - 9.5 mm (Asphalt Rich Base)
- Item 403.2103 Warm Mix Asphalt - 9.5 mm
- Item 403.2104 Hot Mix Asphalt - 9.5 mm (3/4" Surface)
- Item 403.211 Hot Mix Asphalt – Shim
- Item 403.2111 Hot Mix Asphalt – Shim (Polymer Modified)
- Item 403.2113 Warm Mix Asphalt - Shim
- Item 403.212 Hot Mix Asphalt - 4.75 mm (Shim)
- Item 403.2123 Warm Mix Asphalt - 4.75 mm (Shim)
- Item 403.213 Hot Mix Asphalt - 12.5 mm (base and intermediate course)
- Item 403.2131 Hot Mix Asphalt - 12.5 mm (base and intermediate course Polymer Modified)
- Item 403.2132 Hot Mix Asphalt - 12.5 mm (Asphalt Rich Base and intermediate course)
- Item 403.2133 Warm Mix Asphalt - 12.5 mm (base and intermediate course)
- Item 403.214 Hot Mix Asphalt - 4.75 mm (Surface)
- Item 403.2143 Warm Mix Asphalt - 4.75 mm (Surface)
- Item 403.301 Hot Mix Asphalt (Asphalt Rubber Gap-Graded)
- Item 404.70 Colored Hot Mix Asphalt – 9.5mm (Surface)
- Item 404.72 Colored Hot Mix Asphalt – 9.5mm (Islands, sidewalks, & incidentals)
- Item 461.13 Maintenance Surface Treatment

Price adjustments will be based on the variance in costs for the performance graded binder component of hot mix asphalt. They will be determined as follows:

The quantity of hot mix asphalt for each pay item will be multiplied by the performance graded binder percentages given in the table below times the difference in price between the base price and the period price of asphalt cement. Adjustments will be made upward or downward, as prices increase or decrease.

Item 403.102–6.2%			
Item 403.206–4.8%			
Item 403.207–5.2%	Item 403.2071–5.2%	Item 403.2072–5.8%	Item 403.2073–5.2%
Item 403.208–5.6%	Item 403.2081–5.6%	Item 403.20813–5.6%	Item 403.2083–5.6%
Item 403.209–6.2%			
Item 403.210–6.2%	Item 403.2101–6.2%	Item 403.2102–6.8%	Item 403.2103–6.2%
Item 403.2104–6.2%			
Item 403.211–6.2%	Item 403.2111–6.2%		Item 403.2113–6.2%
Item 403.212–6.8%			Item 403.2123–6.8%
Item 403.213–5.6%	Item 403.2131–5.6%	Item 403.2132–6.2%	Item 403.2133–5.6%
Item 403.214–6.8%			Item 403.2143–6.8%
Item 403.301–6.2%			
Item 404.70–6.2%			
Item 404.72–6.2%			
Item 461.13–6.4%			

Hot Mix Asphalt: The quantity of hot mix asphalt will be determined from the quantity shown on the progress estimate for each pay period.

Base Price: The base price of performance graded binder to be used is the price per standard ton current with the bid opening date. This price is determined by using the average New England Selling Price (Excluding the Connecticut market area), as listed in the Asphalt Weekly Monitor.

Period Price: The period price of performance graded binder will be determined by the Department by using the average New England Selling Price (Excluding the Connecticut market area), listed in the Asphalt Weekly Monitor current with the paving date. The maximum Period Price for paving after the adjusted Contract Completion Date will be the Period Price on the adjusted Contract Completion Date.

SPECIAL PROVISION SECTION 401 - HOT MIX ASPHALT PAVEMENT

The Standard Specification 401 – Hot Mix Asphalt Pavement, has been modified with the following revisions. All sections not revised by this Supplemental Specification shall be as outlined in Section 401 of the Standard Specifications.

401.07 Hot Mix Asphalt Plant

401.071 General Requirements HMA plants shall conform to AASHTO M156-97.

a. Truck Scales When the hot mix asphalt is to be weighed on scales meeting the requirements of Section 108 - Payment, the scales shall be inspected and sealed by the State Sealer 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.

b. Additives Additives (WMA, anti-strip, etc.) not directly introduced into the binder at the terminal shall be introduced into the HMA plant per the supplier's recommendations and shall be approved by the Asphalt Pavement Engineer, Pavement Quality Manager, or their authorized representative. The system for introducing additives shall be interlocked with the aggregate feed or weigh system to maintain correct proportions for all rates of production 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.

c. Stockpiles HMA plants shall have sufficient space for stockpiles, with a minimum of supply for 2 days production of all aggregate products used in MaineDOT approved mix designs currently under production for the facility at all times. A minimum stockpile supply of 100 ton (70 yards) shall be maintained at all times no matter the production rate for the HMA plant. Stockpiles shall be separated and built to minimize segregation.

401.18 Quality Control Method A, B & C The Contractor shall operate in accordance with the approved Quality Control Plan (QCP) to assure a product meeting the contract requirements. The QCP shall meet the requirements of Section 106.6 - Acceptance and this Section. The Contractor shall not begin paving operations until the Department approves the QCP in writing.

The QCP shall address any items that affect the quality of the Hot Mix Asphalt Pavement including, but not limited to, the following:

- a. JMF(s)
- b. Hot mix asphalt plant details
- c. Stockpile Management (to include provisions for how the requirements of 401.071c will be met)
- d. Make and type of paver(s)
- e. Make and type of rollers including weight, weight per inch of steel wheels, and average contact pressure for pneumatic tired rollers
- f. Name of QCP Administrator, and certification number
- g. Name of Process Control Technician(s) and certification number(s)
- h. Name of Quality Control Technicians(s) and certification number(s)
- i. Mixing & transportation including process for ensuring that truck bodies are clean and free of debris or contamination that could adversely affect the finished pavement
- j. Testing Plan
- k. Laydown operations including longitudinal joint construction, procedures for avoiding paving in inclement weather, type of release agent to be used on trucks tools and rollers, compaction of shoulders, tacking of all joints, methods to ensure that segregation is minimized, procedures to determine the maximum rolling and paving speeds based on best engineering practices as well as past experience in achieving the best possible smoothness of the pavement. Solvent based agents developed to strip asphalts from aggregates will not be allowed as release agents.
- l. Examples of Quality Control forms including a daily plant report, daily paving report, and delivery slip template for any plant to be utilized.
- m. Silo management and details (can show storage for use on project of up to 36 hours)
- n. Provisions for varying mix temperature due to extraordinary conditions or production limitations. If a warm-mix technology is utilized, a proposed target production temperature range (not to exceed 50°F) will be provided for each mix design.
- o. Name and responsibilities of the Responsible onsite Paving Supervisor.
- p. Method for calibration/verification of Density Gauge
- q. A note that all testing will be done in accordance with AASHTO and the MaineDOT Policies and Procedures for HMA Sampling and Testing.
- r. A detailed description of RAP processing, stockpiling and introduction into the plant as well as a note detailing conditions under which the percent of RAP will vary from that specified on the JMF.
- s. A detailed procedure outlining when production will be halted due to QC or Acceptance testing results.
- t. A plan to address the change in PGAB source or supplier and the potential co-mingling of differing PGAB's.
- u. A procedure to take immediate possession of acceptance samples once released by MaineDOT and deliver said samples to the designated acceptance laboratory.
- v. Provisions for how the QCP will be communicated to the Contractor's field personnel

The Contractor shall cease paving operations whenever one of the following occurs on a lot in progress:

- a. Method A: The Pay Factor for VMA, Voids @ N_d , Percent PGAB, composite gradation, VFB, fines to effective binder or density using all Acceptance or all Quality Control tests for the current lot is less than 0.85. No ceasing of paving operations shall be required for fines to effective binder if the mean test value is equal to the LSL or USL and $s = 0$.
- b. Method B: The Pay Factor for VMA, Voids @ N_d , Percent PGAB, composite gradation, VFB, fines to effective binder or density using all Acceptance or all Quality Control tests for the current lot is less than 0.90. No ceasing of paving operations shall be required for fines to effective binder if the mean test value is equal to the LSL or USL and $s = 0$.
- c. Method C: The Pay Factor for Percent PGAB, percent passing the nominal maximum sieve, percent passing 2.36 mm sieve, percent passing 0.300 mm sieve, percent passing 0.075 mm sieve or density using all Acceptance or all available Quality Control tests for the current lot is less than 0.85. No ceasing of paving operations shall be required for percent passing the nominal maximum sieve, percent passing 2.36 mm sieve, percent passing 0.300 mm sieve, or percent passing 0.075 mm sieve if the mean test value is equal to the LSL or USL and $s = 0$.
- d. The Coarse Aggregate Angularity or Fine Aggregate Angularity value falls below the requirements of Table 3: Aggregate Consensus Properties Criteria in Section 703.07 for the design traffic level.
- e. Each of the first 2 control tests for a Method A or B lot fall outside the upper or lower limits for VMA, Voids @ N_d , or Percent PGAB; or under Method C, each of the first 2 control tests for the lot fall outside the upper or lower limits for the nominal maximum, 2.36 mm, 0.300 mm or 0.075 mm sieves, or percent PGAB.
- f. The Flat and Elongated Particles value exceeds 10% by ASTM D4791.
- g. There is any visible damage to the aggregate due to over-densification other than on variable depth shim courses.
- h. The Contractor fails to follow the approved QCP.

401.203 Method C Lot Size will be the entire production per JMF for the project, or if so agreed at the Pre-paving Conference, equal lots of up to 4500 tons, with unanticipated over-runs of up to 1500 ton rolled into the last lot. Sublot sizes shall be 750 ton for mixture properties, 500 ton for base or binder densities and 250 ton for surface densities. The minimum number of sublots for mixture properties shall be 4, and the minimum number of sublots for density shall be five.

TABLE 7: METHOD C ACCEPTANCE LIMITS

Property	USL and LSL
Passing 4.75 mm and larger sieves	Target +/-7%
Passing 2.36 mm to 1.18 mm sieves	Target +/-5%
Passing 0.60 mm	Target +/-4%
Passing 0.30 mm to 0.075 mm sieve	Target +/-2%
PGAB Content	Target +/-0.4%
% TMD (In place density)	95.0% +/- 2.5%

Pay Adjustment Method C

The Department will use density, Performance Graded Asphalt Binder content, and the percent passing the nominal maximum, 2.36 mm, 0.300 mm and 0.075 mm sieves for the type of HMA represented in the JMF. If the PGAB content falls below 0.80, then the PGAB pay factor shall be 0.55.

Density: For mixes having a density requirement, the Department will determine a pay factor using Table 7: Method C Acceptance Limits:

$$PA = (\text{density PF} - 1.0)(Q)(P) \times 0.50$$

PGAB Content and Gradation The Department will determine a pay factor using Table 7: Method C Acceptance Limits. The Department will calculate the price adjustment for Mixture Properties as follows:

$$PA = (\% \text{ Passing Nom. Max PF} - 1.0)(Q)(P) \times 0.05 + (\% \text{ passing 2.36 mm PF} - 1.0)(Q)(P) \times 0.05 + (\% \text{ passing 0.30 mm PF} - 1.0)(Q)(P) \times 0.05 + (\% \text{ passing 0.075 mm PF} - 1.0)(Q)(P) \times 0.10 + (\text{PGAB PF} - 1.0)(Q)(P) \times 0.25$$

401.223 Process for Dispute Resolution (Methods A B & C only)

TABLE 10: DISPUTE RESOLUTION VARIANCE LIMITS

PGAB Content	+/-0.4%
G _{mb}	+/-0.030
G _{mm}	+/-0.020
Voids @ N _d	+/-0.8%
VMA	+/-0.8%
Passing 4.75 mm and larger sieves	+/- 4.0%
Passing 2.36 mm to 0.60 mm sieves	+/- 3.0%
Passing 0.30 mm to 0.15	+/- 2.0 %
0.075 mm sieve	+/- 0.8%

SPECIAL PROVISION
SECTION 401
HOT MIX ASPHALT PAVEMENT
(Material Transfer Vehicle Option)

Description The Contractor may elect to use a material transfer vehicle at their option to transfer hot mix asphalt to the paver on mainline travelways, shoulders, and ramps as denoted in Special Provision 403 - Hot Mix Asphalt Pavement.

Material transfer vehicles shall operate as an independent unit not attached to the paver. It shall be a commercially manufactured unit specifically designed to transfer the hot mix from haul trucks to the paver without depositing the mix on the roadway. A separate hopper with a capacity of 14 ton shall be inserted into the regular paver hopper. The material transfer vehicle or the hopper insert shall be designed so that the mix receives additional internal mixing action either in the material transfer vehicle or the paver hopper.

Method of Measurement Hot mix asphalt pavement transferred by the material transfer vehicle and hopper insert will be measured by the ton.

Basis of Payment The accepted quantities of hot mix asphalt pavement transferred by the material transfer vehicle and hopper insert will be paid for at a price of \$2.00 per ton.

Payments will be made under:

<u>Pay Item:</u>	<u>Pay Unit:</u>
403.40 Material Transfer Vehicle (MTV)	Ton

SPECIAL PROVISION
SECTION 403
HOT MIX ASPHALT

Desc. Of Course	Grad Design.	Item Number	Bit Cont. % of Mix	Total Thick	No. Of Layers	Comp. Notes
<u>Route 100 & Falmouth Road – Sidewalk & Shoulder Construction Areas</u>						
<u>Mainline Travelway, Auxiliary Lanes, Bike Lanes, & Shoulders (As Indicated in Typical)</u>						
Wearing	12.5 mm	403.208	N/A	1 ½"	1	1,2,5,7,17
Base	12.5 mm	403.213	N/A	1 ½"	1	1,2,4,7,15,16
Base	12.5 mm	403.213	N/A	2"	1	1,2,4,7,15,16
<u>Route 100 & Falmouth Road – Full Construction & Raised Median Areas</u>						
<u>Mainline Travelway, Auxiliary Lanes, & Shoulders (As Indicated in Typical)</u>						
Wearing	12.5 mm	403.208	N/A	1 ½"	1	1,5,7,19,20,21,24
Base	12.5 mm	403.213	N/A	1 ½"	1	1,4,7,15,16,20,24
Base	12.5 mm	403.213	N/A	2"	1	1,4,7,15,16,20,24
<u>Route 100 – Libby Bridge 1 ½" Mill & Fill</u>						
<u>Mainline Travelway & Shoulders (As Indicated in Typical)</u>						
Wearing	12.5 mm	403.208	N/A	1 ½"	1	1,2,5,7,20,21
<u>Leighton Road & Mountain Road – Sidewalk & Shoulder Construction Areas</u>						
<u>Mainline Travelway, Auxiliary Lanes, & Shoulder (As Indicated in Typical)</u>						
Wearing	12.5 mm	403.208	N/A	1 ½"	1	1,5,7,20,21
Base	12.5 mm	403.213	N/A	2 ½"	1	1,2,4,7,15,17
<u>Leighton Road, Mountain Road, Marston Road & Mill Road – Full Construction Areas</u>						
<u>Mainline Travelway, Auxiliary Lanes, & Shoulder (As Indicated in Typical)</u>						
Wearing	12.5 mm	403.208	N/A	1 ½"	1	1,5,7,20,21
Base	12.5 mm	403.213	N/A	2 ½"	1	1,4,7,15,20
<u>Variable Depth Shim (As Indicated in Typical or As Directed by Resident)</u>						
Shim	9.5 mm	403.211	N/A	variable	1/more	1,2,3,10,11,14
<u>Sidewalks, Islands, Misc.</u>						
Wearing	9.5 mm	403.209	N/A	2"-3"	1/more	1,2,3,10,11,14,16

COMPLEMENTARY NOTES

1. The required PGAB for this mixture will meet a **PG 64-28** grading.
2. The incentive/disincentive provisions for density shall not apply. Rollers shall meet the requirements of this special provision. The use of an oscillating steel roller shall be required to compact all mixtures pavements placed on bridge decks.
3. The design traffic level for mix placed shall be <0.3 million ESALS. The design, verification, Quality Control, and Acceptance tests for this mix will be performed at **50 gyrations**.
4. The design traffic level for mix placed shall be 0.3 to <3 million ESALS. The design, verification, Quality Control, and Acceptance tests for this mix will be performed at **50 gyrations**.
5. 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 **75 gyrations**.
7. Section 106.6 Acceptance, (1) Method A.

10. Section 106.6 Acceptance, (2) Method D.
11. The combined aggregate gradation required for this item shall be classified as a 9.5mm “**fine graded**” mixture, (using the Primary Control Sieve control point) as defined in 703.09.
14. The combined aggregate gradation required for this item shall be classified as a 9.5mm Thin Lift Mixture (TLM) mixture, using the Aggregate Gradation Control Points as defined in 703.09.
15. The entire HMA base pavement section (consisting of all base layers) shall be completed before winter suspension. Any surface or base HMA placed after the seasonal limitations shall be considered temporary and removed and replaced the following construction season. The Department will not be responsible for costs or time related to the placement, removal or replacement of temporary pavement.
16. In areas inaccessible to a 10 ton roller, compaction of the new Hot Mix Asphalt Pavement will be obtained using a minimal roller train consisting of a **3-5 ton** vibratory roller. Areas less than 2 feet wide shall be compacted with a minimum of a 150 pound plate compactor. An approved release agent is required to ensure the mixture does not adhere to hand tools, rollers, pavers, and truck bodies. The use of petroleum based fuel oils, or asphalt stripping solvents will not be permitted.
17. Compaction of the new Hot Mix Asphalt Pavement will be obtained using a minimal roller train consisting of a **10 ton** vibratory, **12 ton** pneumatic, and a **10 ton** finish roller for roadway work. In areas inaccessible to a 10 ton roller, compaction of the new Hot Mix Asphalt Pavement will be obtained using a minimal roller train consisting of a **3-5 ton** vibratory roller. Areas less than 2 feet wide shall be compacted with a minimum of a 150 pound plate compactor. A daily paving report, summarizing the mixture type, mixture temperature, equipment used, environmental conditions, and number of roller passes, shall be recorded and signed by the QCT and presented to the Department’s representative by the end of the working day. An approved release agent is required to ensure the mixture does not adhere to hand tools, rollers, pavers, and truck bodies. The use of petroleum based fuel oils, or asphalt stripping solvents will not be permitted.
19. The Contractor may, at their option, use a Material Transfer Vehicle (MTV) for **all mainline travelway and adjacent shoulders surface course** if paved in the same operation. See Special Provision 401 – Material Transfer Vehicle for specifics.
20. The Contractor may place the specified HMA pavement course, not to exceed 2 inch compacted depth, over the full single travel lane width, for each production day. If this option is utilized the Contractor 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 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 for centerline depths exceeding ¾” inch, and provide a single RPM application placed on the newly placed pavement for ¾” inch or less layers. 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. On roadways with two-way traffic, the Contractor will be required to place the specified course over the full width of the mainline traveled way being paved prior to opening the sections to weekend or holiday traffic. 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.
21. At the Contractor’s discretion, the use of concrete fill may be allowed in lieu of pavement. When utilized, at least 3” of HMA shall be placed on top of concrete fill for cover.

24. Bike & auxiliary lanes shall be considered part of the mainline travelway for density testing purposes in accordance to the specified testing method.

Tack Coat

A tack coat of emulsified asphalt, RS-1 or RS-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.

Falmouth
WIN 21784.00
June 21, 2018

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

CLASS OF CONCRETE	ITEM NUMBER	DESCRIPTION	P	METHOD
LP	626.32	24 Inch Diameter Foundation	-	C
LP	626.35	Controller Cabinet Foundation	-	C

Falmouth
Libby Br #2457
WIN 021722.00
August 30, 2018

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

CLASS OF CONCRETE	ITEM NUMBER	DESCRIPTION	P	METHOD
LP	502.49	Structural Concrete Curb and Sidewalks	--	C
LP	526.34	Permanent Concrete Transition Barrier	--	C

SPECIAL PROVISION
SECTION 526
CONCRETE BARRIER
(Temporary Concrete Barrier, Braced Type I)

526.01 Description The following paragraph is added:

This work shall consist of furnishing, setting, resetting and removing Temporary Concrete Barrier, Braced Type I as shown on the Plans.

Temporary Bi-Directional Delineators shall be installed on the roadway face of all temporary concrete barrier in conformance with Special Provision 627, Temporary Bi-Directional Delineators.

The following concrete barrier designations are added:

Temporary Concrete Barrier, Braced Type I Removable concrete barrier fabricated and installed in accordance with New York Department of Transportation U.S. Customary Standard Sheet 619-01 (Temporary Concrete Barrier) available at the following web address:

https://www.dot.ny.gov/main/business-center/engineering/cadd-info/drawings/standard-sheets-us-repository/619-01_010611e2.pdf

526.02 Materials The following paragraphs are added:

f. Temporary Concrete Barrier shall have a 28-day minimum compressive strength of $f'_c=3,600$ psi.

The following subsection is added:

526.021 Acceptance

The Resident shall have the authority to accept or reject all unacceptably damaged portions of Temporary Concrete Barrier, Braced Type I use on the Project.

526.03 Construction Requirements The following paragraph is added:

Temporary Concrete Barrier, Braced Type I All Temporary Concrete Barrier, Braced Type I shall be fabricated and constructed in accordance with New York Department of Transportation U.S. Customary Standard Sheet 619-01 (Temporary Concrete Barrier).

526.04 Method of Measurement The following paragraph is added:

Temporary Concrete Barrier, Braced Type I shall be measured for payment by the lump sum.

Setting, resetting, and temporary storage of concrete barrier between construction phases, if required, will not be measured separately for payment, but shall be incidental to the barrier Pay Item. Additionally, the bracing and/or anchoring of bridge barrier, and all associated work, will not be measured separately for payment, but shall be incidental to the cost of the barrier.

526.05 Basis of Payment The following paragraph is added:

Temporary Concrete Barrier, Braced Type I shall be paid for at the Contract lump sum price, complete in place. Payment shall be full compensation for furnishing, setting, bracing, anchoring, assembling, resetting, and removing the barrier, installation of Temporary Bi-Directional Delineators, and all other incidentals, tools, material and labor necessary to complete the work.

Payment shall be made under:

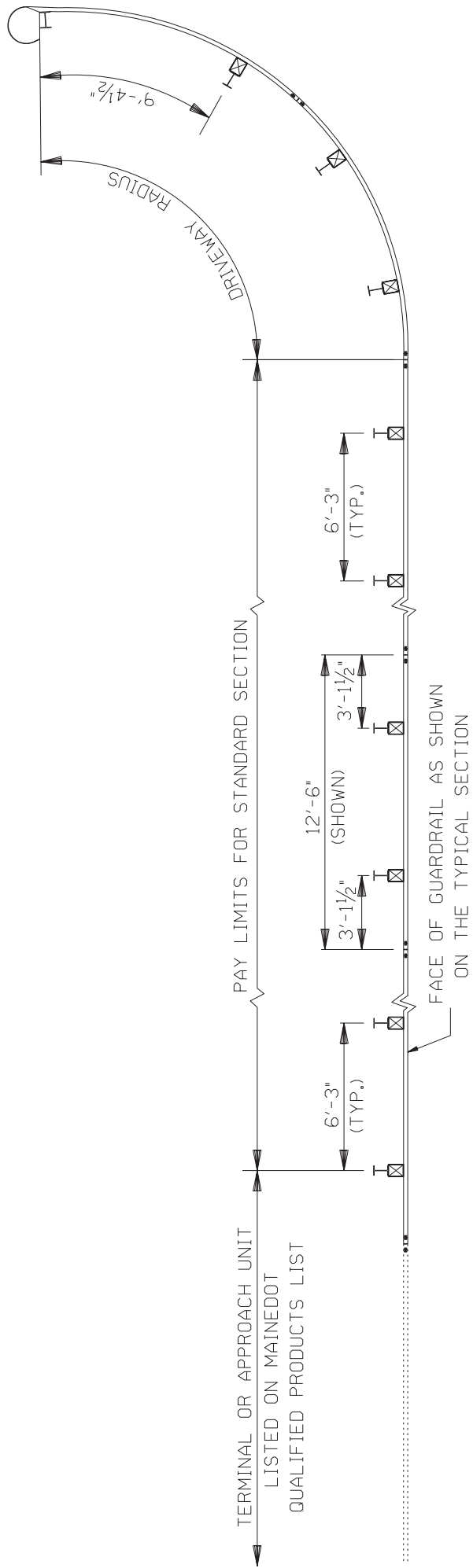
<u>Pay Item</u>	<u>Pay Unit</u>
526.305 Temporary Concrete Barrier, Braced Type I	Lump Sum

Falmouth
21784.00
September 19, 2018

SPECIAL PROVISION
SECTION 606
GUARDRAIL

606.09 Basis of Payment: This section shall be amended with the addition of the following:

<u>Pay Item</u>	<u>Pay Unit</u>
606.1301 31" W-Beam Guardrail - Mid-Way Splice (Steel Post, 8" Offset Blocks, Single Faced)	Linear Foot
606.1303 31" W-Beam Guardrail - Mid-Way Splice (Steel Post, 8" Offset Blocks, 15' Radius and Less)	Linear Foot
606.1304 31" W-Beam Guardrail - Mid-Way Splice (Steel Post, 8" Offset Blocks, Over 15' Radius)	Linear Foot
606.1305 31" W-Beam Guardrail - Mid-Way Splice Flared Terminal (31" Height)	Each
606.1307 Bridge Transition (Asymmetrical) – Type 1	Each



PLAN

W 6x9.0 OR W 6x8.5 STEEL POST
WITH 6" x 8" WOOD OFFSET BLOCK OR
OTHER 8" BLOCK LISTED ON MAINEDOT
QUALIFIED PRODUCTS LIST (TYP.)

31" TYP.

W-BEAM

ELEVATION

SHOULDER GRADE AT
EDGE OF PAVEMENT

31" W-BEAM GUARDRAIL - MID-WAY SPLICE

SPECIAL PROVISION
SECTION 606
TANGENT GUARDRAIL TERMINAL
(ENERGY ABSORBING)

Description: This work shall consist of furnishing and installing an energy absorbing tangent guardrail terminals for W-beam guardrail in accordance with these specifications at locations shown on the Plans or as directed by the Resident.

Materials: The terminal shall be in compliance with AASHTO MASH Test Level 3 criteria and meet Federal Highway Administration eligibility requirements for reimbursement under the Federal-aid highway program. The system selected shall be one that is currently listed on MaineDOT's Qualified Products List of Terminals for W-Beam Guardrail Systems – Tangent Terminals (Energy Absorbing).

Installation: A set of installation drawings shall be submitted to the Resident for the system installed. The system shall be installed according to the manufacturer's installation drawings and recommendations.

Method of Measurement: Terminals shall be measured by each unit, complete, in place, and accepted.

Basis of Payment: The accepted quantity of terminals shall be paid for at the contract unit price, such payment being full compensation for all labor, materials, equipment, and incidentals necessary to complete the work.

Payment will be made under:

<u>Pay Item</u>		<u>Unit</u>
606.81	Tangent Guardrail Terminal – Energy Absorbing	Each

SPECIAL PROVISION
SECTION 606
BURIED-IN-SLOPE GUARDRAIL END

DESCRIPTION

This work shall consist of furnishing and installing a buried-in-slope guardrail end in accordance with this special provision and in conformance with the lines and grades shown on the plans. The work shall also include any excavation or backfill necessary for proper installation

MATERIALS

Guardrail components shall meet the requirements of Standard Specification 606 – Guardrail.

CONSTRUCTION REQUIREMENTS

Buried-in-slope guardrail end shall be constructed in accordance with MaineDot Standard Details and Standard Specification 606 – Guardrail, with the following additions:

- A 9'- 4 ½" w-beam rail shall be used to transition from midway splice guardrail to buried-in-slope guardrail end.

METHOD OF MEASUREMENT

Buried-in-slope guardrail end shall be measured for payment by each unit complete in place.

BASIS OF PAYMENT

The accepted quantities of buried-in-slope guardrail end shall be paid for at the contract unit price per each, complete in place. Such payment shall be full compensation for furnishing all material to assemble and all incidentals necessary to complete the work. All excavation, backfill, grading and compaction required to complete the installation shall be included in the unit bid price for the item

Payment will be made under:

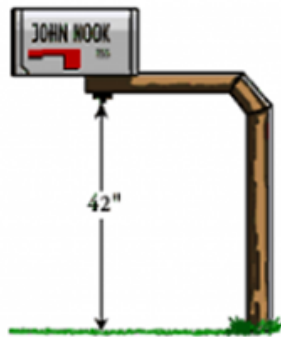
<u>Pay Item</u>	<u>Pay Unit</u>
606.1308 Buried-in-Slope Guardrail End, Mid-Way Splice	Each

SPECIAL PROVISION
SECTION 606 - GUARDRAIL
MAILBOX AND POST

Description: This work shall consist of constructing a mailbox and post.

Material: The materials shall consist of a metal mailbox and wooden mailbox post.

Construction Requirements: The mailbox and post shall be constructed so that there is 42 inches from the lowest point of the mailbox (post or box). See figure below.



The mailbox post shall be set so that the face of the mailbox is at the back edge of the paved shoulder or 8 inches behind the face of curb for streets with curbing.

The mailbox post shall be buried a minimum of two feet.

The mailbox post shall be made of pressure treated exterior wood suitable for ground contact.

The mailbox post shall be similar in style to the examples given in the photos below:



If a mailbox post is placed within a paved sidewalk (existing or proposed in the plan set), the sidewalk shall be paved in a bumped-out configuration around the mailbox post so that a minimum sidewalk width of 4 feet exists. In no case shall the sidewalk extend outside of the right-of-way.

The mailbox shall be a black US Postal Service approved mailbox with white reflective numbers at least 3 inches tall placed on both sides of the mailbox.

All mailboxes and mailbox posts used in the project shall be uniform.

Method of Measurement: Each installation will be measured for payment as one unit, complete in place and accepted.

Basis of Payment: Mailbox and Post will be paid for at the contract unit price for each installation. Such payment will be full compensation for furnishing and installing all materials, incidentals required for a complete functioning installation, and for furnishing all tools and labor necessary for completing the installation. Additional sidewalk pavement placed to meet the construction requirement above is incidental to this item.

Payment will be made under:

Pay Item	Pay Unit
606.521 Mailbox and Post	Each

SPECIAL PROVISION

Granite Curb Item 609

609.01 Description

The intention of this special provision is to provide additional guidance to the construction, measurement, and payment for Type 1 and 5 granite curb, and to provide basis of payment for additional curbing items.

609.02 Materials:

See latest Supplemental Specifications Section 609.02 for concrete backfill specifications.

609.03 Vertical Stone Curb, Terminal Section and Transition Sections and Portland Cement Concrete Curb, Transitional Sections and Transition Sections

a. Installation

The sentence starting and ending with “The foundation...bottom of the stone.” is to be replaced with the following:

The foundation shall be prepared in advance of the setting the stone by grading the proper elevation and shaping to conform with the granite curb details within the planset.

b. Backfilling

The first sentence is to be replaced with the following:

All remaining spaces under the curb shall be filled with the concrete mix specified within this document and thorough worked so that the stones will have a firm uniform bearing on the foundation for the entire length and width. Concrete backfill shall be placed as closely as possible to match the granite curb details within the planset.

643.19 Basis of Payment

See latest Supplemental Specifications Section 609.10.

Payment will be made under:

<u>Pay Item</u>	<u>Description</u>	<u>Pay Unit</u>
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609.111	Special Granite Curb – 24”	Linear Feet
609.2341	Terminal Curb Type 1 – 4 Foot Circular	Each
609.2381	Terminal Curb Type 1 – 8 Foot Circular	Each

**SPECIAL PROVISION
SECTION 621
LANDSCAPING**

The provisions of Section 621 of the Standard Specifications shall apply with the following modifications:

621 .001 Description:

1. This work shall consist of furnishing labor, equipment and materials necessary to complete the planting, maintaining, and guaranteeing of plants in accordance with the drawings, lists, and specifications herein.

621.003 Trees, Shrubs & Perennials:

1. All Plants shall comply with the standards as set forth by the American Association of Nurserymen (ANSI z60.1-1990) .
2. Dimensions of plants, planting materials, placement, and methods shall be in accordance with the requirements specified and indicated on the Tree Planting Detail and Shrub Planting Detail.
3. All trees, shrubs and perennials shall be nursery grown and shall be first class representatives of their species or variety. The plant material shall be healthy, free from disease and insect pests, and shall have a well developed and compact root system. Plant material showing signs of lack of pruning, cultivation, and other proper nursery care will be classified as collected stock regardless of their source and shall be rejected.
4. All trees and shrubs are to be dug with the ball of earth in which they are growing and are to be balled and burlapped unless otherwise specified herein. Broken, loose, or manufactured balls will be rejected.
5. All plants shall conform to the measurements specified on the plant lists and address lists attached. The only exception to this is that plants larger than those specified in the plant list may be used, but only with prior written approval of the Owner's Representative and the use of such plants shall not increase the contract price.

621.0017 General Construction Requirements

1. Planting operations shall be performed in accordance with the plans and specifications and as directed by the Resident.

2. Landscape work shall be performed by a qualified landscape contractor with a minimum five years of experience providing similar service for roadway and municipal work.
3. The project manager / foreman on site shall be held to the same 5 year experience standard.
4. Proof of experience and a minimum of (3) references with current contact information shall be provided to verify qualifications if requested.

621.0019 Plant Pits and Beds

a. Plant Beds Areas designated as plant beds including planting islands, must have the entire bed excavated at the depth required per the provided planting detail, cleared of weeds, filled with Backfill Class A, and be completely covered with mulch. Actual mulch and bed limit will extend 2½ feet out from the center of plant or to the pavement edge, bridge wall, or the roadside face of guardrail. Excavation must include complete removal of all material and other debris to the required depth. This does not apply to bio filtration media plantings.

c. Class A Planting Size of plant pits shall bear the following relationship to the spread of roots or root ball diameter of the plants to be planted in them:

For all plant materials, the sidewall width of excavated holes shall be 2 times the diameter of the ball or container size and a minimum of 12” from a placed rootball of trees and shrubs.

Imported material shall be used as backfill around the roots and to fill plant pits to the level of the surrounding ground. The material needed to fill plant pits to the level of the surrounding ground shall be (Backfill Class A) furnished by the Contractor at their own expense.

621.0024 Backfill Class A

All Backfill Class A (planting mix) shall consist of 3 parts loam thoroughly mixed with one part of organic compost. Organic compost shall be well-composted, stable, and weed-free organic matter, pH range of 5.5 to 8; moisture content 35 to 55 percent by weight; 100 percent passing through 1” sieve; soluble salt content of 5 to 10 decisiemens per meter; not exceeding 0.5 percent inert contaminants and free of substances toxic to plantings. The materials shall be well mixed so that all parts are evenly distributed throughout the entire batch. Sods or clods may not be used as backfill. The backfill material shall be placed and compacted in the bottom of the planting pit and shall be worked around the roots and thoroughly compacted as the backfilling proceeds, leaving no air pockets. The backfill shall be filled in around the root ball to half the depth of the ball, and the remaining wire basket shall be removed and the remaining burlap around the ball shall be loosened and spread out away from the plant or if it is too bulky, cut away and removed. The backfilling shall then be completed, watered and tamped firm. Plastic film wraps shall be completely removed during planting. Nursery containers shall be completely removed before planting. The roots of bare root plant materials shall be placed in their natural arrangement with the backfilling carefully performed to prevent damage to the plant's root system. Broken or bruised roots shall be pruned

immediately, making a clean cut. Shallow basins or saucers of earth will be required to be placed around each plant. However, when drainage conditions are poor, as in heavy clay soil, the Resident may require that such saucers be omitted or used only temporarily. All plants shall be thoroughly watered and liquid fed the day they are planted and as often thereafter as necessary for the plants to become safely established.

621.0036 Maintenance Period

The Maintenance Period shall commence after Physical Work is Complete and shall extend for two years after that date. All other requirements of Maintenance Period from the Standard Specifications apply.

621.0038 Basis of Payment Each item of "Planting" will be paid for at the contract unit price for each accepted plant furnished and planted. Payment shall constitute full compensation for; furnishing and placing plants, digging, delivering, rodent protection, preparing plant pits, beds and drains; planting, watering, fertilizing, mulching, pruning, and the cleanup of planting areas; for all, fertilizer, mulch and other necessary materials; all labor, equipment, tools, Maintenance Period work, Replacement and any other incidentals necessary to complete the work.

When a bid item calls for a "Group" of trees, shrubs, vines or other plants, the Contractor shall furnish each individual species within this "Group" for the same unit bid price.

The name and estimated number of individual species within each "Group" will be shown on the estimated quantities sheet of the plans.

Payment will be made under:

	<u>Pay Item</u>	<u>Pay Unit</u>
621.129	SM Decid Tree (6'-8') Multi-stem Clump GP B	Each
621.145	SM Decid Tree (2"-2.5" Cal) GP B	Each
621.28	LG Decid Tree (2.50"-3" CAL) GP B	Each
621.541	Decid Shrubs (18"-24") GP B	Each
621.711	Herbaceous Perennials GP B	Each

**SPECIAL PROVISION
SECTION 624
TREE PROTECTION**

624.1 Description:

This work shall consist of protecting existing trees scheduled to remain against injury or damage, including cutting, breaking, or skinning of roots, trunks or branches; smothering by stockpiled construction materials or excavated materials; changes in grade within the drip line or root compaction from vehicular traffic within the drip line of the tree.

624.2 Project Conditions

Perform tree protection before commencing site preparation and site construction. There are three standards for tree protection as defined below.

- A. Standard tree protection and operations where trees or shrubs are designated “Preserve and Protect” or “Retain” on the contract drawings.
- B. Standard tree protection and operations for trees or shrubs designated by the Resident.
- C. Enhanced tree protection and operations within the Leighton Road Tree Protection Area. This area is defined as Station 10+00 to 21+50 and Station 24+25 to 36+50 along Leighton Road for all trees 6” diameter and larger within 5 feet of the proposed sidewalk.

624.3 Products

Materials and Equipment: as selected by the Contractor, except as indicated.

A. Tree Protection

- 1. Snow Fence: Beacon Plus Orange Construction Fence by Geotenax Corporation, 4800 Monument Street, Baltimore, MD, 21205 or approved equal. Support snow or construction fence with 1" steel posts or 2"x2" wood stakes spaced at a maximum of 8'-0" on center.
- 2. Trunk Planking: 2" x 6" (or approved equal) wood boards wired together around lower trunk of tree

624.4 SITE EXAMINATION

- A. Examine the site, tree, plant and soil conditions. Notify the Owner’s Representative in writing of any conditions that may impact the successful Tree and Plant Protections that is the intent of this section.

624.5 COORDINATION WITH PROJECT WORK

- A. The Contractor shall coordinate with all other work that may impact the completion of the work.

624.6 TREE AND PLANT PROTECTION AREA: The Tree and Plant Protection Area is defined as the drip line (outer edge of the branch crown) of each tree identified for protection above.

624.7 PREPARATION:

- A. Prior to the preconstruction meeting, layout the limits of the Tree and Plant Protection Area and then alignments of required Tree and Plant Protection Fencing. Obtain the Owner's Representative's approval of the limits of the protection area and the alignment of all fencing.
- B. Flag all trees and shrubs to be removed by wrapping orange plastic ribbon around the trunk and obtain the Owner's Representative's approval of all trees and shrubs to be removed prior to the start of tree and shrub removal. After approval, mark all trees and shrubs to be removed with orange paint in a band completely around the base of the tree or shrub 4.5 feet above the ground.
- C. Flag all trees and shrubs to remain with white plastic ribbon tied completely around the trunk or each tree and on a prominent branch for each shrub. Obtain the Owner's Representative's approval of all trees and shrubs to be remain prior to the start of tree and shrub removal.
- D. Prior to any construction activity at the site including utility work, grading, storage of materials, or installation of temporary construction facilities, install all tree protection measures.

624.8 PROTECTION:

- A. Protect the Tree and Plant Protection Area at all times from compaction of the soil; damage of any kind to trunks, bark, branches, leaves and roots of all plants; and contamination of the soil, bark or leaves with construction materials, debris, silt, fuels, oils, and any chemicals substance. Notify the Owner's Representative of any spills, compaction or damage and take corrective action immediately using methods approved by the Owner's Representative.

624.9 GENERAL REQUIREMENTS AND LIMITATIONS FOR OPERATIONS WITHIN THE TREE AND PLANT PROTECTION AREA:

- A. The Contractor shall not engage in any construction activity within the Tree and Plant Protection Area without the approval of the Owner's Representative including: operating, moving or storing equipment; storing supplies or materials; locating temporary facilities including trailers or portable toilets and shall not permit employees to traverse the area to access adjacent areas of the project or use the area for lunch or any other work breaks. Permitted activity, if any, within the

Tree and Plant Protection Area maybe indicated on the drawings along with any required remedial activity as listed below.

- B. In the event that construction activity is unavoidable within the Tree and Plant Protection Area, notify the Owner's Representative and submit a detailed written plan of action to include: a statement detailing a description of the proposed activity; the time period for the activity, and a list of remedial actions that will reduce the impact on the Tree Protection Area from the activity. Remedial actions shall include but shall not be limited to the following:
1. In general, demolition and excavation within the drip line of trees and shrubs shall proceed with extreme care either by the use of hand tools, directional boring, other low impact equipment that will not cause damage to the tree, roots or soil. Air Knife excavation is required when excavating within the "Leighton Road Tree Protection Area"
 2. When encountered, exposed roots, 1 inches and larger in diameter shall be worked around in a manner that does not break the outer layer of the root surface (bark). When not being actively worked around, these roots shall be covered in moist burlap and shall be maintained above permanent wilt point at all times. Roots one inch and larger in diameter shall not be cut without the approval of the owners representative. Excavation shall be tunneled under these roots without cutting them. In the areas where roots are encountered, work shall be performed and scheduled to close excavations as quickly as possible over exposed roots
 3. Tree branches that interfere with the construction may be tied back or pruned to clear only to the point necessary to complete the work. Other branches shall only be removed when specifically indicated by the Owner's Representative. Tying back or trimming of all branches and the cutting of roots shall be in accordance with accepted arboricultural practices (ANSI A300, part 8)
 4. Trunk Protection: (See Detail) Protect the trunk of each tree to remain by covering it with a ring of 8 foot long 2 inch x 6 - inch planks loosely banded onto the tree with 3 steel bands. Staple the bands to the planks as necessary to hold them securely in place. Trunk protection must be kept in place no longer than 12 months. If construction requires work near a particular tree to continue longer than 12 months, the steel bands shall be inspected every six months and loosened if they are found to have become tight.
 5. Air Excavation Tool: If excavation for sidewalks is required within the Leighton Road Tree Protection Area, air excavation tool techniques shall be used where practical.
 - a. Cover for a distance of not less than 15 feet around the limit of the excavation area with Filter Fabric or plastic sheeting to protect the tree root protection area from silt. Mound Wood Chips if needed so that the plastic slopes towards the excavation.

- b. Using a sprinkler or soaker hose, apply water slowly to the area of the excavation for a period of at least 4 hours, approximately 12 hours prior to the work so that the ground water level is at or near field capacity at the beginning of the work. For excavations that go beyond the damp soil, rewet the soil as necessary to keep soil moisture near field capacity.
 - c. Using an air excavation tool specifically designed and manufactured for the intended purpose, and at pressures recommended by the manufacturer of the equipment, fracture the existing soil to the shape and the depths required. Work at rates and using techniques that do not harm tree roots. Air pressure shall be a maximum of 90-100 psi.
 - 1.) The air excavation tool shall be "Air-Spade" as manufactured by Concept Engineering Group, Inc., Verona, PA (412) 826-8800, or Air Knife as manufactured by Easy Use Air Tools, Inc. Allison Park, Pa (866) 328-5723 or approved equal.
 - d. Using a commercial, high-powered vacuum truck if required, remove the soil from the excavation produced by the Air Knife excavation. The vacuum truck should generally operate simultaneously with the hose operator, such that the soil produced is picked up from the excavation hole, and the exposed roots can be observed and not damaged by the ongoing operation. Do not drive the vacuum truck into the Tree and Plant Protection Area unless the area is protected from compaction as approved in advance by the Owner's Representative.
 - e. Remove all excavated soil and excavated Wood Chips, and contaminated soil at the end of the excavation.
 - f. Schedule the work so that the adjacent impacting work is completed immediately after the excavation. Do not let the roots dry out. Mist the burlap covered roots several times during the day. If the excavated area must remain open overnight, mist the roots and cover the excavation with black plastic.
 - g. Dispose of all soil in a manner that meets local laws and regulations.
 - h. Restore soil within the excavation as soon as the work is completed. Utilize soil of similar texture to the removed soil and lightly compact with hand tools.
 - i. Restore any Geogrids, Filter Fabric, Wood Chips or Mulch and or matting that was previously
6. Finish Grading and Backfilling: Once the adjacent construction work is completed, bring the area to final grade and back fill as soon as feasible.
- a. In root protection areas, fill slopes should be shortened to the extent feasible to reduce the amount of root protection area to receive additional material.
 - b. The Landscape Architect or Owners Representative shall be notified if more than three inches (3") of fill is anticipated over any Root Protection Area.

624.10 CLEAN-UP

- A. During tree and plant protection work, keep the site free of trash, pavements reasonably clean and work area in an orderly condition at the end of each day. Remove trash and debris in containers from the site no less than once a week.
 - 1. Immediately clean up any spilled or tracked soil, fuel, oil, trash or debris deposited by the Contractor from all surfaces within the project or on public right of ways and neighboring property.
- B. Make all repairs to grades, ruts, and damage to the work or other work at the site.
- C. Remove and dispose of all excess Mulch, Wood Chips, packaging, and other material brought to the site by the Contractor.

624.11 REMOVAL OF FENCING AND OTHER TREE AND PLANT PROTECTION

- A. At the end of the construction period or when requested by the Owner's Representative remove all fencing, Wood Chips or Mulch, Geogrids and Filter Fabric, trunk protection and or any other Tree and Plant Protection material.

624.12 DAMAGE OR LOSS TO EXISTING TREES TO REMAIN

- A. Any tree that is scheduled to remain and is damaged beyond repair, as determined by the Owner's Representative by construction operations, shall be replaced with a new tree(s) of similar characteristics according to the following schedule:

<u>Damaged tree</u>	<u>Replacement</u>
4" tree	4" cal. Tree
6" tree	2 trees @ 3" cal.
8" tree	3 trees @ 3" cal. OR 2 trees @ 4" cal.
10" tree	4 trees @ 3" cal. OR 3 trees @ 4" cal.
12" tree	5 trees @ 3" cal. OR 4 trees @ 4" cal.
15" tree or >	6 trees @ 3" cal. OR 5 trees @ 4" cal.

- B. All trees and plants shall be installed per the requirements of Specification Section Planting
- C. Trees and shrubs to be replaced shall be removed by the Contractor at his own

expense.

- D. The Owner's Representative or Contractor may engage an independent arborist to assess any tree or plant that appears to have been damaged to determine their health or condition.

Payment will be made under:

<u>Pay Item</u>		<u>Pay Unit</u>
624.05	TREE PROTECTION	Each

Falmouth
WIN 21784.00
June 21 2018

SPECIAL PROVISIONS
SECTION 634
HIGHWAY LIGHTING
(Ornamental Lighting)

Description. The Contractor shall furnish and install all materials and equipment required for complete, functioning and accepted ornamental light standards with light emitting diode luminaires, as shown on the plans and as directed.

General. Ornamental light standards with LED luminaires for highway lighting and sidewalk lighting on this project shall be as manufactured by Holophane Lighting and specified on the plans and in this special provision. Contact:

Acuity Brands Lighting, Inc.
Northeast Sales Support Team
Attention: Jim Bailey
West Gardiner, Maine 04345
Tel.: 1-207-582-5106
E-mail: JBailey@holophane.com

All materials and installation requirements for Ornamental Lighting shall comply with Section 634 of the Standard Specifications except as modified on the project plans or in this Special Provision.

Method of Measurement. Ornamental Lighting, satisfactorily installed and accepted, will be measured for payment by the single unit each.

Basis of Payment. The accepted quantity of Ornamental Lighting will be paid for at the contract unit price each. Payment for each shall be full compensation for the ornamental light standard, ornamental pole base, bracket arm, decorative arm fitter, ornamental fixture housing, light emitting diode luminaire fixture and incidentals necessary for installation of the pole and fixture. Conduit for power to Ornamental Lighting, foundations, and junction boxes will be paid separately under applicable Section 626 pay items of the contract. All other work and materials necessary to provide the highway and sidewalk lighting system shown on the plans will be paid by lump sum payment under Item 634.160 Highway Lighting.

Payment will be made under:

<u>Pay Item</u>		<u>Pay Unit</u>
634.70	Ornamental Lighting	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 634.09 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 634.09 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
(YEAR)
when tested, was functioning as intended.

Electrician's Signature _____

Electrician's License # _____

**SPECIAL PROVISION
SECTION 643
TRAFFIC SIGNALS
(Rectangular Rapid Flashing Beacon)**

This section is amended by addition of the following:

Description The Contractor shall furnish and install rectangular rapid flashing beacons including signage assemblies at pedestrian crossings where shown on the plans. Their installation shall be as described in this special provision.

Materials

Each rectangular rapid flashing beacon (RRFB) assembly shall consist of two rectangular-shaped yellow indications, each with an LED-array based light source. Each RRFB indication shall be a minimum of approximately 5 inches wide by approximately 2 inches high.

Each RRFB signage assembly shall be mounted on a 14 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.

Where designated on the plans, poles for RRFB signage assemblies shall be installed with breakaway bases. Breakaway devices shall conform to the latest edition of "AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals" and NCHRP 350. Breakaway devices shall be designed such that anchor bolts will not bend upon vehicle impact. A frangible coupling such as Transpo "Pole-Safe" series, Manitoba safety base with reaction plate, or other approved equal meeting requirements of Section 721 shall be used. Electrical conductors at the pole base shall have a fusible breakaway device that will disconnect all ungrounded conductors simultaneously.

Each support pole shall be installed with a square aluminum pedestal base with grounding lug.

Signs for RRFB signage 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 W11-2 pedestrian crossing sign, W16-7p diagonal arrow plaque, and R10-25 pedestrian pushbutton signs.

Pedestrian pushbutton assemblies for activating RRFB indications shall be installed on each RRFB support pole, mounted at 42 inches above sidewalk grade and within 10 inches of the edge of sidewalk. Pushbuttons shall meet Americans with Disabilities Act vibrotactile technical requirements for accessible pedestrian signals (APS). The pushbutton assembly shall include a raised directional arrow indicating the direction of crossing. Audible locator and percussive crossing tones are not required.

Construction and Operation The two RRFB indications in an assembly shall be aligned horizontally, with the longer dimension horizontal and with a minimum space between the two indications of approximately seven inches (7"), measured from inside edge of one indication to inside edge of the other indication.

The outside edges of the RRFB indications, including any housing, shall not project beyond the outside edges of the W11-2 sign in the beacon signage assembly.

Each RRFB shall comply with the criteria outlined in MUTCD interim approval letter IA-21, dated March 20, 2018.

As a specific exception to 2009 MUTCD Section 4L.01 guidance, the RRFB indications shall be located between the bottom of the W11-2 crossing warning sign and the top of the supplemental W16-7p downward diagonal arrow plaque, rather than 12 inches above or below the sign assembly.

When activated, the two yellow indications in each RRFB shall flash in a rapidly alternating "wig-wag" flashing sequence (left light on, then right light on). The flash rate of each individual yellow indication, as applied over the full on-off sequence of a flashing period of the indication, shall not be between 5 and 30 flashes per second, to avoid frequencies that might cause seizures.

The light intensity of the yellow indications shall meet the minimum specifications of Society of Automotive Engineers (SAE) standard J595 (Directional Flashing Optical Warning Devices for Authorized Emergency, Maintenance, and Service Vehicles) dated March 2014.

The RRFBs, normally dark, shall initiate operation only upon pedestrian pushbutton actuation, and shall cease operation at a predetermined time after the pedestrian actuation. For this project, the duration of operation of the RRFBs following each actuation shall be 12 seconds. All RRFBs associated with a given crosswalk shall, when activated, simultaneously commence operation of their alternating rapid flashing indications and shall cease operation simultaneously. Communication between the devices may be either by spread spectrum wireless or hardwired.

MUTCD R10-25 pedestrian instruction signage with the legend PUSH BUTTON TO TURN ON WARNING LIGHTS shall be mounted adjacent to or integral with each pedestrian pushbutton.

Method of Measurement

All rectangular rapid flashing beacon and sign assemblies associated with a single crosswalk shall constitute a single installation. Each installation will be measured for payment by the lump sum in place.

Basis of Payment

Rectangular Rapid Flashing Beacon will be paid for at the contract unit price of each, which payment will be full compensation for furnishing and installing all materials including, but not limited to, the RRFB LED arrays, flasher, timer, lockable controller cabinet, steel poles with base plate, anchor bolts and pedestal base, breakaway devices, wiring and power service, pole risers, pedestrian push button assemblies, crosswalk signage, radio 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.

Falmouth
WIN 21784.00
September 15, 2018

Payment will be made under:

<u>Pay Item</u>	<u>Description</u>	<u>Pay Unit</u>
643.62	Rectangular Rapid Flashing Beacon	Each

SPECIAL PROVISION
SECTION 643
(Traffic Signals)

643.02 General

The following paragraphs are added:

All signal installations shall conform to the latest MaineDOT Standard Specification Section 643 and as amended below. The following is additional information concerning signal hardware for the traffic signal installation:

MAINTENANCE OF THE TRAFFIC SIGNAL SYSTEM

The Contractor shall be responsible for maintaining the existing traffic signal control system throughout the construction period and until the new traffic signal equipment is ready for operation.

It shall be the responsibility of the Contractor to provide all labor, equipment and material required for the maintenance of the new traffic signal control equipment within the project limits, including damage by automobile accident from the date of written notice given to the Contractor to begin work on the proposed traffic signal control system until the date when the Town shall recommend acceptance of the completed project. This written notice must be given before the Contractor may proceed with any traffic signal system work.

For the purpose of these paragraphs, the phrase "Traffic Signal Control Equipment" is intended to include, but is not limited to: controllers, detectors, signal housings, supporting structures, cabinets, wires, conduit and all other ancillary electrical equipment used for traffic control.

TRAFFIC SIGNAL MAST ARM POLES

Composition: Galvanized Steel meeting the requirements of section 720.03

Color: Gloss Black power coating. The Contractor shall provide a paint sample for approval by the Town.

Height: As required

Cross-Section: Round, Tapered pole

Base: Ornamental. The ornamental base shall be 2-piece split (clam shell) design with (2) removable doors at 180 degrees. The location of the door shall coincide with the hand hole on the pole. The base halves shall be split equally and fitted to provide a hairline seam when assembled. The base halves shall be factory assembled before shipment by means of internal lugs cast into the base bottom and stainless steel connecting pins at the top. External connecting hardware is not acceptable. The base casting shall fit securely around the pole and the base opening shall match the contour of the pole. The base shall be connected internally by two (2) interlocking stainless steel pins and two (2) bolts, nuts, and washers. Finish paint base to match pole.

The ornamental base shall be the style of the Huntington Series, manufactured by Valmont Structures. The style of the decorative ornamental base shall be approved by the Town prior to ordering.

SIGNAL MAST ARMS

Composition: Galvanized Steel meeting the requirements of section 720.04

Color: Gloss Black power coating. The Contractor shall submit for approval by the Town, paint chips and sample finishes on aluminum and steel of the intended color prior to any work being done under this Item.

Height: As required

Type: Round, Single Member, Tapered arm

SIGNAL MOUNTINGS

Couplings for the mounting of traffic signals shall be welded into the pole for the purpose of supporting poles side mounted signals as required. Orientations and locations shall be supplied by the installer. No steel banding shall be used.

Arms shall be field drilled by the installer. A rubber grommet shall be furnished for each signal location. All signal heads and signs on the mast arm shall be fixed mounted. Rigid mounted type signal hanger brackets shall be supplied sized to fit the arm diameters at the locations shown on the plans. These brackets shall be finished painted after galvanizing to match the structure finish. No steel banding shall be used.

PEDESTAL POLES

Composition: Steel meeting the requirements of section 720.03

Color: Gloss Black power coating. The Contractor shall provide a paint sample for approval by the Town.

Height: As required

Cross-Section: Round

Base: Ornamental. The ornamental base shall be the style of the Huntington Series, manufactured by Valmont Structures. The style of the decorative ornamental base shall be approved by the Town prior to ordering.

SIGNAL HEADS

Composition: Cast Aluminum meeting the requirements of section 718.01

Lenses: 12" L.E.D. lenses with tunnel visor hood

Color: Doorface: Flat Black;

Body: Gloss Black

Visor (outside): Gloss Black;

Visor (inside): Flat Black

Gloss Black shall match color number 17038 of the Federal Standard 595C "Colors used in government procurement". The inside of visors shall be Flat Black in accordance with Federal color number 37038.

CONTROLLER EQUIPMENT

The exterior of control cabinets shall be painted gloss black. Gloss Black shall match color number 17038 of the Federal Standard 595C "Colors used in government procurement". The cabinet interior shall be painted flat white.

PEDESTRIAN SIGNALS

Lenses: L.E.D. with cutaway visor hood

Display: Lunar White "Hand" and Portland Orange "Walking Person" International Graphic Symbols, with countdown display

Color: Body: Gloss Black

Visor (outside): Gloss Black

Visor (inside): Flat Black

The countdown module shall display the number of seconds remaining throughout the flashing "DON'T WALK" pedestrian, and blank out when not activated. All L.E.D. indications on the pedestrian signal shall have an automatic dimming circuit for night illumination to reduce long-term degradation to the L.E.D.'s

PEDESTRIAN PUSH BUTTON

Pedestrian push buttons shall be located as close as practicable to the sidewalk curb ramp serving the controlled crossing and shall permit operation from a clear ground space. If two crosswalks, oriented in different directions, end at or near the same location, the positioning of pedestrian push buttons and/or legends on the pedestrian push button signs should clearly indicate which crosswalk signal is actuated by each pedestrian push button.

The plunger shall be a maximum of 42 inches above the finished sidewalk and a minimum of two inches in the smallest dimension. The force required to activate controls shall be no greater than 5 lbs. This sign and saddle shall be used in locations where a pushbutton is shown on the plans

PRIORITY CONTROL SYSTEM

The work consists of furnishing and installing optical priority control systems ready for operation, as described herein and shown on the plans. Included in the work at the intersections are the furnishing and installing of priority control systems unit and related equipment, optical detection equipment and all necessary connections to the traffic signal controller. A separate cable shall be installed for the priority control systems equipment, apart from the traffic signal cable. The provision of emergency pre-emption emitters (installed in emergency vehicles) are not part of the work.

Tomar Priority Control Systems shall be used where specified. The detector card installed shall have provisions for all four inputs. The detector and detector cards shall be compatible with existing equipment in use in the Town of Falmouth.

Confirmation red flashing lights shall be installed at the locations identified in the plans.

SIGNAL BACKSHADES

Backshades shall be aluminum with a louvered profile. Backshades shall have a 5 inch border width and which includes a 2" reflectorized yellow border. The border shall be made from an adhesive-backed retroreflective yellow micro-prismatic sheeting, Type III or IV, and cover the entire perimeter of the backplate. The sheeting shall be placed no closer than ½-inch to any single louver, and no sheeting shall cover any portion of a louver.

ADVANCED DETECTION SYSTEM

The Contractor shall provide and install an aboveground dilemma zone protection system, as shown on the plans. Separate TrafiRadar video and radar vehicle presence detection systems (manufactured by FLIR), or equivalent, shall be installed at the intersection of Route 100 and Leighton Road and at the intersection of Route 100 and Falmouth Road. The system shall be configured for dilemma zone protection on both Route 100 approaches to each intersection.

Each system shall include all cables, connections, programming, mounting hardware, and accessories required by the manufacturer for proper operation of the system, including but not limited to surge protection devices.

The system shall be installed in accordance with the manufacturer's recommended procedures. Each detection unit shall be installed with surge protection devices. Surge protection devices shall be of the same manufacturer as the detection system.

The system shall be installed by factory certified installers and as recommended by the manufacturer and documented in installation materials provided by the manufacturer. Proof of the factory certification shall be provided. Installation includes connecting the detection units to the traffic signal controller and power supply in the associated controller cabinet assembly. When the setup is complete and the system is ready for operation, the values of all parameters that were set during the process shall be delivered to the Engineer in printed and computer-readable form. All equipment, software, laptop computer, tools and cables, needed for setup work shall be provided by the Contractor.

The Contractor shall be responsible for the proper programming of the system, orientation of the detection units, and all other work necessary to provide a dilemma zone protection system. The Contractor may be required to field adjust the location of the detection units in the presence of the Engineer to properly detect approaching vehicles.

The Contractor shall provide four (4) hours of personnel training in the use of the detection system and software. This training is to be conducted with the Town of Falmouth. The Contractor is to coordinate with the Town as to the exact location and time of the training. It is the responsibility of the Contractor to provide training manuals, class notes, and other instructional materials for up to six attendees at the training sessions.

No training shall begin unless and until the final inspection process indicates, in the opinion of the Engineer, that the detection system is sufficiently complete and operational such that training would be useful at the time.

The supplier shall provide a limited two-year warranty on the detection system. During the warranty period, technical support shall be available from the supplier via telephone within 4 hours of the time a call is made by a user, and this support shall be available from factory-certified personnel or factory-certified installers. During the warranty period, updates to system software shall be available from the supplier without charge.

REMOVAL OF EXISTING TRAFFIC SIGNAL SYSTEM

Removal of the traffic signal system includes the removal and stacking or removal and disposal of existing traffic signal equipment, including but not limited to signal poles, signal bases, junction boxes, control cabinets, signal heads, wiring and pole and cabinet foundations. Unused items of the existing signal system shall be completely removed and transported to the Town. Foundations shall be disposed of by the Contractor. The Contractor shall dispose of old cable and unusable material.

If removal occurs outside the limits of work, the removal shall also include backfilling and permanent restoration in kind of disturbed surfaces, including bituminous concrete for sidewalk repair and any other materials required to match the existing surface.

643.19 Basis of Payment

The following paragraphs amend Section 643.19:

Traffic signals 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 controllers, vehicular heads, pedestrian heads, wiring, cable, pole risers, LED lamps, emergency vehicle pre-emption systems, pedestrian push buttons, and all appurtenances and incidentals required for a complete functioning installation and for furnishing all tools and labor necessary for completing the installation. Payment for traffic signals shall include compensation for removal of the existing traffic signal system, including but not limited to signal poles, signal bases, junction boxes, control cabinets, signal heads, wiring and pole and cabinet foundations.

New conduits, junction boxes and foundations will be paid for under Section 626.

Pedestal poles and mast arm poles with mast arms will be paid for at the contract unit price each which payment shall be full compensation for furnishing and installing all materials, tools and labor necessary to erect the poles.

Video detection system 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 detection units, supervisory PC software, and all appurtenances and incidentals required for a complete functioning installation at each of two intersections.

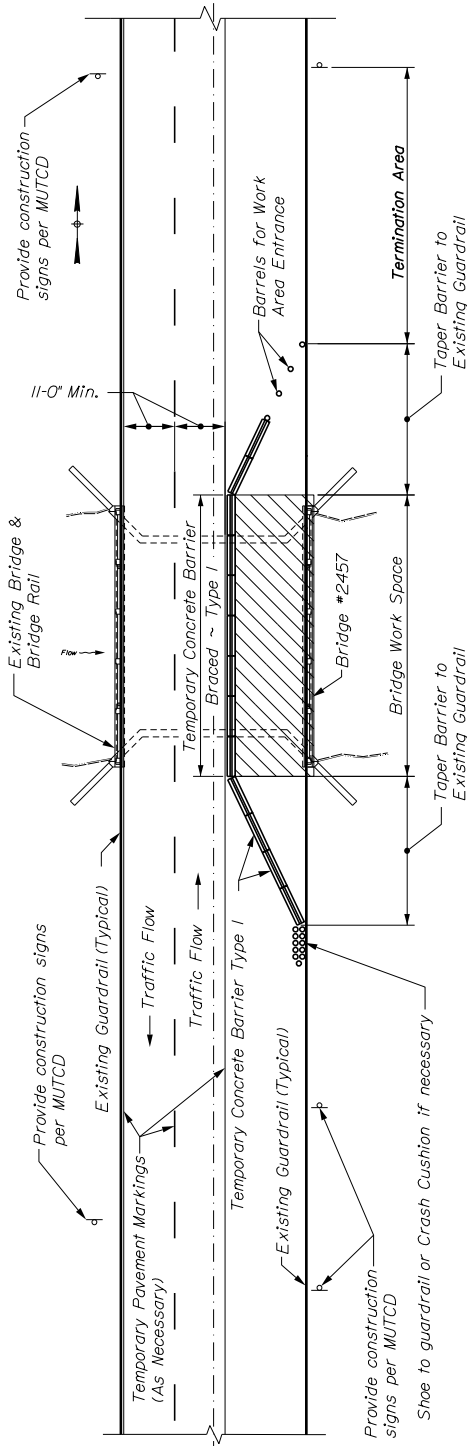
Payment will be made for each Loop Detector at contract price, which will be full compensation for materials, labor, and equipment for each loop installed and fully operational.

<u>Pay Item</u>		<u>Pay Unit</u>
643.80	Traffic Signals at: Route 100 at Leighton Road	Lump Sum
643.80	Traffic Signals at: Route 100 at Falmouth Road	Lump Sum
643.83	Video Detection System	Lump Sum
643.86	Traffic Signal Loop Detector	Each
643.91	Mast Arm Pole - 30' Mast Arm	Each
643.91	Mast Arm Pole - 35' Mast Arm	Each
643.91	Mast Arm Pole - 40' Mast Arm	Each
643.91	Mast Arm Pole - 50' Mast Arm	Each
643.92	Pedestal Pole	Each

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

652.3.1 General Requirements The following is added:

The attached Bridge Work Zone detail is a conceptual drawing for illustrative purposes only. The Traffic Control Plan for WIN 021722.00 – Falmouth is the responsibility of the Contractor and shall be done in coordination with the 105 and 652 provisions for the highway project, WIN 021784.00 – Falmouth.



NOTE:
Not to scale. For illustrative purposes only.

BRIDGE WORK ZONE

STATE OF MAINE DEPARTMENT OF TRANSPORTATION	FALMOUTH CUMBERLAND COUNTY LIBBY BRIDGE over PISCATAQUA RIVER	SHEET NUMBER 1
WIN 21722.00	BRIDGE WORK ZONE	OF 1

SPECIAL PROVISION
ESPLANADE HIGH FLOW BIOFILTER
SECTION 661

661.01 Description

The following general specifications describe the components and installation requirements for an Esplanade High Flow Biofilter for filtration of storm water that utilizes physical, chemical and biological mechanisms of a soil, plant and microbe complex to remove pollutants typically found in urban stormwater runoff. The modular treatment system in which the biologically active biofiltration media is used shall be a complete, integrated system designed to be placed in Square Foot or Linear Foot increments per the approved drawings to treat contaminated runoff from impervious surfaces.

661.02 Materials

Materials shall meet the requirements for the various subsections of the specifications listed below:

1. Plant Component

- a. Plants shall be provided on the landscape plans.
- b. Plants, as specified in the approved drawings/manufacture's plant list, shall be installed at the time the Biofilter is commissioned for use.
- c. Plants must be compatible with the FocalPoint media and associated highly variable hydrologic regime. Plants are typically facultative with fibrous roots systems such a native grasses and shrubs.
- d. All plant material shall comply wit the type and size required by the approved drawings and shall be alive and free of obvious signs of disease.
- e. Plants and planning are typically included in landscape portion of the bid form.

2. Biofilter Component

- a. This component employs a high performance cross-section in which each element is highly dependent on the others to meet the performance specification for the complete system. It is important that this entire cross-section be provided as a complete system, and installed as such.
- b. As indicated in the approved drawings, the elements of the Biofilter include:
 - i. A mulch protective layer.
 - ii. An advanced high infiltration rate biofiltration planting media bed (FocalPoint media) which utilizes physical, chemical and biological mechanisms of the soil, plant, and microbe complex, to remove pollutants found in storm water runoff. The media system

must have an approval letter by Maine Department of Environmental Protection.

- iii. A separation layer which utilizes the concept of 'bridging' to separate the biofiltration media from the underdrain without the use of geotextiles fabrics.
 - iv. A wide aperture mesh layer utilized to prevent bridging stone from entering the underdrain/storage element.
 - v. A modular, high infiltration rate 'modular box' style underdrain/storage system which is designed to directly infiltrate or exfiltrate water through its surface.
3. Precast Curblin 90 Degree Turn Pretreatment Unit
 - a. A rain guardian turret pretreatment chamber drop in or equivalent will be used as a 90 degree turn unit at the entrance to the Esplanade High Flow Biofilter. See Precast Curblin 90 Degree Turn Pretreatment Unit special provision.
 4. Mulch
 - a. Mulch, typically double shredded non-floatable hardwood, shall comply with the type and size required by the approved drawings, and shall be screened to minimize fines.
 5. Energy Dissipation Component
 - a. An Energy Dissipation Component is typically specified to slow and spread out water as it enters the system. This component shall comprise of an apron of a three-inch to six-inch river stone and will be installed immediately downstream of the 90 Degree Turn Unit and upstream of the biofilter. The river stone will be placed 6" deep with loam/compost mixture and bark mulch with plantings around the perimeter.
 6. Observation and Maintenance Component
 - a. A 6" diameter Observation and Maintenance Port shall be installed per the approved drawings to provide for easy inspection of the underdrain/storage element, and cleanout access if needed.
 7. Domed Overflow with Filter Bag
 - a. A Domed Overflow with Filter Bag unit should be located external to, but near the Biofiltration element to provide bypass when needed. See Domed Overflow with Filter Bag Special Provision
 8. Biofiltration Media
 - a. Biologically active biofiltration media shall be visually inspected to ensure appropriate volume, texture, and consistency with the approved drawings, and must bear a batch number marking from the manufacturer which certifies performance testing of the batch to meet or exceed the required infiltration rate.
 - b. Manufacturer shall have a minimum of 5 years' experience and a minimum of 500 systems installed operational units.
 - c. Within 90 days after project completion, the infiltration rate shall be confirmed at the manufacturer or installer's expense, by a wetted condition hydraulic conductivity test.
 - i. Failure to pass this test will result in removal and replacement of all media in the system at no cost to the project owner/operator.
 - ii. Test must utilize the equipment and follow the standard operating procedures found in the Harris County Texas manual entitled, Low

Impact Development & Green Infrastructure Design Criteria for Storm Water Management (2011).

- iii. Replacement media, if required, must be taken from a different batch than the original.
- iv. Manufacturer shall provide, at no additional cost to the project owner/operator, the first removal and replacement of the mulch layer within the first year of the system being active.
- v. Pollutant Removal performance composition and characteristics of the Biofiltration media (FocalPoint media) must meet or exceed the following minimum standards as demonstrated by testing acceptable to the project engineer:

Pollutant	Removal Efficiency
TSS	90%
Total Nitrogen	46%
Phosphorus	65%
Bacteria	60%
Composition and Characteristics	
Sand - Fine	< 5%
Sand - Medium	10% - 15%
Sand - Coarse	15% - 25%
Sand - Very Coarse	40% - 45%
Gravel	10% - 20%
Infiltration Rate	>100 inches per hour
Peat Moss*	5% - 15%
* Peat Moss Specification	
<p>Listed by Organic Materials Review Institute</p> <p>100% natural peat (no composted, sludge, yard or leaf waste) Total Carbon >85%</p> <p>Carbon to Nitrogen Ratio 15:1 to 23:1</p> <p>Lignin Content 49% to 52%</p> <p>Humic Acid >18%</p> <p>pH 6.0 to 7.0</p> <p>Moisture Content 30% to 50%</p> <p>95% to 100% passing 2.00mm sieve</p> <p>> 80% passing 1.0mm sieve</p>	

9. Underdrain/Storage System

- a. Underdrain/storage components shall be manufactured in an ISO certified Facility and be manufactured from at least 90% post-consumer recycled materials.
- b. Underdrain/storage components shall meet or exceed the following characteristics:

Property	Value
Surface Void Area	≥ 85%
Unit Weight	3.25 lbs/cf
Service Temperature	-14° to 167°
Unconfined Crush Strength	32.48 psi
180 Day Creep Test	
Load Applied - Initial and Sustained	11.16 psi
Creep Sustained - After 180 Days	0.20 inches
Creep Sustained - After 180 Days	1.13%
Projected Creep - 40 years	1.72%

10. Separation Mesh

- a. Separation Mesh shall be composed of high-tenacity monofilament polypropylene yarns that are woven together to produce an open mesh geotextile which shall be inert to biological degradation and resistant to

Properties	Test Method	Unit	Min Avg Roll Value	
			MD	CD
Tensile Strength	ASTM D4595	kN/m (lbs/ft)	21 (1440)	25.3 (1733)
Creep Reduced Strength	ASTM D5262	kN/m (lbs/ft)	6.9 (471)	8.3 (566)
Long Term Allowable Design Load	GRI GG-4	kN/m (lbs/ft)	5.9(407)	7.2(490)
UV Resistance (at 500 hours)	--	% strength retained	90	
Aperture Size (machine direction)	--	mm (in)	2 (0.08)	
Aperture Size (cross machine direction)	--	mm (in)	2 (0.08)	
Mass/Unit Area	ASTM D5261	g/m ² (oz/yd ²)	197 (5.8)	

naturally encountered chemicals, alkalis and acids. The mesh shall meet or exceed the following characteristics:

11. Bridging Stone

- a. Bridging Stone shall be 3/8" pea gravel, or other diameter sized to prevent migration of filter media, as specified by manufacturer.
- b. Stone must be washed and free from sediment, soil and contaminants.

661.03 Construction Methods:

661.031 Delivery, Storage, and Handling

1. Protect all materials from damage during delivery and store UV sensitive materials under tarp to protect from sunlight including all plastics, and when time from delivery to installation exceeds one week. Storage should occur on smooth surfaces, free from dirt, mud and debris.
2. Biofiltration media shall be segregated from any other aggregate materials and shall be protected against contamination, including contamination from any stormwater runoff from areas of the site which is not stabilized.

661.032 Submittals

1. Product Data

- a. Submit manufacturer's product data and approved Installation Manual as well as manufacturer's Operations and Maintenance Manual for the system. It will be the responsibility of the system owner/operator or their contractor to ensure the system is operated and maintained in accordance with the manual.
2. Certification
 - a. Manufacturer shall submit a letter of certification that the complete system meets or exceeds all technical and packaging requirements. Biofiltration media packaging must bear a batch number marking from the manufacturer which matches a letter from the manufacturer certifying performance testing of the batch to meet or exceed the required infiltration rate.
3. Drawings
 - a. Manufacturer shall provide dimensional drawings including details for construction, materials, specifications and pipe connections.
4. Manufacturer's Warranty
 - a. Manufacturer shall provide a warranty for all components of the Esplanade High Flow Biofilter for a period of one year provided the unit is installed, operated and maintained in accordance with the manual. Improper operation, maintenance or accidental or illegal activities (i.e. dumping of pollutants, vandalism, etc.) will void the warranty. FocalPoint media shall be warranted to pass the post-installation infiltration test described in this document.
5. Substitutions
 - a. Any proposed equal alternative product substitution to this specification must be submitted for review and approved prior to bid opening. Review package should include third party reviewed performance data for both flow rate and pollutant removal of FocalPoint media. Pollutant removal data must follow specified protocols. All components must meet or exceed Quality Assurance and Performance Criteria indicated herein.

661.033 Project Conditions

1. Review manufacturer's recommended installation procedures and coordinate installation with other work affected, such as grading, excavation, utilities, construction access and erosion control to prevent all non-installation related construction traffic over the completed Esplanade High Flow Biofilter installation.
2. Cold Weather
 - a. Do not use frozen materials or materials mixed or coated with ice or frost.
 - b. Do not build on frozen ground or wet, saturated or muddy subgrade.
 - c. Care must be taken when handling plastics when air temperature is at 40 degrees or below as plastic becomes brittle.
3. Protect partially completed installation against damage from other construction traffic when work is in progress and following completion of backfill by establishing a perimeter with highly visible construction tape, fencing, or other means until construction is complete.
4. Soil stabilization of the surrounding site must be complete before the Biofiltration System can be brought online. Soil stabilization occurs when 90% of the site has been paved or vegetated. Temporary erosion control and/or sedimentation prevention measures shall be implemented to reduce the possibility of sediments

being transported into the Biofiltration System prior to full stabilization of the site. Significant sediment loads can damage the Esplanade High Flow Biofilter and lead to failure if not prevented or remediated promptly.

661.034 Execution

1. Excavation and Backfill

- a. Base of excavation shall be smooth, level and free of lumps or debris, and compacted unless infiltration of storm water into subgrade is desired. A thin layer (3") of compacted base material is recommended to establish a level working platform (may not be needed in sandy soils.) If the base of the excavation is pumping or appears excessively soft, a geotechnical engineer should be consulted for advance. In many cases, a stabilization geotextile and 6" of compactable material that drains well will be sufficient to amend the bearing capacity of the soil.
- b. Most applications require 8 oz Non-Woven Geotextile or equivalent non-woven geotextile with a nominal weight of 8 oz per square yard to line the excavation to separate in situ soils and the Esplanade High Flow Biofilter. (Applications requiring water to infiltrate the in situ sub-soils should use a bridging stone rather than geotextile to provide a separation layer between the HPMBS and the in situ soils). Geotextile, when utilized, should be placed on the bottom and up the sides of the excavation. Absolutely no geotextiles should be used in the water column. If an impermeable liner is specified, it shall be installed according to the manufacturer's instructions and recommendations.
- c. Specified backfill material must be free from lumps, debris and any sharp objects that could penetrate the geotextile. Material is used for backfill along the sides of the system as indicated in engineering detail drawings.

2. Inspection

- a. Examine prepared excavation for smoothness, compaction and level. Check for presence of high water table, which must be kept at levels below the bottom of the underdrain structure at all times. If the base is pumping or appears excessively soft, a geotechnical engineer should be consulted for advice.
- b. Installation commencement constitutes acceptance of existing conditions and responsibility for satisfactory performance. If existing conditions are found to be unsatisfactory, contact Project Manager or Engineer for resolution prior to installation.

3. Clean up and Protection during Ongoing Construction Activity

- a. Perform cleaning during the installation and upon completion of the work.
- b. Remove from site all excess materials, debris, and equipment. Repair any damage to adjacent materials and surfaces resulting from installation.
- c. If surrounding drainage area is not fully stabilized, a protective covering of geotextile fabric should be securely placed to protect the FocalPoint media.
- d. Construction phase erosion and sedimentation controls shall be placed to protect the inlet(s) to the Biofiltration System. Excessive sedimentation, particularly prior to establishment of plants may damage the Esplanade High Flow Biofilter.

- e. Strictly follow manufacturer's guidelines with respect to protection of the Esplanade High Flow Biofilter between Installation and Commissioning phases.
4. Commissioning
 - a. Commissioning should only be carried out once the contributing drainage area is fully stabilized. If Commissioning must be carried out sooner, it is imperative that appropriate erosion and sediment controls be placed to prevent the entry of excessive sediment/pollutant loads into the system.
 - b. Commissioning entails removing the protective covering from the FocalPoint media, planting the plant material in accordance with the approved drawings, and placing mulch if specified.
 - i. Dig planting holes the depth of the root ball and two to three times as wide as the root ball. Wide holes encourage horizontal root growth that plants naturally produce.
 - ii. With trees, you must ensure you are not planting too deep. Don't dig holes deeper than root balls. The media should be placed at the root collar, not above the root collar. Otherwise, the stem will be vulnerable to disease.
 - iii. Strictly follow manufacturer's planting guidance.
 - c. Cover the exposed root ball top with mulch. Mulch should not touch the plant base because it can hold too much moisture and invite disease and insects. Evenly place 3 inches of double-shredded hardwood mulch (if specified) on.

661.04 Method of Measurement:

Given the integrated nature of the Esplanade High Flow Biofilter, measurement and payment will be based not on the individual component prices except those noted below, but on the size of the Esplanade High Flow Biofilter. The surface area as indicated as "Focal Point Bed Area" in the approved plans and executed in the installation will be measured per square foot, complete in place.

661.05 Basis of Payment

Esplanade High Flow Biofilter will be paid for at the contract square foot price, which payment will be full compensation for furnishing and installing all materials, except the components noted below, and incidentals required for a complete functioning installation and for furnishing all tools and labor necessary for completing the installation. 12" storm drain outlet pipe and connection to the catch basin structure shall be incidental to the Esplanade High Flow Biofilter.

Individual components that will be paid separately from the Esplanade High Flow Biofilter are as follows:

- Precast Curblin 90 Degree Turn Pretreatment Unit
- Domed PVC Overflow Riser with Filter Insert
- Plantings
- Loam/Compost Mixture
- Bark Mulch
- Granite Curb

Payment will be made under:

<u>Pay Item</u>	<u>Description</u>	<u>Pay Unit</u>
661.01	Esplanade High Flow Biofilter	Square Feet

SPECIAL PROVISION
PRECAST CURBLINE 90 DEGREE TURN PRETREATMENT UNIT
SECTION 662

662.01 Description

The following specification describes the Precast Curbline 90 Degree Turn Pretreatment Unit for the Esplanade Biofilter stormwater treatment system.

662.02 Introduction

- 1) Scope
 - a) This specification details requirements for proper design, installation, and maintenance of a concrete dry filter box for surface stormwater best management practices (BMP).
- 2) Product Summary
 - a) A concrete dry filter box is a pretreatment structure installed at grade with a curb-cut or curb inlet opening that allows water to enter a high performance modular biofiltration system, bioretention, rain garden, bioswale, or similar stormwater BMP.
 - b) The box provides a stable inlet, reduces runoff velocities, and captures gross pollutants; therefore, simplifying the recurring sediment removal and surface erosion common with turf, rip rap, or smooth concrete inlet aprons.
 - c) Capturing sediment within the box helps extend the life of a downstream primary treatment BMP by reducing the sediment load and internal scour/erosion.
 - d) Concrete dry filter boxes can be installed on both new and existing projects where there are concerns about inlet stability and/or maintenance issues.

662.03 Specifications

- 1) Functional components of the concrete dry filter box must include the components listed below and meet the standards in Table 1.
 - a) Top grate
 - i) Top grate mechanically separates larger debris pieces (e.g. leaf litter and garbage) from stormwater runoff, thereby increasing storage space for sediment and finer debris within the unit. In addition, the top grate of the box must minimally support pedestrian foot traffic loads due to frequent positioning in the road right-of-way.
 - b) Impermeable side walls
 - i) Impermeable side walls which, when connected to a water permeable filter sidewall, create a debris and sediment trap. Chamber therefore allows heavier solids to settle and collect in an easy to clean location. The side walls also contain flow, thereby preventing inlet erosion.
 - c) Water permeable filter sidewall

- i) The water permeable filter sidewall is independently connected to the impermeable side walls. The permeable filter allows for the box to dry out between runoff events, easing maintenance by preventing the need to remove sediment/debris in a slurry state. It also prevents anoxic conditions and habitat for mosquito reproduction.
- d) Impermeable debris walls
 - i) Impermeable debris walls capture floatables when BMP is filled to capacity (e.g. leaf litter and seeds) and prevent transfer of floatables between the inlet and BMP.
- e) High volume overflow points
 - i) The concrete dry filter box must provide for high volume overflow during large storm events such that water within the structure does not overtop the sidewalls, which would reduce the box's ability to retain floatables and maintain a stable inlet. The overflow points also ensure stormwater will not bypass the BMP until it reaches capacity.
- f) Splash pad
 - i) The box should include a splash pad downstream of the principal (permeable filter wall) and emergency overflow (concrete weir) points to reduce scouring below the box (i.e. within the aggregate base and BMP soil).
- g) All components must be easy to clean without specialized equipment.

Table 1: Concrete dry filter box standards.

PROPERTY OF BOX INLET STRUCTURE	VALUE OR METHOD
Steel reinforced, cold joint secured monolithic concrete structure, weight	1,030 lbs.
Concrete minimum compressive strength	4,000 psi at 28 days
Concrete air entrained	4-8% by volume
Manufactured and designed standard	ASTM C858
Standard exterior dimensions	46" x 50" base, 19.5" total height

662.04 Delivery, Storage and Handling

- 1) Delivery
 - a) Delivery of a concrete dry filter box must be from an authorized supplier.
 - b) Reasonable accommodations should be made to protect all materials from damage during delivery. Shipments should be inspected upon arrival to insure no damage occurred during transportation. Any damage found after delivery will be the responsibility of the contractor.
- 2) Storage and Handling
 - a) Storage prior to installation should occur on smooth surfaces, free from dirt, mud, and debris. Boxes are designed to persist in all seasons so temperature and precipitation should not be a problem.

662.05 Installation

- 1) A concrete dry filter box should rest on a level, solid base to prevent settling. A well-draining aggregate base material (minimum 6" thickness) should be compacted to 95% percent standard proctor. The aggregate base should have a surface area equal to or larger than the concrete dry filter box base.

- 2) The aggregate base location and distance behind the curb depends on site considerations but considerations should include bioretention basin side slopes and inlet slope to promote water flow into the unit.
- 3) The filter box must include a 4" base to provide a firm foundation for the chamber structure and to supply a splash pad for water entering the unit.
- 4) Excavation at the unit installation location should ensure sufficient depth for the 6" aggregate base, concrete dry filter box base, and ponding depth of the bioretention practice. For example, if the ponding depth of the basin is designed to be 1' and the concrete dry filter box base is 4", then soil should be excavated to 1'-10" (1' ponding depth, 6" aggregate base, 4" filter box base).
- 5) Stormwater is most commonly directed into the box via a curb-cut or concrete inlet. Said inlet should be framed from the back of the curb to the unit inlet prior to pouring. Top elevations of the framing should match the top of the curb on the street side and the top of the filter box on the bioretention side. Expansion joint material should be used between the concrete curb and concrete dry filter box.
- 6) Side curbs of the poured inlet must have an insurmountable profile to prevent water flow from overtopping the downstream side of the inlet.
- 7) The slope of the inlet from the gutter to the filter box must be large enough to promote the inflow of water to the filter box.

662.06 Operation

- 1) Items below assume proper installation of the concrete dry filter box based on design guidelines.
 - a) Stormwater entering the box via a curb-cut or concrete inlet must pass through the top metal grate. The grate provides for mechanical sorting of larger debris such as leaves and garbage.
 - b) Once in the box, the vertical, permeable filter wall allows for settling within the box and filtration of stormwater through the permeable filter screen. Should the filter screen clog or the unit fill, maintenance will be required.
 - c) As the box and BMP fill, the water level rises and the top debris walls of the box restrict floatable debris from entering or exiting the BMP.
 - d) Cold climate suitability
 - i) During winter, concrete dry filter boxes will likely become buried in snow and ice which is no different from any other inlet type. Runoff will likely continue to enter the box beneath the snow or when an open pathway is formed during snowmelt. When properly designed and installed, concrete dry filter boxes will not shift or separate from the inlet as the ground freezes and thaws.

662.07 Maintenance

- 1) Depending on the characteristics of the contributing watershed and seasonal variation, common maintenance needs include periodic removal of accumulated leaves (and other organic debris) and garbage from the top grate and sediment and fine debris from the concrete dry filter box. Contributing watersheds with high sediment concentrations may require up to monthly or twice monthly visits to satisfy maintenance needs.
- 2) If sediment accumulates beyond an acceptable level in the system, it will be necessary to remove. This can be done by manual removal with a shovel or vacuum device. The filter screen can be cleaned manually through brushing or with pressurized water.

662.08 Method of Measurement

Precast Curblin 90 Degree Turn Pretreatment Unit will be measured by the number of units, complete in place, and accepted.

662.09 Basis of Payment

The accepted quantities of Precast Curblin 90 Degree Turn Pretreatment Unit will be paid for as the contract unit price each complete in place. Payment shall include furnishing and installing the unit and any other necessary materials, labor, or incidentals necessary to complete the work.

Payment will be made under:

<u>Pay Item</u>	<u>Description</u>	<u>Pay Unit</u>
662.01	Precast Curblin 90 Degree Turn Pretreatment Unit	Each

SPECIAL PROVISION
DOMED PVC OVERFLOW RISER WITH FILTER INSERT
SECTION 663

662.01 Description

The following specification describes the Domed PVC Overflow Riser with Filter Insert for the esplanade biofilter stormwater treatment system.

This specification describes a post developed catch basin filtration device (StormSack/Sok high flow geotextile bag) that treats for suspended solids, trash and debris and oils and grease, and is installed in new or existing stormdrain infrastructure that consist of a round PVC riser structure with a domed grate.

663.02 Submittals

The contractor and/or municipality shall be provided with engineering details or standardized top drawings of the catch basin filter device and, when specified, utilize these drawings for approval. Drawings shall be annotated to indicate overall physical dimensions (WxLxH), all materials to be used, design assumptions and performance characteristics that include the following:

1. Treatment capacity
2. Bypass capacity
3. Pollutant storage capacity
4. Approximate oil boom absorption capacity

663.03 Products

663.031 General Configuration:

This technology is a post developed stormwater treatment system. The StormSack/Sok or approved equal device provides effective filtration of solid pollutants and debris typical of urban runoff, while utilizing existing or new storm drain infrastructure. The StormSack/Sok or approved equal is designed to rest on the flanges of conventional catch basin frames and supports a filter sack made of geotextile material. The general configuration of the StormSack/Sok or approved equal shall include the following basic design features.

Structural Load

The filter sack, frame and support items (e.g., drop flanges, sack support clips or hooks) will be engineered to support a dead load significantly greater than the load exerted when the filter sack is filled to capacity with pollutants.

663.032 Pollutant Removal

The StormSack or approved device shall be capable of gross pollutant removal from stormwater, as defined as follows:

1. Litter – includes human derived trash such as paper, plastic, paper, Styrofoam, metal, glass and rubber greater than 0.185 inches (4700 microns). This size can be separated in the laboratory using the #4 sieve.
2. Organic debris – consists of material including leaves, branches, seeds, twigs, grass clippings, bark mulch greater than 0.03 inches (850 microns).
3. Coarse sediments – inorganic breakdown from soils, pavement or building materials, can also include smaller fragments of organic debris and winter road sand greater than 0.0029 inches (75 microns) in size.

The geotextile bag specification shall have a minimum apparent opening size of 0.03 inches (850 microns) in order to qualify as a full capture device with respect to litter and organic debris (Items 1 and 2).

To demonstrate the sediment capture capabilities of the device, cleanout studies of the system installed on roadways or parking lots and performed by the manufacturer in conjunction with a municipality or independent 3rd party evaluator shall be available. These cleanout studies shall indicate significant removal of the annual sediment mass load for particle sizes greater than 85 microns (0.003 inches).

663.033 Flow Capacity

The StormSack/Sok geotextile bag insert specified shall effectively filter the water quality flow rates from a frequently occurring rainfall event and shall provide bypass of larger storm events.

High flows that exceed the treatment capacity of the StormSack/Sok, either clean or during the normal course of service, must be able to escape through overflow ports that are provided at the top of the insert.

The device shall not impede flow into or through the catch basin when properly sized and installed.

The following table provides performance data on common size StormSack and Sok units.

Structure Diameter (inches)	Grate Style	10093 Series Sack Length	Debris Capacity (CF)	Filtered Flowrate (CFS)	Bypass Flowrate (CFS)	Total System Flowrate (CFS)
12"	Beehive	26"	0.77	2.2	1.2	3.4

18"	Beehive	26"	1.65	2.5	1.0	3.5
24"	Beehive	26"	3.6	4.9	2.4	7.3
30"	Beehive	26"	6.2	4.9	2.4	7.3

Structure Diameter (inches)	Grate Style	10135 Series Sok Length	Debris Capacity (CF)	Filtered Flowrate (CFS)	Bypass Flowrate (CFS)	Total System Flowrate (CFS)
12"	Beehive	20"	0.66	1.7	1.2	2.9
15"	Beehive	20"	1.0	2.1	1.5	3.6
18"	Beehive	20"	1.2	2.4	1.5	3.9
24"	Beehive	20"	2.8	3.9	2.4	6.3
30"	Beehive	20"	2.8	3.9	2.4	6.3

663.04 Materials

A complete list of materials and pertinent material properties are included in the table below. Consideration may be given to alternate materials provided they have shown longevity of at least 8-years in cold climate environments exposed to freeze thaw cycles and winter deicing materials (road sand and salts).

Filter sacks shall be fabricated from a woven polypropylene monofilament geotextile. The aperture opening and clean flow through capacity of the filter sack shall be no smaller than US Mesh 35 (500 microns) and 200 US GAL/min/ft² (0.82 L/min/cm²), respectively.

StromSack 10093 Series	Material Specifications
Shroud	High Density Polyethylene (wall thickness 0.125 inches)
Support Hub	CRS Powder Coated
Sack	Woven Polypropylene Geotextile
Hardware	Aluminum Pop Rivets
Expansion Ring	Aluminum Allow Channel
Sok 10135 Series	Material Specifications
Frame and support flange	Aluminum Alloy
Sok	Woven Polypropylene Geotextile
Hardware	CRES 300 Series
Expansion Ring	Aluminum Allow Channel

663.05 Housing Structure

The overflow filter shall be installed in a The Harrington Corporation (HARCO) drainage basin or equivalent. The drain basin shall be manufactured from PVC pipe stock, utilizing thermo molding process to reform the pipe stock to the specified configuration. The drainage pipe stubs shall be manufactured from PVC pipe stock and formed to provide a watertight connection with the specified pipe system. This joint tightness shall conform to ASTM D3212 for joints for drain and sewer plastic pipe using flexible elastomeric seals. The flexible elastomeric seals shall conform to ASTM F477. The pipe bell spigot shall be joined to the main body of the drain basin.

The ductile iron frame and cover shall be considered an integral part of the surface drainage inlet and will be solid or grated as specified on the plans.

Covers for drain basins shall be capable of supporting H-20 wheel loading regardless if it's in a traffic area or not. Metal used in the manufacture of the castings shall confirm to ASTM A536 grade 70-50-05 for ductile iron.

663.06 Clearance

Recommended minimum clearance from bottom of cartridge to inside bottom of drain inlet or resting water surface is 2 inches (50 mm).

663.07 Delivery, Storage and Handling

All materials shall be protected during loading, transportation and unloading, in accordance with the manufacturer's recommendations.

663.08 Manufacturer

The manufacturer of said system shall have been regularly engaged in the engineering design and production of systems for physical treatment of stormwater runoff for a minimum of 8-years and shall have greater than five-hundred (500) installation in two or more municipalities.

663.09 Installation and Maintenance

The specified PVC surface drainage structure shall be installed using conventional flexible pipe backfill materials and procedures. The backfill material shall be crushed stone or other granular material meeting requirements of class 2 material defined in ASTM D2321. Bedding and backfill for drainage basins shall be placed and compacted uniformly in accordance with ASTM D2321. Care should be taken to prevent debris, sediment and foreign debris from entering the unit during construction. Cleaning of the structure may be required per the construction supervisor or Engineer.

Adjust the turnbuckle down to give the smallest ring diameter and locate the expansion ring into the Harco Structure minimum of 6 inches down from the top opening as shown on the submittal drawings. Begin opening the turnbuckle until the expansion ring is self supporting, then verify the ring is level and plumb to the Harco structure. Using a torque wrench, continue to open the turnbuckle to 10 ft-lb torque. Do not over tighten.

The StormSack/Sok shall be lowered by hand to rest on the pre-formed ledge/expanding ring apparatus found or installed on the inside wall of the drainage basin.

Maintenance: Typically the StormSack/Sok is serviceable from the surface level, and therefore maintenance does not require confined space entry into the drain structure. The unit is designed to be maintained in place with a vacuum hose attached to a sweeper or a vactor truck.

662.09 Method of Measurement

Domed PVC Overflow Riser with Filter Insert will be measured by the number of units, complete in place, and accepted.

662.10 Basis of Payment

The accepted quantities of Domed PVC Overflow Riser with Filter Insert will be paid for as the contract unit price each complete in place. Payment shall include furnishing and installing the unit and any other necessary materials, labor, or incidentals necessary to complete the work.

Payment will be made under:

<u>Pay Item</u>	<u>Description</u>	<u>Pay Unit</u>
663.01	Domed PVC Overflow Riser with Filter Insert	Each

SPECIAL PROVISION

SECTIONS 801 AND 803 – SANITARY SEWER INSTALLATION

- 1.1 General Description of Work.** This work shall consist of furnishing and installing PVC gravity sanitary sewer main, gravity sewer services, gravity sewer manholes, HDPE low pressure sewer force main, HDPE low pressure sewer force main services, low pressure sewer force main gate valves and low pressure sewer force main terminal flushing manholes including all excavation, bedding, backfill, trench and pipe insulation, inspection and testing, and maintaining sanitary sewer service during construction, as shown on the plans, specified herein and as directed. The CONTRACTOR shall be responsible for supplying and installing the new sewer main piping and appurtenances in accordance with the sewer plans and specifications and in conformance with the Town of Falmouth's requirements or as ordered by the ENGINEER. The CONTRACTOR shall be responsible for disposing of all asbestos containing material in accordance with local, state, and federal regulations.
- 1.1.1** The Town of Falmouth or its Designated Representative, hereinafter called OWNER, together with the ENGINEER, will inspect, accept, and/or reject work related to the sanitary sewer installation herein specified.
- 1.1.2** The CONTRACTOR shall furnish all materials, labor, tools, and equipment and perform all operations, testing, and incidentals necessary for a complete gravity sewer and low-pressure sewer force main installations as shown on the plans and specified herein.
- 1.2 Sequence/Maintenance of Service.** The CONTRACTOR shall provide a bypass pumping system as necessary to maintain continuous existing sewer service. The CONTRACTOR shall be responsible for providing whatever is necessary to allow for continuation of sewage flow from residences upstream of, and adjacent to, the construction of the new sewer systems. The flow shall be maintained in whatever manner the CONTRACTOR chooses; however, the method chosen must provide for round-the-clock fail-safe sewer service which shall not result in any spills. Should electric pumps be employed by the CONTRACTOR to maintain flow, the CONTRACTOR shall obtain temporary electric services from the utility provider at his own expense. A pump failure 24-hour monitoring and notification device shall be installed and maintained by the CONTRACTOR. The CONTRACTOR shall submit the proposed plan to maintain sewage flow to the OWNER for review and approval a minimum of 10 days prior to start-up of the bypass system(s).
- 1.3 Reference Drawings and Information.** The plans indicate, in general, the alignment and finished grade elevation and underground utility and piping invert grades. The ENGINEER may make such adjustments in grade and alignment, as are necessary, in order to avoid interference and to adapt the piping to other special conditions encountered. All locations of existing pipes, utilities, etc., shall be verified by the CONTRACTOR with the

proper authority. Neither the MaineDOT nor the OWNER guarantees the accuracy or completeness of the existing conditions shown on the construction plans.

- 1.3.1.1** Sufficient investigations shall be made by the CONTRACTOR so that the CONTRACTOR is knowledgeable about existing conditions prior to tendering a bid.

1.4 Submittals

- 1.4.1** Shop Drawings are required for each and every element of the sanitary sewer system installation work. Three copies of shop and working drawings for the sanitary sewer system components shall be submitted to the ENGINEER for review in accordance with 105.7. All submittals for the sanitary sewer system installation shall be submitted to the Town Sewer Department or its Designated Representative, together with the ENGINEER, for review and approval. Each shop drawing shall be assigned a sequential number for purposes of easy identification, and shall retain its assigned number, with appropriate subscript, on required resubmissions.
- 1.4.2** Shop Drawings are generally defined as all fabrication and erection drawings, diagrams, brochures, schedules, bills of material, manufacturers data, spare parts lists, and other data prepared by the CONTRACTOR, his subcontractors, suppliers, or manufacturers which illustrate the manufacturer, fabrication, construction, and installation of the work, or a portion thereof.
- 1.4.3** Shop Drawings shall be submitted as a complete package by Special Provision section, unless otherwise reviewed and approved by the ENGINEER. It is the intent that all information, materials, and samples associated with each specification section be included as a single submittal for the ENGINEER's review. Any deviation from this requirement, such as submitting miscellaneous metals grouped by structure, shall be requested in writing prior to any associated submittal.
- 1.4.4** The CONTRACTOR shall be responsible for the prompt and timely submittal of all shop and working drawings so that there shall be no delay to the work due to the absence of such drawings.
- 1.4.5** No material or equipment shall be purchased or fabricated specifically for the Contract until the required shop and working drawings have been submitted as hereinabove provided and reviewed for conformance to the Contract requirements. All such materials and equipment and the work involved in their installation or incorporation into the Work shall then be as shown in and represented by said drawings.

Materials

- 2.1 Materials.** The CONTRACTOR shall provide the following material for the installation of the sewer mains, manholes, services, and appurtenances:

- 2.1.1 Common Backfill.** Common backfill shall be granular material consisting of hard sand and gravel so graded that, of the material passing the No. 4 (4.75 mm) sieve, not more than 35% shall pass the No. 200 (0.075 mm) sieve. Common backfill shall be free of organic matter, trash, roots, or other deleterious material and shall contain no stone measuring greater in any dimension than two-thirds of the loose lift thickness, or 8 inches (200 mm), whichever is smaller. Common backfill material shall be capable of forming a firm, stable base when spread and compacted in accordance with this specification. In addition, common backfill shall be non-plastic (plasticity index zero, defined as liquid limit minus plastic limit). Common backfill materials may be obtained from either on-site excavations or from off-site sources. Any materials excavated from the trench and not conforming to this specification shall be properly disposed of as specified and replaced with approved material, as required, at no additional cost to the OWNER or MaineDOT.
- 2.1.2 Sand Bedding and Blanket Material.** Sand bedding and blanket material required for installation of the low pressure sewer force mains, services, and appurtenances shall meet MaineDOT Standard Specifications, Section 705.02 – Table for Sand.
- 2.1.3 Stone Bedding and Blanket Material.** Stone bedding and blanket shall be crushed stone conforming to MaineDOT Standard Specifications, Section 703.13 – Crushed Stone 3/4-inch.
- 2.2 Sanitary Sewer.** All products and materials shall conform to the latest ASTM, ANSI or other appropriate standards and as otherwise specified herein.
- 2.2.1 Gravity Polyvinyl Chloride Pipe** for direct burial (non-sleeved) shall be SDR-35, push-on joint conforming with ASTM D 3034. Fittings shall comply with ASTM D 3034. Joints shall comply with ASTM D 3212.
- 2.2.1.1** Each length of pipe shall have an integral bell and shall be supplied in the longest available lengths.
- 2.2.1.2** Joint shall be push-on type using elastomeric gasket designed to prevent slipping during jointing. The gaskets shall be factory installed and secured in place prior to delivery to the job site.
- 2.2.1.3** Wye branch gravity connections shall be supplied for service connections.
- 2.2.1.4** All pipe, fittings, gasket material, and lubricant shall be supplied by the same manufacturer. Petroleum base lubricants shall not be used.
- 2.2.1.5** Physical and chemical properties of pipe couplings shall be equal to those properties of the pipe.

- 2.2.2 Flexible Couplings and Transition Couplings** for non-pressure sewer pipe shall be resilient elastomeric plastic with recessed stainless-steel bands at each end for fastening.
- 2.2.3 Couplings** used to join plain ends of PVC pipes shall be PVC double bell couplings, which shall conform to ASTM D 3034 for materials and ASTM D 3212 for joints.
- 2.2.3.1** Identification. Each pipe length and fitting shall be clearly marked with:
- 2.2.3.1.1** Manufacturer's name and trademark.
 - 2.2.3.1.2** Nominal pipe size with sidewall dimension ratio.
 - 2.2.3.1.3** Material designation.
- 2.2.4 Concrete** for pipe cradles, chimneys, slurry, and miscellaneous concrete shall be Class A concrete in conformance with section 502.
- 2.2.5 Trench insulation** shall be rigid extruded polystyrene 8 feet long and 2 inches thick (2.45 m long, 0.6 m wide, 50 mm thick,) having an R value of 10 and conforming to ASTM C 578, Type VII, and shall be STYROFOAM HI-60 as manufactured by Dow Corning Chemical Co. or approved equal.
- 2.2.6 Gravity Sanitary Sewer Pipe Plug** shall be mechanical-type, nominal size as required for withstanding a maximum backpressure of 17 PSI.
- 2.2.7 Low Pressure Force Main High-Density Polyethylene (HDPE) Pipe** for direct burial shall be DR-11, conforming with ASTM D 3350. Fittings shall comply with ASTM D 3261. Joints shall be thermal butt-fusion.
- 2.2.7.1** Identification. Each pipe length and fitting shall be clearly marked with:
- 2.2.7.1.1** Manufacturer's name and trademark.
 - 2.2.7.1.2** Nominal pipe size with sidewall dimension ratio.
 - 2.2.7.1.3** Material designation.
- 2.2.7.2** Manufactures. Acceptable manufacturers include Performance Pipe, (Chevron Phillips Co.) or approved equal.
- 2.2.7.2.1** Driscoplex 4000 would be the approved PE 3408 manufactured by Performance Pipe.
- 2.2.7.3** Pipe: Nominal pipe size with sidewall dimension ratio.

2.2.7.3.1 The polyethylene resin shall meet or exceed the requirements of ASTM D3035 for PE 4710 material 445574C.

2.2.7.3.2 The polyethylene compound shall be suitably protected against degradation by ultraviolet light by means of carbon black, well dispersed by precompounding in a concentration of not less than 2 percent.

2.2.7.3.3 The pipe manufacturer shall be listed with the Plastic Pipe Institute as meeting the recipe and mixing requirements of the resin manufacturer for the resin used to manufacture the pipe for this project.

2.2.7.3.4 The pipe shall be designed in accordance with the relationship of the AWWA formula:

$$PC = \frac{2 \times HDB \times DF}{(DR-1)}$$

where, PC = Pressure Class (psi)
HDB = hydrostatic design basis for PE 3408 (psi)
DF = design factor (0.5 for clean water)

2.2.7.3.5 The HDPE pipe shall be homogenous throughout and free of visible cracks, holes, foreign inclusions, or other injurious defects. All HDPE pipes shall have a standard dimensional ratio (SDR) of 11.

2.2.7.3.6 Pipe lengths, fittings, and flanged connections to be joined by thermal butt-fusion shall be of the same type, grade, and class of polyethylene compound and supplied from the same raw material supplier.

2.2.7.3.7 Pipe shall have the minimum physical properties:

Property	Specification	Unit	Nominal Value
Material Designation	PPI/ASTM		PE 3408
Material Classification	ASTM D-1248		III C 5 P34
Cell Classification	ASTM D-3350		445574C
Density	ASTM D-1505	gm/cm ³	0.955
Melt Index	ASTM D-1238	gm/10 min.	0.08
Flex Modulus	ASTM D-790	psi	>120,000
Tensile Strength	ASTM D-638	psi	3,500
HDB @ 73NF	ASTM D-2837	psi	1,600
U-V Stabilizer	ASTM D-1603	% C (Carbon Black)	2.5
Hardness	ASTM D-2240	Shore "D"	65
Compressive Strength (yield)	ASTM D-695	psi	1,600
Tensile Strength @ Yield (Type VI Spec.)	ASTM D-638 (2"/min.)	psi	3,500
Elongation @ Yield	ASTM D-638	%, minimum	8

Tensile Strength @ Break (Type VI Spec.)	ASTM D-638	psi	5,000
Elongation @ Break	ASTM D-638	%, minimum	750
Modulus of Elasticity	ASTM D-638	psi	120,000
Linear Thermal Expansion Coefficient	ASTM D-696	in./in./NF	9 X 10 ⁻⁵
Brittleness Temperature	ASTM D-746	NF	<-180
Vicat Softening Temperature	ASTM D-1525	NF	257

2.2.7.4 Fittings. Polyethylene fittings shall be molded for sizes 6-inch and smaller, conforming to ASTM D3261, and shall be fabricated from polyethylene pipe for sizes 8-inch and larger, conforming to AWWA C906, by means of thermal butt-fusion. The ends of the fabricated fittings shall not be trimmed to match the pipe section to which they are going to be joined. All polyethylene fittings shall have the same or higher pressure rating as the pipe when installed in accordance with the latest technical specification.

2.2.7.4.1 Low Pressure Force Main Polyethylene Fittings & Custom Fabrications.

Polyethylene fittings and custom fabrications shall be molded or fabricated by an Approved Manufacturer. All fittings and custom fabrications shall be pressure rated for the same internal pressure rating as the mating pipe

2.2.7.4.2 Molded Fittings. Molded fittings, including tee and end caps, shall be manufactured, and tested in accordance with ASTM D 3261 and shall be so marked. Molded fittings shall be tested in accordance with AWWA C906.

2.2.7.4.3 Polyethylene Flange Adapters. Flange adapters shall be made with sufficient through-bore length to be clamped in a butt fusion-joining machine without the use of a stub-end holder. The sealing surface of the flange adapter shall be machined with a series of small v-shaped grooves (serrations).

2.2.7.4.4 Back-up Rings & Flange Bolts. Flange adapters shall be fitted with back-up stainless steel rings that are pressure rated equal to or greater than the mating pipe. The back-up ring bore shall be chamfered or radiused to provide clearance to the flange adapter radius. Flange bolts and nuts shall be Grade 3 or higher.

2.2.7.5 Joints. Joints shall be thermal butt-fusion, except where connecting to unions, valves, and other fittings with mechanical (flanged) connections. No mechanical couplings shall be used unless shown on the Drawing.

2.2.7.6 Low Pressure Force Main Insulated Pipe Section.

2.2.7.6.1 General: All underground insulated low-pressure force main lines shall be XTRU-THERM as manufactured by PERMA-PIPE or approved equal. All straight sections, fittings, anchors, and other accessories shall be factory fabricated, insulated, and jacketed. The piping system manufacturer shall analyze the piping system layout to

determine the stresses and displacements of the service pipe. The piping system design and manufacture shall be in strict conformance with ASME B31.1, latest edition. Installation of the piping system shall be in accordance with the manufacturer's instructions. Factory trained field technical assistance shall be provided for critical periods of installation, unloading, field joint instruction and testing

2.2.7.6.2 Service Pipe - The service pipe shall be 1-1/4" HDPE pipe that shall meet or exceed the requirements of ASTM D3035 for PE 4710 material with a cell classification of 445574C and have a standard dimensional ration (SDR) of 11. All joints shall be butt-welded for 2 1/2" and smaller. Where possible, straight sections shall be supplied in 40-foot random lengths with piping exposed at each end for field joint fabrication.

2.2.7.6.3 Accessories: Elbows, tees, reducers, anchors, field joints, and end seals shall be designed, and factory fabricated to prevent the ingress of moisture into the system.

2.2.7.6.4 The service pipe insulation shall be polyurethane foam with 2.0 Lbs./Ft.² minimum density, 90% minimum closed cell content and initial thermal conductivity of 0.16 Btu in./Hr. FT² °F. The insulation shall completely fill the annular space between the service pipe and jacket and shall be bonded to both. Systems using open cell insulation, or a non- bonded design shall not be allowed. The insulation shall be provided to the minimum thickness specified below:

Pipe Size (in.)	Minimum Insulation Thickness (in.)
1 to 8	2
10 to 12	2
14 to 36	2

2.2.7.6.5 Insulation Jacket: The outer protective insulation jacket shall be seamless high-density polyethylene (HDPE) in accordance with ASTM D1248, type 3, Class C. PVC or tape materials are not allowed. The insulation jacket along the service pipe shall extend a minimum five (5) feet in each direction beyond the edge of crossing. The minimum thickness of the HDPE jacket shall be as follows:

Jacket OD (in.)	Minimum Jacket Thickness (in.)
OD ≤ 12	0.125
12 < OD ≤ 24	0.150
OD > 24	0.175

2.2.7.6.6 Fittings: All fittings shall be factory prefabricated and pre-insulated. Straight tangent lengths shall be added to all ends so that all field joints are at straight sections of pipe. Elbow jackets shall be molded HDPE. Tee jackets shall be extrusion welded or butt fusion welded HDPE. Gluing, taping or hot air welding shall not be allowed.

2.2.7.6.7 Field Joints: The service pipe shall be hydrostatically tested to 150 psig or 1 1/2 times the design pressures whichever is greater. Insulation shall then be poured in place into the field joint area. All field-applied insulation shall be placed only in straight sections of pipe. Field insulation of fittings is not acceptable. The installer shall seal the field joint area with a heat shrinkable adhesive backed sleeve. Backfilling shall not begin until the heat shrink sleeve has cooled. All insulation and jacketing materials for the field joint shall be furnished by PERMA-PIPE or approved equal.

2.2.7.7 Low Pressure Force Main Gate Valves shall be constructed of High Impact PVC and have no metal-to-media contact. The gate shall be a tapered cylindrical plug design PVC shall conform to ASTM 01784 Cell Classification 12454-A. & PP to ASTM 04101 Cell Classification PP0210B67272. Valves shall have a pressure rating of 150 psi at 70 degrees F sizes 1-1/2" through 8". The 2-inch valves shall have a 2-inch square operating nut, come standard with sealed position indicator, clean-out plug and EPDM or FKM seals as manufactured by Asahi/ America Inc. or approved equal. Each gate valve shall be furnished with a valve box set to finish grade and the valve box is included as part of this item.

2.2.7.8 Valve Boxes: All valve boxes shall be grey cast iron, tar coated, sliding, heavy pattern type, consisting of three (3) pieces; a flanged bell type base section; a top flange type upper section; and a cover with two lifting holes and the word "SEWER" cast on the top. A minimum 6-inch overlap is required between sliding sections. The upper section shall have a bottom flange of sufficient bearing area to prevent settling. Valve box covers shall be recessed in the box top to prevent any snow plow damage. The bottom of the lower section shall enclose the valve and provide access to the operating nut of the valve. The inside diameter of boxes shall be a minimum 5-1/4 inch. Section lengths shall be as necessary to suit ground elevation. All valve box components shall be manufactured in North America.

2.2.7.9 Lot Service Connection – Low Pressure Sewer.

2.2.7.9.1 General: Lot service connection for low pressure sewer service shall consist of stainless steel 1-1/4-inch curb stop/check valve assembly, stainless steel rod, valve box, 1-1/4-inch HDPE pipe section with end cap, concrete thrust block, and concrete grade blocks supports in accordance with the contract documents. The 1-1/4-inch HDPE service pipe from the force main tee to the curb stop is not included under this item.

2.2.7.9.2 Curb Stop/Check Valve Assembly shall be stainless steel lateral kits for 1-1/4-inch SDR11 HDPE pipe under part number NC0193G01 for E-One Sewer Systems or approved equal, assembled, and installed per manufacturer's instruction. Working pressure rating of 150 psi, entire assembly shall be made of 316 stainless steel.

2.2.7.9.3 Stainless Steel Rod shall be 5/8 inch with end fitting properly constructed to attach and properly operate curb stop/check valve assembly with sufficient length

and tee handle top to operate curb stop within 12 inches of final grade of curb box cover or equal for E-One Sewer Systems assembled and installed per manufacturer's instructions.

2.2.7.9.4 Valve Box shall meet requirements of valve boxes under polyethylene fittings noted above.

2.2.7.9.5 HDPE pipe section and end cap shall meet requirements of Low Pressure Force Main High-Density Polyethylene (HDPE) Pipe and Low-Pressure Force Main Polyethylene Fittings & Custom Fabrications noted above.

2.2.7.9.6 Concrete thrust block and grade blocks shall be precast Class A 4,000 psi concrete meeting section 502 and/or 534 as applicable.

2.3 Precast Concrete Manholes.

2.3.1 Materials.

2.3.1.1 Cement shall conform to ASTM C 150, Portland Type II.

2.3.1.2 Fine and coarse aggregates shall conform to ASTM C 33.

2.3.1.3 Water shall be fresh, clean, and potable.

2.3.1.4 Reinforcing steel shall conform to ASTM A 615, Grade 60.

2.3.1.5 Welded wire fabric shall conform to ASTM A 185.

2.3.2 Precast Manhole Sections.

2.3.2.1 Precast manhole structures shall be reinforced concrete in conformance with ASTM C478 and capable of supporting H-20 loads.

2.3.2.2 Cone sections shall be eccentric.

2.3.2.3 In lieu of a cone section, when manhole depth is less than 6 feet (1.8 m), a reinforced concrete slab cover shall be used; having an eccentric entrance opening.

2.3.2.4 The base section shall be monolithic to a point at least 6 inches (150 mm) above the openings cast to receive the sewer lines. For drop manholes, any opening shall be a minimum of 6 inches (150 mm) away from any joint.

2.3.2.5 All precast manhole sections and bases shall have the date of manufacture and the name or trademark of the manufacturer impressed or indelibly marked on the inside wall.

2.3.3 Manhole Joints and Pipe Seals.

2.3.3.1 Horizontal joints between precast manhole sections shall be tongue and groove as shown on the Drawings and shall have a mastic-like sealant such as Ram-Nek, Kent Seal No. 2 or a butyl rubber joint gasket (O-ring) conforming to ASTM C 443. All horizontal joints shall be watertight in accordance with the testing requirements of this Section.

2.3.3.2 Pipe to manhole joints shall be an embedded flexible rubber boot or as shown on the Drawings. Nonshrinking mortar or grout is not acceptable. Pipe to manhole connections and joints shall be watertight in accordance with the testing requirements of this Section.

2.3.4 Waterproofing.

2.3.4.1 All manholes shall be waterproofed, at the factory, with two seal coats applied to the exterior of the manhole in accordance with the seal coating manufacturer's recommendations. Waterproofing shall be masonry seal MSP-1 waterproofing material as made by the Masonry Seal Corporation, 7500 West Ridge Road, Elyria, Ohio, or Foundation Coating 47-461 as made by TNEMEC, 6800 Corporate Drive, Kansas City, Missouri, or approved equal.

2.3.4.2 Exterior of all joints shall be filled with hydraulic cement and then coated with waterproofing after setting and leakage tests have been satisfactorily completed except as noted in section 3.5.5 Leakage Tests for Sewer Manholes.

2.3.5 Brick Masonry. Brick Masonry for Inverts and Grade Adjustment shall conform to ASTM C 32, Grade SS.

2.3.6 Mortar.

2.3.6.1 Masonry Cement shall conform to ASTM C 150 (Type II).

2.3.6.2 Aggregate for Masonry Mortar shall conform to ASTM C 144.

2.3.6.3 Hydrated Lime for Masonry Purposes shall conform to ASTM C 207.

2.3.6.4 Mortar for Unit Masonry shall conform to ASTM C 270, Type S.

2.3.6.5 Premixed Materials shall conform to ASTM C 387.

2.3.7 Manhole Steps shall:

2.3.7.1 Be manufactured of stainless steel, plastic-covered steel, or plastic;

2.3.7.2 Be shaped so that they cannot be pulled out of the concrete wall into which they are secured;

- 2.3.7.3** Meet requirements of ASTM C478-06 for load carrying capacity and pull-out resistance.
- 2.3.7.4** Not be secured with mortar;
- 2.3.7.5** Be approximately 14 inches by 10 inches in dimension;
- 2.3.7.6** Have a drop section or raised abutments to prevent sideways slippage of the step; and
- 2.3.7.7** Have non-skid safety serrations on the foot contact surfaces.

2.4 Sewer Manhole Frames and Covers.

2.4.1 General.

- 2.4.1.1** The castings shall be of good quality, strong, tough, even-grained cast iron, smooth, free from scale, lumps, blisters, sand holes and defects of every nature which would render them unfit for the service for which they are intended. Contact surfaces of covers and frame seats shall be machined at the foundry, before shipment to prevent rocking of covers in any orientation.
- 2.4.1.2** All castings shall be thoroughly cleaned and subject to a careful hammer inspection.
- 2.4.1.3** Castings shall be at least Class 30 conforming to ASTM A 48.
- 2.4.1.4** All castings shall be heavy duty; suitable for H-20 loadings.
- 2.4.1.5** Gravity sewer manhole frames and covers shall provide a 24-inch diameter clear opening for sanitary sewer manholes. The cover shall have the word "SEWER" in 3-inch letters cast into a diamond design top surface. Manhole frames and covers shall be Neenah Foundry R-1556 or approved equal.
- 2.4.1.6** Low pressure force main sewer manhole frames and covers shall provide a 30-inch diameter clear opening for sanitary sewer manholes. The cover shall have the word "SEWER" in 3-inch letters cast into a diamond design top surface. Manhole frames and covers shall be Neenah Foundry R-1758-G or approved equal

2.5 Low Pressure Sewer Terminal Flushing Manholes

2.5.1 General.

- 2.5.1.1** The manholes shall conform to sections 2.3 and 2.4 above and in accordance with the contract documents.

- 2.5.1.2** All metal pipe anchors, clamps, rods, bolts, nuts, washers, and associated accessories shall be stainless steel, unless otherwise specified.
- 2.5.1.3** Pipe supports shall consist of: 1) threaded rod and 2) adhesive formula. Threaded rod shall be embedded/inserted in concrete a minimum of 2" Threaded rod inserts shall meet the minimum requirements of ASTM A193 Grade B6 (Type 410 Stainless Steel) or ASTM A193 Grade B8 and B8M (Types 304 and 316 Stainless Steel). Adhesives shall be injectable, two-component, cartridge-type systems dispensed and mixed through a static mixing nozzle supplied by the manufacturer. Acceptable installation and performance temperature ranges shall be verified with manufacturer's literature prior to installation. Adhesive anchors shall be designed in accordance with ACI 318 Appendix D as amended by the specific design provisions of ICC-ES AC308. Adhesive anchors shall have an evaluation report issued by ICC-ES or IAPMO-UES and have been tested and qualified for performance in cracked and uncracked concrete in accordance ICC-ES AC308 for all mandatory tests. Adhesive anchors for cracked and uncracked concrete shall be Simpson Strong-Tie SET-XP Epoxy Adhesive, ICC-ES ESR-2508 or approved equal.
- 2.5.1.4** Concrete pipe supports, and fill concrete shall be Class A 4,000 psi concrete meeting section 502.
- 2.5.1.5** Reinforcing for concrete pipe supports shall meet section 503.
- 2.5.1.6** 2-inch PVC pipe and fitting shall be schedule 40 manufactured from PVC material which needs or exceeds the requirements of ASTM D-1784, cell classification 12454B, Type 1, Grade 1. Pressure pipe used in fabrication must conform to ASTM D-1785 (Schedule 40/80) or ASTM D-2241 (SDR-26/41) and listed by the National Sanitation Foundation (NSF) for potable water applications. PVC pipe and fitting shall be attached with solvent cement.
- 2.5.1.7** 2-inch PVC pipe and fitting solvent cements shall conform to ASTM D-2564, listed by NSF for potable use applications. Welding rod used in the manufacture of the above fittings, shall conform to ASTM D-1784, cell class 12454B for PVC, and shall be of a material compatible with the corresponding pipe.
- 2.5.1.8** 2-inch ball valve shall be constructed of High Impact PVC and have no metal-to-media contact. The gate shall be a tapered cylindrical plug design PVC shall conform to ASTM 01784 Cell Classification 12454-A. & PP to ASTM 04101 Cell Classification PP0210B67272. Valves shall have a pressure rating of 150 psi at 70 degrees F sizes 1-1/2" through 8", The 2-inch valves shall have a non-rising stem, come standard with sealed position indicator, clean-out plug and EPDM or FKM seals as manufactured by Asahi/ America Inc. or approved equal. Ball valve shall be attached per manufactures requirements.

2.6 Warning and Tracer Tape

- 2.6.1** Warning and tracer tape shall be at least 6 inches wide and shall be located at a depth as indicated on the drawings.
- 2.6.2** Tracer tape for non-ferrous pipe or conduit shall be constructed of a metallic core bonded to plastic layers. The metallic tracer tape shall be a minimum 5-mil thick.
- 2.6.3** Warning tape for ferrous pipe or conduit shall consist of multiple bonded plastic layers. The non-metallic tracer tape shall elongate at least 500% before breaking.
- 2.6.4** The tape shall bear the wording (or approved equivalent): 'BURIED SEWER LINE BELOW', continuously repeated every 30 inches to identify the pipe.
- 2.6.5** Tape colors shall be green for sewer pipe as recommended by the American Public Works Association (APWA).

2.7 Tracer Wire

- 2.7.1** Tracer wire shall be located at a depth as indicated on the drawings for the low-pressure sewer force main and low-pressure lot sewer service lines.
- 2.7.2** Tracer wire for open-cut installation shall be a 12 AWG solid, PRO-TRACE HF-CCS PE30 or equal. Conductor shall be annealed, 21% IACS, copper-clad steel, utilizing an AISI 1006 low carbon steel core with minimum break load of 282 lbs or 55,000 psi (required to meet break load, flexibility, and ASTM B910). Conductor shall be extruded with a 30 mil, high density, high molecular weight polyethylene (HMW-HDPE) pursuant to ASTM D1248. Tracer wire shall be rated for direct burial use at 30 volts and RoHS compliant.

Construction Requirements

- 3.1 General.** The CONTRACTOR shall furnish all sanitary sewer pipe, fittings, services and related material and appurtenances, labor, tools and equipment, granular material, and concrete; and perform all operations and incidentals necessary for complete excavation, installation, backfill and testing, as outlined herein and on the plans; and maintaining service at all times.
 - 3.1.1** The CONTRACTOR shall be responsible for the layout of the work. The sanitary sewer and appurtenances shall be built at the locations indicated on the plan to facilitate reconstruction of other facilities within this area of the project.
 - 3.1.2** The CONTRACTOR shall be responsible to field locate all existing sewer service laterals for the purpose of connecting them to the proposed sewer.
 - 3.1.3** Consequential damages resulting from the CONTRACTOR not locating the facilities as shown on the plan are the responsibility of the CONTRACTOR.

- 3.1.4** Location of new sewer services for all lots throughout the project area as part of the new sewer line shall be as determined by the OWNER and ENGINEER.
- 3.1.5** The CONTRACTOR, at the completion of each part of the work, shall furnish the as-built locations of the sewer main, and appurtenances referenced to the DEPARTMENT's Construction Base Line and Benchmarks. The as-built locations shall be to an accuracy of plus or minus 0.10 feet (0.03 m) in plan and elevation.
- 3.1.6** Any deviations from the locations shown on the plans require the OWNER's and ENGINEER's approval. Any discrepancies with locations shown on the plans shall be brought to the ENGINEER's attention and subsequently resolved between the OWNER, the ENGINEER, and the CONTRACTOR.
- 3.1.7** Maintenance of Existing Utilities: The CONTRACTOR will at all times be responsible for maintaining the sewer mains and services. In the event that the sewer system is damaged by the CONTRACTOR'S activities, the CONTRACTOR will immediately notify the Falmouth Wastewater Department at 207-781-4462 (emergency 207-781-2300). It will be the responsibility of the CONTRACTOR to make repairs to the system under the supervision of the Falmouth Wastewater Department. The CONTRACTOR will be responsible for payment of any overtime by Department personnel.

3.2 Trench Excavation

- 3.2.1** General - Excavation, dewatering, sheeting, and bracing shall be carried out in such a manner as to eliminate any possibility of undermining or disturbing the foundations of any existing structure, utilities or any work previously completed under this contract.
 - 3.2.1.1** All lawns, paved surfaces, roadways, and structures which have been damaged or disturbed by the CONTRACTOR's operations outside of the project work areas shall be restored to a condition at least equal to that in which they were found immediately prior to the beginning of operations or as specified on the drawings.
 - 3.2.1.2** On paved surfaces that will not be resurfaced under this contract, the CONTRACTOR shall not use or operate tractors, bulldozers, or other power-operated equipment with treads or wheels which are so shaped as to allow cutting or damage of such surfaces during excavation or other phases of the work.
- 3.2.2** Execution. The CONTRACTOR shall provide trench shoring and dewatering, if necessary, to provide a stable and dry trench at all times. The pipe trench must be dewatered to 1 foot 6 inches (0.5 m) below the invert of the new sewer pipe. Trench width shall be 2 feet (0.6 m) plus the diameter of the pipe or a minimum of 3 feet (1 m), whichever is greater. Cover on the gravity sewer pipe shall be a minimum of 6 feet (1.8 m) or as shown on the contract drawings. Trench depth shall extend to 6 inches (150 mm) below the invert of the main, except in areas of ledge or rock shall extend to 12 inches (300 mm) below the invert.

- 3.2.2.1** As the excavation approaches pipes, conduits, or other underground structures, digging by conventional trenching machine methods shall be discontinued. Only manual methods of excavating shall be employed around buried utilities.
- 3.2.2.2** Prior to doing any work outside the right-of-way line on private property or disturbing private property, the CONTRACTOR shall advise the property owner of the work and/or disturbance of the person's property that shall be performed, and the restoration thereof.
- 3.2.2.3** The CONTRACTOR shall maintain utilities, utility services and sewers encountered in the excavation, and repair or replace them to their owner's satisfaction and be responsible for consequential damages thereof.
- 3.2.2.4** The CONTRACTOR shall not be compensated for any additional work required in working in close proximity to a utility line, water, or underground structure in the trench line above or below the sewer pipe, except for common structure excavation (if required).
- 3.2.2.5** Excavations shall be kept dry until the pipes and appurtenances to be built therein have been completed to such extent that they shall not be damaged.

Provide, operate, and maintain any dewatering system required to lower and control groundwater levels and groundwater hydrostatic pressure during the construction of the Work as required by this Section and the Contract Documents. The CONTRACTOR shall assume full responsibility and expense for the adequacy of the dewatering system with no additional time for performance.

The dewatering system shall be capable of developing an excavated subgrade relieved of any hydrostatic pressure that could cause a decrease in the stability of the excavated subgrade and which shall provide the necessary groundwater control for the proper performance required for completion of the Work.

Properly dispose of subsurface water collected in a manner which conforms to all applicable local and state ordinances, statutes, and laws. Obtain all permits required for operation of the dewatering system.

Maintain continual and complete effectiveness of the dewatering system operation to provide a firm, stable, excavated subgrade at all times as required for proper performance of the Work.

Provide dewatering necessary to maintain the groundwater table 18 inches (450 mm) below the base of the proposed structure and/or pipe at all times.

Erosion Control. Provide adequate protection from erosion from any of the dewatering operations utilized during the course of the construction. Any damage, disruption, or interference to newly constructed work or existing properties, buildings,

structures, utilities, and/or other work resulting directly or indirectly from dewatering operations conducted under this Contract shall be remedied by the CONTRACTOR, at no cost to the OWNER or DEPARTMENT.

Treatment of Dewatering Operations Discharges. Provide such additional treatment devices as may be required to meet the provisions of the Contract. This may include the construction of sumps and/or settling basins, stone rip-rap, silt fences or other requirements. The treatment devices shall be later removed and/or filled in with acceptable backfill material and restored to original conditions once they are no longer needed, at no additional cost to the OWNER or DEPARTMENT.

3.2.3 Over-Excavation. If, in the opinion of the ENGINEER together with the OWNER, the material at or below the depth of the trench is unsuitable for foundation, it shall be removed to such depths as directed by the OWNER and ENGINEER and shall be replaced in accordance with the MaineDOT Standard Specifications, Section 206 – Structural Excavation.

3.2.3.1 If the bottom of the excavation is deeper than the depth shown on the drawings, by error of the CONTRACTOR, the condition shall be corrected by refilling to the proper grade in accordance with MaineDOT Standard Specifications, Section 206 – Structural Excavation. All costs shall be borne by the CONTRACTOR.

3.2.4 Rock and Boulder Excavation. Rock and boulder excavation shall be in accordance with MaineDOT Standard Specifications, Section 206 – Structural Excavation.

3.2.5 Excess and Unsuitable Excavation. Excess excavation that shall not be used for backfill, and unsuitable excavation shall be removed from the site and disposed of by the CONTRACTOR in accordance with local, State or Federal regulations.

3.2.6 All abandoned pipe left in place shall be filled with a concrete slurry or sand and have the ends plugged with concrete or as approved by the ENGINEER. The exception is for pipes with diameter less than 12-inches and depths greater than 6 feet. All existing sewer pipe is to be abandon in place unless specifically called for removal on the plans or approved by the ENGINEER. Existing sewer pipe will be removed from the ground if it is in the same trench line during the installation of any other utility, and removal of the pipe does not shut down the operation of the sewer system.

3.3 Trench Backfill.

3.3.1 General. After the pipe has been placed and has been inspected by the OWNER together with the ENGINEER, backfilling shall be performed without delay.

3.3.2 Gravity Sewer Bedding. Bedding shall be crushed stone and shall extend 6 inches (150 mm) below the pipe invert (12 inches (300 mm) in ledge or rock), to the trench walls, to springline (horizontal centerline) of pipe. Placement and compaction of

bedding to 95% Modified Proctor in accordance with ASTM D 157 and ASTM D 2922 shall be done prior to placement of the pipe and blanket.

3.3.3 Gravity Sewer Blanket. From the springline of the pipe to a minimum of 12 inches (300 mm) above the pipe crown, the trench shall be backfilled by placing and compacting the crushed stone in lifts of 6 in (150 mm) or less to 95% Modified Proctor in accordance with ASTM D 157 and ASTM D 2922. The filling shall be carried up evenly on both sides of the pipe, care being taken not to raise or otherwise dislodge the pipe. Backfill to this depth shall be thoroughly compacted with approved hand-operated devices.

3.3.4 Low Pressure Force Main Bedding. Bedding shall be sand and shall extend 6 inches (150 mm) below the pipe invert (12 inches (300 mm) in ledge or rock), to the trench walls, to springline (horizontal centerline) of pipe. Placement and compaction of bedding to 95% Modified Proctor in accordance with ASTM D 157 and ASTM D 2922 shall be done prior to placement of the pipe and blanket.

3.3.5 Low Pressure Force Main Blanket. From the springline of the pipe to a minimum of 12 inches (300 mm) above the pipe crown, the trench shall be backfilled by placing and compacting the sand in lifts of 6 in (150 mm) or less to 95% Modified Proctor in accordance with ASTM D 157 and ASTM D 2922. The filling shall be carried up evenly on both sides of the pipe, care being taken not to raise or otherwise dislodge the pipe. Backfill to this depth shall be thoroughly compacted with approved hand-operated devices.

3.3.6 Backfill. Backfill material from 12 inches (300 mm) above the pipe crown to the underside of the pavement select material profile, or to the underside of gravel and loam areas, shall be backfilled with common backfill described herein and as approved by the ENGINEER.

3.3.6.1 Backfill shall be placed and compacted in layers of 6 inches (150 mm) or less. Compaction shall be by hand-operated compactors.

3.3.6.2 Tamping of trenches with excavating machines is prohibited.

3.3.6.3 Trench areas improperly backfilled or having excessive settlement, as determined by the ENGINEER, shall be reopened to the required grade, and repaved as necessary. The CONTRACTOR shall receive no additional compensation for repair of trenches constructed under this Contract.

3.3.6.4 Soil compaction for pipe backfill shall be 95% Modified Proctor in accordance with ASTM D 157 and ASTM D 2922.

3.4 Sewer Installation.

3.4.1 General for Gravity Sewer.

- 3.4.1.1** Pipe and fittings shall be handled with care to ensure that the pipe and fittings are in sound, undamaged condition. Particular care shall be taken to prevent damage to pipe coating and lining (if any).
- 3.4.1.2** The CONTRACTOR shall furnish slings, straps, and/or other approved devices to support the pipe when it is lifted. Pipe and fittings shall not be dropped from trucks onto the ground or into the trench. Transporting pipe and fittings from storage areas shall be restricted to operations which shall not cause damage to the pipe or lining (if any).
- 3.4.1.3** All pipe and fittings shall be examined before laying, and no pipe or fittings shall be installed which are found to be defective. Damaged pipe coatings and/or lining (if any) shall be repaired as approved or directed by the ENGINEER at no additional cost to the OWNER or MaineDOT.
- 3.4.1.4** Any pipe showing a distinct crack with no evidence of incipient fracture beyond the limits of the visible crack, if approved, may have the cracked portion cut off by, and at the expense of, the CONTRACTOR before the pipe is laid so that the pipe used is sound. The cut shall be made in the sound portion of the barrel at least 12 inches (300 mm) from the visible limit of the crack.
- 3.4.1.5** If any defective pipe is discovered after it has been laid, the CONTRACTOR shall remove the defective pipe and replace it with sound pipe at no additional cost to the OWNER or DEPARTMENT.
- 3.4.1.6** In general, gravity pipe laying shall proceed upgrade with spigot ends pointing in the direction of the flow.
- 3.4.1.7** Flow from existing service connections and main lines shall be maintained at all times by pumping or other methods approved by the ENGINEER. Under no circumstances will the dumping of raw sewage on private property, in municipal streets or into waterways, be allowed.

3.4.2 Control of Alignment and Grade.

- 3.4.2.1** Easement and property and other control lines necessary for locating the Work, as well as elevations and benchmarks used in the design of the Work, are shown on the Drawings. The CONTRACTOR shall use this information to set line and use a level or transit to set grade.
- 3.4.2.2** The CONTRACTOR shall use laser equipment to assist in setting the pipe and casing and must demonstrate satisfactory skill in its use.
- 3.4.2.3** The use of string levels, hand levels, carpenter's levels, or other similar devices for transferring grade or setting pipe will not be permitted.

- 3.4.2.4** During construction provide the OWNER, upon request, all reasonable and necessary materials, opportunities, and assistance for setting stakes and making measurements, including the furnishing of one or two rodmen as needed at intermittent times.
- 3.4.2.5** The CONTRACTOR shall not proceed until he has made timely request of the ENGINEER for, and has received, such controls and instructions as may be necessary as Work progresses. The Work shall be done in strict conformance with such controls and instructions.
- 3.4.2.6** The CONTRACTOR shall carefully preserve benchmarks, reference points and stakes, and in case of willful, careless, or accidental destruction by his own workers, he shall be responsible for the resulting expense to re-establish such destroyed control data and shall be responsible for any mistakes or delay that may be caused by the loss or disturbance of such control data.
- 3.4.2.7** Maintain good alignment while laying pipe. The deflection at joints shall not exceed the manufacturer's recommended limit. Provide fittings, if required, in addition to those shown on the Drawings when pipe crosses utilities encountered when excavating the trench. Use solid sleeves only where shown on the plans unless otherwise approved by ENGINEER.

3.4.3 Installing Pipe and Fittings.

- 3.4.3.1** The CONTRACTOR shall have on the job site with each pipe laying crew, all the proper tools to handle and cut the pipe.
- 3.4.3.2** All pipe and fittings shall be thoroughly cleaned before laying, and shall be kept clean until installed.
- 3.4.3.3** Pipe shall be laid in the dry trench conditions. At no time shall water in the trench be permitted to flow into the pipe. At any time that work is not in progress, or the trench is unattended, the end of the pipe in the trench shall be suitably closed to prevent the entry of animals, earth, water, etc. using watertight expandable plugs.
- 3.4.3.4** Lay PVC pipe and fittings in accordance with the requirements of AWWA C 900, except as provided herein. PVC pipe shall not be installed when temperatures are below 32 ° F (0 ° C) unless approved by the ENGINEER.
- 3.4.3.5** Lay ductile iron pipe and fittings in accordance with the requirements of AWWA C 600, except as provided herein.
- 3.4.3.6** Excavation shall conform to the Trenching Section shown on the plans.
- 3.4.3.7** As soon as excavation has been completed to the proper depth the pipe bed shall be prepared as follows:

Pipe Laid on Bedding Material. Place and compact bedding materials, as specified in the Trenching Section, to the elevation necessary to bring the pipe to grade. The compacted material shall be shaped so that the bottom quadrant of the pipe rests firmly on the bedding for the entire length of pipe barrels. Suitable holes shall be dug for bells or couplings to provide ample space for jointing pipe.

3.4.3.8 Each pipe section shall be placed into position on the pipe bed in such a manner and by such means required to avoid injury to all persons, property and pipe involved.

3.4.3.9 Permanent blocking under the pipe is not permitted, except where a concrete cradle is required, in which case precast concrete blocks shall be used.

3.4.3.10 Jointing shall conform to the manufacturer's instructions and appropriate ASTM Standards.

3.4.3.11 Any debris, tools, etc. shall be removed from the pipe.

3.4.3.12 After placing the pipe on the bedding, the bedding material shall be placed and compacted to the springline of the pipe.

3.4.3.13 Following placement of the bedding material, the blanket material shall be placed and compacted from the springline to 12 inches (300 mm) above the crown of the pipe.

3.4.3.14 After placement of the blanket material the pipe shall be checked for alignment and grade. If the pipe has been properly installed, the CONTRACTOR may refill or backfill the remainder of the trench in conformance with the Trenching Section, and details shown on the Drawings.

3.4.3.15 At the end of each day's work, or more frequently, the ENGINEER will view the pipe installation with the CONTRACTOR. Unsatisfactory work shall be dug up and reinstalled to meet the requirements of the Contract Documents with no additional time allowed for completion of the Work and at no additional cost to the OWNER or DEPARTMENT.

3.4.3.16 When cutting of pipe is required, the cutting shall be done by machine (power cutter) without damage to the pipe or cement lining (if any). Cut ends shall be smooth and at right angles to the long axis of the pipe. Pipe ends to be used with a rubber gasket joint shall be beveled and filed or ground smoothly to conform to a manufactured spigot.

3.4.4 Service Connections.

3.4.4.1 House service lines shall be laid from the wye connection on the main line sewer to the property line, as directed by the ENGINEER.

3.4.4.2 All new gravity service connections shall be 6-inch (150 mm) SDR 35 PVC.

3.4.4.3 New services shall terminate as shown on the Drawings, be capped with a watertight cap, and the end shall be marked with a ferrous metal rod or pipe terminating at finish grade.

3.4.5 Low Pressure Force Main.

3.4.5.1 Low Pressure Force Main General - All polyethylene pipe shall be cut, fabricated, and installed in strict conformance with pipe manufacturer's recommendations. Joining, laying, and pulling of polyethylene pipe shall be accomplished by personnel experienced in working with polyethylene pipe. The pipe supplier shall certify, in writing, that the Contractor is qualified to join, lay, and pull the pipe or representative of the pipe manufacturer shall be onsite to oversee the pipe joining. Expenses for the representative shall be paid for by the Contractor.

3.4.5.2 Pipe Preparation - Inspect all pipe and fittings before lowering into the prepared trench to ensure that no cracked, broken, or defective materials are being used in the work and that the pipe is free from all debris. Clean the ends of the pipe thoroughly with a brush or appropriate means. Remove foreign matter and dirt from the inside of the pipe and keep clean during and after laying. Ensure that the inside surfaces are smooth and free from any projections that would interfere with the assembly of the joint or impeded flow.

3.4.5.3 Pipe Placement - Care shall be exercised when installing the pipe in the ground or above grade onto pipe supports to prevent damage or twisting of the pipe.

3.4.5.4 Joining Pipe Sections - Pipes shall be joined to one another, to the polyethylene fittings, and to the flange connections by means of thermal butt-fusion. Polyethylene pipe lengths, fittings, and flanged connections to be joined by thermal butt-fusion shall be of the same type, grade, and class of polyethylene compound and supplied from the same raw material supplier.

3.4.5.4.1 Connections of the polyethylene pipe to auxiliary equipment such as valves, pumps, tanks, and other piping systems shall be through mechanical joint adapters, or flanged connections which shall consist of the following:

1. A mechanical joint adaptor (or flange) shall be thermally butt-fused to the ends of the pipe.
2. Provide ductile iron backup rings.
3. Bolts and nuts of appropriate diameter and sufficient length to show a minimum of three complete threads when the joint is made and tightened to the manufacturer's standard. Retorque the nuts after 4 hours.

4. Gaskets as specified.

5. Thrust restraint at connections shall include clamps, rods, polyethylene welded tabs, and concrete thrust blocks as shown on the plans or directed by the Engineer.

3.4.5.5 Butt Fusion Joining.

3.4.5.5.1 The polyethylene pipe shall be joined by the method of thermal butt fusion, as outlined in ASTM D2657, Heat Joining Polyolefin Pipe and Fittings. Butt fusion joining of pipe and fittings shall be performed in accordance with the procedures recommended by the manufacturer. The temperature of the heater plate should not exceed $425^{\circ}\text{F} \pm 25^{\circ}\text{F}$. The joining interfacial pressure should not exceed 25 pounds per square inch of projected end area for European design fusion machines or 75 pounds per square inch of projected end area for American design fusion machines.

3.4.5.5.2 Butt fusion equipment used in the joining procedures shall be capable of meeting all conditions recommended by the pipe manufacturer, including, but not limited to, temperature requirements, alignment, and fusion pressures. The Contractor shall utilize a manufacturer's factory trained technician to provide training to personnel who will be performing butt fusion jointing prior to assembling pipe.

3.4.5.5.3 The pipe supplier shall be consulted to obtain machinery and expertise for the joining by butt fusion of polyethylene pipe and fittings. No pipe or fittings shall be joined by fusion by any contractor unless he is adequately trained and qualified in the techniques involved.

3.4.5.5.4 Fusion Quality. The Contractor shall ensure the field set-up and operation of the fusion equipment, and the fusion procedure used by the Contractor's fusion operator while on site. Upon request by the Owner or Engineer, the Contractor shall verify field fusion quality by making and testing a trial fusion. The trial fusion shall be allowed to cool completely; then test straps shall be cut out and bent strap tested in accordance with ASTM D2657. If the bent strap test of the trial fusion fails at the joint, the field fusion represented by the trial fusion shall be rejected. The Contractor at his expense shall make all necessary corrections to equipment, set-up, operation, and fusion procedure, and shall re-make the rejected fusion.

3.4.5.6 Electrofusion Joining.

3.4.5.6.1 The polyethylene pipe shall be joined at corporations, branches, adapters, and couplings by electrofusion. The fittings shall meet the requirements of ASTM F1055 (Standard Specification for Electrofusion Type Polyethylene Fittings for Outside Diameter Controlled Polyethylene Pipe and Tubing).

3.4.5.6.2 Electrofusion equipment shall be capable of meeting all conditions recommended by the pipe manufacturer, including, but not limited to, temperature requirements and alignment. The Contractor shall utilize a manufacturer's factory

trained technician to provide training to personnel who will be performing the electrofusion.

3.4.5.6.3 The pipe supplier shall be consulted to obtain machinery and expertise for the electrofusion of the coupling, branches, adapters, and corporations.

3.4.5.6.4 The Contractor shall ensure the field set-up and operation of the fusion equipment, and the fusion procedure used by the Contractor's fusion operator while on-site. The Owner or Engineer can request the Contractor to field verify the quality of the electrofusion. If the fusion fails, the Contractor, at his own expense, shall make all necessary corrections to equipment, set-up, operation, and electrofusion procedures, and shall re-make the rejected electrofusions.

3.4.5.6.5 Contractor to inspect all electric coils prior to commencing an electrofusion.

3.4.5.6.6 If electrofusion fails due to Contractor installation (water entering fuse), the Contractor will replace the electrofusion at his expense.

3.4.5.7 Transportation: Damaged pipe shall be removed from the job site as directed by the Engineer and shall be replaced at the Contractor's sole expense.

3.4.5.8 Each pipe and fitting shall be carefully inspected before the exposed pipe or fitting is installed or the buried pipe or fitting is lowered into the trench. Clean ends of pipe thoroughly. Remove foreign matter and dirt from inside of pipe and keep clean during and after laying.

3.4.5.9 Installation of Exposed Piping:

1. Unless shown otherwise, piping shall be parallel to structure lines.
2. Lateral supports for seismic loads shall be provided at all changes in direction.
3. Piping shall be installed without springing or forcing the pipe in a manner that would set up stressed in the pipe, valves, or connected equipment.

3.4.5.10 Interim Cleaning: Care shall be exercised during fabrication to prevent the accumulation of pipe cuttings and filings, gravel, cleaning rags, etc., within the piping sections. All piping shall be examined to assure removal of these and other foreign objects prior to assembly. Shop cleaning may employ any conventional commercial cleaning method if it does not deform, swell, or otherwise alter the physical properties of the material being cleaned.

3.4.6 Testing.

3.4.6.1 General.

Leakage tests shall be conducted on all pipes installed under this section of the Work. Deflection tests shall be conducted on PVC pipe. The ENGINEER will witness all tests. The CONTRACTOR shall supply all plugs, pumps, weirs, gauges, water, water

trucks, mandrels, etc., necessary to conduct the tests. Should the Work fail the leakage or deflection tests, corrective action shall be taken by the CONTRACTOR in a manner approved by the ENGINEER and, if directed by the ENGINEER, the CONTRACTOR shall dig up and relay the failed section with no additional time allowed for completion of the Work and at no additional cost to the OWNER or DEPARTMENT. The CONTRACTOR shall have no more than 1,000 feet of untested sewer including contiguous manholes constructed at any time.

The use of sealants, applied from the inside of the pipe, is not acceptable.

Flush all piping systems with water prior to testing.

Testing forms which indicate all testing information and results shall be submitted to the ENGINEER.

If sufficient manpower and equipment are not provided to prosecute this phase of the work, the OWNER may engage an independent firm to perform the cleaning and testing work or if the OWNER shall have reasonable suspicion of the methods or test results, an independent firm shall be brought in. The cost for this work will be born by the CONTRACTOR or deducted from payments due to the CONTRACTOR and HE shall not place any claims against the OWNER, or said independent contractor incurred by this work

3.4.6.2 Sanitary Gravity Sewer Pipe Testing With All Service Connections Capped.

3.4.6.2.1 Air Test: Leakage testing shall be by means of low-pressure air in accordance with the procedures described in UNI-B-6. The maximum allowable pressure drop from the test pressure shall be 1.0 psig (6.89 kPa) during the minimum holding time.

Test pressure psi (kPa) shall be calculated using the following equation:

(ENGLISH)	(METRIC)
$P = 3.5 + (H/2.31)$	$P = 24.1 + (H/0.102)$
P = Test pressure (max. = 9 psi)	P = Test pressure (max. = 62.0 kPa)
H = Height (ft) of groundwater above invert.	H = Height (m) of groundwater above invert.

Minimum holding time required for a 1.0 psig (6.89 kPa) maximum pressure drop shall be calculated using the following chart:

(ENGLISH)

Pipe Dia. (in.)	Min. Time (min: sec)	Length For Min. Time (ft)	Time For Longer Length (sec)	Time (min:sec) for Length (L) Shown					
				100 ft	150 ft	200 ft	250 ft	300 ft	350 ft
4	3:46	597	.380 L	3:46	3:46	3:46	3:46	3:46	3:46
6	5:40	398	.854 L	5:40	5:40	5:40	5:40	5:40	5:40
8	7:34	298	1.520 L	7:34	7:34	7:34	7:34	7:36	8:52
10	9:26	239	2.374 L	9:26	9:26	9:26	9:53	11:52	13:51
12	11:20	199	3.418 L	11:20	11:20	11:24	14:15	17:05	19:56
15	14:10	159	5.342 L	14:10	14:10	17:48	22:15	26:42	31:09
18	17:00	133	7.692 L	17:00	19:13	25:38	32:03	38:27	44:52
21	19:50	114	10.470 L	19:50	26:10	34:54	43:37	52:21	61:00
24	22:40	99	13.674 L	22:47	34:11	45:34	56:58	68:22	79:46
27	25:30	88	17.306 L	28:51	43:16	57:41	72:07	86:32	100:57
30	28:20	80	21.366 L	35:37	53:25	71:13	89:02	106:50	124:38
33	31:10	72	25.852 L	43:05	64:38	86:10	107:43	129:16	150:43
36	34:00	66	30.768 L	51.17	76.55	102.34	128.12	153.50	179.29

(METRIC)

Pipe Dia. (mm.)	Min. Time (min: sec)	Length For Min. Time (m)	Time For Longer Length (sec)	Time (min:sec) for Length (L) Shown					
				30 m	45 m	60 m	75 m	90m	105 m
100	3:46	182	1.24 L	3:46	3:46	3:46	3:46	3:46	3:46
150	5:40	121	2.80 L	5:40	5:40	5:40	5:40	5:40	5:40
200	7:34	91	4.99 L	7:34	7:34	7:34	7:34	7:36	8:52
250	9:26	73	7.789 L	9:26	9:26	9:26	9:53	11:52	13:51
300	11:20	61	11.21 L	11:20	11:20	11:24	14:15	17:05	19:56
375	14:10	48	17.526 L	14:10	14:10	17:48	22:15	26:42	31:09
450	17:00	41	25.236 L	17:00	19:13	25:38	32:03	38:27	44:52
525	19:50	35	34.350 L	19:50	26:10	34:54	43:37	52:21	61:00
600	22:40	30	44.862 L	22:47	34:11	45:34	56:58	68:22	79:46
675	25:30	27	56.778 L	28:51	43:16	57:41	72:07	86:32	100:57
750	28:20	24	70.098 L	35:37	53:25	71:13	89:02	106:50	124:38
825	31:10	22	84.816 L	43:05	64:38	86:10	107:43	129:16	150:43
900	34:00	20	100.945L	51.17	76.55	102.34	128.12	153.50	179.29

3.4.6.3 Deflection/Video Tests for Flexible Pipe:

Deflection Test: Optional devices for testing include calibrated television, photography, properly sized "GO-NO-GO" mandrel, sewer ball or deflectometer. Maximum allowable pipe deflection shall be five percent (5%). The deflection test shall be performed no sooner than thirty (30) days nor longer than ninety (90) after installation.

Video Inspection: An internal video inspection shall be conducted of the sewer lines prior to the installation of the surface finish. The pipe runs shall be cleaned and inspected for cracks, joint gaps, deformation, and other visual defects using a video camera that meets the following requirements:

- The video camera shall be able to verify the quality of the pipe installation and not be limited by poor lighting, water flow, or pipe length.
- Provide its own light source or have a separate light source capable of producing images acceptable to the Engineer.
- Be able to move remotely inside the entire length of pipe.
- Be able to pan and tilt to enable full view of joints.
- Have a remote monitor and a recording apparatus to view and record the condition of the installed pipe.
- The video should include identification before each section of pipe filmed. The identification should include project number, structure numbers corresponding to the structure numbers on the plans, size of pipe, date, and time. The video should also be marked with distances down the pipe length with an accuracy of one foot per 100 ft.
- A copy of the video shall be provided to the Engineer on CD/DVD media in .WMV or .MPEG format and a written report shall accompany the video.

Any pipe found to be damaged shall be repaired or replaced at the CONTRACTOR's expense. Any repairs will be done at the approval of the Engineer.

3.4.6.4 Low Pressure Force Main Testing.

3.4.6.4.1 General: The Contractor shall test all installed pipe in accordance with the requirements of AWWA C600 and the manufacturer's recommended testing procedures for polyethylene pipe, except as amended or added below:

1. The Contractor shall furnish all labor, materials, and equipment necessary for any and all required pipe taps for testing, and as necessary for testing as specified.
2. A pressure test and leakage test are required for all pipe.

3. Water to be furnished by the Owner.

3.4.6.4.2 Testing Requirements:

1. Test duration: 2 hours.
2. Test pressure: 150% of maximum operating pressure as determined by the Engineer or the rated pressure of the pipe whichever is greater.
3. Allowable pressure loss: Pressure shall not vary more than ± 5 psi for the duration of the pressure test.
4. Allowable leakage: Allowable leakage shall be determined by the following formula:

$$L = \frac{SD\sqrt{P}}{148,000}$$

L = allowable leakage, in gallons per hour
S = length of pipe tested, in feet.
D = nominal pipe diameter, in inches.
P = average test pressure, in psi (gauge)

3.4.7 Protection of Water Supplies.

- 3.4.7.1** There shall be no physical connection between a public or private potable water supply system and a sewer, or sewer appurtenance, which would permit the passage of any sewage or polluted water into the potable supply. No water pipe shall pass through or come in contact with any part of a sewer manhole.
- 3.4.7.2** Sewers shall be located outside a 400-foot (125 m) radius centered at a municipal well; a 200-foot (60 m) radius centered at a small public well; and a 75-foot (25 m) radius centered at a private well.
- 3.4.7.3** Sewers shall be located during design with at least 10 feet (3 m) of horizontal separation distance from any existing or proposed water main; except in cases to avoid conflict with subsurface structures, utility chambers and building foundations, shall be allowed, provided that the sewer is constructed of pressure pipe meeting water system standards.
- 3.4.7.4** Whenever sewers must cross water mains, the sewer shall be constructed as follows:
 - Vertical separation of the sewer and water main shall not be less than 18 inches (450 mm) with water above sewer; and
 - Sewer pipe joints shall be located at least 10 feet horizontally from the water main.

3.4.7.5 Whenever local conditions prevent the vertical separation as described in 3.4.7.4 above, the following construction shall be used:

- Vertical separation of the sewer and water main shall not be less than 12 inches (300 mm) between bottom of water line and top of the sewer.
- If 12 inches of separation cannot be provided, sewers under or over water mains shall be constructed of materials and with joints that are equivalent to water main standards of construction and shall be pressure tested to assume water tightness prior to backfill.

For water mains passing under sewers:

- There shall be a vertical separation of at least 12 inches between the bottom of the sewer and the top of the water main.
- There shall be adequate structural support for the sewer to prevent excessive deflection of the joints and settling on and breaking of the water main.
- One full length of water pipe (minimum of 18 feet) shall be centered at the point of the crossing so that the joints will be equidistant and as far as possible from the sewer.

3.5 Manhole Installation.

3.5.1 Installation of Manhole Bases and Sections.

3.5.1.1 Precast bases shall be placed on a 1'-0" (0.3 m) layer of compacted bedding material. The excavation shall be properly dewatered to allow placing of bedding material and setting the manhole base on completely drained subgrade.

3.5.1.2 Inlet and outlet stubs shall be connected and sealed in accordance with the manufacturer's recommended procedure, and as shown on the Drawings.

3.5.1.3 Barrel sections and cones of the appropriate combination of heights shall then be placed, using manufacturer's recommended procedure for sealing the horizontal joints.

3.5.1.4 A leakage test shall then be made as described below in this section.

3.5.1.5 Upon successful completion of the leakage test all joints shall be pointed.

3.5.1.6 The exterior waterproofing coat shall be touched up after installation and shall be applied to the exterior of all joints in accordance with manufacturer's recommendations.

3.5.1.7 The inverts and the shelf shall be constructed of brick. Inverts and shelves shall be placed after testing of the manhole.

3.5.1.8 The frame and cover shall be placed on the top of the manhole or some other approved means shall be provided to prevent accidental entry by unauthorized persons, children, animals, etc., until the CONTRACTOR is ready to make final adjustment to grade.

3.5.2 Mixing Mortar. Mortar shall be mixed in accordance with ASTM C 270 or the recommendations of the manufacturer.

3.5.3 Brick Masonry.

3.5.3.1 Only clean bricks shall be used in brickwork for grade adjustment and manhole inverts. The bricks shall be moistened by suitable means, until they are in a surface dry, saturated condition.

3.5.3.2 Each brick shall be laid in full bed and joint of mortar without requiring subsequent grouting, flushing, or filling; and shall be thoroughly bonded.

3.5.3.3 Brick masonry shall be protected from drying too rapidly. Use an approved cover and protect from the weather and frost.

3.5.3.4 All masonry joints which are exposed to view shall be examined to locate cracks, pointed up and filled with mortar. Where necessary, in the opinion of the ENGINEER, the joints shall be cut out and repointed with mortar.

3.5.3.5 All brick masonry inverts shall allow unimpeded flow. Steps or puddles will be basis for rejection.

3.5.4 Setting Frames and Covers.

3.5.4.1 Frames shall be set with the tops conforming accurately to the grade of the pavement or finished ground surface or as indicated on the Drawings. Frames shall be set concentric with the top of the masonry and in a full bed of mortar so that the space between the top of the manhole masonry and the bottom flange of the frame shall be completely filled and made watertight. A thick ring of mortar extending to the outer edge of the masonry shall be placed all around and on the top of the bottom flange. The mortar shall be smoothly finished and have a slight slope to shed water away from the frame.

3.5.4.2 Manhole covers shall be left in place in the frames on completion of other work at the manholes.

3.5.5 Leakage Tests for Sewer Manholes.

3.5.5.1 Leakage tests shall be made and observed by the ENGINEER on each manhole. The test shall be a vacuum test made as described below.

3.5.5.2 Vacuum test.

The vacuum test may be performed on manholes, completely constructed, with inlet and outlet pipes in place. Plug pinholes and horizontal seams with a non-shrinking mortar.

Brace the inlet and outlet pipes/plugs to prevent movement during the test. Use air inflated plugs in good condition.

The vacuum test shall be performed using equipment approved by the ENGINEER. The equipment shall be in good operating condition. No gauges are to have any broken glass or other visible abnormalities. The test shall be performed by trained personnel familiar with the equipment and the test.

The test shall have a minimum duration of two minutes. The vacuum shall be pumped down to 10 inches (250 mm) of mercury on an approved gauge, and held. At the time the removal of air is stopped, the test time shall begin.

Any manhole that has a vacuum drop to nine inches (225 mm) of mercury or less, within the following time intervals, shall have failed the test.

0 – 10 ft. (3.0 m) deep: less than 2 minutes.

10 ft. (3.0 m) – 15 ft. (4.5 m) deep: less than 2-1/2 minutes.

15 ft. (4.5 m) – 20 ft. (6.0 m) deep: less than 3 minutes.

over 20 ft. (6.0 m) deep: less than T.

Calculations for manholes deeper than 20 feet (6.0 m).

$$T = 0.085 DK/Q$$

T = Time of pressure drop in seconds

K = 0.000419 DL; but not less than 1.0

Q = 0.0015 ft³/min/ft² of area

D = Nominal manhole diameter in.

L = Depth of manhole in feet.

$$T = 2.159 DK/Q$$

T = Time of pressure drop in seconds

K = 0.003244 DL; but not less than 1.0

Q = 0.00046 m³/min/m² of area

D = Nominal manhole diameter in mm

L = Depth of manhole in meters

If the pressure drop exceeds 1" Hg in within the allowable time that unit shall be repaired and retested.

If a unit fails to meet a 1" Hg drop in 1 minute after repair, the unit shall be water exfiltration tested and repaired as necessary.

Testing using either air or water shall be done whenever possible prior to backfilling to assist in locating leaks. Joint repairs by parging are to be done on both outside and inside of the joint to ensure a permanent seal. Vacuum testing draws together the joint and applies high pressure to the elastomeric joint material. Properly placed and sized elastomeric joint material must be used to avoid leakage or to enable sections to be separated if necessary to affect a repair.

The test may be conducted either before or after backfilling around the sewer manhole. However, if the CONTRACTOR elects to backfill prior to testing, for any reason, it shall be at his own risk and it shall be incumbent upon the CONTRACTOR to determine the reason for any failure of the test. No adjustment in the test will be made for unknown causes such as leaking plugs, absorption, etc. (i.e., it will be assumed that all loss of vacuum during the test is a result of leaks through the joints or through the concrete.) Furthermore, the CONTRACTOR shall take any steps necessary to assure the ENGINEER that the water table is below the bottom of the manhole throughout the test.

Method of Measurement

- 4.1** Sanitary gravity sewer and sewer services of the kind, type and size specified will be measured by the linear foot (linear meter) to the nearest 0.1 foot (meter) to the inside face of manholes.
- 4.2** Sanitary gravity sewer service wyes will be measured as each wye furnished and installed.
- 4.3** Sanitary gravity sewer chimneys will be measured as each chimney furnished and installed.
- 4.4** Sanitary gravity sewer manholes will be measured by the number of units based upon a standard depth of eight (8) feet, complete, and accepted in place.
- 4.5** Low pressure force main sewer and sewer services of the kind, type and size specified will be measured by the linear foot (linear meter) to the nearest 0.1 foot (meter) to the inside face of manholes.
- 4.6** Low pressure force main sewer tees will be measured as each wye furnished and installed.
- 4.7** Low pressure force main lot services will be measured by the number of units, complete, and accepted in place.
- 4.8** Low pressure force main sewer manholes will be measured by the number of units, complete, and accepted in place.

- 4.9** No separate measurement will be made for any removal of existing sewer manholes or sewer pipe, bypass system, or plugging of abandoned sewers.
- 4.10** The ENGINEER must be involved in and approve the measurement of any pay item.
- 4.11** Test pits will be measured per each location they are conducted.

Basis of Payment

- 5.1** The accepted quantity of sanitary gravity sewer and service pipe will be paid for at the contract price per linear foot (linear meter) complete in place as shown on the plans and specified herein, and shall include furnishing and installing pipe, excavation, bedding, blanket, backfill, couplings, bends, testing, furnishing and placing temporary pavement trench patch, sheeting, shoring, dewatering, maintaining sewage flow, restoration, connection to existing sewers, and all other work required for or incidental to the completion of this item except as noted below.
 - 5.1.1** Common structure excavation required for the removal of unsuitable material below the typical trench section will be paid for as provided in MaineDOT Standard Specifications, Section 206 – Structural Excavation.
 - 5.1.2** Rock structure excavation will be paid for as provided in MaineDOT Standard Specifications, Section 206 – Structural Excavation.
 - 5.1.3** Granular backfill to replace material excavated under 5.1.1 and 5.1.2 will be paid for as provided in MaineDOT Standard Specifications, Section 206 – Structural Excavation, Subsection 206.03 – Backfilling.
- 5.2** The accepted quantity of gravity sewer service wyes will be paid at the contract unit price and shall include furnishing and installing the wyes and all other work required or incidental to the completion of this item.
- 5.3** The accepted quantity of gravity sewer chimney will be paid at the contract unit price and shall include furnishing and installing the chimney, complete in place and all other work required or incidental to the completion of this item.
- 5.4** The accepted quantity of gravity sewer manholes will be paid for at the contract unit price per each and shall include furnishing and installing manhole base, riser and cone sections, frames and covers, installing inside drop connections where required, furnishing and installing pipe stubs and couplings for "cut-in" manholes where required, brick channel and table, all brick work to adjust frames, testing, and all other work required or incidental to the completion of this item.
- 5.5** The accepted quantity of sanitary low pressure force main sewer and service pipe will be paid for at the contract price per linear foot (linear meter) complete in place as shown on the plans and specified herein, and shall include furnishing and installing pipe,

excavation, bedding, blanket, backfill, couplings, bends, testing, furnishing and placing temporary pavement trench patch, sheeting, shoring, dewatering, maintaining sewage flow, restoration, connection to existing sewers, and all other work required for or incidental to the completion of this item except as noted below.

- 5.5.1** Common structure excavation required for the removal of unsuitable material below the typical trench section will be paid for as provided in MaineDOT Standard Specifications, Section 206 – Structural Excavation.
- 5.5.2** Rock structure excavation will be paid for as provided in MaineDOT Standard Specifications, Section 206 – Structural Excavation.
- 5.5.3** Granular backfill to replace material excavated under 5.5.1 and 5.5.2 will be paid for as provided in MaineDOT Standard Specifications, Section 206 – Structural Excavation, Subsection 206.03 – Backfilling.
- 5.6** The accepted quantity of low pressure force main sewer service tees will be paid at the contract unit price per each and shall include furnishing and installing the tees and all other work required or incidental to the completion of this item.
- 5.7** The accepted quantity of low pressure force main sewer lot service assembly will be paid at the contract unit price per each and shall include furnishing and installing the lot service and all other work required or incidental to the completion of this item.
- 5.8** The accepted quantity of low pressure force main terminal sewer manholes will be paid for at the contract unit price per each and shall include furnishing and installing manhole base, riser and cone sections, frames and covers, installing pipe supports where required, furnishing and installing pipe fittings and couplings where required, concrete fill and sump, all brick work to adjust frames, testing, and all other work required or incidental to the completion of this item.
- 5.9** Any work not specifically having a pay item and necessary for a complete and operational sanitary sewer, as herein specified and called for on the plans, shall be considered incidental and subsidiary to the pay item work specified herein. The work considered as subsidiary and not separately paid for shall include but not be limited to the following:
 - 5.9.1** Pipe material handling and storage on site.
 - 5.9.2** Excavation, bedding, blanket, backfill and compaction.
 - 5.9.3** Sheeting, shoring, and dewatering of trenches (if applicable).
 - 5.9.4** Maintaining existing sewer service, including bypass pumping and temporary bypass connections.

- 5.9.5** Restoration of property, utilities, and water lines (if applicable).
- 5.9.6** Warning and tracer tape.
- 5.9.7** Plugging abandoned sewers, removal and disposal of abandoned sewers, and removal and disposal of existing manholes
- 5.9.8** Bituminous pavement for the temporary trench patch, including saw cutting of existing pavement and pavement subbase material.
- 5.9.9** Traffic Control.
- 5.9.10** Record drawings.
- 5.9.11** Connections to existing sewers and couplings.
- 5.10** The accepted quantity of trench insulation will be paid at the contract unit price and shall include furnishing and installing the trench insulation and all other work required or incidental to the completion of this item.
- 5.11** Test pits, where approved by the ENGINEER, will be paid for at the contract unit price per each location they are conducted.
- 5.12** The owner's testing allowance includes leakage, deflection and video testing on pipes and leakage tests on manholes. Testing will be paid for using the allowance allotted in this item. Only the final passing tests will be paid for. All final passing testing costs shall be submitted to the ENGINEER and a final Contract Modification will be issued balancing the actual testing costs and stated allowance. Payment will be paid in accordance with Maine DOT Standard Specification Section 109.7.5 – Force Account Work.

Pay items and units:

801.03	TEST PIT	EA
801.031	1.25" HDPE-CTS LPFM LOT SERVICE ASSEMBLY	EA
801.0312	2" PVC LPFM CURB STOP/GATE VALVE	EA
801.04	LPFM WRAP AROUND PIPE INSULTATION AT CULVERTS	LF
801.132	2" HDPE-CTS LPFM PIPE	LF
801.1321	2" X 2" X 2" HDPE-CTS LPFM TEE	EA
801.1322	1.25" HDPE-CTS LPFM PIPE	LF
801.1323	2" X 2" X 1.25" HDPE -CTS LPFM TEE	EA
801.16	6" PVC GRAVITY SEWER PIPE	LF
801.161	6" PVC GRAVITY SEWER SERVICE CHIMNEY	EA
801.17	8" PVC GRAVITY SEWER PIPE MAIN PIPE – SDR 35	LF
801.172	8" PVC GRAVITY SEWER MAIN PIPE- SDR 35-OVER 10 FT. DEPTH	LF

801.175	10" PVC GRAVITY SEWER MAIN PIPE -SDR35	LF
803.1722	5' DIA. CONCRETE LPFM SEWER MANHOLE CLEANOUT WITH FITTINGS	EA
803.173	4 FT. DIA. CONCRETE SEWER MANHOLE	EA
812.164	REBUILDING SEWER MANHOLE	EA
823.421	6" PVC GRAVITY SEWER SERVICE WYE	EA
827.331	TRENCH INSULATION	SY
832.07	OWNER'S TESTING ALLOWANCE	LS

SPECIAL PROVISION
SECTION 801
SANITARY SEWER

Description This work shall consist of constructing cellar drain inspection standpipes, in accordance with these specifications and in reasonably close conformity with the lines and grades shown on the plans and as directed by the resident in the field.

Materials Meet Sections:

Sewer Line Bedding and Initial Backfilling Stone
PVC Pipes & Fittings (100 mm [4 in])

703.02 for class AA
ASTM D3034 (SDR 35)

Construction Requirements

Excavation Trenches shall be excavated in accordance with the requirements of Section 206 - Structural Excavation and wide enough to allow joining the pipe and compacting the bedding and backfill material under and around the pipe. Unless otherwise designated, trench walls shall be as nearly vertical as possible and the trench width no greater than necessary for installation of the pipe.

Bedding The inspection standpipe and pipe line shall be bedded in original material.

Laying The Contractor shall not install nor backfill cellar drain inspection standpipes between December 15th and April 1st without written permission. Installing shall begin at the downhill end of the cellar drain line. Bell or groove ends shall be placed facing uphill.

Joining The pipe ends shall be thoroughly cleaned before the joint is made. Joints shall be made in accordance with the manufacturer's recommended procedures.

Backfilling After the inspection standpipe and pipe are installed, it will be inspected before any backfill material is placed. All pipe found to be out of alignment, unduly settled or damaged to the extent that full performance is impaired, shall be taken up and re-laid or replaced. One bag of concrete mix shall be installed around the foot of the standpipe, placement as per manufacturer's recommendations.

Trenches shall be backfilled in accordance with Section 206.03 and as follows. The backfill shall be original excavation in 300 mm [12 in] maximum lifts and shall be thoroughly compacted with power tampers or vibratory compactors or other approved equipment or combination of equipment.

Method of Measurement PVC pipe will be measured by the length in meter [foot] along the invert, horizontally and vertically, including fittings and caps, laid as directed, complete in place, and accepted. Pipe laid in excess of the authorized length will not be included. Pipe installed inside a manhole will not be measured for payment.

Basis of Payment The accepted quantities of pipe will be paid for at the contract unit price per meter [linear foot], for the types and sizes specified, complete in place and shall be full compensation for all labor, materials, equipment, excavation, dewatering, bedding, furnishing and installing pipe, removal and disposal of existing pipes, connecting to manholes, connecting to existing cellar drain, concrete footing, backfill, compacting, cleaning, testing, maintaining existing flows, and all other incidental required.

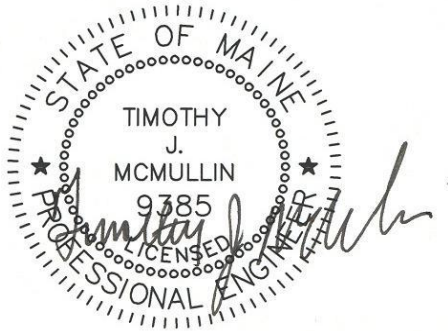
No payment will be made for pipe ordered without written approval of the Resident when such pipe is not required to be installed for completion of the work.

Payment will be made under:

<u>Pay Item</u>	<u>Pay Unit</u>
801.141 100 mm [4 in] PVC Sanitary Sewer (SDR-35)	meter [Linear Foot]

**CONTRACT DOCUMENTS
FOR
WATER MAIN REPLACEMENTS**

RTE 100/26 - FALMOUTH



SEPTEMBER 2018

**PORTLAND WATER DISTRICT
225 Douglass Street
Portland, Maine 04104**

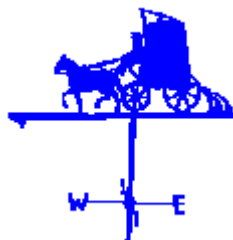


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SECTION 01001 - DESCRIPTION OF WORK

PART 1: GENERAL

1.1 SCOPE:

- A. The CONTRACTOR shall furnish and install water main and appurtenances in Gray Rd, Falmouth, Maine and as shown on the drawings and specified herein.
- B. The CONTRACTOR shall perform leakage and pressure tests and disinfect the installed water main as specified herein.

1.2 DUTIES OF THE OWNER:

- A. The OWNER will locate the terminal points of the work and will also locate any of its facilities lying in close proximity which would in any way be a hazard to the CONTRACTOR's operations.
- B. The OWNER will operate any valves or hydrants which may be found desirable or necessary to be used for any purpose. The OWNER will perform work in coordination with the CONTRACTOR at the locations specified on the plans.
- C. The OWNER will notify customers of all work involving temporary shutdown of service.

1.3 DUTIES OF THE CONTRACTOR:

- A. The CONTRACTOR will familiarize himself with all obstructions which he can foresee, such as existing pipes, services, conduits, ducts, sewers or any other such obstructions which might interfere with the construction, and he agrees to make arrangements with the owners of such facilities so as to save the OWNER harmless from any damages thereto caused by his operations and to make whatever arrangements might be necessary to move or remove and replace these facilities so as to permit the construction, all at his own

expense. The CONTRACTOR agrees that there will be no extras charged for this type of work, except by special agreement with the ENGINEER and upon written order from him.

- B. The CONTRACTOR will make any changes which may be required, such as the removing or restoring of the property of others in the land through which this line will cross in right-of-way or otherwise. The CONTRACTOR will place all pipe, fittings and all attendant facilities to proper line and grade, as called for in the plans and specifications and to the satisfaction of the ENGINEER.
- C. The CONTRACTOR must give the District at least 4 days notice prior to a shutdown in order to properly notify customers.
- D. The CONTRACTOR will furnish all fuel, gasoline, oil, etc. for the operation of his equipment, all tools and equipment, and all labor and supervision necessary for the handling of material, for excavation, installation, backfilling and cleaning the site as required. He will dispose of excess spoil and restore the land surface to the original contour over the entire length of the project. Restoration shall be made to the satisfaction of the ENGINEER.
- E. The CONTRACTOR will perform the pressure and leakage test and disinfection of the main as described herein in the presence of the ENGINEER or OWNER.
- F. The CONTRACTOR shall install the water mains to supply the OWNER with a satisfactory, watertight pipeline, laid to proper line and grade in accordance with these contract documents, to the satisfaction of the OWNER. The CONTRACTOR shall leave the site in a condition, which is suitable to the OWNER, abutting landowners and any municipal or state authorities having jurisdiction over the areas involved.

END OF SECTION

SECTION 01035 - CONTROL OF WORK

PART 1: GENERAL

1.01 PLANT

- A. The Contractor shall furnish plant and equipment which will be efficient, appropriate and large enough to secure a satisfactory quality of work and a rate of progress which will insure the completion of the work within the time stipulated in the Proposal. If at any time such plant appears to the Owner to be inefficient, inappropriate or insufficient for securing the quality of work required or for producing the rate of progress aforesaid, he may order the Contractor to increase the efficiency, change the character or increase the plant equipment, and the Contractor shall conform to such order. Failure of the Owner to give such order shall in no way relieve the Contractor of his obligations to secure the quality of the work and rate of progress required.

1.02 PIPE LOCATIONS

- A. Pipelines shall be located substantially as indicated on the Drawings, but the Owner reserves the right to make such modifications in locations as may be found desirable to avoid interference with existing structures or for other reasons. Where fittings are noted on the Drawings, such notation is for the Contractor's convenience and does not relieve him from laying and jointing different or additional items where required.

1.03 CARE AND PROTECTION OF PROPERTY

- A. The Contractor shall be responsible for the preservation of all public and private property, and shall use every precaution necessary to prevent damage thereto. If any direct or indirect damage is done to public or private property by or on account of any act, omission, neglect, or misconduct in the execution of the work on the part of the Contractor, such property shall be restored by the Contractor, at his expense, to a condition similar or equal to that existing before the damage was done, or he shall make good the damage in other manner acceptable to the Owner.

1.04 PROTECTION AND RELOCATION OF EXISTING STRUCTURES, TREES AND UTILITIES

- A. The Contractor shall assume full responsibility for the protection of all trees, buildings, structures, and utilities, public or private, including poles, signs, services to buildings, buried utilities, gas pipes, water pipes, hydrants, sewers, drains, and electric and telephone cables, whether or not they are shown on the Drawings. The Contractor shall carefully support and protect all such

structures and utilities from injury of any kind. Any damage resulting from the Contractor's operations shall be repaired by him at his expense.

- B. Protection and temporary removal and replacement of existing utilities and structures as described in this Section shall be a part of the work under the Contract and all costs in connection therewith shall be included in the Prices in the Proposal.

1.05 CLEANUP

- A. During the course of the work, the Contractor shall keep the site of his operations in as clean and neat a condition as is possible. He shall dispose of all residue resulting from the construction work and, at the conclusion of the work, he shall remove and haul away any surplus excavation, lumber, equipment, temporary structures, and any other refuse remaining from the construction operations, and shall leave the entire site of the work in a neat and orderly condition.

END OF SECTION

SECTION 01151 - MEASUREMENT AND PAYMENT

PART 1: GENERAL

1.1 METHOD OF MEASUREMENT AND BASIS OF PAYMENT:

All measurements for payments will be based on completed work performed in strict accordance with the drawings and specifications, and on the contract bidding and payment item schedules. All work completed under the contract will be measured by the PORTLAND WATER DISTRICT ("DISTRICT") according to the methods outlined below. In cases where the payment clause in the specifications relating to any unit or lump sum price stated in the contract requires that the said unit or lump sum price cover and be considered compensation for certain work or material essential to the item, this same item will not be measured or paid for under any other pay item which may appear elsewhere in the specifications.

PART 2: PAYMENT ITEMS:

2.1 ITEM NO. 625.01 Temporary Water System

- A. Method of Measurement: Lump Sum
- B. Basis of Payment: Payment of the unit price established in the Bid shall be full compensation for excavation, installation and removal of temporary valves, fittings, piping and connections, laying and jointing, maintenance, testing, temporary pavement, restoration of property and associated work as specified and shown on the Drawings.

2.2 ITEM NO. 822.3605 – CL 52 DI Pipe Push On Joint Pipe

- A. Method of Measurement: Linear feet as measured along the centerline of the pipe for the actual number of linear feet of pipe and fittings installed.
- B. Basis of Payment: Payment of the unit price established in the Bid shall be full compensation for excavating, shoring and bracing, dewatering, pipe, laying and jointing, connections to existing piping, removal and disposal of existing piping, services and appurtenances, capping existing pipes that are not removed, abandoning existing services, thrust restraint, select backfill, backfilling, testing, restoration, and associated work as specified and shown on the Drawings.

2.3 ITEM NO. 822.3606 – High Density Polyethelene Water Main

- A. Method of Measurement: Linear feet as measured along the centerline of the pipe for the actual number of linear feet of pipe and fittings installed.
- B. Basis of Payment: Payment of the unit price established in the Bid shall be full compensation for excavating, shoring and bracing, dewatering, pipe, fittings, fusing, locator wire, installation utilizing horizontal directional drilling methods, thrust restraint, capping pipes that are not removed, testing, restoration and associated work as specified and shown on the Drawings.

2.4 ITEM NO. 823.31 & 823.3101 – Gate Valves

- A. Method of Measurement: Actual number installed
- B. Basis of Payment: Payment of the unit price established in the Bid shall be full compensation for excavation, shoring and bracing, dewatering, valve, valve box, abandoning/removing existing valves, backfill, testing and associated work as specified and shown on Drawings.

2.5 ITEM NO. 823.341 – Air Release Assembly

- A. Method of Measurement: Actual number installed
- B. Basis of Payment: Payment of the unit price established in the Bid shall be full compensation for excavation, shoring and bracing, dewatering, corporation, angle valve, fittings, operating rod, service box, valve box, installation, backfill, testing and associated work as specified and shown on the Drawings.

2.6 ITEM NO. 823.30 - Hydrant Assembly

(Sta. 169+30, 180+45L)

- A. Method of Measurement: Actual number installed
- B. Basis of Payment: Payment of the unit price established in the Bid shall be full compensation for excavation, shoring and bracing, dewatering, hydrant tee, 6-inch hydrant control valve, valve box, 6-inch pipe, hydrant, hydrant extensions, thrust blocks, backfill, testing and associated work as specified and shown on Drawings.

2.7 ITEM NO. 823.30 - Hydrant Relocation

(Sta. 143+45L, 156+17L, 163+12L, 176+71L, 187+63R, 195+59R, 59+09R Falmouth Rd)

- A. Method of Measurement: Actual number installed

- B. Basis of Payment: Payment of the unit price established in the Bid shall be full compensation for excavation, shoring and bracing, dewatering, hydrant removal, resetting hydrant, hydrant extensions, 6" ductile iron pipe from the existing control valve, bends/offset to avoid underdrain, thrust blocks, backfill, testing and associated work as specified and shown on Drawings.

2.8 ITEM NO. 824.31 – Remove Fire Hydrant

(Sta. 172+80, 180+60L)

- A. Method of Measurement: Actual number removed

- B. Basis of Payment: Payment of the unit price established in the Bid shall be full compensation for excavation, shoring and bracing, dewatering, hydrant removal, 6-inch hydrant control valve removal, valve box removal, 6-inch pipe removal or capping, installation of MJ plug in tee and associated work as specified and shown on Drawings.

2.9 ITEM NO. 825.334 & 825.335 – 1" Copper Service

51 Leighton Rd.		116 Gray Rd		154 Gray Rd		80 Leighton Rd
82 Gray Rd.		117 Gray Rd		155 Gray Rd		5 Mountain Rd
81 Gray Rd		123 Gray Rd		156 Gray Rd		4 Mountain Rd
85 Gray Rd		124 Gray Rd		12 Riley's Way		3 Mountain Rd
87 Gray Rd		134 Gray Rd		10 Riley's Way		2 Mountain Rd
91 Gray Rd.		133 Gray Rd		172 Gray Rd		423 Falmouth Rd
94 Gray Rd		137 Gray Rd		173 Gray Rd		422 Falmouth Rd
100 Gray Rd		143 Gray Rd		176 Gray Rd		419 Falmouth Rd
101 Gray Rd		144 Gray Rd		177 Gray Rd		418 Falmouth Rd
102 Gray Rd		145 Gray Rd		180 Gray Rd		417 Falmouth Rd
106 Gray Rd		149 Gray Rd		196 Gray Rd		404 Falmouth Rd
110 Gray Rd		151 Gray Rd		199 Gray Rd		402 Falmouth Rd
114 Gray Rd						

- A. Method of Measurement: Actual number installed

- B. Basis of Payment: Payment of the unit price established in the Bid shall be full compensation for excavation, shoring and bracing, dewatering, pipe, corporation (for connections to new main only), fittings, connection to existing service, service box, rod, curb stop, backfilling and associated work as specified and shown on Drawings.

2.10 ITEM NO. 825.57 – Reconnect Copper Service

- A. Method of Measurement: Each
- B. Basis of Payment: Payment of the unit price established in the Bid shall be full compensation for excavation, gravel, shoring and bracing, dewatering, pipe, corporation, fittings, connection to existing service near water main, backfilling and associated work as specified and shown on Drawings.

2.11 ITEM NO. 825.571 – Retire 1” Water Service
(Sta. 180+03)

- A. Method of Measurement: Each
- B. Basis of Payment: Payment of the unit price established in the Bid shall be full compensation for excavation, shoring and bracing, shutting the corporation at the main, disconnecting/cutting service at the main, removing service box and rod, backfilling and associated work as specified and shown on Drawings.

2.12 ITEM NO. 823.3101 , 823.3250 & 823.3310 – Cut-In Offset

- A. Method of Measurement: Each
- B. Basis of Payment: Payment of the unit price established in the Bid shall be full compensation for relocation of existing water main to avoid proposed sewer or storm drain. Includes excavation, shoring and bracing, dewatering, D.I. pipe, (4) 45 degree bends, sleeves, fittings, installation, backfill, testing and associated work as specified and shown on the Drawings.

2.13 ITEM NO. 653.22– 2” Rigid Extruded Polystyrene Insulation (2’x8’)

- A. Method of Measurement: Each
- B. Basis of Payment: Payment of the unit price established in the Bid shall be full compensation for the furnishing and installation of insulation as shown on the plans or directed by the PWD inspector .

END OF SECTION

SECTION 01310 - SUBMITTALS

PART 1 - GENERAL

1.01 SUBMITTALS FOR OWNER'S APPROVAL

- A. For all products to be incorporated into the Work submit to the OWNER for approval sufficient information in the form of shop drawings, product data and/or samples such that the OWNER can determine that the product is in compliance with the Technical Specifications and Drawings.
- B. Submit two (2) copies of each submittal. One (1) copy will be returned to the CONTRACTOR. Each copy shall include a cover sheet which clearly identifies the product and corresponding specification section. Each cover sheet shall bear the CONTRACTOR's stamp and signature certifying that the submittal is in full compliance with the Contract Documents or that any deviations from the Contract Documents are clearly identified on a separate sheet(s) labeled "Deviations From Contract Documents" and attached to the cover sheet.
- C. OWNER's Review: The OWNER shall review the submittals and indicate their status as:
 - 1. APPROVED SUBJECT TO REQUIREMENTS OF THE CONTRACT DOCUMENTS
 - 2. APPROVED AS NOTED, SUBJECT TO REQUIREMENTS OF THE CONTRACT DOCUMENTS
 - 3. REVISE AS NOTED, RESUBMITAL REQUIRED.
 - 4. NOT APPROVED

OWNER's review is only for general conformance with the design concept and general conformance with the information given in the Contract Documents. Corrections or comments made during the review do not relieve the CONTRACTOR from compliance with the requirements of the Contract Documents.

- D. Re-submittals: Make re-submittals under procedures specified for submittals; identify changes made since previous submittal.
- E. CONTRACTOR shall be responsible for the delays and or additional expenses that result from the CONTRACTOR's failure to submit a complete submittal and/or to identify portions of the submittal that does not conform to the specifications.

END OF SECTION

SECTION 01710 - CLEANUP

PART 1: GENERAL

1.1 SCOPE:

- A. The work covered by this section is to provide all cleanup over the entire project.

PART 2: PRODUCTS

2.1 METHOD:

- A. The Contractor may choose any method he wishes for cleanup and shall assume all responsibility for the adequacy of the method and equipment employed.

PART 3: EXECUTION

3.1 CLEANING UP:

- A. During the progress of the work, the construction areas shall be kept clean and all rubbish, surplus materials, and unneeded construction equipment shall be removed and all damages repaired so that the public and property owners will be inconvenienced as little as possible.
- B. Contractor shall fill in all depressions and water pockets on public and private property caused by his operations; clean all drains, ditches and culverts which have been obstructed by his work; and, shall leave the site in a neat condition wherever his operations have disturbed existing conditions.
- C. Contractor shall make restitution for any damage to trees, shrubbery or other structures or facilities owned by adjacent property owners.
- D. Cleanup shall follow directly behind the progress of the project.
- E. All excess material, rubbish or other type of mess shall be cleaned up and the site shall be left to the satisfaction of the right-of-way grantor, or any abutters, as well as to the satisfaction of any municipal or state authority which may be involved if in public right-of-way.

- F. Any damage to or displacement of street or highway surfaces due to blasting or otherwise shall be either replaced satisfactorily by the Contractor or shall be paid for by him to the authority responsible for the street or highway

END OF SECTION

SECTION 02105 - CLEARING, GRUBBING AND RESTORATION

PART 1: GENERAL

1.1 SCOPE:

- A. The CONTRACTOR shall do all clearing, grubbing, topsoil stripping, and restoration necessary for the construction of this project.

1.2 RELATED WORK SPECIFIED ELSEWHERE:

- A. Cleanup - Section 01710
- B. Loam and Seeding - Section 02821

PART 2: PRODUCTS

2.1 MATERIALS:

- A. Materials shall be at CONTRACTOR's option, except that stripped topsoil shall be stockpiled and replaced in approximately its original location and to its original depth.

PART 3: EXECUTION

3.1 CLEARING AND GRUBBING:

- A. Before any excavation shall begin, the CONTRACTOR shall remove all underbrush, trees, stumps, or other obstructions within the work area, but shall not work on any private property without permission. The Contractor and Engineer shall agree upon the extent of clearing within the work area prior to the start of work. The Contractor shall not deviate from the agreed upon limits without the permission of the Engineer.
- B. All limbs, stumps, etc., shall be disposed of off site by the CONTRACTOR and at his expense unless otherwise specified.
- C. After the trees have been cut and stumps removed from wooded areas and in all field areas, existing topsoil and humus material shall be excavated and stockpiled by the CONTRACTOR. After pipelines have been completed, the topsoil and humus material shall be placed back over the disturbed areas and seeded in accordance with Section 02821.
- D. If the CONTRACTOR fails to salvage and reuse existing topsoil and humus material, he shall furnish sufficient loam from off the project site to restore the disturbed areas to match the existing topsoil depth, at his own expense.
- E. No excavations for pipe laying shall begin until the existing topsoil and humus material has been stockpiled.

3.2 CARE AND RESTORATION OF EXISTING PROPERTY:

- A. Excavating machinery shall be of suitable type and be operated with care to prevent injury to trees not to be cut, and particularly to overhanging branches or limbs.
- B. Branches, limbs and roots shall not be cut except by permission of the ENGINEER. All cutting shall be smooth and neatly done without splitting or crushing. In case of cutting or unavoidable injury to branches, limbs, or trunks of trees, the cut or injured portion shall be neatly trimmed and covered with an application of grafting wax or tree-healing paint as directed.
- C. Cultivated hedges, shrubs, and plants which might be injured by the CONTRACTOR's operations shall be protected by suitable means or shall be dug up and temporarily replanted and maintained. After the construction operations have been substantially completed, they shall be replanted in their original position and cared for until growth is re-established. If cultivated hedges, shrubs and plants are injured to such a degree as to affect their growth or diminish their beauty or usefulness, they shall be replaced by items of kind and quality at least equal to the kind and quality existing at the start of the work.
- D. All surfaces which have been damaged by the CONTRACTOR's operations shall be restored to a condition at least equal to that in which they were found immediately before work was started.
- E. The CONTRACTOR shall be fully responsible for all damages to public and private property and will be expected to carefully protect from injury all walls, fences, buildings, and underground facilities. If removal and replacement is required, it shall be done so that the replacement is equivalent to that which existed prior to construction and shall be paid for by the CONTRACTOR.

END OF SECTION

SECTION 02217 - EXCAVATION AND BACKFILLING FOR WATER MAINS

PART 1: GENERAL

1.1 SCOPE:

- A. This section includes all excavation for water mains, hydrants and appurtenances, including drainage, sheeting and bracing, backfilling, disposal of surplus material, and miscellaneous grading. All work shall be done as indicated on the drawings and as herein specified.
- B. Excavation for water mains shall be the width and depth as indicated on the standard details. Excavation for hydrants and appurtenances shall provide suitable room for their construction.
- C. The CONTRACTOR shall furnish and place all sheeting, bracing and supports, and necessary dewatering, and shall carry out the excavation in such a manner as to eliminate all possibilities of undermining or disturbing existing pipelines, utilities, roadways, shoulders and/or structures.

1.2 RELATED WORK SPECIFIED ELSEWHERE:

Bedding and Backfill Material - Section 02219

PART 2: PRODUCTS

2.1 EQUIPMENT:

Equipment shall be at CONTRACTOR'S option.

PART 3: EXECUTION

3.1 EXCAVATION:

- A. When any pavement, regardless of type, must be cut, it shall be done in a neat and symmetrical manner by use of a saw, chisel, or other suitable method. In no case shall pavement be torn up with a backhoe bucket except between and inside of cuts previously made as above. Should any further pavement be broken, outside of the cuts, as by blasting, such damaged pavement shall be cut out in a neat and orderly fashion.
- B. The CONTRACTOR shall perform all excavation of every description and of whatever substances encountered to the depths shown on the drawings or directed by the ENGINEER.

- C. No extras will be allowed for quicksand excavation, muck excavation, or any other type unless specifically provided for in the bidding schedule.
- D. Surplus excavated material may be used at other parts of the construction project as required for fill, etc. Excess material shall be disposed of by the CONTRACTOR.
- E. The sidewalls of all trench excavation shall be kept as nearly vertical as possible in all roadways, lawns, near homes, etc. by sheeting, bracing, or other means. The width of the trench at a point six (6) inches above the top of the water pipe shall not be greater than the width detailed. If the type of excavated material will not allow the width detailed, then the trench shall be properly sheeted and braced. The cost of sheeting, bracing, or other means is included in the cost of the pipelines and no extras will be allowed.
- F. The excavation shall be made to secure a flat bottom trench (undisturbed earth bottom) for the full length of the pipe so as to give a uniform support to the pipe and shall be in accordance with ANSI A21.50 (AWWA C150), Type 2 Laying Condition.
- G. The bottom of the trench shall be accurately graded to provide support to the full length of the pipe barrel. Excavate at each bell to prevent bell from bearing on trench bottom.

3.2 EXCAVATION BELOW TRENCH GRADE:

- A. By mistake of CONTRACTOR: Where the bottom of the trench shall, by mistake of the Contractor, have been taken out to a greater depth than required, it shall be refilled to the proper grade with bedding material, and all to be placed and compacted as specified. The CONTRACTOR shall receive no additional compensation.
- B. By instruction from ENGINEER: If, in the opinion of the ENGINEER, existing material below trench grade is unsuitable for properly laying the pipe, the CONTRACTOR will excavate and remove the unsuitable material and replace the same with bedding material as authorized by the ENGINEER and properly compacted to his satisfaction. The CONTRACTOR will be paid under the item titled "Unsuitable Material Excavated Below Trench Grade."

3.3 EXCAVATION NEAR EXISTING UTILITIES, ETC.

- A. It will be necessary to excavate near existing pipes, drains and other utilities in certain locations. Some of these have been indicated on the drawings, but no attempt has been made to show all of the services and the completeness and accuracy of the information given is not guaranteed. The CONTRACTOR shall call "Dig-Safe" at least three business days in advance of any excavation to allow utilities to locate underground facilities.

- B. As the excavation approaches pipes, conduits, or other underground structures and utilities, digging by machinery shall be discontinued and the excavation shall be done by means of hand tools.
- C. If the utility is of the opinion that at any point sufficient or proper support has not been provided, they may order additional supports placed at the expense of the CONTRACTOR. Compliance with such order shall not relieve the CONTRACTOR from his responsibility for the sufficiency of such supports. It shall be the responsibility of the CONTRACTOR to prevent damage to or displacement of utilities and to consult with and request the concurrence of the utility company's representative in this matter at all locations. The cost of protecting such utilities shall be considered incidental to the cost of laying the pipe.

3.4 TRENCH SURCHARGES:

The excavated material shall be placed adjacent to the excavation in a manner to cause no excessive surcharge on the trench bank nor to obstruct free access to hydrants and valves. Should traffic or other conditions make it impractical or unsafe to stack material adjacent to trench, it shall be hauled and stored at a location provided by the CONTRACTOR and at the expense of the CONTRACTOR. When required, it shall be re-handled and used in backfilling the trench by the CONTRACTOR and at his expense.

3.5 SHEETING AND BRACING:

- A. The CONTRACTOR shall be responsible for the design, construction, maintenance and safety of all sheeting and bracing required to support the sides of the excavation and to prevent the movement of earth which could in any way damage or endanger adjacent structures, utilities, roadways, increase the width of the excavation to more than that specified, or delay the work.
- B. All sheeting, bracing and shoring is to be included in prices bid for several items of work in bidding schedule and will not be paid for as separate items.
- C. No shoring shall be left in place unless so directed by the ENGINEER.

3.6 DRAINAGE AND DEWATERING OF EXCAVATIONS:

- A. The CONTRACTOR shall conduct his operations so as to prevent at all times the accumulation of water, ice and snow in excavations or in the vicinity of excavated areas so as to prevent water from interfering with the progress or quality of the work. Under no conditions shall water be allowed to rise in unbackfilled trenches after pipe has been placed.
- B. Accumulated water, ice and snow shall be promptly removed and disposed of by dewatering. Disposal shall be carried out in a manner which will not create a

hazard to public health; nor cause injury to public or private property, work completed or in progress, or public streets; nor cause any interference in the use of streets and roads by the public. Pipes under construction shall not be used for drainage of excavations.

- C. During construction, when an unstable condition in the pipe sub-grade has been created due to the CONTRACTOR'S excavation, the sub-grade shall be stabilized by dewatering or other means accepted by the ENGINEER.

3.7 BACKFILLING - GENERAL:

- A. In general and unless other material is indicated on the drawings or is specified, material used for backfilling trenches and excavations around structures shall be suitable material which was removed in the course of making the construction excavations or as specified.
- B. Frozen materials shall not be placed in the backfill, nor shall material be placed upon frozen material. Previous frozen material shall be removed or shall be otherwise treated as required before new backfill is placed.
- C. Backfilling shall be done as soon as practical after the pipe has been laid and jointed.

3.8 SUITABLE BACKFILL MATERIAL

Suitable backfill material shall be the following or a combination of the following:

- (1) Excavated material that will compact to the compaction requirements.
- (2) Material that does not contain rocks larger than 8" in any dimension.
- (3) Dry clay backfill free from lumps.
- (4) Wet clay that alone would pump but when mixed with sand and/or gravel will be stable and will compact.

3.9 BACKFILLING PIPE TRENCHES:

- A. As soon as practicable after the pipes have been laid and jointed, backfilling shall begin and shall proceed until it is completed or has sufficient backfill to allow pipe testing.
 - (1) The first layer of suitable backfill material shall be brought half-way up the pipe and compacted to 80% maximum density and then the normal backfilling shall begin and shall be compacted as specified.
 - (2) All backfill shall be thoroughly compacted by hand tamping as placed, by use of mechanical or vibratory compactors, or by other acceptable methods.

- (3) Remainder of the trench shall be backfilled as follows:
 - a) In paved areas, road shoulders and seeded areas, the entire depth of trenches above the center line of the pipe shall be backfilled in eight (8) inch layers with suitable backfill material and each layer thoroughly and carefully compacted as specified. Bring backfill up to bottom of gravel base and/or loam.
 - b) In other areas, the trench above the center- line of the pipe shall have suitable backfill material placed and compacted in eighteen (18) inch maximum layers as specified.
- B. The nature of the excavated materials will govern both their acceptability for backfill and the method best suited for their placement and compaction in the backfill.
 - (1) Both the materials and the methods shall be subject to the acceptance of the ENGINEER.
 - (2) No stones or rock larger than 8" in the greatest dimension shall be placed in the backfill.
- C. Backfilling in public right-of-way, along the streets or highways in or along shoulder, berm or backslope shall be done in accordance with the specifications and requirements of the state or municipality, whichever is responsible for the street or highway involved. Responsibility for the fulfillment of permit conditions or any other applicable requirements of the street or highway authority shall be the obligation of the CONTRACTOR. Surface restoration shall be carried out to the satisfaction of the street or highway authority or as shown on the plans.
- D. Backfilling shall follow pipe laying as closely as reasonable, so that a minimum of trench shall be open at any time. The regulations of the highway authorities shall be observed as regards the amount of trench to be open at any one time. Over night, and especially over weekends and holidays, the amount of open trench shall be kept at an absolute minimum. Any caved-in trench, especially after heavy rain and flooding, shall be cleaned out and the bottom consolidated before any additional pipe shall be laid.

3.10 TOP OF BACKFILL:

- A. In paved and shoulder areas, backfill shall be carried up to pavement or shoulder sub-grade ready to receive the gravel base. In other areas, backfill shall be brought up to adjacent finished grade minus the depth of any required topsoil and so as to provide a finished surface slightly mounded over the trench. Any trenches improperly backfilled, or where settlement occurs, shall be reopened to the depth required for proper compaction, and shall then be refilled and compacted with the surface restored to required grade and degree of compaction, mounded over, and smoothed off, at no additional expense.

- B. In unpaved areas, the gravel topping shall be left in a smooth and even condition, with no large stone on or in the surface. In cases where a paved surface has been broken, a temporary bituminous patch and/or a permanent paving restoration shall be made as required by the appropriate local or state road authority.

3.11 COMPACTION:

- A. Compaction densities specified herein shall be the percentage of the maximum density obtainable at optimum moisture content as determined and controlled in accordance with AASHTO Standard T-180, Method A or D depending on the material size. Field density tests shall be made in accordance with AASHTO Standard T-147.

Each layer of backfill shall be moistened or dried as required and shall be compacted to the following densities, unless otherwise specified in the project specifications.

(1) Bedding material	80%
(2) Suitable backfill material under paved or shoulder areas	90%
(3) Gravel base:	
(a) Under paved areas	95%
(b) In shoulder areas	90%
(c) As replacement for unsuitable material excavated below grade	90%
(4) Loam areas	90%
(5) All other areas	85%

- B. Methods and equipment proposed for compaction shall be subject to prior acceptance by the ENGINEER. Compaction generally shall be done with vibrating equipment. Displacement of, or injury to, the pipe and structure shall be avoided. Movement of in-place pipe or structures shall be at the CONTRACTOR'S risk. Any pipe or structure damaged thereby shall be replaced or repaired as directed by the ENGINEER and at the expense of the CONTRACTOR.

C. Testing:

- (1) Field density tests may be ordered by the ENGINEER for each foot of depth of backfill at an average interval of 200 feet along the trench.
- (2) The CONTRACTOR shall furnish all necessary samples for laboratory tests and shall provide assistance and cooperation during field tests. The CONTRACTOR shall plan his operations to allow adequate time for

laboratory tests and to permit taking of field density tests during compaction.

- (3) Any costs of retesting required as a result of failure to meet compaction requirements shall be borne by the CONTRACTOR.

3.12 FILL AND GRADING:

- A. Excavated material not required for backfilling around pipes or structures may be used for fill in areas which require material for re-grading.
- B. The re-grading shall be carried out as directed by the ENGINEER, so that all surface water will drain towards brooks or drainage pipes.
- C. All material shall be of such nature that after it has been placed and properly compacted, it will make a dense and stable fill.

3.13 PROTECTION OF EXISTING STRUCTURES:

- . All existing pipes, wires, poles, fences, property line markers and other items, which must be preserved in place without being temporarily or permanently relocated, shall be carefully supported and protected from injury by the CONTRACTOR, at no additional cost to the OWNER. Should such items be injured, they shall be restored by the CONTRACTOR, without compensation therefore, to at least as good condition as that in which they were found immediately before the work was begun.

3.14 ACCOMMODATION OF TRAFFIC:

- A. The CONTRACTOR shall construct and maintain, without extra compensation, such adequate and proper bridges over excavations as may be necessary or as directed for the safe accommodation of pedestrians and vehicles. The CONTRACTOR shall furnish and erect, without cost to the OWNER, substantial barricades at crossing of trenches, or along the trench, to protect the traveling public.
- B. The CONTRACTOR shall not obstruct fire hydrants.

END OF SECTION

SECTION 02219 - BEDDING AND BACKFILL MATERIAL

PART 1: GENERAL

1.1 SCOPE:

- A. The CONTRACTOR shall furnish, place and compact various types of bedding material and trench sand as called for in the specifications or as directed.
- B. The types and quality of bedding and backfill material are specified in this section, but its use for pipe bedding, backfill, replacement of unsuitable material excavated below trench grade, and other uses are as specified elsewhere.

1.2 RELATED WORK SPECIFIED ELSEWHERE:

Excavation and Backfilling for Water Mains - Section 02217

PART 2: PRODUCTS

2.1 MATERIALS:

A. Bedding Material:

- 1. Screened or crushed gravel bedding material shall be hard durable particles free from organic matter, lumps of clay and other deleterious substances. The gradation shall meet the requirements of the following table and MDOT specifications Section 703.06 Type B aggregate

<u>Sieve Size Designation</u>	<u>% By Weight</u>
1/2 inch	35 - 75
1/4 inch	25 - 60
No. 40	0 - 25
No. 200	0 - 5.0

- 2. Select backfill as specified below may be used for bedding material.
- 3. Bedding material shall not contain particles of rock which have any dimensions greater than 4".

B. Select Backfill:

- 1. Sand backfill shall be hard, durable particles of granular material with 100% passing the 1/2" sieve and between 0-15% passing the #200 mesh. All

percentages are by weight. Sand shall be graded so as to secure the required compaction.

C. Backfill:

1. Suitable native material that does not contain stone or rock particles with any dimensions greater than 8".
2. Bank Run gravel borrow consisting of uniformly graded granular material having no rocks with a maximum dimension greater than 8" and that portion passing a 3-inch square mesh sieve shall contain no more than 70% passing 1/4 inch mesh sieve and not more than 10% passing a No. 200 mesh sieve.

PART 3: EXECUTION

3.1 METHODS:

The materials will be used in accordance with the requirements of the various sections of the specifications, drawings and standard details.

END OF SECTION

SECTION 02270 - SEDIMENTATION AND EROSION CONTROL

PART 1: GENERAL

1.1 SCOPE

Furnish all labor, materials, equipment and incidentals necessary to perform all installation, maintenance, removal and area cleanup related to sediment and erosion control work as shown on the Drawings and as specified herein. The work shall include, but not necessarily be limited to installation of silt fences, sediment traps, sediment removal and disposal, device maintenance, removal of temporary devices, temporary mulching, erosion control blanket, and final cleanup

1.2 RELATED WORK

A. Loam and seeding is included in Section 02821.

1.3 SUBMITTALS

Within 10 days after award of Contract, submit to the ENGINEER for approval technical product literature for all commercial products to be used for sedimentation and erosion control.

1.4 REFERENCE MANUAL

Except as otherwise specified herein, the material and construction shall be in accordance with the Department of Transportation "Standard Specifications for Highways and Bridges of the State of Maine" and the "Maine Erosion and Sedimentation Control Handbook for Construction, Best Management Practices" (BMP Handbook).

1.5 TEMPORARY EROSION AND SEDIMENTATION CONTROL DEVICES

A. Minimizing the exposed soil areas on the construction site is one of the most important and reliable methods of erosion control. The CONTRACTOR must phase the work so that areas of bare soil will be minimized. Exposed areas must be treated as described below and in the BMP Handbook.

Temporary erosion and sedimentation control measures will include silt fences, hay bale barriers, temporary seeding, temporary mulching and topsoil stockpiling. These measures are described in more detail below.

B. Silt fence will be placed down slope of all construction areas which drain toward a stream, wetland or improved area.

C. Hay bale barriers will be used as necessary until final restoration is complete. They may also be used as check dams in drainage areas. Hay bales will be

staked end to end in an excavated trench four inches deep across the area of runoff.

- D. Temporary mulching will be placed on all disturbed areas within two days or prior to any storm event. Mulch anchoring will be used on areas where the slope is greater than 5% or when placed after September 15. Straw mulch shall be applied at a rate of 90 lbs. per 1000 sq. ft. All mulched areas will be inspected before and after storms. If less than 90% of the surface is covered by mulch, additional mulch shall be applied immediately. Mulching shall be installed and maintained as recommended in the BMP Handbook.
- E. Topsoil shall be stockpiled on site with silt fence installed down slope of the piles. These stockpiles shall be mulched in accordance with the temporary mulching requirements.

1.6 PERFORMANCE REQUIREMENTS

- A. The CONTRACTOR shall be responsible for the timely installation and maintenance of all sedimentation control devices necessary to prevent the movement of sediment from the construction site to off site areas or into streams and wetland areas via surface runoff or underground drainage systems. Measures in addition to those shown on the drawings necessary to prevent the movement of sediment off site, control erosion or stabilize disturbed areas shall be installed, maintained, removed and cleaned up at no additional cost to the OWNER.
- B. Sedimentation and erosion control measures shall conform to the requirements of the BMP Handbook.
- C. Where CONTRACTOR's effort to control erosion has been demonstrated to be ineffective or potentially ineffective in the opinion of the ENGINEER, the ENGINEER may order that the erosion control plan be amended and that additional erosion control measures be constructed at no additional cost to the OWNER.

1.7 SEQUENCE OF CONSTRUCTION

- A. All hay bale check dams and silt fencing shall be in place below or adjacent to construction areas before actual construction begins. These devices shall remain in place until a healthy grass cover is obtained and the site is stabilized. These temporary structures shall be inspected weekly throughout the construction phase. They shall be repaired or replaced when necessary. These devices shall be removed when the area they serve is completely stabilized.
- B. Permanent re-vegetation or seeding of all disturbed areas shall occur immediately upon completion of work or, if temporary stabilization measures were used, within 7 days from the time the area was last actively worked.

Temporary stabilization measures are required within two days from the time the area was last actively worked or prior to storm events.

PART 2: PRODUCTS

2.1 MATERIALS

A. Silt Fence

- 1) Steel or wood posts shall be a minimum of 5 feet in length.
- 2) Silt fence fabric shall be a woven, polypropylene, ultraviolet resistant material such as Mirafi 100X as manufactured by Mirafi, Inc., Charlotte, N.C. or equal.

B. Mulch material for all slopes equal to or greater than 20% shall be an erosion control blanket (ECB). The ECB shall consist of 70% long fiber hay or straw and 30% coconut fiber. The fibrous material shall be held in place by top and bottom netting sewn together. The fibrous material shall be reasonably free from noxious weeds or other undesirable material. The ECB shall be Type SC150 as manufactured by North American Green, or approved equal.

C. For slopes less than 20% and level areas, mulch material shall consist of long fiber hay or straw reasonably free from noxious weeds or other undesirable material. No material shall be used which is so wet, decayed, or compacted as to inhibit even and uniform spreading. No chopped hay, grass clippings or other short fiber material shall be used unless directed. The hay or straw shall be treated with a mulch tackifier.

D. Latex acrylic copolymer such as Soil Sealant with coalescing agent as manufactured by Soil Stabilization Co., Merced, California, or approved equivalent, shall be used as hay or straw mulch tackifier. Asphalt tackifiers are not allowed.

PART 3: EXECUTION

3.1 INSTALLATION

A. Silt Fence Installation

- 1) Position silt fences as shown on the Drawings and as necessary to prevent off site movement of sediment produced by construction activities as directed by the ENGINEER.
- 2) Dig trench approximately 4 inches wide and 4 inches deep along proposed fence lines.

- 3) Drive stakes 8 feet on center (maximum) at back edge of trenches. Drive stakes 2 feet (minimum) into ground.
- 4) Attach filter fabric on stakes to bottom of trench with about 4 inches of fabric laid across bottom of trench. Stretch fabric fairly taut along fence length and secure.
- 5) Backfill trench with excavated material and tamp.
- 6) Install pre-fabricated silt fence according to manufacturer's instructions.

3.2 MAINTENANCE AND INSPECTIONS

A. Inspections

- 1) CONTRACTOR shall make a visual inspection of all sediment control devices daily and immediately before and after every rainstorm.
- 2) If such inspection reveals that additional measures are needed to prevent movement of sediment to off site areas or into streams or wetland areas, CONTRACTOR shall promptly install additional devices as needed. Sediment controls in need of maintenance shall be repaired promptly.

B. Device Maintenance

Silt Fences

- a) Remove accumulated sediment once it builds up to one-half of the height of the fabric.
- b) Replace damaged fabric or patch with a two foot minimum overlap.
- c) Make other repairs as necessary to ensure that the fence is filtering all runoff directed to the fence.

3.4 EROSION CONTROL BLANKET

- A. Install erosion control blankets in accordance with manufacturer's instructions. Properly prepare, fertilize and seed the area to be covered with permanent vegetation before the blanket is applied. Apply the blankets in the direction of water flow and staple together in accordance with manufacturer's instructions. Side overlaps shall be 2-inch minimum. The staples shall be made of wire .091-inch in diameter or greater, "U" shaped with legs 10 inches in length and a 1-inch crown. The staples shall be driven vertically into the ground at a rate of one staple per square yard according to manufacturer's staple pattern guide.

- B. Bury upper and lower ends of the matting to a depth of 4 inches in a trench. Where the matting must be cut or more than one roll is required, turn down upper end of downstream roll into a slit trench to a depth of 4 inches. Overlap lower end of upstream roll 4 inches past edge of downstream roll and staple.
- C. To ensure full contact with soil surface, roll matting with a roller weighing 100 pounds per foot of width perpendicular to flow direction after seeding, placing matting, and stapling. Thoroughly inspect after completion. Correct any areas where matting does not present a smooth surface in full contact with the soil below.

3.5 REMOVAL AND FINAL CLEANUP

Once the site has been fully stabilized against erosion, remove sediment control devices and all accumulated silt. Dispose of silt and waste materials in proper manner. Re-grade all areas disturbed during this process and stabilize.

END OF SECTION

SECTION 02536 – TEMPORARY WATER SYSTEMS

In order to maintain uninterrupted water service to District customers, the Contractor shall provide temporary above ground water systems. The temporary water systems consist of mains, services and fire department outlets. The above ground systems shall be installed only for the duration of deep water main replacement and removed promptly after main replacement is complete. Currently the District has approved 2 manufacturers for the temporary mains and 100-psi poly tube for individual services. Only authorized District personnel shall operate control valves attached to these systems.

Temporary Water Systems Approved Pipe

Certaiteed Certa-Lok Yellowmine	Restrained Joint PVC pressure pipe and fittings
AquaMine (Victaulic Co)	Restrained Joint PVC pressure pipe and fittings

Temporary above ground water mains shall be installed in a manner to both protect the public water supply and to minimize customer service interruption. To allow the District to notify its affected customers, the Contractor shall provide the District a minimum of 5 working days notice prior to installing any temporary lines.

The size and approximate location of the temporary systems are shown on the drawings. The Contractor must obtain the approval of the District for any changes prior to installation of the system.

Temporary mains shall typically be installed behind sidewalks or along the edge, and within the public right of way. The mains shall follow a uniform straight course and shall not bow to accommodate long sections of pipe. Temporary mains shall not be installed on private property. The route of services lines installed from the mains to houses shall be acceptable to the property owner.

The Contractor shall follow the pipe manufactures installation guidelines when installing temporary systems. Additionally, an approved joint lubrication for the installation of potable water pipe shall be used on all joints prior to connecting pipe.

Hydrant Connections: Provide temporary main connection to hydrant using LL brass or 304ss adaptor, 304ss adaptor, 304ss NPT to HDPE transition, and flanged HDPE piping to bring piping elevation from hydrant port to grade. Provide piping supports/blocking adaptors and D.I. backup rings, dimensions per AWWA C207. All piping and fittings shall be NSF 61.

Provide flanged LL double check valve backflow device, same nominal size as temporary main, at each hydrant connected to a temporary main. Provide flanged resilient seated gate valve for isolation, and provide upstream and downstream taps. Remove backflow only upon Owner's request and provide flanged HDPE replacement spool piece. HDPE shall be AWWA C906, SDR 11 with IPS flange adaptors and D.I. backup rings. Flange dimensions per AWWA C207. All piping and fittings shall be NSF 61. Provide documentation of annual inspection by a person certified by the New England Water Works Assoc. or American Backflow Prevention Assoc.

Source: See drawings for source location(s) and associated notes.

Disinfections: All 2" diameter and larger temporary mains shall be chlorinated, sampled, and tested for bacteria prior to activating any portion of the temporary mains. (See disinfection specification for deep mains).

Leakage test: All systems shall be watertight. A static pressure test shall be performed on all systems prior to disinfecting any portion of the system.

Test Procedure

1. Install a pressure gauge at furthest end of the system.
2. Open main feed valve to fully charge the system with water and bleed all air.
3. Record the static pressure reading.
4. Close main feed valve.
5. The system must hold static pressure for a minimum of 30 minutes.

Driveway crossings: A gravel or cold patch raised berm shall be placed over temporary mains to prevent vehicles from dragging along the ridge.

Sidewalk crossings: Temporary mains crossing sidewalks must be buried below grade or temporary pavement ramps constructed over the pipe in compliance with Americans with Disabilities Act standards.

Roadway crossings: Temporary mains shall be buried just below the surface of the roadway. The pipe shall be protected with clean sand or material free from

rocks, as the rocks tend to punch through the pipe when exposed to heavy traffic. The use of cold patch or QPR as fill material is acceptable.

Curbing or esplanade rise: To accommodate curb rise, pre-fabricated certa-lock bends and/or elbows shall be used. Sweeping or bending the actual pipe is not an acceptable method unless the sweep lies flat on the ground and is not obstructing walkways. A traffic barrel shall be placed near the curb at offset connections to protect the offsets from being damaged by vehicles.

Cutting pipe: Follow manufacturer's installation instructions. All joints, including those on cut lengths of pipe, shall be grooved to provide a restrained joint. Pre-fabricated bends, elbows, and tees shall be used when changing direction.

Blow off: A 1" blow off shall be installed at the ends of all temporary mains. The blow off shall be constructed using a 1" brass female curb stop.

Isolation valves: Shall be 2" brass female curb stops for 2" mains and 4" resilient wedge valves for 4" mains (grip rings shall be used for 4" valves). Valves shall be located as shown on the plan. The valves are attached to the mains using pre-fabricated adapters.

Service line connections: All temporary individual service lines shall be ¾" poly tube rated at a minimum working pressure of 100 psi. The service lines shall be connected to a 2"x ¾" factory tapped restrained joint coupling, then a ¾" close brass nipple, a ¾" female curb stop and a brass poly tube adapter ¾" insert x male. The tube shall be extended to a sill cock (outside faucet) and connected using the same poly tube adapter. Prior to connecting the service, a garden hose connection, including a brass boiler drain or sill cock valve shall be installed in the line. All service lines shall be flushed prior to activating mains.

Anti-siphon sill cocks: Only District authorized personnel shall disassemble anti-siphon sill cocks.

Excavating and connecting into existing deep service lines may be required where properties have malfunctioning sill cocks or no exterior plumbing.

Shutting off meters

After activating the temporary lines, all meters shall be shut off. Only District authorized personnel may de-activate meters.

Maintenance of temporary water systems: The contractor shall be responsible for maintaining the temporary systems during the regular workday including making repairs to the systems. The District's Inspector must be on site prior to any work, or repairs being performed on the temporary water systems. District crews will respond to all after hour's emergencies. All affected customers shall be notified as soon as possible prior to any service interruption.

It is expected that contractors will keep an inventory of readily available repair parts on hand enabling them to quickly respond to any type of problem. Restrained joints shall be maintained. The use of non-restrained joint couplings is prohibited. Joint leaks shall be cut out. The use of stainless steel wrap around repair clamps over pinholes is acceptable.

END OF SECTION

SECTION 02537 - DUCTILE IRON WATER PIPE & FITTINGS

PART 1: GENERAL

1.1 SCOPE:

- A. This section includes the furnishing and installing of ductile iron water pipe and ductile iron or cast iron fittings as specified.

1.2 RELATED WORK SPECIFIED ELSEWHERE:

- A. Excavation and Backfill for Water Mains - Section 02217
- B. Bedding and Backfill Material - Section 02219

1.3 SUBMITTALS:

- A. Submit shop drawings for all material in accordance with the provisions of Section 01310.

PART 2: PRODUCTS

2.1 MATERIALS:

- A. See SEC02999 – Water Main Material Specifications

PART 3: EXECUTION

3.1 PIPE LAYING CONDITIONS:

- A. The interior of each pipe shall be inspected while being joined to see that the alignment is preserved and to assure that no dirt or debris has entered the pipe after laying and partial backfilling.
- B. Pipe fittings and accessories shall be carefully lowered into the trench, piece by piece, by means of derrick, crane, slings and other suitable tools and equipment, in a manner such as to prevent damage to the material or to its protective coating and linings. No chain or slings shall be passed through the inside bore of any pipe or valve or fitting. Under no circumstances shall piping materials be dropped or dumped into the trench.

3.2 LAYING DUCTILE IRON PIPE:

- A. As soon as the excavation is completed and the existing trench bottom has been brought to the proper grade, the pipe shall be laid.

- B. All pipe, before being lowered into the trench, shall be inspected inside and out. Both ends shall be cleaned and any visible dirt or debris removed from inside the pipe. Care shall be taken to lay the pipe to true lines and grades as shown on the drawings.
- C. Coupling holes shall be excavated so that the barrel of the pipe shall bear upon the trench bottom.
- D. Blocking under the pipe will not be permitted.
- E. Each section shall rest upon the pipe bed for the full length of its barrel.
- F. The circular rubber gasket shall be inserted in the gasket seat provided. A thin film of gasket lubricant shall be applied to the inside surface of the gasket. Gasket lubricant shall be a solution of vegetable soap or other solution supplied by the pipe manufacturer.
- G. The spigot end of the pipe shall be cleaned and entered into the rubber gasket in the bell, using care to keep the joint from contacting the ground. The joint shall then be completed by forcing the plain end to the seat of the bell. Pipe which is not furnished with a depth mark shall be marked before assembly to assure that the spigot end is inserted to the full depth of the joint.
- H. Pipe shall be aligned with the preceding unit and laid so as to form a close joint with the adjoining pipe and bring the inverts continuously to the required line and grade.
- I. No length of pipe shall be laid until the previous length has had sufficient material tamped about it to firmly secure it in place so as to prevent any movement or disturbance.
- J. Under no circumstances shall pipe be laid in water, and no pipe shall be laid when trench conditions or weather are unsuitable for such work, except by permission of the ENGINEER.
- K. The pipe shall be laid with the bell ends facing the direction of the laying, unless otherwise permitted by the ENGINEER.
- L. Joints, when made, shall be done in the manner prescribed by the manufacturer of the pipe. In the case of rubber gasket joints, these joints shall be made up in accordance with the American National Standards for the jointing of cast iron pressure pipe and fittings. (ANSI/AWWA C111/A21.11).
- M. Thrust blocks shall be used behind tees, bends, or other fittings where shown. Size shall be appropriate for soil conditions and thrust forces acting on the specific fitting.

3.3 TRENCH BOTTOM:

- A. Should the trench bottom contain unsuitable material, as indicated in Section 02217, Article 3.2-b, the CONTRACTOR shall over-excavate and replace with bedding material as required and authorized by the ENGINEER. The quantity of unsuitable material will be measured from the bottom outside of the pipe.
- B. Should ledge be encountered, it shall be removed to a depth of 6" below the bottom of the pipe, and replaced with bedding material.

3.4 CUTTING PIPE:

- A. All ductile iron pipe shall be cut using abrasive wheel cutter, rotary wheel hand cutter (with carbide cutter) or a guillotine pipe saw. All cuts shall be square and even with no ragged rough ends.
- B. Field cut pipe lengths shall be beveled and filed to avoid damage to the gasket and facilitate making the joint.
- C. When the cut end of pipe is to be used as a joint, the outside of the cut end shall be tapered back about 1/8-inch at an angle of about 30 degrees with the center line of the pipe. This shall be done with a coarse file or a portable grinder.

3.5 TEMPORARY PLUGS:

When pipelaying is not actually in progress, the openings of pipes shall be closed by temporary watertight plugs or other accepted means.

3.6 RETAINER GLANDS:

Install retainer glands on all mechanical joints of fittings, valves and hydrants.

3.7 POLYETHYLENE ENCASEMENT:

- A. Tube type polyethylene encasement shall be installed on all ductile iron pipe and fittings in accordance with AWWA Standard C105 - latest revision, Method A. Circumferential wraps of tape or plastic tie straps shall be placed at 2-ft. intervals along the barrel of the pipe.
- B. The polyethylene encasement shall prevent contact between the pipe and the surrounding backfill and bedding material but is not intended to be a completely airtight or watertight enclosure. All lumps of clay, mud, cinders, and so forth, on the pipe surface shall be removed prior to installation of the polyethylene encasement. During installation, care shall be exercised to prevent soil or embankment material from becoming trapped between the pipe and the polyethylene.

- C. The polyethylene film shall be fitted to the contour of the pipe to effect a snug, but not tight, encasement with minimum space between the polyethylene and the pipe. Sufficient slack shall be provided in contouring to prevent stretching the polyethylene where it bridges irregular surfaces, such as bell-spigot interfaces, bolted joints, or fittings, and to prevent damage to the polyethylene due to backfilling operations. Overlaps and ends shall be secured with adhesive tape, string, plastic tie straps, or any other material capable of holding the polyethylene encasement in place until backfilling operations are complete.

END OF SECTION

SECTION 02538 - HIGH DENSITY POLYETHYLENE PIPE & APPURTENANCES

PART 1: GENERAL

1.1 SCOPE

- A. This section includes the furnishing and installing of High Density Polyethylene (HDPE) pipe.

1.2 SUBMITTALS

- A. Submit detailed description of proposed construction methods and equipment.

PART 2: PRODUCTS

2.1 HIGH DENSITY POLYETHYLENE PIPE AND FITTINGS

- A. HDPE pipe shall be manufactured in accordance with AWWA C906. This material shall have a long term Hydrostatic Strength of 1600 psi when tested in accordance with ASTM D2837. HDPE shall be manufactured from PE 4710 polyethylene compounds that meet or exceed ASTM D3350 cell classification 445574. The manufacturer shall comply with NSF Standard 61 and/or Standard 14 and must be certified by the NSF International for potable water.
- B. The pipe and fittings shall have a Standard Dimension Ratio (SDR) of 11 and be rated for a working pressure of 200 psi at a temperature of 75 degrees Fahrenheit with a service life of 50 years. All pipe and fittings shall be ductile iron pipe size.
- C. Service connections shall be made using an electrofusion transition corporation saddle. Outlet material shall be brass alloy and the compression ring shall be 304 stainless.

PART 3: EXECUTION

3.1 HIGH DENSITY POLYETHYLENE PIPE JOINTS

- A. The HDPE pipe sections shall be joined on the job site using heat fusion methods. Transitions to other pipe materials shall be via heat fused polyethylene stub ends connected to an H.D.P.E. mechanical joint adaptor.
- B. All heat fused joints shall be made by qualified personnel of the pipe supplier. The Contractor shall be responsible for scheduling, coordination and all costs associated with the pipe jointing.

- C. Joining pipe lengths shall be performed using equipment specifically designed for heat fusion of polyethylene pipe of the sizes specified. The equipment shall have a trimming mechanism to produce a clean, flush surface perpendicular to the pipe wall at all joints and a Teflon coated heating plate to prevent adhesion of the pipe to the plate. Pipe ends shall be clean and free of polyethylene trimmings, dirt or other deleterious material prior to fusing.
- D. The heat fusion process shall be performed in full accordance with the pipe manufacturer's recommendations. Pipe joining equipment shall monitor pressure and heating plate temperature to insure proper jointing.

3.2 OPEN CUT PIPE INSTALLATION

- A. Proper implements, tools and facilities, satisfactory to the Owner, shall be provided and used by the Contractor for the safe and convenient handling of all materials. Pipe fittings and accessories shall be carefully installed in a manner such as to prevent damage to the material or to its protective coating.
- B. Every possible precaution shall be taken to prevent foreign material from entering into the pipe as it is being fabricated and placed in the trench.
- C. Suitable mechanical equipment shall be used to pull, lift and push the pipeline into place. Under no circumstances should the pipe be pulled by attaching to the flange. If flange assemblies are installed, these must be elevated to keep them from dragging, both in front and behind.
- D. The majority of the pipeline except the connection area shall be backfilled and compacted prior to the final connection to minimize movement away from the connection.
- E. Detectable warning tape shall be buried approximately one foot above all HDPE pipe. Tape shall be 6" wide and read "Buried Water Line". Tape shall be manufactured for below ground applications and contain a core such as aluminum for detection. In addition a locator wire per material specification shall be installed. The wire shall be fastened approximately every 10'.

3.3 DIRECTIONAL DRILLING INSTALLATION (See Section 02600)

END OF SECTION

SECTION 02593
PRESSURE AND LEAKAGE TESTS OF HDPE WATER MAINS

PART 1: GENERAL

1.1 SCOPE

- A. Furnish all labor, materials, equipment gages and related items necessary to complete all pressure and leakage tests of all water mains.

PART 2: PRODUCTS

2.1 MATERIALS

- A. Materials shall be at the Contractor's option.
- B. All gages shall be certified.

PART 3: EXECUTION

3.1 PRESSURE AND LEAKAGE TESTS:

- A. After the pipe has been laid and backfilled, it shall be pressure tested and tested for leakage in the presence of the Engineer and/or the Owner. Following acceptance of the pressure and leakage tests, the new mains shall be thoroughly cleaned by flushing and shall be disinfected by chlorination per Section 2595.
- B. All tests shall be conducted at a time and in a manner to minimize as much as possible any interference with the operation of the existing water system. The Owner will supply all water necessary for testing and placing the lines in service. The Contractor shall supply all labor, materials and equipment necessary to make any necessary connections to the water system and to carry out the tests.
- C. The Contractor shall provide a corporation tap (or use blow off assembly) for pressure and leak testing and chlorination as directed by the Engineer. The Contractor is responsible for all work associated with the excavation, including proper trench protection, barricades, traffic control and proper backfilling and compaction upon successful completion of the test.
- D. Each section of pipe shall be slowly filled with water and all air expelled from the pipe. If permanent air vents are not located at all high points, Contractor shall install corporation stops at such high points to bleed off air as the line is filled with water.

- E. A pressure test pump will be connected to the new main at the testing point. The pressure will be slowly increased to 150 psi. The 150 psi test pressure shall be maintained for four hours by adding water as necessary. The pump will then be shut off and the test pressure reduced to 140 psi. If the pressure remains steady (about 5%) for one hour, no leakage is indicated.
- F. If any test discloses leakage greater than that specified above, the Contractor shall, at his own expense, locate and make repairs as necessary until the leakage is within the specified allowance.
- G. Final acceptance of the lines will not occur until satisfactory tests have been passed.

END OF SECTION

SECTION 02594 - PRESSURE AND LEAKAGE TESTS OF DI WATER MAINS

PART 1: GENERAL

1.1 SCOPE:

Furnish all labor, materials, equipment, gages and related items necessary to complete all pressure and leakage tests of all ductile iron (DI) water mains.

PART 2: PRODUCTS

2.1 MATERIALS:

Materials shall be at CONTRACTOR's option.

PART 3: EXECUTION

3.1 PRESSURE AND LEAKAGE TESTS:

- A After the pipe has been laid and backfilled, it shall be pressure tested and tested for leakage in the presence of the ENGINEER and/or the OWNER.
- B All tests shall be conducted at a time and in a manner to minimize as much as possible any interference with the operation of the existing water system. The OWNER will supply all water necessary for testing and placing the lines in service. The CONTRACTOR shall supply all labor, materials and equipment necessary to make any necessary connections to the water system and to carry out the tests.
- C The CONTRACTOR shall excavate and provide a corporation tap for pressure and leak testing as directed by the ENGINEER. The CONTRACTOR is responsible for all work associated with the excavation, including proper trench protection, barricades, traffic control and proper backfilling and compaction upon successful completion of the test.
- D The pipe shall be slowly filled with water and all air expelled from the pipe. If permanent air vents are not located at all high points, CONTRACTOR shall install corporation stops at such high points to bleed off air as the line is filled with water.
- E A pressure test pump will be connected to the new main at the testing point. The pressure will be slowly increased to 150 psi and allowed to stabilize (+/-2.5 psi) for a minimum of 15 minutes.
- F A reservoir of potable water shall be connected to the test pump and the initial level of water recorded.

- G. The pump pressure shall be maintained at 150 psi for one hour with all make up water withdrawn from the reservoir.
- H. After one hour, the water level in the reservoir will be measured and the volume of water drawn from the reservoir calculated and compared with the following allowable leakage:

$$\text{Allowable Leakage (gph)} = \frac{\text{Pipe Length (feet)} \times \text{Nominal Diameter (inches)}}{10,876^*}$$

*Correct only for 150 psi test pressure

- I. If any test discloses leakage greater than that specified above, the CONTRACTOR shall, at his own expense, locate and make repairs as necessary until the leakage is within the specified allowance.
- J. Final acceptance of the lines will not occur until satisfactory tests have been passed.

END OF SECTION

SECTION 02595 - DISINFECTION OF WATER MAINS

1.1 Products:

Acceptable Disinfectants:

Sodium hypochlorite (NaOCl):

- o Shall conform to the provisions of AWWA B300 'Standard for Hypochlorites' and
- o Shall be certified to meet NSF/ANSI Standard 60 - *latest revision*, Drinking Water Treatment Chemicals – Health Effects.

Acceptable Dechlorination (neutralizing) Agents:

As defined in AWWA C651 'Standard for Disinfecting Water Mains',

Appendix C

2.1 Scope

This specification becomes a standard part of the contract documents and covers the disinfecting and flushing of water mains within the Portland Water District distribution system. Unless specified otherwise, all procedures apply to new mains, cleaned mains, cleaned and relined mains, repaired mains, and mains which have been out of service for a long period of time.

In certain circumstances, the Director of Water Services or designee may waive or alter the requirements in this specification where it is determined that no reasonable threat of contamination constituting a health hazard or aesthetic deterioration exists in the water main in question.

3.1 Keeping the Pipe Clean and Dry

Precautions shall be taken by the Contractor to protect the interiors of pipes, fittings, and valves against contamination:

- Pipe delivered for construction, or any remaining piece of cut pipe not immediately installed, shall be strung and protected so as to prevent entrance of any foreign material.
- Pipe shall not be laid in water, or when trench conditions or weather conditions are unsuitable for such work.
- All openings in the pipeline shall be closed with watertight plugs when pipe laying is stopped at the close of the day's work or for other reasons.
- Joints of all pipe in the trench shall be completed before work is stopped.
- The surface of the joint rings shall be thoroughly cleaned with an approved soap solution and all foreign matter removed from the pipe and fittings before the pipe is lowered in the trench.

- If dirt enters the pipe, it shall be removed and the interior of all affected pipe and fittings shall be swabbed with a 5% Hypochlorite solution (compliant with NSF/ANSI Standard 60, latest revision) immediately before they are installed.
- Pipes and services in the ground shall be closed off when not under construction.

4.1 Pre-Flushing

The District shall flush the source water, as near the shut off as possible prior to tying-in to ensure that contaminants or debris are not introduced into the new pipe.

5.1 Flushing

The main shall be flushed through a hydrant at the end of the main. If no hydrant is installed at the end of the main, the Contractor shall provide a tap large enough with a goal of achieving a velocity of 2.5 ft/sec. The gallons per minute to achieve 2.5 ft./sec velocities for different diameter pipes are provided in Table 1.

Table 1 Gallons per minute required to obtain 2.5 feet per second flushing velocity

Main Size (in.)	Gallons per minute
6	200
8	400
12	900
16	1600

District water at no cost to the Contractor will be available to the work site for use in disinfecting and flushing mains. The Contractor shall furnish all necessary pipe and hose connections. The Contractor shall exercise care in the use of the water to prevent contamination of the existing water supply. The Contractor is responsible for providing adequate drainage during flushing and is responsible for any damage that may occur. Drainage shall be away from the main, and flooding of the trench shall be prevented. The volume of water flushed shall be measured or calculated and reported to the District Inspector.

Wherever the conditions allow, the new water main shall be kept isolated from the active distribution system using a physical separation until satisfactory bacteriological testing has been completed and the disinfectant water flushed out. Water required to fill the new main for hydrostatic pressure testing, disinfection, and flushing shall be supplied through a temporary connection between the distribution system and the new main. The temporary connection shall include a double check valve assembly backflow preventer and shall be disconnected (physically separated) from the new main during the hydrostatic pressure test. It will be necessary to reestablish the temporary connection after completion of the hydrostatic pressure test to flush out the disinfectant water prior to final connection of the new main to the distribution system.

6.1 Methods of Disinfection

The Contractor shall disinfect all portions of the water main that was worked on as well as any portion(s) of the network that was taken out-of-service to allow completion of the contract. The chlorine solution to be used must be Sodium Hypochlorite.

NOTE – The use of Calcium Hypochlorite granules left in the main to be dissolved on filling of the main is not an approved method.

6.1.1 Continuous Feed Method

The continuous feed method consists of, in this order: completely filling the main to remove all air pockets, flushing the completed main to remove particulates, and filling the main with chlorinated potable water so that after a 24±4-hour holding period in the main there will be a free chlorine residual of not less than 10 mg/L at all locations of the main.

NOTE – Flushing is not a substitute for preventive measures to avoid pipe contamination during construction.

At a point not more than 10 ft. downstream from the beginning of a new main, water entering the new main shall receive a dose of chlorine pumped at a constant rate such that the water at any location will have not less than 25 mg/L of chlorine. To ensure that this concentration is provided, the District representative shall measure the chlorine concentration at regular intervals at available blow-offs or hydrants in accordance with procedures described in the current editions of “Standard Methods for the Examination of Water and Wastewater” or using an appropriate chlorine test kit.

Table 2 gives the amount of chlorine required for each 100 ft. of pipe of various diameters. Solutions of 1% chlorine shall be prepared with Sodium Hypochlorite. During the application of chlorine, valves shall be closed so that the strong chlorine solution in the main being treated will not flow into water mains in active service. Chlorine application shall not cease until the entire main is filled with heavily chlorinated water. The chlorinated water shall be retained in the main for at least 24±4 hours, during which time all valves and hydrants in the section treated shall be operated in order to disinfect the appurtenances. At the end of this 24±4-hour period, the treated water in all the portions of the main shall have a residual of not less than 10 mg/L of free chlorine.

Table 2 Chlorine Required to Produce 25 mg/L Concentration in 100 feet of Pipe by diameter

Pipe size (in.)	Volume (gals in 100 feet of Pipe)	12.5% Chlorine solution per 100 feet of Pipe	
4	65	2 oz.	
6	150	4oz.	
8	260	7 oz.	

10	410	10 oz.	
12	590	15 oz.	
16	920	27 oz.	
24	2350	60 oz.	
30	3680	94 oz.	
36	5290	1.06	
42	7200	1.44	
48	9400	1.88	
54	11900	2.38	
60	14690	2.94	

NOTE: To make a 5% chlorine solution. Using Sodium Hypochlorite, dilute the hypochlorite according to the percent available chlorine on the container. For example, if you have one gallon of 12.5% Sodium Hypochlorite, place 1 gallon in 1.5 gallons of water. You then have 2.5 gallons of 5% solution.

6.1.2 Slug Method (Emergency Use Only)

At a point not more than 10 ft. downstream from the beginning of the new main, water entering the new main shall receive a dose of chlorine fed at a constant rate such that the water will have not less than 100 mg/L of free chlorine. To ensure that this concentration is provided, the District representative shall measure the chlorine concentration at regular intervals along the main where taps and/or hydrants have been provided. The chlorine shall be applied continuously and for sufficient period to develop a solid column or 'slug' of chlorinated water that will, as it moves through the main, expose all interior surfaces to a concentration of approximately 100 mg/L for at least 3 hours.

The free chlorine residual shall be measured in the slug as it moves through the main. If at any time it drops below 50 mg/L, the Contractor shall stop the flow, chlorination equipment shall be relocated at the head of the slug, and as flow is resumed, chlorine shall be applied to restore the free chlorine in the slug to not less than 100 mg/L.

As the chlorinated water flows past fittings and valves, related valves and hydrants shall be operated so as to disinfect appurtenances and pipe branches.

7.1 Flushing After Disinfection

After the applicable retention period, the heavily chlorinated water shall be flushed from the main into the sewer until chlorine measurements show that the concentration in the water leaving the main is no higher than that generally prevailing in the system. Where domestic sewers are not available, the heavily chlorinated water shall be dechlorinated. The replacement water shall be allowed to remain in the pipeline for 24 hrs.(+/- 4 hrs.) prior to sampling for physical, bacteriological, and chemical testing.

7.2 Analytical Tests

After the appropriate retention time (24±4 hours or 3 hours for the slug method), after flushing and before the water main is placed into service, a sample or samples shall be collected for sanitary analysis by a District representative. Suitable sample piping shall be furnished by the Contractor to allow sample collection. The sampling point or points shall provide samples, which are representative of the water in all sections of the main for which sanitary approval is requested. All samples shall be collected in a manner as to avoid contamination from the environment surrounding the main. Rubber or synthetic hose shall not be connected to the main to collect a representative sample. The area around the sampling point of the main shall not be filled with water. At least one sample shall be taken from each main, and in the case where a main is greater than 1000 feet, one sample from each 500 feet of line. The samples shall be submitted to the District Laboratory for bacteriological, chemical, and physical analysis. The following analyses shall be completed and reported on the appropriate form. Total chlorine residual, Total Coliform (Membrane Filtration method), pH, and turbidity.

7.3 Final Flushing

Disinfected water mains shall be flushed within 4 hours of being placed into service. Flushing shall be designed to restore water quality to that of the source water, immediately prior to being placed into service. The length of time of flushing shall depend on the size and length of the water main, however at least three volumes of water should flow through the entire length of the main. Pipe volumes can be calculated by using Table 2 and adjusting for the full length of the main.

7.4 Redisinfection

If the initial disinfection and flushing fail to produce satisfactory analytical results, the main may be reflushed and shall be resampled. If check samples show the presence of coliform organisms, then the main shall be rechlorinated by the Contractor using the continuous feed method of chlorination.

7.5 Foam Pigging

If re-chlorination still produces unsatisfactory test results the main shall be cleaned utilizing polyurethane foam pigs. Pigging shall be performed by a contractor experienced in pigging operations acceptable to the District. Foam pigs shall be new and only used once. The pig shall be immersed in a 25 mg/l solution of sodium hypochlorite prior to launching. Pigs shall be pushed through the main with water pressure until the water is clear and the pig is clean. If water samples taken after the pigging operation indicate the presence of coliform bacteria, the pigging process shall be repeated until two consecutive samples test negative for bacteria.

7.6 Miscellaneous

The contractor will be responsible for all District costs beginning with pigging operations and continuing through successful bacteriological testing. This includes all inspection, sampling and laboratory costs.

7.7 Final Connection

Water mains and appurtenances must be completely installed, flushed, tested for leakage, disinfected, and satisfactory bacteriological sample results received prior to permanent connections being made to the active distribution system where the new main was isolated from the existing system. Sanitary construction practices must be followed during installation of the final connection to insure that there is no contamination of the new or existing water main with foreign material or groundwater.

The new pipe, fittings, and valve(s) required for the connection will be spray-disinfected or swabbed with a 5% solution of chlorine just prior to being installed.

7.8 Dechlorination

Contact the local sewer authority before discharging the highly chlorinated water to the sewer. The discharge of water to the environment with chlorine concentrations greater than the ambient distribution system chlorine residual is prohibited. The highly chlorinated water must be dechlorinated before being discharged to the environment.

END OF SECTION

SECTION 02600 – INSTALLING WATER MAINS BY DIRECTIONAL DRILLING

PART 1: GENERAL

1.1 SCOPE

- B. This work shall consist of furnishing and installing water mains by directional drilling methods in accordance with these specifications and the contract plans.

1.2 EQUIPMENT

- A. Furnish equipment of adequate capacity and power to install water main by directional drilling methods. Supplement each rig with the necessary auxiliaries, appurtenances, tools and other equipment required for proper operation. The alignment, profile, size and length of the installation are specified in the contract documents.

1.3 SUBMITTALS

- F. Submit for review and approval a detailed work plan and schedule of activities required to perform all directional drilling, including any proposed variation from the methods and techniques stipulated in this specification. Information in this work plan should include, but not limited to, the following:
 - 1. Qualifications of the Contractor showing that all directional drilling operations will be performed by a competent driller with a minimum of 5 years of relevant experience. The experience must include at least 5 projects with installations of 12" or larger pipe and lengths equal to or greater than this project. Completed projects with details of the types of pipe installations, owner contact names, and telephone numbers must be included.
 - 2. Designed directional drill path indicating compliance with the project design criteria.
 - 3. Plan showing the work zone equipment configuration at the end of the bores, staging areas and the location of slurry, cuttings and pit spoil handling areas.
 - 4. Equipment list including make and model number and specifications of all major equipment proposed for use on the project.
 - 5. Boring procedure, tooling for drilling, method to control slurry, design of entrance and exit pits and method to verify that installed water main is acceptable.
 - 6. Steering and tracking equipment, procedures and proposed locations of ground based tracking coils or other equipment requiring subsurface access.
 - 7. Materials list including bentonite and bentonite additives proposed for use on the project along with material detail sheets for all material used on site.

8. Methods for erosion and sediment control.

1.4 SHORING

- A. Shore entrance and exit pits as necessary to meet OSHA requirements.

PART 2: PRODUCTS

2.1 HIGH DENSITY POLYETHYLENE PIPE AND FITTINGS (See SEC 02538)

PART 3: EXECUTION

3.1 GENERAL

- A. Exercise special care and handling during delivery and distribution of pipe to avoid damage. Damaged pipe will be rejected and replaced at the contractor's expense. Store materials prior to use so as to keep the interior free from dirt and foreign matter. Thoroughly clean any piping that becomes contaminated before it is incorporated into the work.
- B. The alignment of the pipe must conform to the following requirements:
1. Choose the ground entry and exit angles such that the water main can be installed along the alignment and profile indicated on the contract plans and to the depths indicated.
 2. The entrance and exit points shall be approved by the Engineer and physically located in the field.
 3. The exit point shall be no more than 1 foot left or right of the location in the field
 4. Limit the longitudinal pull so as to prevent any damage of the water main. Continuously monitor the longitudinal pulling forces during pullback.

3.2 INSTALLATION PROCEDURE

- A. Direct all drilling operations using steering and tracking systems capable of producing the required alignment. The control system shall provide an angle of inclination reading and the direction in which the cutting tool is pointing. Provide access to the Engineer at all times all measuring or gauging devices used for drilling operations including drilling logs maintained by the Contractor.
- B. Adequately support the water main on rollers during the pullback into the pre-drilled hole. Rollers and cradles shall be a type that will prevent damage to the water main and in sufficient number to prevent overstressing during pullback. Pullback equipment shall be adequate for the length and depth of the runs and soil types encountered.

- C. The Owner's representative will examine the pipe at the entrance pit upon pullback for scratches, scores, gouges, cuts and other forms of damage. The permissible depth of gouges and scratches shall not exceed 10% of the wall thickness of the pipe.
- D. Pull a solid copper-clad steel (CCS) tracer wire with a minimum break load of 2,000 lbs. Wire size shall be #10 AWG and shall contain a 45mil HDPE insulated coating. Rated for direct burial use at 30 volts. Copperhead Soloshot or equal.
- E. Take necessary precautions to prevent bentonite leakage.
- F. Supply portable mud tanks or construct temporary mud pits to contain excess drilling fluids during construction. Upon completion of the water main installation, dispose of any cuttings and excess drilling fluid in a manner consistent with local, state and federal regulations.
- H. In the event that the drill hole must be abandoned before completion of the installation, fill abandoned drill hole with grout. Progress new drill hole at the Contractor's expense.
- I. During construction, maintain the site in a neat and orderly condition. At the completion of work, remove all temporary structures erected, drill and pipe staging areas, platforms, and drilling fluids. Restore the area to the approximate original conditions.

END OF SECTION

SECTION 02999 – Water Main Materials Specifications

Note: All materials must meet all Buy America provisions of MDOT contract documents

BOLTS AND NUTS

GENERAL SPECIFICATIONS

General Description of Properties Required:

- 1.0 Stainless Steel: Type 304 – contains the addition of Molybdenum to the nickel-chromium steels.
- 2.0 High Strength/Low Alloy Steel: Trade name for cold formed T-head bolts containing alloying elements such as copper, nickel, and chrome (Cor-Ten).

CORPORATION STOPS

GENERAL SPECIFICATIONS

- 1.0 Conforming to AWWA C-800.
- 2.0 $\frac{3}{4}$ " to 2" curb stops shall be ball valve design with brass ball that is teflon coated or brass ball with teflon seats.
- 3.0 The ball shall be supported by seats which are water tight in either direction.
- 4.0 The valve shall have a full port opening.
- 5.0 The body of the corporation stop shall be of heavy duty design.
- 6.0 The valve working pressure shall be 300 p.s.i.

APPROVED MANUFACTURERS

- A. A.Y. McDonald
- B. Cambridge Brass
- C. Ford Meter Box Co.
- D. Mueller Co.

CURB STOPS

GENERAL SPECIFICATIONS

- 1.0 Conforming to AWWA C-800
- 2.0 $\frac{3}{4}$ " to 2" curb stops shall be ball valve design with brass ball that is teflon coated or brass ball with teflon seats.
- 3.0 The ball shall be supported by seats which are water tight in either direction.
- 4.0 The valve shall have a full-port opening.
- 5.0 The valve shall open with $\frac{1}{4}$ turn (90°) with a check or stop.
- 6.0 The valve shall not have a drain.
- 7.0 The valve stem shall have 2 "O" rings and a bronze ring lock which holds the stem solidly in the valve body.
- 8.0 The valve body shall be of heavy duty design.
- 9.0 The valve working pressure shall be 300 p.s.i.

APPROVED MANUFACTURERS

- A. A.Y. McDonald
- B. Cambridge Brass
- C. Ford Meter Box Co.
- D. Mueller Co.

CUT-IN SLEEVE

GENERAL SPECIFICATIONS

- 1.0 The sleeve shall be mechanical joint to plain-end type.
- 2.0 The sleeve shall fit over either AB or CD pattern pipe.
- 3.0 Coatings:
 - a) Interior – Seal-coated – AWWA C104-74, min. 4 mils D.F.T.
 - b) Exterior – Bituminous coated, min. 4 mils D.F.T.
- 4.0 Mechanical joint accessories shall be furnished:
 - a) Glands: Duck-tipped for AB pipe, Plain Gaskets for CD pipe
 - b) Cor-Ten tee bolts and nuts
- 5.0 Cut-in sleeves shall have at least one stop-screw in sizes up through 10” and at least 2 stop-screws in 12” size.
- 6.0 The stop-screw “O” ring shall be recessed into the body of the sleeve between stop-screw and body.

APPROVED MANUFACTURERS

- A. Mueller Co.

DUCTILE IRON FITTINGS

INCLUDING BENDS, REDUCERS, OFF-SETS, TEES AND SLEEVES

GENERAL SPECIFICATIONS

- 7.0 Material shall be ASTM A536 latest, grade 70-50-05, in accordance with AWWA C110 (latest revision) for fittings larger than 24" and C153 (latest revision) for fittings 3" thru 24".
- 8.0 Fittings shall be cement lined AWWA C104 (latest revision) or fusion bonded epoxy coated with a 5 mil nominal thickness per AWWA C550 and C116.
- 9.0 Interior seal coated AWWA C104 with minimum of 4 mils dry film thickness.
- 10.0 Exterior bituminous coated, 4 mils minimum dry film thickness or fusion bonded epoxy coated with a 5 mil nominal thickness per AWWA C550 and C116.
- 11.0 Sleeves shall not be cement lined, but shall be bituminous coated inside to 4 mils dry film thickness. All sleeves shall be long body type.
- 12.0 Mechanical joint with accessories furnished: D.I. glands, gaskets, Cor-Ten T-bolts and nuts.
- 13.0 Pressure Ratings:
 - a) Class 350 pressure rating in accordance with AWWA C153 - 3"-24" sizes.
 - b) Class 250 pressure rating in accordance with AWWA C110 - 30"-48" sizes.
- 14.0 The "compact design" fittings must provide adequate space for the MJ joint and accessories to be installed without special tools (i.e. Lowell wrench can be used).

APPROVED MANUFACTURERS

- A. All Manufacturers

DUCTILE IRON PIPE

GENERAL SPECIFICATIONS

- 1.0 Ductile iron pipe shall meet requirements of AWWA Standard C-151 (latest revision) and be cement lined and seal coated to meet AWWA Standard C-104 (latest revision).
- 2.0 Joints shall meet requirements of AWWA C-111 (latest revision).
- 3.0 Interior seal coated, bituminous paint oil cut, emulsion not acceptable, thickness minimum of 2 mils dry film thickness.
- 4.0 Exterior bituminous coated with minimum of 2 mils dry film thickness.
- 5.0 Class 52 wall thickness, 4-inch diameter through 12-inch diameter inclusive.
- 6.0 Ductile Iron Pipe with diameters 16-inches and larger shall be Class 51.
- 7.0 State nominal laying length and mark shorter lengths near bell.
- 8.0 Mechanical joint pipe to be furnished with gland, gaskets and Cor-Ten bolts and nuts.
- 9.0 Welded-on thrust collars, for wall pipe and pipe thrust restraint, shall be welded steel collars designed for the thrust generated by 250 psi working pressure with a safety factor of at least two (2.0) against failure. The manufacturer shall qualify all welding procedures and welders per the requirements of a documented quality assurance system based on ANSI/AWS D11.2.

APPROVED MANUFACTURERS

- A. American Cast Iron Pipe
- B. Griffin Pipe
- C. U.S. Pipe

FIRE HYDRANT

GENERAL SPECIFICATIONS

- 1.0 The hydrant shall open right.
- 2.0 The operating nut shall:
 - a) be D.I. or bronze
 - b) be pentagon in shape with dimensions: Top 1-13/16" tapering to 1-7/8" on bottom.
- 3.0 Nozzles shall be:
 - a) 2 each – 2-1/2" National Standard Thread
 - b) 1 each – 4-1/2" National Standard Thread.
- 4.0 Port covers shall be supplied without chains and shall have the same size pentagon operator as specified in 3.0(b) above.
- 5.0 Traffic model hydrant with breakaway feature
- 6.0 Barrel length(s) shall be:
 - a) 6 ft. cover, 6-1/2 ft. bury; or
 - b) 5-1/2 ft. cover, 6 ft. bury, or
 - c) 5 ft. cover, 5'-6" bury
- 7.0 Hydrant shoe or base shall have the following:
 - a) 6" MJ inlet;
 - b) 5-1/4" valve opening with non-draining bronze seat that is permanently plugged;
 - c) valve seat and sub-seat arrangement shall be bronze to bronze;
 - d) Horizontal and vertical blocking planes manufactured into hydrant base
- 8.0 Bolts:
 - a) all buried mechanical joint bolts and nuts (T-head, etc.) shall be Cor-Ten or equal;
 - b) all buried flange joint bolts shall be stainless steel (Type 304) or silicone bronze.
- 9.0 Protective Coatings shall consist of the following:
 - a) all paintings and coatings shall be a minimum of 3 mils total dry film thickness, unless noted

- b) the internal area of the hydrant base, which is normally exposed to water and which includes the internal body of hydrant shoes, including lower valve plate, shall be epoxy coated
- c) all internal and external cast iron or ductile iron components shall be coated with an approved bituminous coating, 3 mils minimum
- d) Coatings for upper barrel - exterior:
 - 1. Surface preparation blast clean SSPC-SP-6
 - 2. Primer Sherwin Williams Red Oxide E61RC21, 1.5 mils, dry
 - 3. Finish coat Sherwin Williams – Regal Yellow, F78Y30, 1.5 mils, dry or sufficient paint to hide the second coat
 - 4. Total dry film thickness - 3 mils minimum.
- e) Coatings for bonnet, operating nut, port cap:
 - 1. Surface preparation: Blast clean, SSPC-SP-6
 - 2. Exterior primer
 - 3. Exterior aluminum
 - 4. Total dry film thickness: 3 mils minimum.

10.0 Flow Indicator Collars: PWD personnel shall install flow indicator collars on all new hydrants.

FIELD TEST OF INSTALLED HYDRANT

- 1.0 Hydrant flow shall completely stop with no more than 200 ft. lb. of torque applied to the operating nut.
- 2.0 Failure to shut completely at no more than 200 ft. lb. of torque will be cause for rejection of that hydrant.

APPROVED HYDRANTS

- A. Clow Eddy – with lower stem machined from bar stock
- B. American Darling Models: B62B-1, B62B-5

PIPE JOINT RESTRAINER

GENERAL SPECIFICATIONS

1.0 Pipe Restraints:

- 1.1 Use in conjunction with mechanical joint fittings.
- 1.2 The joint restraint ring and its wedging components shall be made of ductile iron conforming to ASTM A536-80.
- 1.3 Dimensions of the restrainer must allow use with standard M.J. bell conforming to AWWA C111 and AWWA C153.
- 1.4 Restrainer must restrain up to 350 psi of working pressure in 3" to 16" sizes and 250 psi of working pressure in 18" to 48" sizes with a 2:1 safety factor.
- 1.5 Torque limiting twist off nuts shall be used to ensure proper actuation of the restraining wedges (used on a,b,c below).

APPROVED MANUFACTURERS

- A. Sigma Super Lug
- B. Ford Uni-Flange Series 1400
- C. Ebba Mega Lug
- D. Romac Grip Ring
- E. Star Grip Series 300
- F. Romac Romagrip
- G. MJ FIELD LOK Gasket

POLYETHYLENE ENCASEMENT

GENERAL SPECIFICATIONS

- 1.0 Tube type polyethylene encasement shall be installed on all ductile iron pipe and fittings in accordance with AWWA Standard C105 - latest revision, Method A.
- 2.0 Polyethylene encasement shall be either linear low-density polyethylene (LLDPE) film with a minimum thickness of 8-mil or high-density, cross-laminated polyethylene (HDCLPE) film with a minimum thickness of 4-mil.
- 3.0 Circumferential wraps of tape or plastic tie straps shall be placed at 2-ft. intervals along the barrel of the pipe.
- 4.0 The polyethylene encasement shall prevent contact between the pipe and the surrounding backfill and bedding material but is not intended to be a completely airtight or watertight enclosure. All lumps of clay, mud, cinders, and so forth, on the pipe surface shall be removed prior to installation of the polyethylene encasement. During installation, care shall be exercised to prevent soil or embankment material from becoming trapped between the pipe and the polyethylene.
- 5.0 The polyethylene film shall be fitted to the contour of the pipe to effect a snug, but not tight, encasement with minimum space between the polyethylene and the pipe. Sufficient slack shall be provided in contouring to prevent stretching the polyethylene where it bridges irregular surfaces, such as bell-spigot interfaces, bolted joints, or fittings, and to prevent damage to the polyethylene due to backfilling operations. Overlaps and ends shall be secured with adhesive tape, string, plastic tie straps, or any other material capable of holding the polyethylene encasement in place until backfilling operations are complete.
- 6.0 Three layers of polyethylene adhesive tape shall be wrapped around any polywrapped pipe where a tapping machine will be placed. All copper services connected to a pipe wrapped in polyethylene encasement shall be wrapped within three feet of the pipe.

PVC WATER PIPE

GENERAL SPECIFICATIONS

1.0 For all water main installations that are less than 4" I.D. (4" and larger use ductile iron), the District will require use of 2" I.D. PVC plastic water pipe meeting the following: Under special site conditions the District does require the use of C-900 PVC in sizes larger than 4".

2.0 Pipe Specifications (2"):

2.1 Diameter:

- A. The I.D. shall be a minimum of 2"
- B. The O.D. shall be a maximum of 2.38"

5.2 Pressure Rating

- A. The minimum working pressure rating shall be 250 PSI (SDR-17).
- B. The pipe shall conform to standard ASTM 2241.

Pipe Length

- A. The pipe shall be provided in 20' lengths.
 - * Shorter lengths may be allowed and/or field cut following manufacturer's recommended procedures.

5.2 Gaskets

- A. The gasket or O-Ring material shall be rubber meeting ASTM F 477 and of the "permanent use" type.

3.0 Fittings:

3.1 Standard AWWA C900 fittings are not available in the 2" I.D. and therefore "steel pipe" class fittings, or Certa-Lok Yelomine couplings and fittings meeting ASTM D 3139 shall be used.

5.2 The normal nomenclature for "steel fittings" is Schedule 40 or Schedule 80, with the respective pressure ratings of 280 PSI and 400 PSI. Both of these fitting classes are acceptable for use.

4.0 Service Connections:

- 4.1 All service connections shall be made with tapping saddles* per Portland Water District specifications or by use of tees meeting the above noted fitting specifications.
- 5.0 Installation:
 - 5.1 Follow manufacturer's instructions.
 - 5.2 A 10 gauge insulated (for direct buried use) solid copper wire shall be fastened to the buried PVC pipe to facilitate electronic pipe locating. The wire shall be fastened at two locations per length and not at any joint.
 - a. Wire shall be polyethylene coated per ASTM D-1248
 - b. Insulation thickness shall be a minimum of .030"
- 6.0 The District requires 305 PSI (SDR-14) PVC pipe for sizes such as 4", 6", 8", and 12". Pipe shall conform to AWWA C-900.

APPROVED MANUFACTURER / TYPE

- A. J-M Manufacturing - Blue Brute
- B. Certainteed - Yelomine
- C. Victaulic - Aquamine
- D. IPEX – Blue Brute

RESILIENT SEATED GATE VALVE

GENERAL SPECIFICATIONS

- 1.0 Valve shall meet the latest revision of the AWWA C-509 or C-515 Standard.
- 2.0 Valve shall have a smooth unobstructed water way which shall be a minimum diameter of the valve.
- 3.0 Valve ends to be specified and shall be furnished with Cor-ten (or equal) bolts and nuts.
- 4.0 Valve shall be rated for zero leak rate at 200 psi differential working pressure and have a 400 psi hydrostatic test for structural integrity.
- 5.0 Sealing - Valve shall have a minimum of 2 "O" rings situated such that the "O" rings above the thrust collar can be replaced with the valve under pressure and in the open position.
- 6.0 Stem - Valve stem shall:
 - a) open right with a stem nut made of grade D,E manganese bronze;
 - b) be non-rising;
 - c) be designed with a thrust collar integrally cast to the stem;
 - d) be designed with two (2) thrust washers, placed one above and one below the stem thrust collar;
 - e) be constructed of grade D,E manganese bronze;
 - f) be such that the thrust washers are made of a synthetic polymer with physical properties required.
- 7.0 Valve Body - The body, including the stuffing box and the bonnet, shall be constructed of cast iron or ductile iron, meeting the latest revision of AWWA C-153.
- 8.0 Valve Wedge:
 - a) shall be constructed of ductile iron (less guiding mechanism);
 - b) shall be fully encapsulated and permanently bonded with a resilient elastomer;
 - c) shall be constructed such to allow the flushing of any interior exposed surface during operations.
- 9.0 Coatings:

- a) the internal and external valve body, including the stuffing box, bonnet, and interior of the wedge shall be fusion bonded epoxy coated with 8 mils D.F.T.
 - b) interior shall meet latest version of AWWA C-550.
 - c) shall be holiday free, interior and exterior, per testing method described in AWWA C-550, Sec. 5.1.
- 10.0 Operating Nut:
- a) shall be two (2) inch square ductile iron:
 - 2. with a countersunk hold down nut (made of 316 stainless steel or silicone bronze). This applies to stems that are tapered; or
 - 3. with a stainless steel pin inserted thru the stem. This applies to stems of full diameter.
- 11.0 Bolts – The seal plate and bonnet bolts shall be stainless steel (Type 316 or Type 304).
- 12.0 Valves 12" nominal diameter and smaller shall be directly operated by the nut on the valve stem and mounted vertically. Number of turns to open or close shall closely match the formula: $(3 \times D) + 2$. For example, a 12" valve should open or close with approximately $(3 \times 12) + 2 = 38$ turns of the operating nut.
- 13.0 Horizontal valves larger than 12" nominal diameter shall have bevel gear operators driven by the operating nut. Vertical valves larger than 12" nominal diameter shall have spur gear operators driven by the operating nut. Valves 14" – 24" nominal diameter shall have 4:1 bevel gear operators. Valves with 30" – 36" nominal diameters shall have 6:1 bevel gear operators and valves with 42" – 48" nominal diameters shall have 8:1 bevel gear operators. Number of turns to open or close shall closely match the formula: $((3 \times D) + 2)$ times the bevel gear ratio. For example, a 24" valve should open or close with approximately $((3 \times 24) + 2) \times 4 = 296$ turns of the operating nut.

GENERAL PROVISIONS

- 1.0 Vendor shall identify any and all exceptions to the specifications.
- 2.0 Vendor shall provide standard brochures for item quoted.
- 3.0 Vendor may be required to supply a valve for inspection and determination of coating process.

APPROVED RESILIENT SEATED GATE VALVES

- A. U.S.P.
- B. AFC Series 2500
- C. Mueller A-2360/61
- D. Clow Series F6100

INSERTION GATE VALVE

GENERAL SPECIFICATIONS

- 1.0 Valve shall meet the latest revision of the AWWA C-509 Standard.
- 2.0 Valve shall have a smooth unobstructed water way which shall be a minimum diameter of the valve.
- 3.0 Valve ends to be specified and shall be furnished with Cor-ten (or equal) bolts and nuts.
- 4.0 Valve shall be rated for 250 psi differential working pressure.
- 5.0 Valve Body - The body, including the stuffing box and the bonnet, shall be constructed ductile iron, meeting the latest revision of AWWA C-153.
- 6.0 The milled slot in the pipe wall shall be less than 2" wide.
- 7.0 Coatings:
 - a) the internal and external valve body, including the stuffing box, bonnet, and interior of the wedge shall be fusion bonded epoxy coated with 8 mils D.F.T.
 - b) interior shall meet latest version of AWWA C-550.
- 8.0 Bolts – The seal plate and bonnet bolts shall be stainless steel (Type 316 or Type 304).

APPROVED INSERTION VALVE:

- A. Inserta Valve (Romac) or approved American Manufacturer

RESTRAINED JOINT GASKETS

GENERAL SPECIFICATIONS

- 1.0 All accepted restrained joint gaskets in the Portland Water District distribution system shall be rated in accordance with the performance requirements of ANSI/AWWA C111/A21.11.
- 2.0 Required Applications
 - 2.1 Any hydrant branch or service with a distance greater than 18' shall have an approved restrained joint gasket in the bell ends.
 - 2.2 Where a casing is required, all joints within the casing shall have an approved restrained joint gasket unless restrained joint pipe is used.
 - 2.3 At any time as required by a PWD Engineer.
 - 2.4 Any live service tap where there is a joint between the connection and the end of the service.

APPROVED MANUFACTURERS

- A. American Fast-Grip Gasket – American Pipe
- B. Field Lok 350 Gasket – US Pipe

SERVICE BOX AND ROD

GENERAL SPECIFICATIONS

Reference Standard Details

1.0 Service Box

- 1.1 Shall be 1.0" Schedule 40 steel pipe with top having 1.0" N.P.T. pipe threads for screw-on cover or coupling.
- 1.2 Shall be Erie style with 6' slide-type riser.
- 1.3 Any extension of a service box requires a threaded merchant coupling with no set screw.

2.0 Service Box Cover

- 2.1 Shall be Quincy type (heavy duty) cover that screws on Service Box (1.1 above).
- 2.2 Shall be tapped with a 1" rope thread with a solid brass plug with pentagon operating head.

3.0 Service Box Foot Piece

- 3.1 The standard foot piece shall be heavy duty (Ford style or equal) cast iron design.
- 3.2 The large, heavy-duty foot piece shall have an arch that will fit over 2" ball-valve curb stops.

4.0 Service Rod

- 4.1 Shall have a self aligning design.
 - a) 36" length for all services.
 - b) 24" length for air valves.
- 4.2 Shall be round and constructed of stainless steel (304) with an epoxy coating (minimum 4 mil D.F.T.).

4.3 Shall have a yoke design that is an integral part of the rod.

4.4 The curb-stop attachment pin shall be a brass cotter pin.

4.5 The rod "wrench-flat" shall have a minimum thickness of $\frac{1}{4}$ " tapered to $\frac{1}{16}$ " and width of $\frac{5}{8}$ " or $\frac{1}{2}$ ".

4.6 Diameter

a) $\frac{1}{2}$ ", $\frac{3}{4}$ " and 1" services use $\frac{1}{2}$ " diameter.

b) 1 $\frac{1}{2}$ " and 2" services use $\frac{5}{8}$ " diameter.

SERVICE SADDLES

GENERAL SPECIFICATIONS FOR DUCTILE IRON PIPE

- 1.0 The service saddle shall have the “larger sized” body, the same as associated with the “service repair” saddle, which shall have a minimum diameter of 6 in. and multiple “O” ring type sealing.
- 2.0 The saddle body shall be constructed of epoxy coated ductile iron.
- 3.0 The sealing gasket(s) shall be either Buna-N rubber or SBR rubber (ASTM D2000).
- 4.0 Service saddles shall be installed with all 1 1/2” and 2” corporation stops (cc only).

Approved Manufacturers

<u>Size</u>	<u>Tap</u>	<u>Saddle</u>
2” – 2-1/4”	3/4”, 1” cc	Smith-Blair 315, Ford FC 202
4” - 12” D.I.	3/4” - 1 1/2” cc	Smith Blair 331
4” - 12” D.I.	2” cc	Smith-Blair 313
16”	3/4”-2” cc	Smith-Blair 313
20” – 36”	3/4”-2”cc	Smith-Blair 366

GENERAL SPECIFICATIONS FOR PVC PIPE

- 1.0 Stainless steel straps will be used on saddles on C-900 PVC Pipe

Approved Manufacturers

<u>Size</u>		<u>Saddle</u>
4”-12”		Smith-Blair 265

STAINLESS STEEL REPAIR CLAMPS

GENERAL SPECIFICATIONS

- 1.0 The sleeve shall be of full circle design, either one piece or two piece, for pipe sizes 2" thru 12".
- 2.0 Body: Shall be 18-8 stainless steel shell.
- 3.0 Gasket:
 - a) Shall be full length and diameter of the body size;
 - b) This gasket shall form a multiple O-ring, or grid, sealing barrier for the entire length and circumference;
 - c) Shall be virgin SBR rubber (ASTM D2000 AA 415).
- 4.0 Lugs, sidebar, and lifting bar shall be heavy gauge 18-8 stainless steel with TIG/MIG welding and chemical passivation of all welds.
- 5.0 Bolts and Nuts shall be Teflon coated 18-8 heavy gauge stainless steel.
- 6.0 Armor: The armor, or bridging plate between the side bars shall be heavy gauge 18-8 stainless steel bonded to the gasket to bridge the lug area.

APPROVED MANUFACTURERS

- A. All Manufacturers

TAPPING SLEEVES (on Ductile Iron Pipe)

GENERAL SPECIFICATIONS

- 1.0 For sizes 12" and smaller tapping sleeve shall be ductile iron or approved fabricated steel:
 - 1.1 Tapping sleeve shall be mechanical joint with recessed outlet flange for tapping valve.
 - 1.2 Tapping sleeve shall conform to AWWA C-207, Class D, with rated maximum working pressure of 200 psi.
 - 1.3 The side rubber gaskets shall be rectangular in cross-section and fit into grooved channels in the casting. These gaskets shall extend the entire length of the sleeve and shall not require cutting or trimming to match MJ end gaskets.
 - 1.4 Tapping sleeve shall be AB-CD pattern to permit use of plain rubber and duck-tipped gaskets for various O.D. piping sizes.
 - 1.5 Mechanical joint with accessories furnished; glands, gaskets, and Cor-Ten T-bolts and nuts or equal.
 - 1.6 All flange outlet bolts shall be stainless steel (Type 304).
 - 1.7 Interior and exterior to be bituminous coated with a minimum of 4 mils dry film thickness or fusion bonded epoxy coated.
 - 1.8 The sleeve shall be provided with a $\frac{3}{4}$ " F.I.P.T. test port and brass lug.
- 2.0 For sizes 16" and larger tapping sleeve shall be fabricated steel:
 - 2.1 Body and Flange - A-36
 - 2.2 Coating - Fusion-bonded epoxy coating with minimum D.F.T. of 15 mils, inside and out.
 - 2.3 Bolts, Nuts - Stainless Steel (Type 304).
 - 2.4 Gaskets - Nitrile

- 2.5 Flange - AWWA Class D plate flange with ANSI 150# drilling, proper recessing for tapping valves.
- 2.6 Sleeves shall be provided with 3/4" F.I.P.T. test port and plug.
- 2.7 Taps larger than 20" require an experience submittal. The tapping contractor shall have a minimum of seven continuous years of experience tapping pipes larger than 20" in diameter. Furmanite Corp. – Paulsboro, NJ or equal.

APPROVED MANUFACTURERS (4"-12")

- A. AFC
- B. Mueller Co.
- C. U.S. Pipe
- D. Tyler / Union
- E. Powerseal Model 3490 and 3490MJ (Fabricated Steel)

APPROVED MANUFACTURERS (16" and larger)

- A. Romac FTS 420
- B. Ford FTSC
- C. Smith Blair 622
- D. JCM 412
- E. Powerseal Model 3490 and 3490 MJ (up to 24")
- F. JCM 415 or approved equal (for RCCP pipe only)

VALVE BOXES

GENERAL SPECIFICATIONS

Reference Standard Details

- 1.0 The valve box bottom section shall be slide-type with bell-type base with bottom lip.
Manufacturer: North American Manufacture
- 2.0 The valve box top section shall be slide-type, 36 inches long (minimum). No top flange and no "bead" or bottom flange.
Manufacturer: North American Manufacture
- 3.0 The valve box cover shall be a 2" drop-type cover to fit the 7-1/4" opening of the top section.
Manufacturer: Bibby St-Croix (no substitute)
- 4.0 The valve box intermediate (mid) section shall be slide-type with a minimum 3" belled bottom.
Base section No. 645 may be used as an alternate.
Manufacturer: North American Manufacture
- 5.0 Material shall be cast iron or ductile iron free from defects.
- 6.0 Interior and exterior of all components shall be bituminous coated with a minimum of 4 mils dry film thickness.

END OF SECTION

STANDARD DETAIL UPDATES

Standard Details and Standard Detail updates are available at:
<http://maine.gov/mdot/contractors/publications/standarddetail/>

<u>Detail #</u>	<u>Description</u>	<u>Revision Date</u>
501(02)	Pipe Pile Splice	3/05/2015
501(03)	H – Pile Splice	3/05/2015
504(07)	Diaphragm & Cross Frame Notes	10/13/2015
504(10)	Drip Bar Details	9/06/2017
505(01)	Shear Connectors	10/24/2016
507(13)	Steel Bridge Railing	6/03/2015
507(14)	Steel Bridge Railing	6/03/2015
507(31)	Barrier – Mounted Steel Bridge	8/06/2015
526(02)	Temporary Concrete Barrier	2/01/2015
526(02)	Temporary Concrete Barrier	2/01/2018
609(9)	Concrete Slip Form Curb	5/06/2018
626(07)	Conduit Trench for Traffic Signals, Highway Signing and Lighting	5/17/2018
645(06)	H-Beam Posts Highway Signing	1/09/2018
652(06)	Construction Signs	10/24/2016
652(12)	Construction Traffic Control	10/24/2016
802(05)	Roadway Culvert End Slope Treatment	1/03/2017

SUPPLEMENTAL SPECIFICATIONS
(Corrections, Additions, & Revisions to Standard Specifications - November 2014)

SECTION 101
CONTRACT INTERPRETATION

101.1 Abbreviations Revise the definition of AWP to “**American Wood Protection Association**”.

101.2 Definitions

Page 1-5 – Remove the definition of Bridge in its entirety and replace with:

Bridge A structure that is erected over a depression or an obstruction, such as water, a highway or a railway, and has an opening measured along the centerline of the Roadway of more than 20 feet between: The faces of abutments; spring line of arches; extreme ends of openings of box culverts, pipes or pipe arches; or the extreme ends of openings for multiple box culverts, pipes or pipe arches.”

Page 1-12 – Remove the definition of Large Culvert in its entirety and replace with:

Large Culvert Any structure not defined as a Culvert or Bridge that provides a drainage or non-drainage opening under the Roadway or Approaches to the Roadway, with an opening that is 5 feet but less than 10 feet.”

Remove the definition of Minor Span in its entirety and replace with:

Minor Span Same definition as Bridge, except having an opening of between 10 feet and 20 feet, inclusive.”

SECTION 103
AWARD AND CONTRACTING

Amend this Section by adding the following:

“103.1a Tie Bids - In the case where two responsive bids from responsible bidders are equal monetarily, the Department shall determine the apparent low bidder by flipping a coin. The coin shall have sides clearly marked as heads and tails. The contractor whose first letter in their official company name that comes first in the alphabet shall be heads.

If there are three bids, each bidder will flip the coin and the bidder with the odd toss will be the winner. (i.e. if the results are two heads and a tails, the bidder who had tails is the winner). For a three way tie, bidders may flip their own coin or have the Contracts Engineer flip for them.

The coin flip will occur at the next bid opening by the Contracts and Specifications Engineer or a designee. The tied bidders may attend the coin flip in person or watch on the internet as they choose.”

In 103.3.2 Notice of Determination Revise this section by removing sections A – M and replacing with the following A - K:

(A) Default(s) or termination(s) on past or current Contracts.

**(B) Failure on past or current Contracts to pay or settle all bills for labor, Materials or services;
to comply with directives of the Department, to fulfill warranty obligations, or to provide Closeout Documentation.**

(C) "Below Standard" performance as determined from the Department's Contractor's Performance Rating process.

(D) Insufficient bonding capability or Inability of the Contractor to obtain or retain performance or Payment Bonds meeting MDOT requirements, or a pattern of unsupported Claims.

(E) Failure to accept an Award of a Contract made by the Department.

(F) Failure to provide information requested by the Department in a timely manner.

(G) Debarment, suspension or a denial of prequalification or 'award of contract' by any federal, State, or local governmental procurement agency or the Contractor's Agreement to refrain from Bidding as part of the settlement with any such agencies or any of the reasons contained in Section 102.02 of the "Rules Regarding Debarment of Contractors", Maine Department of Transportation Register 17-229, Chapter 102 (October 2, 1985).

(H) Failure to demonstrate ability to do work to the satisfaction and at the sole discretion of the Department.

(I) Number of personnel working directly for the Contractor with applicable knowledge and experience is significantly below industry standards.

(J) Safety Record, Environmental Record, Civil Rights or Equal Opportunity Record significantly below industry standards.

(K) Serious misconduct that the Department reasonably determines will substantially and adversely affect the cost, quality or timeliness of Work, or the safety of Workers or the public, any deceptive, evasive or fraudulent statements or omissions contained in the Application, made or omitted at any interview or hearing, or otherwise made to or omitted from the Department; or any other substantial deficiencies in experience or conduct that are clearly below industry standards and that clearly demonstrate in the sole discretion of the Department, that the Contractor is "Not Qualified".

SECTION 104

GENERAL RIGHTS AND RESPONSIBILITIES

This Section shall be amended by adding the following two sub-sections:

104.3.8.1 Electronic Payroll Submission On federally funded projects the prime contractor, all subcontractors, and lower-tier subcontractors will submit their certified payrolls electronically utilizing the Elations system. There is no charge to the contracting community for the use of this service. The submission of paper payrolls will not be allowed or accepted. Additional information can be found at <http://www.maine.gov/mdot/contractors/> under the “Bidder Info” go to “Electronic Payroll System.”

104.3.8.2 Payment Tracking On federally funded projects the prime contractor and all subcontractors and lower-tier subcontractors will track and confirm the delivery and receipt of all payments through the Elation System

104.4.10 Coordination of Road Closure / Bridge Closure / Bridge Width Restrictions

Revise the last sentence by adding a period after ‘Resident’; remove the “and” after Resident; and adding “**not covered by Pay Items**” between ‘costs’ and ‘will’. So that the last paragraph reads “**All Newspaper notices, radio announcements and any notifications will be subject to the approval of the Resident. All costs not covered by Pay Items will be considered incidental to the Contract.**”.

104.5.5 Prompt Payment of Subcontractors Add the following paragraph to this subsection:

C. Payment Tracking Federal Projects On federally funded projects, the prime contractor, subcontractors and lower-tier subcontractors will track and confirm the delivery and receipt of all payments through the Elation System. They will be responsible for entering all payments to all sub and lower tier contractors. MaineDOT will run a query monthly to ensure that contractors are complying and generate an e-mail to contractors who have not responded to confirm receipt of MaineDOT payment or contractor payment to lower tier subcontractors.

SECTION 105

GENERAL SCOPE OF WORK

105.2.5 Compliance with Health and Safety Laws Remove the second paragraph of this subsection in its entirety and replace with:

“For related provisions, see Sections 105.2.3 – Project Specific Emergency Planning, 105.3 – Traffic Control and Management and 105.4 – Maintenance of work.”

105.4.5 Special Detours Remove this subsection in its entirety and replace with:

“105.4.5 Maintenance of Existing Structures When a new Bridge or Minor Span is being installed on a new alignment and the existing structure is to remain in service, the Department will maintain the existing structure and the portions of the roadway required for maintaining traffic until such time that the new structure is opened to traffic and the existing structure is taken out of service. A similar situation exists when a new Bridge or Minor Span is being installed on the same alignment as the existing structure, requiring a temporary detour to be installed by the Contractor per Section 510, Special Detours, prior to removal of the existing structure. In this case, the Department will maintain the existing structure and the portions of the existing roadway required for maintaining traffic until such time that either the temporary detour is opened to traffic or the Contractor begins any work on the existing structure, including, but not limited to, repairs, modifications, moving, demolition or removal. In either case, once the new structure or temporary detour is opened to traffic, or the Contractor begins any work on the existing structure, the Contractor shall be solely responsible for all maintenance of the existing structure and the portions of the existing approaches that lie outside the new roadway or the temporary detour, respectively. This specification is not intended to supersede Standard Specification Section 104.3.11, Responsibility for Property of Others.”

105.6.2.4 Department Verification Add the following to the end of the first sentence:
“or other approved method, such as reference staking, to allow the Department to independently verify the accuracy of the work, as approved by the Department.”

SECTION 106 **QUALITY**

106.3.4 Storage Revise this Section by adding the following sentence after the first sentence:
“Materials shall not be stored under or in close proximity to Highway Structures unless the Contractor receives written permission from the Resident.”

106.4.1 General - In the first sentence, remove “When required by Special Provision,” and replace with “When required elsewhere in the Contract,”

Revise Subsection C by replacing the last sentence with the following:

Approval of both standard and project specific QCPs shall be as outlined in paragraph B above, with the exception that the initial 14 day review period for standard plans will begin on March 1, and that the supplemental project specific QCP for the project shall be submitted a minimum of 14 days prior to any related work being performed with an initial review period of 7 days.

SECTION 107 **TIME**

107.7.2 SCHEDULE OF LIQUIDATED DAMAGES

Revise this section by removing the numbers in the chart and replace with the following:

Original Contract Amount		Per Diem Amount of Liquidated Damages	
From More Than	To and Including	Calendar Day	
\$ 0	to \$ 100,000.00		\$250.00
\$ 100,000.00	to \$ 250,000.00		\$500.00
\$ 250,000.00	to \$ 500,000.00		\$650.00
\$ 500,000.00	to \$1,000,000.00		\$800.00
\$1,000,000.00	to \$2,000,000.00		\$1,000.00
\$2,000,000.00	to \$4,000,000.00		\$1,200.00
\$4,000,000.00	and More		\$2,100.00

SECTION 108 **PAYMENT**

108.3 Retainage - Remove the paragraph beginning with “ The Contractor may withdraw...” in its entirety.

108.4.1 Price Adjustment for Hot Mix Asphalt:

Remove this section in its entirety and replace with the following

For all contracts with hot mix asphalt in excess of 500 tons total, a price adjustment for performance graded binder will be made for the following pay items:

Item 403.102	Hot Mix Asphalt – Special Areas
Item 403.206	Hot Mix Asphalt - 25 mm
Item 403.207	Hot Mix Asphalt - 19 mm
Item 403.2071	Hot Mix Asphalt - 19 mm (Polymer Modified)
Item 403.2072	Hot Mix Asphalt - 19 mm (Asphalt Rich Base)
Item 403.208	Hot Mix Asphalt - 12.5 mm
Item 403.2081	Hot Mix Asphalt - 12.5 mm (Polymer Modified)
Item 403.209	Hot Mix Asphalt - 9.5 mm (sidewalks, drives, & incidentals)
Item 403.210	Hot Mix Asphalt - 9.5 mm
Item 403.2101	Hot Mix Asphalt - 9.5 mm (Polymer Modified)
Item 403.2102	Hot Mix Asphalt - 9.5 mm (Asphalt Rich Base)

Item 403.2104	Hot Mix Asphalt - 9.5 mm (Thin Lift Surface Treatment)
Item 403.21041	Hot Mix Asphalt - 9.5 mm (Polymer Modified Thin Lift Surface Treatment)
Item 403.211	Hot Mix Asphalt – Shim
Item 403.2111	Hot Mix Asphalt – Shim (Polymer Modified)
Item 403.212	Hot Mix Asphalt - 4.75 mm (Shim)
Item 403.213	Hot Mix Asphalt - 12.5 mm (base and intermediate course)
Item 403.2131	Hot Mix Asphalt - 12.5 mm (base and intermediate course Polymer Modified)
Item 403.2132	Hot Mix Asphalt - 12.5 mm (Asphalt Rich Base and intermediate course)
Item 403.214	Hot Mix Asphalt - 4.75 mm (Surface)
Item 403.235	Hot Mix Asphalt (High Performance Rubberized HMA)
Item 403.301	Hot Mix Asphalt (Asphalt Rubber Gap-Graded)
Item 404.70	Colored Hot Mix Asphalt – 9.5mm (Surface)
Item 404.72	Colored Hot Mix Asphalt – 9.5mm (Islands, sidewalks, & incidentals)
Item 461.13	Light Capital Pavement
Item 461.210	9.5 mm HMA - Paver Placed Surface
Item 462.30	Ultra-Thin Bonded Wearing Course
Item 462.301	Polymer Modified Ultra-Thin Bonded Wearing Course

Price adjustments will be based on the variance in costs for the performance graded binder component of hot mix asphalt. They will be determined as follows:

The quantity of hot mix asphalt for each pay item will be multiplied by the performance graded binder percentages given in the table below times the difference in price between the base price and the period price of asphalt cement. Adjustments will be made upward or downward, as prices increase or decrease.

Item 403.102–6.2%
Item 403.206–4.8%
Item 403.207–5.2%
Item 403.2071–5.2%
Item 403.2072–5.8%
Item 403.208–5.6%
Item 403.2081–5.6%
Item 403.209–6.2%
Item 403.210–6.2%
Item 403.2101–6.2%
Item 403.2102–6.8%
Item 403.2104–6.2%
Item 403.21041–6.2%
Item 403.211–6.2%
Item 403.2111–6.2%
Item 403.212–6.8%
Item 403.213–5.6%
Item 403.2131–5.6%

Item 403.2132–6.2%
Item 403.214–6.8%
Item 403.235–5.5%
Item 403.301–6.2%
Item 404.70–6.2%
Item 404.72–6.2%
Item 461.13–6.5%
Item 461.210 – 6.4%
Item 462.30–0.0021 tons/SY
Item 462.301–0.0021 tons/SY

Hot Mix Asphalt: The quantity of hot mix asphalt will be determined from the quantity shown on the progress estimate for each pay period.

Base Price: The base price of performance graded binder to be used is the price per standard ton current with the bid opening date. This price is determined by using the average New England Selling Price (Excluding the Connecticut market area), as listed in the Asphalt Weekly Monitor.

Period Price: The period price of performance graded binder will be determined by the Department by using the average New England Selling Price (Excluding the Connecticut market area), listed in the Asphalt Weekly Monitor current with the paving date. The maximum Period Price for paving after the adjusted Contract Completion Date will be the Period Price on the adjusted Contract Completion Date.

SECTION 109 **CHANGES**

109.5.1 Definitions - Types of Delays

Delete Paragraph 'A' in its entirety and replace with:

"A. Excusable Delay Except as expressly provided otherwise by this Contract, an "Excusable Delay" is a Delay to the Critical Path that is directly and solely caused by (1) a weather related Event of such an unusually severe nature that a Federal Emergency Disaster is declared. The Contractor will only be entitled to an adjustment of time if the Project falls within the geographic boundaries prescribed under the disaster declaration. or (2) a flooding event at the effected location of the Project that results in a Q25 headwater elevation, or greater, but less than a Q50 headwater elevation. Theoretical headwater elevations will be determined by the Department; actual headwater elevations will be determined by the Contractor and verified by the Department or (3) An Uncontrollable Event."

SECTION 110 **INDEMNIFICATION, BONDING AND INSURANCE**

110.3.9 Administrative & General Provisions

B. Defense of Claims Amend this section by adding the following sentence to the end:
“The Contractor’s insurer shall name the Department of Transportation as a released party (Releasee”) on any release or settlement agreement for settled claims.”

APPENDIX A TO DIVISION 100

Remove Section D in its entirety as this is now covered in Section 105.10 EQUAL OPPORTUNITY AND CIVIL RIGHTS.

SECTION 203
EXCAVATION AND EMBANKMENT

203.02 Materials

At the bottom of page 2-12, add as the first item in the list:

Crushed Stone, ¾ inch 703.13

203.042 Rock Excavation and Blasting

On page 2-16, add the word **“No”** to the third sentence in Section 5 Submittals, Subsection V, 1 so that it reads:

“No blasting products will be allowed on the job site if the date codes are missing.”

203.09 Preparation of Embankment Area Revise the first sentence of the second paragraph so that it reads:

“When fill material is placed against existing slopes or previously placed fill, the interface shall be continuously benched by excavating steps of sufficient width to permit operations of placing and compacting the additional material.”

SECTION 304
AGGREGATE BASE AND SUBBASE COURSE

304.02 – Aggregate Add the following sentence before the sentence starting with “When designated on the plans...”: **“Aggregate Base Course – Type C will be capped with 2” of millings or Untreated Aggregate Surface Course – Type B. Payment for this material will be made under 304.16”**

Revise the sentence beginning “When designated on the Plans, Type E...” by removing “When designated on the Plans,” so it reads **“Type E subbase may be used 9 inches below and lower beneath the pavement.”**

SECTION 307
FULL DEPTH RECYCLED PAVEMENT

Remove this Section in its entirety and replace with:

SECTION 307
FULL DEPTH RECYCLING
(UNTREATED OR TREATED WITH EMULSIFIED ASPHALT STABILIZER)

307.01 Description This work shall consist of pulverizing a portion of the existing roadway structure into a homogenous mass, adding an emulsified asphalt stabilizer (if required) to the depth of the pulverized material specified in the contract, placing and compacting this material to the lines, grades, and dimensions shown on the plans or established by the Resident.

MATERIALS

307.02 Pulverized Material Pulverized material shall consist of the existing asphalt pavement layers and one inch or more as specified of the underlying gravel, pulverized and blended into a homogenous mass. Pulverized material will be processed to 100% passing a 2 inch square mesh sieve.

307.021 New Aggregate and Additional Recycled Material New aggregate, if required by the contract, shall meet the requirements of Subsection 703.10 - Aggregate for Untreated Surface Course and Leveling Course, Type A. Aggregate Subbase Course Gravel Type D processed to 100 percent passing a 2 inch square mesh sieve and meeting the requirements of 703.06 – Aggregate for Base and Subbase may be used in areas requiring depths greater than 2 inches. New aggregate, will be measured and paid for under the appropriate item.

Recycled material, if required, shall consist of salvaged asphalt material from the project or from off-site stockpiles that has been processed before use to 100 percent passing a 2 inch square mesh sieve. Recycled material shall be conditionally accepted at the source by the Resident. It shall be free of winter sand, granular fill, construction debris, or other materials not generally considered asphalt pavement.

Recycled material generated and salvaged from the project shall be used within the roadway limits to the extent it is available as described in 307.09. No additional payment will be made for material salvaged from the project.

Recycled material supplied from off-site stockpiles shall be paid for as described in the contract, or by contract modification.

307.022 Emulsified Asphalt Stabilizer. If required, the emulsified asphalt stabilizer shall be grade MS-2, MS-4, SS-1, or CSS-1 meeting the requirements of Subsection 702.04 Emulsified Asphalt.

307.023 Water Water shall be clean and free from deleterious concentrations of acids, alkalis, salts or other organic or chemical substances.

307.024 Portland Cement If required, Portland Cement shall be Type I or II meeting the requirements of AASHTO M85.

307.025 Hydrated Lime If required, Hydrated Lime shall meet the requirements of AASHTO M216.

EQUIPMENT

307.03 Pulverizer The pulverizer shall be a self-propelled machine, specifically manufactured for full-depth recycling work and capable of reducing the required existing materials to a size that will pass a 2 inch square mesh sieve. The machine shall be equipped with standard automatic depth controls and must maintain a consistent cutting depth and width. The machine also shall be equipped with a gauge to show depth of material being processed.

307.04 Liquid Mixer Unit or Distributor. If treatment of the recycled layer with emulsified asphalt is required by the contract, a liquid mixing unit or distributor shall be used to introduce the emulsified asphalt stabilizer into the pulverized material. The mixing unit shall contain a liquid distribution and mixing system which has been specifically manufactured for full-depth recycling work, capable of mixing the pulverized material with an evenly metered distribution of emulsified asphalt into a homogeneous mixture, to the depth and width required.

The mixing unit shall be designed, equipped, maintained, and operated so that emulsified asphalt stabilizer at constant temperature may be applied uniformly on variable widths of pulverized material up to 6 feet at readily determined and controlled rates from 0.01 to 1.06 gal/yd² with uniform pressure and with an allowable variation from any specified rate not to exceed 0.01 gal/ yd². Mixing units shall include a tachometer, pressure gages, and accurate volume measuring devices or a calibrated tank and a thermometer for measuring temperatures of tank contents.

307.041 Cement or Lime Spreader If required by the contract, spreading of the Portland Cement or Hydrated Lime shall be done with a spreader truck designed to spread dry particulate (such as Portland Cement or Lime) or other approved means to insure a uniform distribution across the roadway and minimize fugitive dust. Pneumatic application, including through a slotted pipe, will not be permitted. Other systems that have been developed include fog systems, vacuum systems, etc. Slurry applications may also be accepted. The Department reserves the right to accept or reject the method of spreading cement. The Contractor shall provide a method for verifying that the correct amount of cement is being applied.

307.05 Placement Equipment Placement of the Full Depth recycled material to the required slope and grade shall be done with an approved highway grader or by another method approved by the Resident.

307.06 Rollers The full depth recycled material shall be rolled with a vibratory pad foot roller, a vibratory steel drum soil compactor and a pneumatic tire roller. The pad foot roller drum shall have a minimum of 112 tamping feet 3 inches in height, a minimum contact area per foot of 17 inch², and a minimum width of 84 inches. The vibratory steel drum roller shall have a

minimum 84 inch width single drum. The pneumatic tire roller shall meet the requirements of Section 401.10 and the minimum allowable tire pressure shall be 85 psi.

MIX DESIGN

If treatment of the recycled layer with emulsified asphalt is required by the contract, the Department will supply a mix design for the emulsified asphalt stabilized material based on test results from pavement and soil analysis taken to the design depth. The Department will provide the following information prior to construction:

1. Percent of emulsified asphalt to be used.
2. Quantity of lime or cement to be added.
3. Optimum moisture content for proper compaction.
4. Additional aggregate (if required).

After a test strip has been completed or as the work progresses, it may be necessary for the Resident to make necessary adjustments to the mix design. Changes to compensation will be in accordance with the Mix Design Special Provision.

CONSTRUCTION REQUIREMENTS

307.06 Pulverizing The entire depth of existing pavement shall be pulverized together with 1 inch or more of the underlying gravel into a homogenous mass. All pulverizing shall be done with equipment that will provide a homogenous mass of pulverized material, processed in-place, which will pass a 2 inch square mesh sieve.

307.07 Weather Limitations Full depth recycled work shall be performed when;

- A. Recycling operations will be allowed between May 15th and September 15th inclusive in Zone 1 - Areas north of US Route 2 from Gilead to Bangor and north of Route 9 from Bangor to Calais. Recycling will be allowed between May 1st and September 30th inclusive in Zone 2 - Areas south of Zone 1 including the US Route 2 and Route 9 boundaries.
- B. The atmospheric temperature, as determined by an approved thermometer placed in the shade at the recycling location, is 50°F and rising.
- C. When there is no standing water on the surface.
- D. During generally dry conditions, or when weather conditions are such that proper pulverizing, mixing, grading, finishing and curing can be obtained using proper procedures, and when compaction can be accomplished as determined by the Resident.
- E. When the surface is not frozen and when overnight temperatures are expected to be above 32°F.
- F. Wind conditions are such that the spreading of lime or cement on the roadway ahead of the recycling machine will not adversely affect the operation.

307.08 Surface Tolerance The complete surface of the Full Depth Recycled course shall be shaped and maintained to a tolerance, above or below the required cross sectional shape, of $\frac{3}{8}$ inch.

307.09 Full Depth Recycling Procedure New aggregate or recycled material meeting the requirements of Section 307.021 - New Aggregate and Additional Recycled Material, shall be added as necessary to restore cross-slope and/or grade before pulverizing. Locations will be shown on the plans or described in the construction notes. The Resident may add other locations while construction of the project is in progress. The Contractor will use recycled material to the extent it is available, in lieu of new aggregate. The material shall then be pulverized, processed, and blended into a homogeneous mass passing a 2 inch square mesh sieve. Material found not pulverized down to a 2 inch size will be required to be reprocessed by the recycler with successive passes until approved by the Resident.

Should the Contractor be required to add new aggregate or recycled material to restore cross-slope and/or grade after the initial pulverizing process, those areas will require re-processing to blend into a homogenous mass passing a 2 in square mesh sieve.

Sufficient water shall be added during the recycling process to maintain optimum moisture for compaction.

The resultant material from the initial pulverizing processes shall be graded and compacted to the cross-slope and profile shown on the plans or as directed by the Resident. The Contractor will also be responsible for re-establishing the existing profile grade. The completed surface of the full depth recycled course shall be shaped and maintained to a tolerance, above or below the required cross sectional shape, of $\frac{3}{8}$ inch. Areas not meeting this tolerance will be repaired as described in Section 307.091. The initial pulverizing process density requirements will be the same as Section 307.101 unless otherwise directed by the Resident.

Additives, if required, shall be introduced following completion of the initial pulverizing and blending process. Emulsified asphalt stabilizer shall be incorporated into the top of the processed material as specified in section 307.04 to the depth specified in the contract by use of the liquid mixer unit or a distributor, at the rate specified in the mix design. The emulsified asphalt shall then be uniformly blended into a homogeneous mass until an apparent uniform distribution has occurred. The rate of application may be adjusted as necessary by the Resident. Cement or lime shall be introduced as described in section 307.041. The resultant material shall be graded and compacted to the cross-slope and profile shown on the plans or as directed by the Resident. The Contractor will also be responsible for re-establishing the existing profile grade.

After final compaction, the roadway surface shall be treated with a light application of water, and rolled with pneumatic-tired rollers to create a close-knit texture. The finished layer shall be free from:

- A. Surface laminations.
- B. Segregation of fine and coarse aggregate.
- C. Corrugations, centerline differential, potholes, or any other defects that may adversely

affect the performance of the layer, or any layers to be placed upon it. The Contractor shall protect and maintain the recycled layer until a lift of pavement is applied. Any damage or defects in the layer shall be repaired immediately. An even and uniform surface shall be maintained. The recycled surface shall be swept prior to hot mix asphalt overlay placement.

307.091 Repairs Repairs and maintenance of the recycled layers, resulting from damage caused by traffic, weather or environmental conditions, or resulting from damage caused by the Contractor's operations or equipment, shall be completed at no additional cost to the Department.

For recycled layers stabilized with emulsified asphalt, low areas will be repaired using a hot mix asphalt shim. Areas up to 1 inch high can be repaired by milling or shimming with hot mix asphalt. Areas greater than 1 inch high will be repaired using a hot mix asphalt shim. All repair work will be done with the Resident's approval at the Contractor's expense.

TESTING REQUIREMENTS

307.10 Quality Control The Contractor shall operate in accordance with the approved Quality Control Plan (QCP) to assure a product meeting the contract requirements. The QCP shall meet the requirements of Section 106.4 - Quality Control and this Section. The Contractor shall not begin recycling operations until the Department approves the QCP in writing. Prior to performing any recycling process, the Department and the Contractor shall hold a Pre-recycle conference to discuss the recycling schedule, type and amount of equipment to be used, sequence of operations, and traffic control. A copy of the QC random numbers to be used on the project shall be provided to the Resident. All field supervisors including the responsible onsite recycling process supervisor shall attend this meeting.

The QCP shall address any items that affect the quality of the Recycling Process including, but not limited to, the following:

- A. Sources for all materials, including New Aggregate and Additional Recycled Material.
- B. Make and type of rollers including weight, weight per inch of steel wheels, and average contact pressure for pneumatic tired rollers.
- C. Testing Plan.
- D. Recycling operations including recycling speed, methods to ensure that segregation is minimized, grading and compacting operations.
- E. Methods for protecting the finished product from damage and procedures for any necessary corrective action.
- F. Method of grade checks.
- G. Examples of Quality Control forms.
- H. Name, responsibilities, and qualifications of the Responsible onsite Recycling Supervisor experienced and knowledgeable with the process.
- I. A note that all testing will be done in accordance with AASHTO and MDOT/ACM procedures.

The Project Superintendent shall be named in the QCP, and the responsibilities for successful implementation of the QCP shall be outlined.

The Contractor shall sample, test, and evaluate the full depth reclamation process in accordance with the following minimum frequencies:

MINIMUM QUALITY CONTROL FREQUENCIES

Test or Action	Frequency	Test Method
Density	1 per 1000 feet / lane	AASHTO T 310
Air Temperature	4 per day at even intervals	
Surface Temperature	At the beginning and end of each days operation	
Yield of all materials (Daily yield, yield since last test, and total project yield.)	1 per 1000 ft/lane	

The Department may view any QC test and request a QC test at any time. The Contractor shall submit all QC test reports and summaries in writing, signed by the appropriate technician, to the Department's onsite representative by 1:00 P.M. on the next working day, except when otherwise noted in the QCP due to local restrictions. The Contractor shall make all test results, including randomly sampled densities, available to the Department onsite.

The Contractor shall cease recycling operations whenever one of the following occurs:

- A. The Contractor fails to follow the approved QCP.
- B. The Contractor fails to achieve 98 percent density after corrective action has been taken.
- C. The finished product is visually defective, as determined by the Resident.
- D. The computed yield differs from the mix design by 10 percent or more.

Recycling operations shall not resume until the Department approves the corrective action to be taken.

307.101 Test Strip The contractor shall assemble all items of equipment for the recycling operation on the first day of the recycling work. The Contractor shall construct a test strip for the project at a location approved by the Resident. The Responsible onsite Recycling Supervisor will work with Department personnel to determine the suitability of the mixed material, moisture control within the mixed material, and compaction and surface finish. The test strip section is required to:

- A. Demonstrate that the equipment and processes can produce recycled layers to meet the requirements specified in these special provisions.
- B. Determine the effect on the gradation of the recycled material by varying the forward speed of the recycling machine and the rotation rate of the milling drum.

- C. Determine the optimum moisture necessary to achieve proper compaction of the recycled layer.
- D. Determine the sequence and manner of rolling necessary to obtain the compaction requirements and establish a target density. The Contractor and the Department will both conduct testing with their respective gauges at this time.

The test strip shall be at least 300 feet in length of a full lane-width (or a half-road width). Full recycling production will not start until a passing test strip has been accomplished. If a test strip fails to meet the requirements of this specification, the Contractor will be required to repair or replace the test strip to the satisfaction of the Resident. Any repairs, replacement, or duplication of the test strip will be at the Contractor's expense.

After the test strip has been pulverized, and the roadway brought to proper shape, the Contractor shall add water until it is determined that optimum moisture has been obtained. The test strip shall then be rolled using the specified compaction equipment as directed until the density readings show an increase in dry density of less than 1 pcf for the final four roller passes of each roller. The Contractor and Department will each determine a target density using their respective gauges by performing several additional density tests and averaging them. The average of these tests will be used as the target density of the recycled material for QC and Acceptance purposes.

Following completion of the test strip, compaction of the material shall continue until a density of not less than 98 percent of the test strip target density has been achieved for the full width and depth of the layer. During the construction and compaction of the Full Depth Recycled base, should three consecutive Acceptance test results for density fail to meet a minimum of 95 percent of the target density, or exceed 102 percent of target density, a new test strip shall be constructed.

ACCEPTANCE TEST FREQUENCY

Property	Frequency	Test Method
In-place Density	1 per 2000 ft / lane	AASHTO T 310

307.102 Curing. No new pavement shall be placed on the full depth recycled pavement until curing has reduced the moisture content to 1 percent or less by total weight of the mixture, or a curing period of 4 days has elapsed, whichever comes first.

307.11 Method of Measurement Full Depth Recycled Pavement (Untreated or Treated with Emulsified Asphalt Stabilizer) will be measured by the square yard.

307.12 Basis of Payment The accepted quantity of Full Depth Recycled Asphalt Pavement (Untreated or Treated with Emulsified Asphalt Stabilizer) will be paid for at the contract unit price per square yard, complete in-place which price will be full compensation for furnishing all equipment, materials and labor for pulverizing, blending, placing, grading, compacting, and for all incidentals necessary to complete the work.

The addition of materials to restore profile grade and/or cross-slope in areas shown on the plans or described in the construction notes will be paid separately under designated pay items within the contract. No additional payment will be made for materials salvaged from the project.

Payments will be made under:

<u>Pay Item</u>	<u>Pay Unit</u>
307.331 Full Depth Recycled Pavement (Untreated)	Square Yard
307.332 Full Depth Recycled Pavement (with Emulsified Asphalt Stabilizer) 5 in. depth	Square Yard
307.333 Full Depth Recycled Pavement (with Emulsified Asphalt Stabilizer) 6 in. depth	Square Yard

SECTION 411 **UNTREATED AGGREGATE SURFACE COURSE**

411.02 – Aggregate Add the following to the end of the first sentence: “- Type A”

SECTION 501 **FOUNDATION PILES**

501.05 – Method of Measurement

b. **Piles Furnished** – After the second sentence, add the sentence “**Measurement will not include any pile tips**”.

c. **Piles in Place** – Add the sentence to the end of the second paragraph, “**Measurement will include the pile tips**”.

d. **Pile Tips** – Add the words “**on the Pile**” to the end of the sentence.

SECTION 502 **STRUCTURAL CONCRETE**

502.05 Composition and Proportioning

Replace Table 1 with

TABLE 1

Concrete CLASS	Minimum Compressive Strength (PSI)	Permeability as indicated by Surface Resistivity (KOhm-cm)	Entrained Air (%)		Notes
			LSL	USL	
S	3,000	LSL N/A	N/A	N/A	4,5
A	4,000	14	6.0	9.0	1,4,5
P	-----	-----	5.5	7.5	1,2,3,4
LP	5,000	17	6.0	9.0	1,4,5
Fill	3,000	N/A	6.0	9.0	4,5

In the list of information submitted by the contractor for a mix design:

Item J Replace “Target Coulomb Value.” with “Target KOhm-cm Value.”

Note #1 - Remove, “...**Standard Specification Section 711.05, Protective Coating for Concrete Surfaces, and per the manufacturer’s recommendations, at no additional cost to the Department.**” and replace with, “...**Standard Specification Section 515, Protective Coating for Concrete Surfaces, at no additional cost to the Department.**”

502.1703 Acceptance Methods A and B

In the paragraph that starts with “The Department will take Acceptance...” Remove the word chloride from chloride permeability in the last sentence.

Replace the paragraph starting with “Rapid Chloride Permeability specimens...” With the following:

“Surface Resistivity specimens will be tested by the Department in accordance with AASHTO TP-95 at an age \geq 56 days. Four 4 inch x 8 inch cylinders will be cast per subplot placed. The average of three concrete specimens per subplot will constitute a test result and this average will be used to determine the permeability for pay adjustment computations.”

502.1706 Acceptance Method C

Remove in its entirety and Replace with:

502.1706 Acceptance Method C The Department will determine the acceptability of the concrete through Acceptance testing. Acceptance tests will include compressive strength, air content and permeability. Method C concrete not meeting the requirements listed in Table 1 shall be removed and replaced at no cost to the Department. At the Department's sole discretion, material not meeting requirements may be left in place and paid for at a reduced price as described in Section 502.195.

502.1707 Resolution of Disputed Acceptance Test Results
Section B

Remove "Rapid Chloride" from the section heading.
In paragraph 4 replace T-277 with TP-95

502.192 Pay Adjustment for Chloride Permeability

Remove "Chloride" from the heading and from the first sentence.

Replace the sentence that starts with "values greater than..." and replace with "values less than 10 KOhms-cm for Class A concrete or 11 KOhms-cm for Class LP concrete shall be subject to rejection and replacement, at no additional cost to the Department."

502.194 Pay Adjustments for Compressive Strength, Chloride Permeability and Air Content, Methods A and B

Remove the word "Chloride" from the section heading and from the equation for CPF.

502.195 Pay Adjustment Method C

In Table 6: Method C Pay Reductions (page 5-53)
Under "Entrained Air" for "Class Fill", in the first line,
change from "< 4.0 (Removal)" to "< **4.5 (Removal)**"

In Table 6: Method C PAY REDUCTIONS, revise the Chloride Permeability section by removing it in its entirety and replacing it with:

Surface Resistivity {Permeability in Kohm-cms and Pay Reduction per CY}			
15-16 (\$50)	13 (\$25)	N/A	N/A
13-14 (\$75)	12(\$50)	N/A	N/A
12 (\$100)	11 (\$75)	N/A	N/A
11 (\$125)	10 (\$100)	N/A	N/A
< 11 (Removal)	< 10 (Removal)	N/A	N/A

SECTION 503 **REINFORCING STEEL**

503.06 Placing and Fastening Revise this Subsection by removing, in its entirety, the paragraph which begins, “Stainless steel reinforcement shall not be tied to any other type of reinforcement.....”

SECTION 504 **STRUCTURAL STEEL**

504.26 Welding Remove the second paragraph beginning with “The range of heat....” in its entirety.

504.29 Welding ASTM A 709 HPS 70W Steel. Remove the third paragraph beginning with “Make Weld runoff tabs...” in its entirety.

SECTION 510 **SPECIAL DETOURS**

510.032 Geometric and Approach Design a. Horizontal alignment
The third paragraph of this section is revised to read as follows:

“The roadway width shall be increased on curved portions of the Special Detour to account for the off tracking characteristics of WB-62 vehicle in accordance with **the AASHTO publication A Policy On Geometric Design of Highways and Streets (the Green Book), chapter 3 table entitled Design Widths of Pavements for Turning Roadways.**”

SECTION 527 **ENERGY ABSORBING UNIT**

527.02 Materials This section is revised to read as follows.

527.02 Materials Work Zone Crash Cushions must comply with NCHRP Report 350. Work Zone Crash Cushions shall be selected from MaineDOT’s Qualified Products List of Crash Cushions / Impact Attenuators, or an approved equal.

SECTION 534 **PRECAST STRUCTURAL CONCRETE**

534.14 Process Control Test Cylinders
Revise this subsection to read:

“534.14 Acceptance and Quality Control Testing of Concrete Refer to Section 712.061.”

SECTION 535

PRECAST, PRESTRESSED CONCRETE SUPERSTRUCTURE

Section 535.08 – Quality Assurance

Revise the second paragraph to read:

“The QAI will perform acceptance sampling and testing and will witness or review documentation, workmanship and testing to assure the Work is being performed in accordance with the Contract Documents.”

Section 535.15 - Process Control Test Cylinders

Revise the first paragraph to read:

“535.15 Acceptance and Quality Control Testing of Concrete Acceptance of structural precast/prestressed units, for each day’s production, will be determined by the Department, based on compliance with this specification and satisfactory concrete testing results. At least once per week, the QAI will make 2 concrete cylinders (6 cylinders when the Contract includes permeability requirements) for use by the Department; cylinders shall be standard cured in accordance with AASHTO T23 (ASTM C31). The QAI will perform entrained air content and slump flow testing, determine water-cement ratio and determine temperature of the sampled concrete at the time of cylinder casting. All testing equipment required by the QAI to perform this testing shall be provided in accordance with Standard Specification Section 502.041, Testing Equipment. In addition, the Contractor shall provide a slump cone meeting the requirements of AASHTO T 119. Providing and maintaining testing and curing equipment shall be considered incidental to the work and no additional payment will be made.”

Insert the following as the second paragraph of Section 535.15:

“Quality Control concrete test cylinders shall be made for each day’s cast and each form bed used. Cylinders tested to determine strand release strength and design strength shall be field cured in accordance with AASHTO T23 (ASTM C31). 28 day cylinders shall be standard cured. Record unit identification, entrained air content, water-cement ratio, slump flow and temperature of the sampled concrete at the time of cylinder casting.”

SECTION 604

MANHOLES, INLETS CATCH BASINS

604.04 Adjusting Catch Basins and Manholes,

Add the following paragraph to the end of 604.04 b:

The Department will allow the use of metal ring inserts set into the manhole top frame or composite risers placed beneath the manhole frame to adjust manhole slope and grade for paving projects. The use of metal ring inserts shall be in accordance with 604.04 d. Ring Insert Requirements. The use of composite risers shall be in accordance with 604.04 e. Composite Riser Requirements.

Add the following paragraph after the first paragraph of 604.04 c:

The Department will allow the use of metal ring inserts set into the manhole top frame or composite risers placed beneath the manhole frame to adjust manhole slope and grade for paving projects. The use of metal ring inserts shall be in accordance with 604.04 d. Ring Insert Requirements. The use of composite risers shall be in accordance with 604.04 e. Composite Riser Requirements.

Add the following sections to 604.04:

d. Ring Insert Requirements Ring inserts to adjust manhole top frame slope and grade will be allowed in accordance with the following requirements:

1) Materials

- i. All ring inserts must be made of iron. *Multiple ring inserts will not be allowed.* The single ring insert may be any height up to a maximum of 2 inches tall.**
- ii. Ring inserts shall not be welded to the manhole frame to prevent brittle failure of the cast iron frame.**
- iii. Ring inserts shall be fastened to the manhole frame using liquid steel-filled epoxy such as Loctite Fixmaster Steel Liquid or equivalent. The epoxy shall be installed in accordance with the manufacturer's recommendations.**

2) Where Ring Inserts May/May Not Be Used

- i. MaineDOT will allow the use of a single manhole ring insert to raise manholes on state and state-aid highways.**
- ii. *Manhole ring inserts may not be used along state and state-aid highway sections where the speed limit is 40 miles per hour or more.* The standard brick and mortar or flat composite risers beneath the manhole frame must be used at these locations.**

3) Construction Requirements For The Use of Iron Manhole Ring Inserts

- i. Wherever iron ring inserts are used to raise manhole top elevations, the rings shall be fastened to the existing manhole frame using liquid steel-filled epoxy. The liquid steel-filled epoxy shall be placed evenly around the entire manhole frame before placing the ring insert. *Unbonded ring inserts will not be allowed.* If the manufacturer's recommended construction practices result in loose or unacceptable manhole cover restraint, standard brick and mortar or flat composite risers beneath the manhole frame must be used at these locations.

e. Composite Riser Requirements Flat or beveled, doughnut-shaped, composite risers placed beneath the manhole frame to adjust slope and grade are allowed. The composite riser shall be fastened to both the top of the concrete cone and bottom of the manhole frame with the manufacturer's recommended epoxy. Composite risers may be used at all locations on state and state-aid highways under any legal speed limit without restriction.

SECTION 606 **GUARDRAIL**

606.09 Basis of Payment Amend the first sentence of the eighth paragraph of this subsection by removing the word "meter" and replace it with "linear foot".

SECTION 608 **SIDEWALKS**

608.021 Sidewalk Materials Revise this section by removing the second paragraph which begins with "Portland cement concrete shall..." in its entirety and replace with **"Portland cement concrete shall be Class A and meet the requirements of Section 502, Structural Concrete."**

SECTION 609 **CURB**

609.03 Vertical Stone Curb, Terminal Section and Transition Sections and Portland Cement Concrete Curb, Terminal Sections and Transition Sections

Amend this section by adding the following paragraph to the end of it:

"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 following is added to Standard Specification 609 – Curb"

609.02 Materials Amend this section by adding the following to it:

Portland cement and Portland Pozzolan Cement	701.01
Water	701.02
Fine Aggregate for Concrete	703.01
Coarse Aggregate for Concrete	703.02

The Contractor shall submit a concrete mix design for the Portland Cement Concrete to the Resident, with a minimum designed compressive strength of 4000 psi Class A concrete.

609.10 Basis of Payment Revise by changing the fifth paragraph which begins with “There will be no separate payment...” this section by removing the word “cement” and replacing it with “**concrete fill, mortar**”.

SECTION 619 **MULCH**

619.07 Basis of Payment Amend this section by adding the words “; **Bark Mulch and Erosion Control Mix will be paid for by the Cubic Yard;**” into the first sentence so that it reads:

“The accepted areas mulched will be paid for at the contract price per unit; **Bark Mulch and Erosion Control Mix will be paid for by the Cubic Yard;** which shall be full compensation for furnishing and spreading the hay or straw and mulch binder, cellulose fiber mulch, bark mulch or erosion control mix.

Revise the second sentence by removing “ **for pay item 619.1201**” So that it reads:

“When Mulch is measured in Bales, each bale will be paid for at 60% of the contract price per Unit”.

Revise this section by removing all pay items and replace them with the following:

619.12 Mulch	Unit
619.13 Bark Mulch	Cubic Yard
619.14 Erosion Control Mix	Cubic Yard

SECTION 621 **LANDSCAPING**

621.0002 Materials - General

In the list of items change “Organic Humus” to “**Humus**”.

621.0019 Plant Pits and Beds

c Class A Planting

In the third paragraph beginning with “ The plant pit...” change “½ inch” to “**1 inch**”

SECTION 626
FOUNDATIONS, CONDUIT AND JUNCTION BOXES FOR HIGHWAY
SIGNING, LIGHTING AND SIGNALS

626.02 General Amend the Material list by adding the following to the list:

Gravel Borrow	703.20
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Revise the Material List by removing:

Prewired Conduit	715.04
Metallic Junction and Fuse Box	715.05

626.021 Miscellaneous Material Amend this section by adding the following to the end of it:

“All concrete for concrete encasement of conduit shall be Fill Class concrete in accordance with the applicable requirements of Section 502 – Structural Concrete.”

Amend the third paragraph that begins with “If grouting is necessary...” by adding “**included on the Qualified Product List and**” after the word “material”.

626.03 General Amend this section by adding the following section to the end of it

“626.0301 Electrical Supply Lines and Service Connections The following requirements shall apply to Electric Supply Lines and Service Connections feeding traffic signalization equipment control boxes and lighting breaker boxes.

Whenever possible, the meter and breaker panel feeding traffic signal control boxes or lighting control boxes shall be constructed within 30 feet of the service drop pole.

All underground service connections that are constructed in trenches and carrying Secondary Utility Power to a MaineDOT meter and breaker panel, or, directly to MaineDOT traffic signalization control cabinets or lighting breaker boxes shall be in Rigid Metal Conduit or concrete encased PVC conduit.

Where trenchless technologies are employed to install the service connection conduit, Schedule 120 PVC conduit shall be used for the trenchless bore section of conduit. In addition, concrete encasement shall be used for any PVC conduit placed in trench sections and carrying Secondary Utility Power more than 10 feet before or after the limits of the trenchless bore conduit.

The construction practices described above shall be used for service connections up to a maximum of 600 feet. There may be rare exceptional cases where the service connection must exceed 600 feet. In these cases, the power companies may require primary power be run over 600 feet for the purpose of power consumption and dependable service. These cases will be evaluated on a case-by-case basis for alternate power feed methods and/or the need for steel or concrete encased conduit.”

626.031 Conduit Revise this section by removing the second paragraph which begins with “Trenches for conduits...” and replace it with the following:

“Trenches for conduits shall be excavated to a width that will permit proper installation of the conduit and to a minimum depth of 3 feet below finish grade as measured from the top of the conduit. If deeper depths are required, the conduit shall be installed at the depth shown on the plans or as directed. Conduit shall not interfere with poles, guardrail posts, sign foundations or other objects.”

Amend the third paragraph which begins with “All junction or pull boxes...” by adding “**concrete, in accordance with the applicable requirements of Section 502 – Structural Concrete,**” after Class LP.

Revise the fifth paragraph which begins with “After the trench has been...” by adding the following to the end of it:

“Where concrete encasement is required around the conduit, backfilling with approved material may begin adjacent to and above the encased conduit no sooner than 24 hours after concrete placement.”

Remove the following:

“All underground conduit shall be placed to at least the depth shown on the plans and shall not interfere with poles, guardrail posts, sign foundations or other objects.”

Revise the paragraph beginning with “All conduit ends shall...” by removing “Prewired Conduit shall be sealed during construction to prevent entry of moisture, dirt, or rocks.”

626.033 Polyvinylchloride Conduit Installation Amend the first paragraph of this section which begins with “Polyvinylchloride conduit and High Density...” by adding the following to the end of it:

“In addition, PVC conduit used for Electrical Supply Lines and Services constructed as underground service connections in trenches and carrying Secondary Utility Power to a MaineDOT meter and breaker panel, or, directly to MaineDOT traffic signalization control cabinets or lighting breaker boxes shall be concrete encased. When trenchless technologies are used to install PVC conduit, concrete encasement shall not be required.

Concrete encasement shall consist of a minimum of 4 inches of concrete above, below and on both sides of the conduit that shall have a minimum compressive strength of 3000 psi and a maximum aggregate size of 1-inch (Fill Class concrete). The concrete encasement may be backfilled no sooner than 24 hours after placement. “

“NON-METALLIC UNDER PAVEMENT CONDUIT INSTALLATION

Where noted on the drawings, non-metallic under pavement conduit of schedule 80 or greater rating shall be provided to facilitate conduit crossing of the existing highway and ramps without disruption to the existing highway and ramp pavement surface. The non-metallic under pavement conduit shall be hydraulically jacked or directional bored below the highway and ramp at a depth of not less than (36 inches). Under pavement conduit shall extend for a distance of (10 feet) beyond the highway or ramp edge at each side.”

Amend the sixth paragraph which begins with “Where PVC conduit runs are...” by changing “3 inch minimum bedding” to “**6 inch minimum bedding**”.

626.034 Concrete Foundations

Revise this section by removing the third paragraph which begins with “In the absence of Design Requirements...” in its entirety and replace with the following:

“In the absence of design requirements being provided on the plans, the Contractor shall prepare and submit the foundation design(s) to the Department for review. The Contractor may propose an alternate shallow spread footing or drilled shaft configuration/design than that set forth on the drawings. Design shall be in accordance with AASHTO LRFD Specifications for Structural Supports for Highway Sign, Luminaires and Traffic Signals, current edition; AASHTO LRFD Bridge Design Specifications, current edition; and FHWA-NHI-10-016 Drilled Shafts, Construction Procedures and Design Methods, current edition. Where conflicting requirements occur, the more stringent requirements shall govern. In addition to other design requirements, foundation design shall account for Torsion for which a minimum Factor of Safety equal to 1.2 shall be achieved. In evaluating axial capacity and torsional resistance in cohesionless soils, load transfer coefficient or side resistance coefficient (beta, β) will be used in accordance with Subsection 13.3.5.1 of FHWA-NHI-10-016, with beta determined in accordance with Equations 13-13 and 13-11 for silty sands to sandy silts (with varying amounts of gravel). The design criteria for the resistance of drilled shaft and spread footing foundations against overturning, sliding and bearing capacity failure shall meet the requirements of Section 4 of AASHTO LRFD Bridge Design Specifications, current edition. The structural design of foundations shall meet the requirements of AASHTO LRFD Bridge Design Specifications, current edition. The Contractor shall submit to the Department for review, three (3) copies of detailed plans and calculations of the proposed design. Design shall be prepared and sealed by a Professional Engineer licensed in the State of Maine. Construction of foundation(s) shall not commence until the Department has reviewed the foundation design.”

On Page 6-85, add the following paragraph before the paragraph beginning with “Drilled shafts shall not be...”.

“ No foundation design will be required for 18- and 24-inch diameter foundations for structures less than 30-feet tall and with no projecting arms. A foundation design prepared by a Professional Engineer licensed in accordance with the laws of the State of Maine will be required for all other foundations Precast foundations will be permitted for 18 and 24-inch diameter foundations for structures less than 30-feet tall and with no projecting arms. Where precast foundations are permitted flowable concrete fill shall be used as backfill in the annular space, and placed from the bottom up. Construction of precast foundations shall conform to the Standard Details and all requirements of Section 712.061 except that the concrete shall have a minimum permeability of 17 kOhm-cm and the use of calcium nitrite will not be required. “

On Page 6-86, Revise the paragraph beginning with “Concrete for drilled shafts...” so that a portion of it reads as follows:

“....The Contractor shall provide temporary dewatering of excavations for foundations such that concrete is placed in the dry. Concrete for drilled shafts shall be placed in accordance with Section 502.10 as temporary casing is withdrawn to prevent debris from contaminating the foundation and to ensure concrete is cast against the surrounding soil. Concrete for drilled shafts and spread footings shall be Class LP in accordance with Section 502 - Structural Concrete. Precast foundations will not be permitted except as specified above in this Section. Backfill for spread footing foundations shall be Gravel Borrow meeting the requirements of Section 703.20 - Gravel Borrow.....”

626.05 Basis of Payment Amend this section by removing the following paragraphs:

The one which starts with “Payment will be made for the total number of linear feet of prewired conduit...”

The one which starts with “Prewired conduit within the foundations...”

Amend this subsection by adding the following paragraph and Pay Items:

“Payment will be made for the total number of linear feet of under pavement conduit actually furnished, installed and accepted at the contract price per linear foot. This price shall include the cost of: furnishing and installing the conduit; excavating; furnishing special backfilling materials, pull wire, fittings, grounding and bonding; test cleaning interiors of conduits and all materials, labor, equipment and incidentals necessary to complete the work.”

Pay Item	PayUnit
626.221 Non-metallic Conduit, Concrete Encased	Linear Foot
626.251 Non-Metallic Under pavement Conduit (Schedule 80 or greater rating)	Linear Foot

Remove the following Pay Items:

626.23	Prewired Conduit Secondary Wiring	Linear Foot
626.24	Prewired Conduit Primary Wiring	Linear Foot

SECTION 627

PAVEMENT MARKINGS

Revise this section by removing it in its entirety and replacing with the following:

627.01 Description This work shall consist of furnishing and placing reflectorized pavement lines and markings, removing pavement lines and markings, and furnishing and applying reflectorized paint to curbing in reasonably close conformity with the plans and as designated.

627.02 Materials Materials shall conform to the requirements specified in the following Sections of Division 700 - Materials.

Pavement Marking Paint	708.03
Reflectorized Plastic Pavement Marking	712.05

Temporary Bi-directional Yellow Delineators shall be Temporary Object Markers (T.O.M.) as manufactured by the Davidson Plastic Company, 18726 East Valley Highway, Kent, WA 98031 or an approved equal.

627.04 General All pavement lines and markings shall be applied in accordance with the latest edition of Manual on Uniform Traffic Control Devices.

Longitudinal lines placed on tangent roadway segments shall be straight and true. Longitudinal lines placed on curves shall be continuous smoothly curved lines consistent with the roadway alignment. All pavement markings placed shall meet the tolerance limits shown on the plans.

Unless otherwise shown on the plans, non-interstate lines shall be 4 inches wide and broken lines shall consist of alternate 10 foot painted line segments and 30 foot gaps. On controlled access divided highways and on the interstate system lines shall be 6 inches wide and broken lines shall consist of alternate 15 foot painted line segments and 25 foot gaps. Width tolerance shall be +/- 1/4 inch.

Temporary pavement marking lines, defined in Special Provision Section 652, Maintenance of Traffic, Temporary Centerline, will be applied as many times as necessary to properly delineate traffic lanes for the safe passage of traffic. Bi-directional delineators may be used in place of temporary lines, except where specified otherwise in Special Provision 652 Maintenance of Traffic, Temporary Centerline. Delineators will be applied at 40 foot intervals.

In overnight lane closure areas that are not to be overlaid, temporary plastic lines or raised pavement markers shall be used through the length of the taper.

Newly painted lines, markings and curb shall be protected from traffic by the use of cones, stationary vehicles or other approved methods until the paint is dry.

627.05 Preparation of Surface Immediately before applying the pavement marking paint to the pavement or curb, the surface shall be dry and entirely free from dirt, grease, oil, or other foreign matter.

Surface preparation for application of plastic markings shall conform to the manufacturer's recommendations.

627.06 Application Prior to applying paint for final pavement lines, the Contractor shall perform a test for paint thickness by furnishing and placing a piece of smooth, clean metal with an area of at least 144 in² in the path of the striping truck. The striping truck shall be passed over the piece of metal, painting the surface as it passes, without applying beads. The result of this test will be used to determine the pressure setting and speed of the truck when applying paint to obtain the specified thickness. Additional paint thickness testing may be required on the final paint markings. The wet thickness of paint without beads on final pavement lines shall be a minimum of 16 mils.

On other final pavement markings and on curb, where the paint is applied by hand painting or spraying, application shall be in two uniform covering coats, each at least 10 mils thick. Before the second coat of 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.

Glass beads shall be applied to the final and temporary pavement lines, marking and curb at a sufficient rate and in sufficient quantity to assure complete and uniform coverage of hand painted surfaces and achieve proper reflectivity.

Permanent and temporary white lines and markings shall have a minimum final reflectivity value of 250 millicandelas per square meter per lux (mcd/m²/lux) and permanent and temporary yellow lines and markings shall have a minimum final reflectivity value of 150 millicandelas per square meter per lux (mcd/m²/lux), as measured by the Department. Measurements taken to determine reflectivity shall be done within 4 weeks after final placement.

If the final reflectivity values are less than the described minimums, the Contractor shall repaint those areas not meeting required reflectivity at no cost to the Department. If the final reflectivity values are less than the described minimums after the second attempt, 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 re apply at no cost to the Department.

Temporary painted lines and markings shall be applied as specified for permanent painted lines, except that the thickness shall be a minimum of 16 mils.

Temporary pliant polymer marking material shall be used for temporary markings on the final pavement and on pavements not to be resurfaced when such pavement markings do not conform to the final pavement markings pattern.

The plastic final pavement lines and markings shall be applied in accordance with the manufacturer's recommendations by the inlay method of application.

627.07 Establishment Period Inlaid plastic pavement lines and marking material furnished and installed under this contract for final pavement markings shall still be subject to a six-month period of establishment.

The period of establishment shall commence as soon as the plastic pavement lines and markings are complete and in place and shall continue for six months. At the end of the establishment period, a minimum of 95% of the plastic pavement lines and markings shall still be in place to be acceptable.

If less than 95% of the plastic pavement lines and markings are in place after six months, the Contractor shall replace all unsatisfactory plastic pavement lines and markings on the project without additional payment. Plastic pavement lines and markings designated for replacement shall be installed according to these specifications, unless otherwise directed. Plastic pavement lines and markings replaced at the end of the six month establishment period will not be subject to a further establishment period.

627.08 Removing Lines and Markings When it is necessary to remove pavement lines and markings, it shall be done by high pressure water, grinding or other approved acceptable means. The method chosen must be capable of completely eradicating the existing line or marking without excessive damage to the pavement. Burning and the use of solvents to remove temporary markings from final pavement or from existing pavement not to be resurfaced will not be permitted.

627.09 Method of Measurement The quantity of pavement marking lines identified in the contract as a plan quantity pay item, the measurement of payment will be the number of feet shown in the Schedule of Items. This quantity will be considered final and no adjustments will be made except when changes resulting in increases or decreases are made by the Resident.

The accepted quantity of temporary or permanent pavement marking lines when identified in the contract as a linear foot item shall be measured and paid for at the contract unit price per linear foot for the total amount applied and accepted.

Double yellow centerline, broken or solid, will be considered one line for measurement purposes. The measurement of broken lines will include the gaps when painted and will not include the gaps when plastic. Double Yellow Centerline, broken or solid shall not be paid through intersections or side roads and will be paid for the actual length of painted line.

Broken white lines will include the gaps when painted and will not include the gaps when plastic inlaid pavement lines are applied. Yellow or white solid edge lines and will not be paid through intersections or side roads and will be measured by the actual length of painted line.

Temporary pavement marking lines shall not be paid through intersections or side roads and will be measured per linear foot of actual length of painted and accepted.

Reflectorized curb will be measured or computed by the square foot of curb surface actually painted and reflectorized.

The accepted quantity of removing existing pavement markings will be measured by the square foot.

Temporary Bi-directional Yellow Delineators will be measured by each unit, complete in place, maintained, and accepted.

627.10 Basis of Payment The accepted quantity of pavement marking lines identified in the contract as a plan quantity pay item will be paid for at the contract unit price for plan quantity. No adjustment will be made to the quantity for payment, except as described 627.09 Method of Measurement

The quantity of permanent or temporary pavement marking lines identified in the contract paid by the linear foot will be measured for payment as described under section 627.09 Method of Measurement.

All other permanent pavement markings will be paid for at the contract unit price per square foot in accordance with 627.09 Method of Measurement.

If allowed by Special Provision, the Contractor may utilize Temporary Bi-Directional Yellow and White (as required) Delineators. When utilized, payment will be made as temporary pavement marking lines, measured and paid at the contract unit price per linear foot. Such payment will include as many applications as required and removal.

Payment for final plastic pavement lines and markings will be made in two parts. The first payment of 75% will be made when plastic pavement lines and markings are placed. The payment of the remaining 25% will be made at the end of the establishment period for all plastic line and pavement markings accepted.

The accepted quantity of any pavement marking lines will be paid for at the contract unit price and will include as many applications as required and removal when required.

The accepted quantity of Temporary Bi-directional Yellow Delineators will be paid for at the contract unit price.

Payment will be made under:

<u>Pay Item</u>	<u>Pay Unit</u>
627.18 12 inch Solid White Pavement Marking Line	Linear Foot
627.711 White or Yellow Pavement Marking Line - Plan Quantity	Linear Foot
627.733 4" White or Yellow Painted Pavement Marking Line	Linear Foot
627.744 6" White or Yellow Painted Pavement Marking Line	Linear Foot
627.75 White or Yellow Pavement & Curb Marking	Square Foot
627.77 Removing Existing Pavement Marking	Square Foot
627.78 Temporary 4" Painted Pavement Marking Line, White or Yellow	Linear Foot
627.781 Temporary 6" Painted Pavement Marking Line, White or Yellow	Linear Foot
627.407 Reflectorized Plastic, White or Yellow Pavement Marking	Square Foot
627.4071 Reflectorized Plastic, White or Yellow Pavement	Linear Foot
Marking Line - Plan Quantity	
627.811 Temporary Bi-directional Yellow Delineators	Each

SECTION 639

ENGINEERING FACILITIES

Revise this section by removing this section in its entirety and replace with the following:

639.01 Description This work shall consist of providing, erecting, lighting, equipping and maintaining buildings to be solely used by the Resident and other assigned Department representatives as a field office. Upon completion of the work, the buildings and equipment shall remain the property of the Contractor.

639.02 Materials Materials for buildings shall be of good quality customarily used in standard frame house or office trailer construction.

639.03 General The building of the type called for shall be provided before the start of work, and shall remain until work is completed and accepted, unless earlier removal is authorized. The location shall be approved by the Resident and should be adjacent or virtually adjacent to the Project.

A fire extinguisher shall be provided in each building or office trailer for electrical and chemical fires and effective on all solvents used in the building.

Walls, roof, floor, windows, and doors shall be tightly constructed to the required area.

Furnishings shall be supplied as called for. Doors shall be equipped with locks and all keys shall be in the possession of the Resident. Windows shall be equipped with latches so they may be locked on the inside. Window screens and screen doors shall be supplied when necessary. Adequate desk and desk space shall be provided. If a portable table is supplied, it should be adjustable to accommodate the various heights of employees. A 5-way adjustable office chair shall be provided in the quantities listed.

639.04 Field Offices Field Offices are designated Type A, Type B, or Type C. Buildings, including trailers, may be provided if they substantially equal or exceed the following requirements. Air conditioning, appropriate to the building size, shall be provided in all field offices.

The walls, roof, and floor of the building shall be completely insulated with a minimum insulation value of R-15. Office trailers shall be either new or in very good used condition. The interior walls shall be covered with suitable wall paneling. The entire office trailer shall be for the exclusive use of the Resident. The office trailer shall be winterized and completely enclosed at the bottom, if the trailer will be used in cold weather.

Other types of buildings and facilities may be furnished of equal or better quality.

A public work area will be provided in the field office that shall be designed and constructed so that individuals with disabilities can approach, enter, and exit this area.

At least one accessible route to the field office shall be provided from accessible parking. The accessible route shall comply with the Americans with Disabilities Act Accessibility Guidelines (ADAAG) and this specification.

The minimum clear width of an accessible route shall be 36 inches except at doors. The least possible slope shall be used for an accessible route. An accessible route with a running slope greater than 1:20 shall be considered a ramp. Maximum ramp slope is 1:12. The maximum rise for any run of a ramp shall be 30 inches and the minimum clear width shall be 36 inches. Nowhere shall the cross slope of an accessible route exceed 1:50. Changes in level up to ¼ inch may be vertical and without edge treatment. Changes in level between ¼ inch and ½ inch shall be beveled with a slope no greater than 1:2. Ramp floor surfaces shall be stable, firm, and slip-resistant.

Ground floor surfaces along accessible routes and in accessible rooms and spaces including floors, walks, ramps, stairs, and curb ramps, shall be stable, firm, and slip-resistant.

The main door to the public work area shall have a minimum clear opening of 32 inches with the door opened 90 degrees, measured between the face of door and the opposite stop. Minimum maneuvering clearances at doors shall be provided. The floor or ground area within the required clearances shall be level and clear.

The handle and other operating devices on accessible doors shall have a shape that is easy to grasp with one hand and does not require tight grasping. Lever-operated mechanisms push type mechanisms, and U-shaped handles are acceptable designs. Hardware required for accessible door passage shall be mounted no higher than 48 inches above finished floor.

A minimum of 3 parking spaces will be supplied for Class B & C Field Offices and 6 for Class A. One wheelchair accessible parking space shall be located on the shortest accessible route of travel from adjacent parking to an accessible entrance.

Level landings shall be provided at bottom and top of each run. The landing shall be at least as wide as the ramp run leading to it with a minimum length of 60 inches.

If a ramp run has a rise greater than 6 inches or a horizontal projection greater than 72 inches, then it shall have handrails on both sides. Handrails shall have the following features:

- 1) Handrails shall be provided along both sides of ramp segments. The inside handrail on switchback ramps shall always be continuous.
- 2) If handrails are not continuous, they shall extend at least 12 inches beyond the top and bottom of the ramp segment and shall be parallel with the floor or ground surface.
- 3) The clear space between the handrail and the wall shall be 1½ inch.
- 4) Gripping surfaces shall be continuous.
- 5) Top of handrail gripping surfaces shall be mounted between 34 and 38 inches above ramp surfaces.

- 6) Ends of handrails shall be either rounded or returned smoothly to floor, wall, or post.
- 7) Handrails shall not rotate within their fittings.
- 8) The diameter or width of the gripping surfaces of a handrail shall be 1¼ to 1½ inch, or the shape shall provide an equivalent gripping surface.

Firm and sturdy steps shall also be provided with 7 inch maximum riser and 11 inch minimum depth, and at least one handrail extending from the top of the steps to a minimum 12 inches beyond the bottom of the steps.

The Contractor will make reasonable effort(s) to provide wheelchair accessible toilet facilities when "portable" facilities are provided.

The Contractor shall provide wheelchair accessible toilet facilities when flush type facilities, that is, those with running water, are provided; and the Contractor shall provide wheelchair accessible portable facilities, if used, when the contract duration exceeds two continuous construction seasons.

In addition to the facilities previously specified in this subsection, each field office shall meet the following minimum requirements:

<u>Description</u>	<u>Quantity</u>		
	<u>Type A</u>	<u>Type B</u>	<u>Type C</u>
Floor Area (Outside Dimension) - ft ²	312	220	125
Inside Wall Height – feet	7	7	7
Window Area - ft ²	55	35	35
Drafting Table Surface Area - ft ²	15	15	15
Drafting Stools - each	2	1	1
Office Desks - each	2	1	1
Ergonomic Swivel Chairs -ea (5-way adjustable)	3	2	2
Folding Chairs - each	3	2	2
Lighting Units - each	4	2	2
Electric Wall Outlets - each	6	4	3
Power Strip Surge Protectors - each	3	2	1
Wall Closets - each	1	1	1
Plan Rack for minimum of 6 sets of plans	1	1	0
Toilet Facility	1	1	1
Wastebaskets - each	2	2	1

All windows shall be provided with shades or blinds.

The toilet facility shall be for the exclusive use of State personnel. If requested, the Contractor will supply a lock to ensure exclusive use.

The Resident will have the option to reject any furniture or supplies provided to the field office based on general condition.

One hundred ten volt, 60 cycle, continuous electric service shall be supplied for lighting and 15 amp duplex wall outlets. Lighting shall consist of florescent light units with rapid start bulbs or LED shop style lights located over the work areas for a minimum of 50 foot candles overall. At least one external light source will be provided.

Drafting surfaces shall be 40 inches above the floor and have shelves beneath. Shelves for plans and rolls shall also be furnished overhead. Drafting stools shall be approximately 28 inches high.

Desks shall be single or double pedestal standard office type, and shall be in addition to “built-in” type desks in the office trailer.

Field offices shall be furnished with one four-drawer letter size metal filing cabinet.

Wall closets shall be 21 inches wide, 15 inches deep, and at least 4 feet high.

Each office shall be furnished with a broom, dustpan, sweeping compound, trash bags, and with cleaning material for cleaning glass. If the field office is carpeted, then a vacuum cleaner will be provided. The contractor will be responsible for disposing of trash from the field office.

The Contractor shall provide a fully functional wireless desktop copier/scanner/printer, capable of copying field books, for the Resident’s use during the project. All maintenance and supplies, except paper, shall be the responsibility of the Contractor.

The Contractor shall provide bottled water and a microwave for the duration of the project. All maintenance and supplies shall be the responsibility of the Contractor. Alternate source of water, such as a water cooler, may be provided as approved by resident.

The Contractor shall provide a 4 cubic-foot refrigerator in the field office for the duration of the project.

Each office shall be furnished with a 10-person general-purpose first aid kit. The first aid kit shall be periodically inspected and refilled as necessary.

639.08 Heat Heat appropriate to the building size shall be supplied by the Contractor to maintain an acceptable room temperature during occupancy.

639.091 Broadband Connection The contractor will supply one computer broadband connection, modem lease and router. The router shall have wireless access and be 802.11n or newer capable. The type of connection supplied will be contingent upon the availability of services (i.e. DSL or Cable Broadband). It shall be the contractor's option to provide dynamic or static IP addresses through the service. The selected service will have a minimum download connection of 5.0 Mbps and 1.0 Mbps upload. The contractor shall be responsible for the installation charges and all reinstallation charges following suspended periods. Monthly service and maintenance charges shall be billed by the Internet Service Provider (ISP) directly to the contractor.

639.10 Method of Measurement Field office will be measured by the unit or lump sum for each building provided, equipped and maintained satisfactorily.

639.11 Basis of Payment The accepted quantity of field office will be paid for at the contract unit price each or lump sum which payment shall be full compensation for furnishing until contract completion, erecting, equipping, maintaining, furnishing electricity, heating, installing and maintaining toilet facilities and if necessary removing the buildings or office trailers.

Payment for these items will be made in 3 parts; the first payment of ½ to be made after the Contractor has supplied the building or office trailer and it has been approved. The remaining payments shall be made at intervals as follows:

A second payment of ¼ shall be made when one-half of the anticipated work has been completed.

The final payment of the remaining ¼ shall be made upon completion of the work.

Payment will be made under:

<u>Pay Item</u>	<u>Pay Unit</u>
639.18 Field Office, Type A	Each
639.19 Field Office, Type B	Each
639.20 Field Office, Type C	Each

SECTION 652

MAINTENANCE OF TRAFFIC

652.2.4 Other Devices Revise this Section by removing the following paragraph:

“ STOP/SLOW paddles shall be the primary and preferred hand held signaling device. Flags shall be limited to Emergencies. The paddle shall have an octagonal shape and be at least 18 inches wide with letters at least 6 inches high and should be fabricated from semi-rigid material”

And replace with these two paragraphs

“Flaggers shall use a STOP / SLOW hand held paddle as the primary and preferred hand signaling device. Use of flags shall be limited to emergency situations.

STOP / SLOW paddles shall have high intensity prismatic retro reflective sheeting Type XI, have an octagonal shape on a rigid handle and shall be at least 18 inches wide with letters at least 6 inches high and shall be constructed from light semi-rigid material. The STOP (R1-1) face shall have white letters and a white border on a red background. The SLOW (W20-8) face shall have black letters and a black border on an orange background. Paddles in existing stock meeting the current specification (Type VII, Type VIII, or Type IX) may be utilized until the end of the service life or until 12/31/18. All new paddles must meet the Type XI requirements.”

652.3.3 Submittal of Traffic Control Plan On page 6-148, note f, in the last sentence revise the “105.2.2” to “105.2.3” so that the last sentence reads, **“For a related provision, see Section 105.2.3 – Project Specific Emergency Planning.”**

652.3.4 General Revise the eighth paragraph by removing “Earth Berm” and replace it with **“Concrete Barrier”**.

Amend this section by adding the following paragraph before the paragraph beginning with “Special Detours and temporary structures...”:

“A temporary ramp shall be constructed with HMA at the ends of the roadway section paved or milled each day. The use of millings or RAP will not be allowed, but cold patch may be temporarily utilized until HMA plants are open for the season. The maximum ramp change in elevation shall not exceed 4” vertical. For Interstate Highways or roadways with speed limits equaling or exceeding 50 mph; temporary ramps shall be constructed at a length of eight feet per inch of transition depth. For roadways with speed limits less than 50 mph and greater than 25 mph, temporary ramps shall be constructed at a length of four feet per inch of transition depth. For roadways with speed limits 25 mph or less, temporary ramps shall be constructed at a length of two feet per inch of transition depth. Materials, placement, maintenance, and removal shall be incidental to contract items.”

652.4 Flaggers Revise this section by removing the first paragraph, and replace it with the following”

“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. All flaggers must carry an official certification card with them at all times while flagging.

For daytime conditions, flaggers shall wear a top (vest, shirt or jacket) that is orange, yellow, yellow-green, or fluorescent versions of these colors meeting ANSI 107-2004, Class 2 or Class 3, along with a hardhat with 360 ° retro-reflectivity.

For nighttime conditions, flaggers shall wear all Class 3 apparel, meeting ANSI 107-2004, including a Class 3 top (vest, shirt or jacket) and a Class E bottom (pants or coveralls), shall be worn along with a hardhat with 360 ° retro-reflectivity and shall be visible at a minimum distance of 1000 ft. Flagger stations must be illuminated in nighttime conditions to assure visibility and will be specifically addressed in detail in the Contractor's TCP".

652.41 TRAFFIC OFFICERS

Revise this subsection so that the subsection number and title is

"652.4.1 TRAFFIC OFFICERS "

SECTION 656

TEMPORARY SOIL EROSION AND WATER POLLUTION CONTROL

656.5.2 If No Pay Item Add the following to the end of the first paragraph:

"Failure by the Contractor to follow Standard Specification or Special Provision - Section 656 will result in a violation letter and a reduction in payment as shown in the schedule list in 656.5.1. The Department's Resident or any other representative of The Department reserves the right to suspend the work at any time and request a meeting to discuss violations and remedies. The Department shall not be held responsible for any delay in the work due to any suspension under this item."

SECTION 660

ON-THE-JOB TRAINING

660.06 Method of Measurement

Remove the first sentence in its entirety and replace with **" The OJT item will be measured by the number of OJT hours by a trainee who has successfully completed an approved training program."**

660.07 Basis of payment to the Contractor

Remove the last word in the first sentence so that the first sentence reads " The OJT shall be paid for once successfully completed at the contract unit price per **hour**."

Payment will be made under

Change the Pay Item from "660.22" to **"660.21"** and change the Pay Unit from "Each" to **"Hour"**.

SECTION 672

PRECAST CONCRETE BLOCK GRAVITY WALL

672.035 Backfill Material– Revise this section by adding the following after the second paragraph:
Backfill materials shall meet the criteria in the following table.

<u>Base Polymer</u>	<u>Property</u>	<u>Criteria</u>	<u>Test Method</u>
Polyester (PET)	pH	3 < pH < 9	AASHTO T-289
Polyolefin (PP & HDPE)	pH	pH > 3	AASHTO T-289

672.04 Design Requirements – Revise this section by replacing items 2 and 3 in the second paragraph with the following:

2. FHWA-NHI-10-024 and FHWA-NHI-10-025, Design and Construction of Mechanically Stabilized Earth Walls and Reinforced Soil Slopes, Volumes I and II, current edition.
3. FHWA-NHI-09-087 Corrosion/Degradation of Soil Reinforcements for Mechanically Stabilized Earth Walls and Reinforced Soil Slopes, current edition.

SECTION 673 **WETCAST SMALL LANDSCAPE BLOCK WALL**

673.035 Backfill Material – Revise this section by adding the following after the second paragraph:

Backfill materials shall meet the criteria in the following table.

<u>Base Polymer</u>	<u>Property</u>	<u>Criteria</u>	<u>Test Method</u>
Polyester (PET)	pH	3 < pH < 9	AASHTO T-289
Polyolefin (PP & HDPE)	pH	pH > 3	AASHTO T-289

673.04 Design Requirements – Revise this section by replacing items 2 and 3 in the second paragraph with the following:

2. FHWA-NHI-10-024 and FHWA-NHI-10-025, Design and Construction of Mechanically Stabilized Earth Walls and Reinforced Soil Slopes, Volumes I and II, current edition.
3. FHWA-NHI-09-087 Corrosion/Degradation of Soil Reinforcements for Mechanically Stabilized Earth Walls and Reinforced Soil Slopes, current edition

SECTION 674

PREFABRICATED CONCRETE MODULAR GRAVITY WALL

674.02 Materials

Amend this section by adding the following after “Concrete Units:” and before the paragraph beginning with “Tolerances”.

Concrete shall be Class P. The concrete shall contain a minimum of 5.5 gallons per cubic yard of calcium nitrite solution.

The minimum permeability of the concrete as indicated by Surface Resistivity shall be 17 KOhm-cm.

Defects Defects which may cause rejection of precast units include, but are not limited to, the following:

Any discontinuity (crack, rock pocket, etc.) of the concrete which could allow moisture to reach the reinforcing steel.

Rock pockets or honeycomb over 6 square inches in area or over 1 inch deep.

Edge or corner breakage exceeding 12 inches in length or 1 inch in depth.

Any other defect that clearly and substantially impacts the quality, durability, or maintainability of the structure, as determined by the Fabrication Engineer.

Repair honeycombing, ragged or irregular edges and other non-structural or cosmetic defects using a patching material from the MaineDOT Qualified Products List (QPL). The repair, including preparation of the repair area, mixing and application and curing of the patching material, shall be in accordance with the manufacturer's product data sheet. Corners that are not exposed in the final product may be ground smooth with no further repair necessary if the depth of the defect does not exceed 1/2 inch. Remove form ties and other hardware to a depth of not less than 1 inch from the face of the concrete and patch the holes using a patching material from the MaineDOT QPL.

Repair structural defects only with the approval of the Fabrication Engineer. Submit a nonconformance report (NCR) to the Fabrication Engineer with a proposed repair procedure. Do not perform structural repairs without an NCR that has been reviewed by the Fabrication Engineer. Structural defects include, but are not be limited to, exposed reinforcing steel or strand, cracks in bearing areas, through cracks and cracks 0.013 inch in width that extend more than 12 inches in length in any direction. Give the QAI adequate notice prior to beginning any structural repairs.

SECTION 677

MECHANICALLY STABILIZED EARTH RETAINING WALL

677.03 Design Requirements – Revise this section by replacing items 6, 7 and 8 in the second paragraph with the following:

6. FHWA-NHI-10-024, Design and Construction of Mechanically Stabilized Earth Walls and Reinforced Soil Slopes, Volumes I, current edition.
7. FHWA-NHI-10-025, Design and Construction of Mechanically Stabilized Earth Walls and Reinforced Soil Slopes, Volumes II, current edition.
8. FHWA-NHI-09-087 Corrosion/Degradation of Soil Reinforcements for Mechanically Stabilized Earth Walls and Reinforced Soil Slopes, current edition

On page 6 - 203 change “636.041” to “677.041”

Amend 677.042 Precast Panel Tolerances and Surface Finish by the addition of the following:

Defects Defects which may cause rejection of precast units include, but are not limited to, the following:

Any discontinuity (crack, rock pocket, etc.) of the concrete which could allow moisture to reach the reinforcing steel.

Rock pockets or honeycomb over 6 square inches in area or over 1 inch deep.

Edge or corner breakage exceeding 12 inches in length or 1 inch in depth.

Any other defect that clearly and substantially impacts the quality, durability, or maintainability of the structure, as determined by the Fabrication Engineer.

Repair honeycombing, ragged or irregular edges and other non-structural or cosmetic defects using a patching material from the MaineDOT Qualified Products List (QPL). The repair, including preparation of the repair area, mixing and application and curing of the patching material, shall be in accordance with the manufacturer's product data sheet. Corners that are not exposed in the final product may be ground smooth with no further repair necessary if the depth of the defect does not exceed 1/2 inch. Remove form ties and other hardware to a depth of not less than 1 inch from the face of the concrete and patch the holes using a patching material from the MaineDOT QPL.

Repair structural defects only with the approval of the Fabrication Engineer. Submit a nonconformance report (NCR) to the Fabrication Engineer with a proposed repair procedure. Do not perform structural repairs without an NCR that has been reviewed by the Fabrication Engineer. Structural defects include, but are not be limited to, exposed reinforcing steel or strand, cracks in bearing areas, through cracks and cracks 0.013 inch in width that extend more than 12 inches in length in any direction. Give the QAI adequate notice prior to beginning any structural repairs.

SECTION 702

BITUMINOUS MATERIAL

702.01 Asphalt Cement - Remove this section in its entirety and replace with the following:
Performance-Graded Asphalt Binder (PGAB) that has not been modified with polymer shall

conform to the requirements of AASHTO M 320. Polymer modified binder shall meet the requirements of AASHTO M 332 (including Appendix X1), except that the percent difference in nonrecoverable creep compliance, J_{nr}diff, shall not be enforced. Performance-Graded Asphalt Binder shall not contain re-refined engine oil bottoms (REOB).

The Contractor shall arrange for the Supplier to furnish the following items to the Department's Asphalt Pavement Engineer:

a. A Quality Control Plan that conforms to the requirements of AASHTO R 26 "Certifying Suppliers of Performance-Graded Asphalt Binders" and

b. A CERTIFICATE OF ANALYSIS for all asphalt materials furnished for use on the project. The Certificate shall include the actual test results of the material in storage from which the shipments are being made. Certificates shall be supplied for each lot, batch, or blend of each type and grade of material. A new certificate shall be issued at least every 30 days or upon receiving or manufacture of a new material. The original of each Certificate of Analysis shall be mailed to the Departments Asphalt Pavement Engineer.

The Contractor shall give the supplier sufficient notice of orders to permit testing and certification. Material not certified will not be accepted for use.

Deliveries of asphalt materials shall be accompanied by a Bill of Lading containing the information required under Section 108.1.3 f. The Bill of Lading shall include the applicable certificate number and shall include a printed or stamped statement such as the following: "THIS IS TO CERTIFY THAT THE ASPHALT MATERIAL REPRESENTED BY THIS LOADING INVOICE CONFORMS TO THE SPECIFICATIONS OF THE PURCHASER FOR THE MATERIAL TYPE AND GRADE STATED THEREON."

In the event an intermediate hauler of the asphalt material is involved, a copy of their own delivery slip shall be furnished, as well as a copy of the supplier's loading invoice. The hauler's delivery slip and the supplier's loading invoice shall be cross-referenced by use of their respective serial numbers.

All non-bituminous components added to the binder prior to the sampling point for binder certification shall be included on the asphalt binder Certificate of Analysis identifying their presence. All non-bituminous components added after the certification sampling point and prior to transport shall be included on the Bill of Lading. All non-bituminous components added to the binder at the HMA plant shall be identified on the mix plant documentation and accompanied by test results and certification showing the effect of the additives introduced, if any.

702.04 Emulsified Asphalt

Revise this Section by removing the first paragraph in its entirety and replace with the following:

Emulsified Asphalt shall conform to the requirements of AASHTO M 140. Cationic emulsified asphalt shall conform to the requirements of AASHTO M 208. Anionic emulsified asphalt Grade RS-1h shall conform to the requirements in the following table:

Type	Rapid-Setting	
Grade	RS-1h	
Tests on Emulsions	min	max
Viscosity, Saybolt Furol at 25°C SFS	20	100
Storage Stability test, 24-h, % ^A	-	1.0
Demulsibility, 35 ml, 0.02 N CaCl ₂ , %	60	-
Sieve Test, % ^A	-	0.10
Residue by distillation, %	55	-
Tests on Residue from Distillation Test	min	max
Penetration, 25°C 100g, 5 s	40	90
Ductility, 25°C 5 cm/min, cm	40	-
Solubility in trichloroethylene or n-propyl bromide, %	97.5	-

^A This requirement is waived if successful application of material has been achieved in the field.

SECTION 703 **AGGREGATES**

703.01 Fine Aggregate for Concrete Replace the second paragraph with the following:

“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 organic plate number 3, the fine aggregate shall be rejected.”

703.0201 Alkali Silica Reactive Aggregates. Remove this section in its entirety and replace with the following:

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:

Class F Coal Fly Ash meeting the requirements of AASHTO M 295.

Ground Granulated Blast Furnace Slag (Grade 100 or 120) meeting the requirements of AASHTO M 302.

Densified Silica Fume meeting the requirements of AASHTO M 307.

Lithium based admixtures

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.

703.06 Aggregate for Base and Subbase - Remove the first two paragraphs in their entirety and replace with these:

“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. “

703.081 RAP for Asphalt Pavement

Remove this section in its entirety and replace with the following:

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:

Table 4: Maximum Percent RAP According to Test Results

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	

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 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 or 52-34 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.

703.19 Granular Borrow

Remove the gradation requirements table, and replace with the following:

Sieve Designation	Percentage by Weight Passing Square Mesh Sieves	
	Material for Underwater Backfill	Material for Embankment Construction
6 inch	100	
No. 40	0-70	0-70
No. 200	0-7.0	0-20.0

703.33 Stone Ballast - In the third paragraph, remove the words “less than” before 2.60 and add the words “or greater” after 2.60.

SECTION 708

PAINTS AND PRESERVATIVES

708.05 Timber Preservative Revise this section by removing it in its entirety and replacing with:
“Timber preservatives shall conform to the requirements of AASHTO M 133 and AWPA Standard U1. All preservatives shall meet the requirements of the US EPA regulations under the Federal Insecticide, Fungicide and Rodenticide Act.”

SECTION 709

REINFORCING STEEL AND WELDED STEEL WIRE FABRIC

709.01 Reinforcing Steel Revise this section by removing the sentence starting with “The chemical composition...” in the third paragraph and replace it with the following:
“The chemical composition shall conform to one of the types listed in Table 2 of ASTM A955 or UNS S32304 Duplex.”

SECTION 710

FENCE AND GUARDRAIL

710.07 Guardrail Posts Amend subsection ‘a’ by removing the words “white oak”, “cedar”, “tamarack”, “maple”, “beech”, “birch” and “red oak” from the first sentence. Also in the first sentence, place an “or” between “pine” and “eastern hemlock”. In the second sentence remove the words “well seasoned”. Remove the sentence beginning with “Wood posts and offset brackets...” and replace it with: **“Wood posts and offset brackets shall be preservative treated in accordance with the requirements of AASHTO M 133 and AWPA U1, UC4A Commodity Specification A: Sawn Products.”**

SECTION 712

MISCELLANEOUS HIGHWAY MATERIAL

712.061- Structural Precast Concrete Units

Under the heading, Quality Control and Quality Assurance, revise the fourth paragraph to read:

“Acceptance is the prerogative of the Department. The Department will conduct Quality Assurance (QA) in accordance with Standard Specification Subsection 106.5. Testing deemed necessary by the Department that is in addition to the minimum testing requirements will be scheduled to minimize interference with the production schedule. The QAI will perform acceptance sampling and testing and will witness or review documentation, workmanship and testing to assure the Work is being performed in accordance with the Contract Documents.”

Under the heading, Concrete Testing, revise the first paragraph to read as the following two paragraphs:

“Concrete Testing Acceptance of structural precast units, for each day’s production, will be determined by the Department, based on compliance with this specification and satisfactory concrete testing results.

At least once per week, the QAI will make 2 concrete cylinders (6 cylinders when the Contract includes permeability requirements) for use by the Department; cylinders shall be standard cured in accordance with AASHTO T23 (ASTM C31). The QAI will perform entrained air content and slump flow testing, determine water-cement ratio and determine temperature of the sampled concrete at the time of cylinder casting. All testing equipment required by the QAI to perform this testing shall be in accordance with Standard Specification Section 502.041, Testing Equipment. In addition, the Contractor shall provide a slump cone meeting the requirements of AASHTO T 119. Providing and maintaining testing and curing equipment shall be considered incidental to the work and no additional payment will be made.

Quality Control test cylinders shall be made and tested in accordance with the following standards:

AASHTO T 22 (ASTM C39) Test Method for Compressive Strength of Cylindrical Concrete Specimens

AASHTO T23 (ASTM C31) Practice for Making and Curing Concrete Test Specimens in Field

AASHTO T141 (ASTM C172) Practice for Sampling Freshly Mixed Concrete

AASHTO T152 (ASTM C231) Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method

AASHTO T196 (ASTM C173) Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method

ASTM C1064 Test Method for Temperature of Freshly mixed Portland Cement Concrete

ASTM C1611 Standard Test Method for Slump Flow of Self-Consolidating Concrete”

Under the heading, Concrete Testing, delete the paragraph that begins:

“At least once per week, the Contractor shall make 2 concrete cylinders.....for use by the Department.....”

SECTION 713

STRUCTURAL STEEL AND RELATED MATERIAL

Section 713.01- Structural Steel Revise this Section by removing the sentence:

“Impact test sampling and testing procedures shall be in accordance with AASHTO T.”

And replace it with: **“Impact test sampling and testing procedures shall be in accordance with AASHTO T 243 M/T 243 and AASHTO T 244.”**

SECTION 717

ROADSIDE IMPROVEMENT MATERIAL

717.02 Agricultural Ground Limestone

In the table after the third paragraph which starts with “Liquid lime...” change the Specification for Nitrogen (N) from “15.5 percent of which 1% is from ammoniac nitrogen and 14.5 /5 is from Nitrate Nitrogen” to read **“15.5 % of which 1% is from Ammoniacal Nitrogen and 14.5 % is from Nitrate Nitrogen”**

717.061 Erosion Control Blankets Revise this section by removing it in its entirety and replacing it with the following:

“717.061 Erosion Control Blankets Shall consist of a machine produced rolled blanket of biodegradable fibers, evenly distributed over the entire area of blanket, of a consistent thickness, sewn into a biodegradable mesh on the top and bottom surface using a cotton blend thread. The blanket shall remain in place when subject to shear stress of 1.55 lb/ft². The blanket shall remain intact until grass is established. The blanket shall be a product currently listed on the department’s Qualified Products List (QPL) of Erosion Control Products. See Section 618.10 - Seeding, Maintenance and Acceptance.”

SECTION 720

STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS

720.10 Wood Utility Pole Amend the first sentence in this section by adding “, **Red Pine**” after “Douglas Fir”.

Replace the paragraph beginning with “Wood Utility poles...” with:

“Wood Utility poles shall be pressure treated, after fabrication in accordance with AASHTO Specifications M 133 and AWP A U1, UC4B, Commodity Specification D: Poles.”

720.12 Wood Sign Posts Remove the first sentence and replace with **“Wood sign posts shall be rectangular, straight and sound timber, cut from live growing native spruce, red pine, hemlock or cedar trees, free from loose knots or other structurally weakening defects of importance, such as shake or holes or heart rot.”**

Remove the paragraph beginning with “When pressure treated sign posts are called for on the plans ...” with **“When pressure treated sign posts are called for on the plans, the wood shall be Yellow Pine, Number 2 or better, or the species listed above. The pressure treated wood shall meet AASHTO M 133 and AWP A Standard U1, UC4A, Commodity Specification A: Sawn Products.”**



LAP Environmental Summary Sheet

WIN: 21784.00

Date Submitted: September 19, 2018

Town: Falmouth

ENV Team Leader: Danielle Tetreau, Maine DOT

ENV Field Contact: Jay Reynolds, Town of Falmouth

NEPA Complete: State funds NEPA completed with ACOE permit
State Funds Only

Letter 11 Submitted: not applicable

☐ **Section 106**
SHPO Concurrence No Effect Programmatic Agreement (B)
Special Conditions:

☐ **Section 4(f) and 6(f)**
Section 4(f)
No USDOT Funds
Section 6(f)
Not Applicable

☐ **Maine Department of Inland Fisheries and Wildlife Essential Habitat**
Not Applicable Timing Window: Not Applicable

☒ **Section 7**

Species of Concern: Atlantic salmon DPS/CH
Comments/References: In water work shall be conducted between July 15 and September 30 of any year in order to minimize potential impacts to fisheries and local water quality.

Species of Concern: Northern long-eared bat
Comments/References: All tree cutting shall occur between October 19 and April 19 of any year to the maximum extent practicable and no tree cutting shall occur between June 1 and July 31 of any year in order to minimize potential impacts to federally threatened northern long-eared bats.

☐ **Essential Fish Habitat**
Review Complete – No effect

☒ **Stormwater Review**
Review Complete – Not Applicable

☒ **Hazardous Waste Review**
Complete General Note for Hazardous Waste

☒ **State and Federal Permits**
Letter 12 submitted 10/26/2017
Copies of approvals submitted n/a

☒ **Special Provisions Required**

Special Provision 105-Timing of Work Restriction	N/A <input checked="" type="checkbox"/>	Applicable <input type="checkbox"/>
Special Provision 656-Minor Soil Disturbance	N/A <input checked="" type="checkbox"/>	Applicable <input type="checkbox"/>
Standard Specification 656-Erosion Control Plan	N/A <input type="checkbox"/>	Applicable <input checked="" type="checkbox"/>
Special Provision 203-Dredge Spec	N/A <input checked="" type="checkbox"/>	Applicable <input type="checkbox"/>
General Note for Hazardous Waste	N/A <input type="checkbox"/>	Applicable <input checked="" type="checkbox"/>
Special Provision 203-Hazardous Waste	N/A <input checked="" type="checkbox"/>	Applicable <input type="checkbox"/>

Comments:

Applicable Standards and Permits are included with the contract

**All approvals based on plans/scope as of: 10/26/2017*



REPLY TO
ATTENTION OF

DEPARTMENT OF THE ARMY
NEW ENGLAND DISTRICT, CORPS OF ENGINEERS
696 VIRGINIA ROAD
CONCORD, MASSACHUSETTS 01742-2751

MAINE GENERAL PERMIT (GP)
AUTHORIZATION LETTER AND SCREENING SUMMARY

NATHAN POORE, MANAGER
TOWN OF FALMOUTH
271 FALMOUTH ROAD
FALMOUTH, MAINE 04105

CORPS PERMIT # NAE-2017-02640
CORPS GP ID# 17-615
STATE ID# PBR

DESCRIPTION OF WORK:

Place temporary and permanent fill below the ordinary high water line of unnamed streams and in adjacent freshwater wetlands at Falmouth, Maine in order to reconstruct a 1.3 mile section of Route 100/26 with associated culvert replacements and reconstruction of portions of Leighton and Mountain Roads. The project will result in approximately 1,258 s.f. of permanent and 255 s.f. of temporary stream bed impact; and 8,015 s.f. of permanent wetland impact. This work is shown on the attached plans entitled "FALMOUTH, MAINE ROUTE 100/26" in 41 sheets undated.

LAT/LONG COORDINATES : 43.736172° N -70.297712° W USGS QUAD: PORTLAND WEST, ME

I. CORPS DETERMINATION:

Based on our review of the information you provided, we have determined that your project will have only minimal individual and cumulative impacts on waters and wetlands of the United States. Your work is therefore authorized by the U.S. Army Corps of Engineers under the enclosed Federal Permit, the Maine General Permit (GP). Accordingly, we do not plan to take any further action on this project.

You must perform the activity authorized herein in compliance with all the terms and conditions of the GP [including any attached Additional Conditions and any conditions placed on the State 401 Water Quality Certification including any required mitigation]. Please review the enclosed GP carefully, including the GP conditions beginning on page 5, to familiarize yourself with its contents. You are responsible for complying with all of the GP requirements; therefore you should be certain that whoever does the work fully understands all of the conditions. You may wish to discuss the conditions of this authorization with your contractor to ensure the contractor can accomplish the work in a manner that conforms to all requirements.

If you change the plans or construction methods for work within our jurisdiction, please contact us immediately to discuss modification of this authorization. This office must approve any changes before you undertake them.

Condition 38 of the GP (page 16) provides one year for completion of work that has commenced or is under contract to commence prior to the expiration of the GP on October 13, 2020. You will need to apply for reauthorization for any work within Corps jurisdiction that is not completed by October 13, 2021.

This authorization presumes the work shown on your plans noted above is in waters of the U.S. Should you desire to appeal our jurisdiction, please submit a request for an approved jurisdictional determination in writing to the undersigned.

No work may be started unless and until all other required local, State and Federal licenses and permits have been obtained. This includes but is not limited to a Flood Hazard Development Permit issued by the town if necessary.

II. STATE ACTIONS: PENDING [], ISSUED [X], DENIED [] DATE 12/29/17

APPLICATION TYPE: PBR: , TIER 1: , TIER 2: , TIER 3: X, LURC: , DMR LEASE: , NA:

III. FEDERAL ACTIONS:

JOINT PROCESSING MEETING: 10/26/17 LEVEL OF REVIEW: CATEGORY 1: CATEGORY 2: X

AUTHORITY (Based on a review of plans and/or State/Federal applications): SEC 10 , 404 X 10/404 , 103

EXCLUSIONS: The exclusionary criteria identified in the general permit do not apply to this project.

FEDERAL RESOURCE AGENCY OBJECTIONS: EPA_NO , USF&WS_NO , NMFS_NO

If you have any questions on this matter, please contact my staff at 207-623-8367 at our Manchester, Maine Project Office. In order for us to better serve you, we would appreciate your completing our Customer Service Survey located at http://corpsmapu.usace.army.mil/cm_apex/f?p=136:4:0

Jay L. Clement
JAY L. CLEMENT
SENIOR PROJECT MANAGER
MAINE PROJECT OFFICE

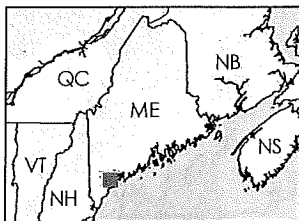
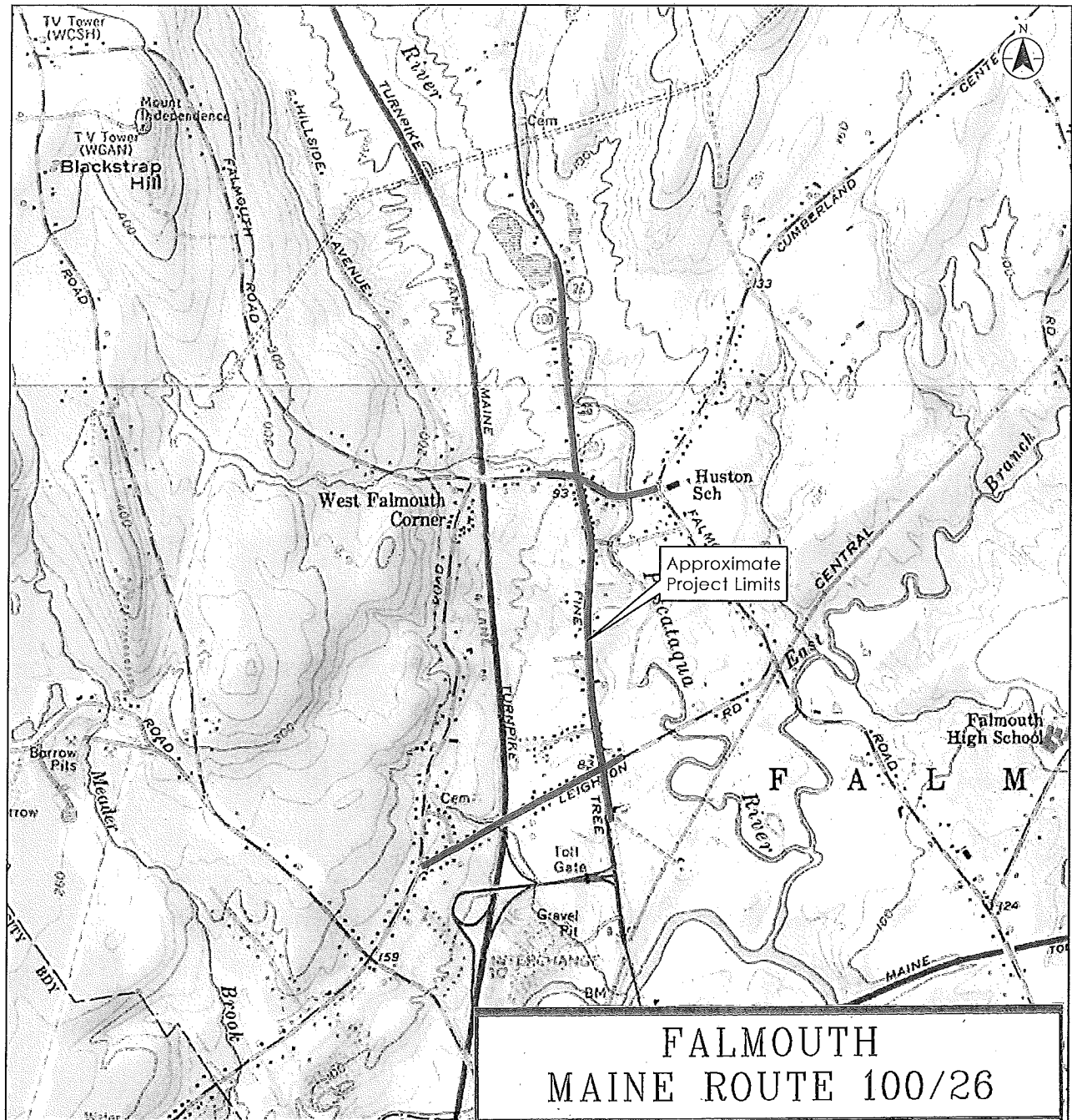
for Jay L. Clement 1/18/18
FRANK J. DEL GIUDICE
CHIEF, PERMITS & ENFORCEMENT BRANCH
REGULATORY DIVISION



**US Army Corps
of Engineers®**
New England District

**PLEASE NOTE THE FOLLOWING ADDITIONAL CONDITIONS FOR
DEPARTMENT OF THE ARMY
GENERAL PERMIT
NO. NAE-2017-02640**

1. This authorization requires you to 1) notify us before beginning work so we may inspect the project, and 2) submit a Compliance Certification Form. You must complete and return the enclosed Work Start Notification Form(s) to this office at least two weeks before the anticipated starting date. You must complete and return the enclosed Compliance Certification Form within one month following the completion of the authorized work and any required mitigation (but not mitigation monitoring, which requires separate submittals).
2. The permittee shall assure that a copy of this permit is at the work site whenever work is being performed and that all personnel performing work at the site of the work authorized by this permit are fully aware of the terms and conditions of the permit. This permit, including its drawings and any appendices and other attachments, shall be made a part of any and all contracts and sub-contracts for work which affects areas of Corps of Engineers' jurisdiction at the site of the work authorized by this permit. This shall be done by including the entire permit in the specifications for the work. If the permit is issued after construction specifications but before receipt of bids or quotes, the entire permit shall be included as an addendum to the specifications. The term "entire permit" includes permit amendments. Although the permittee may assign various aspects of the work to different contractors or sub-contractors, all contractors and sub-contractors shall be obligated by contract to comply with all environmental protection provisions of the entire permit, and no contract or sub-contract shall require or allow unauthorized work in areas of Corps of Engineers jurisdiction.
3. Adequate sedimentation and erosion control devices, such as geotextile silt fences or other devices capable of filtering the fines involved, shall be installed and properly maintained to minimize impacts during construction. These devices must be removed upon completion of work and stabilization of disturbed areas. The sediment collected by these devices must also be removed and placed upland, in a manner that will prevent its later erosion and transport to a waterway or wetland.
4. All exposed soils resulting from the construction will be promptly seeded and mulched in order to achieve vegetative stabilization.
5. All areas of temporary fill shall be restored to their original contour and character upon completion of the project.
6. In water work shall be conducted between July 15 and September 30 of any year in order to minimize potential impacts to fisheries and local water quality.
7. All tree cutting shall occur between October 16 and April 19 of any year to the maximum extent practicable and no tree cutting shall occur between June 1 and July 31 of any year in order to minimize potential impacts to federally threatened northern long-eared bats.



Legend
 — Approximate Project Limits

0 2,000
 Feet
 1 inch = 2,000 feet (At page size of 8.5"x11")



Project Location 1953504000
 Falmouth, Maine
 Prepared by EHX on 2017-03-31
 Quality Review by KYN on 2017-04-13
 Independent Review by KYN on 2017-04-12

Client/Project
 Town of Falmouth, Maine
 Route 100/26 Road Improvements

Figure No.
 1
 Title

Project Location Map

Notes
 1. Coordinate System: ME 2000 State Plane Maine West Zone Feet
 2. Topographic base map provided by ArcGIS online World Topographic Map
 (http://server.arcgisonline.com/arcgis/services/World_Topo_Map/MapServer/)

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Portland West
 43.736172
 -70.297712

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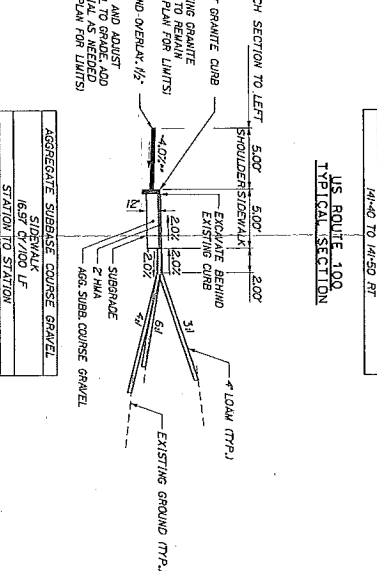
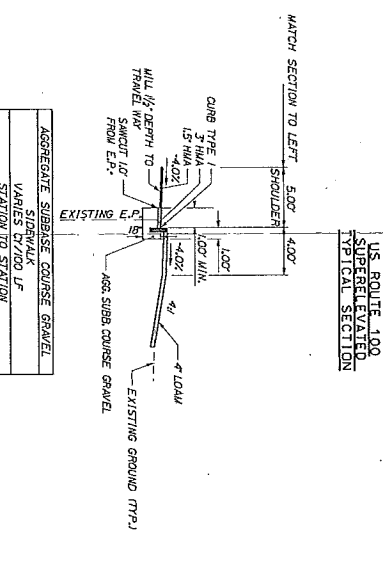
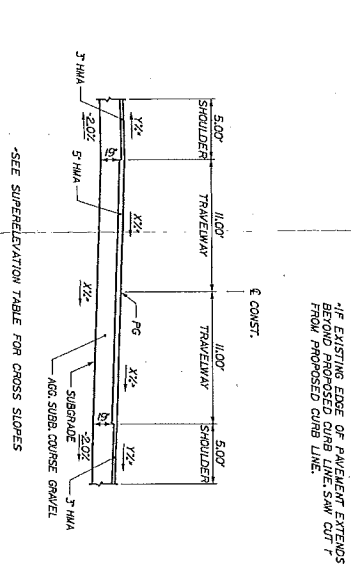
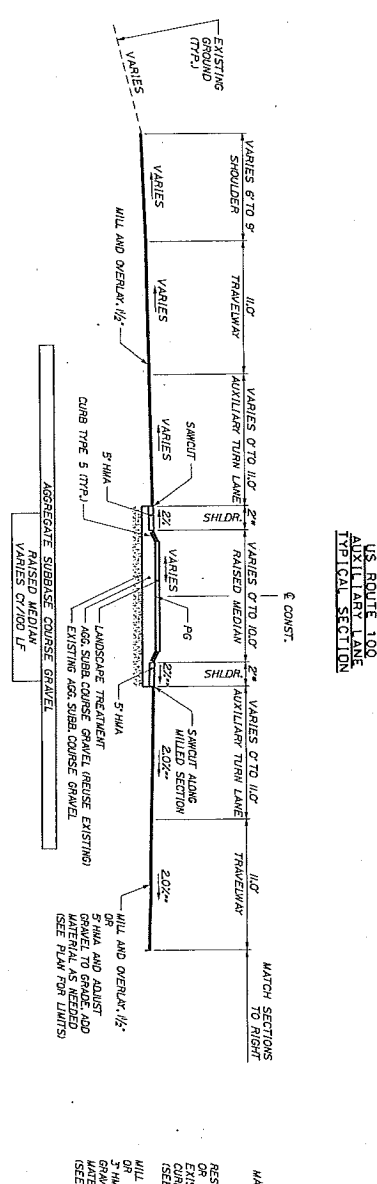
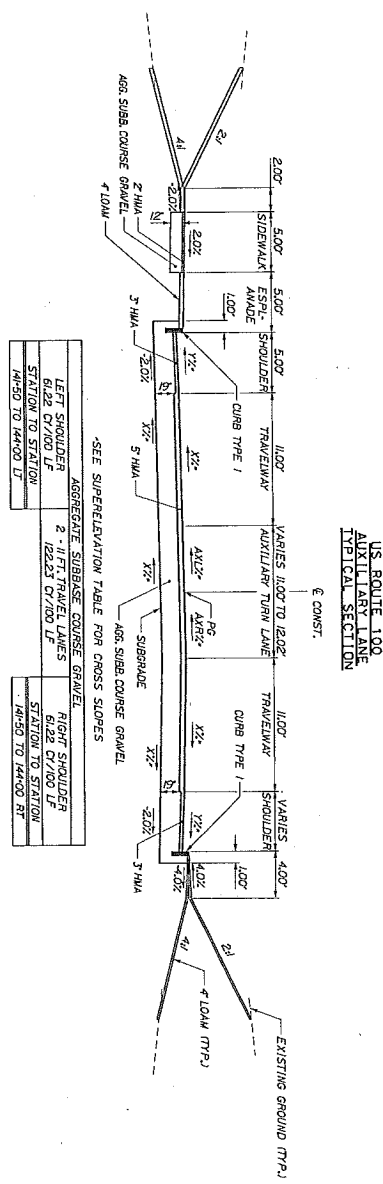
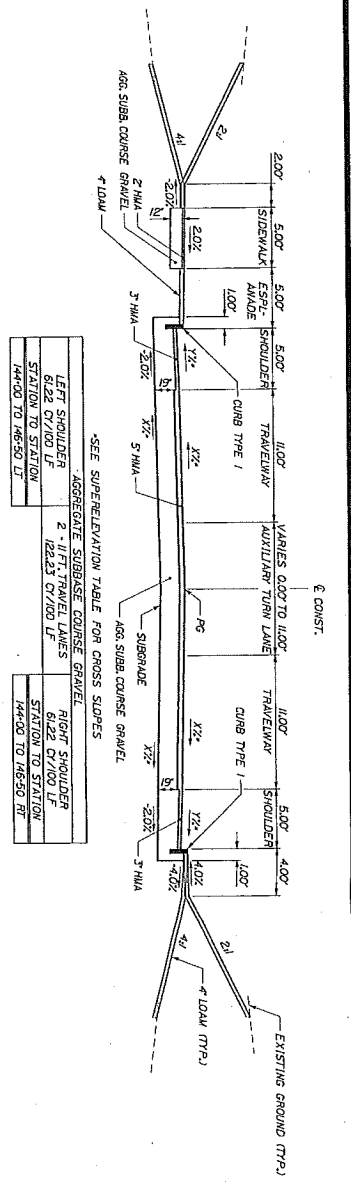
LAYOUT SCALE



Scale in Feet

PROJECT LOCATION:	ROUTE 100/26 -100' NORTH OF ROBERTS ROAD TO 200' NORTH OF LIBBY BRIDGE, LEIGHTON RD FROM BROOK ST TO 500' EAST OF ROUTE 100/26, MOUNTAIN RD AND FALMOUTH ST - 300' WEST OF ROUTE 100/26 TO WINK ST.
PROGRAM AREA:	MULTIMODAL / LAP
SCOPE OF WORK:	HIGHWAY RECONSTRUCTION WITH ALIGNMENT, DRAINAGE, AND INTERSECTION IMPROVEMENTS, LANDSCAPING, AND PUBLIC SAN. SEWER

OF 175 SHEET NUMBER 1	FALMOUTH MAINE ROUTE 100/26		PROJECT INFORMATION PROGRAM MULTIMODAL LIP PROJECT MANAGER BRIAN FEEZER DESIGNER WISK DEBOWSKI CONSULTANT STATEEC		STATE OF MAINE DEPARTMENT OF TRANSPORTATION	
	TITLE SHEET		SIGNATURE _____ P.E. NUMBER _____ DATE _____		APPROVED _____ DATE _____ COMMISSIONER: _____ CHIEF ENGINEER: _____	



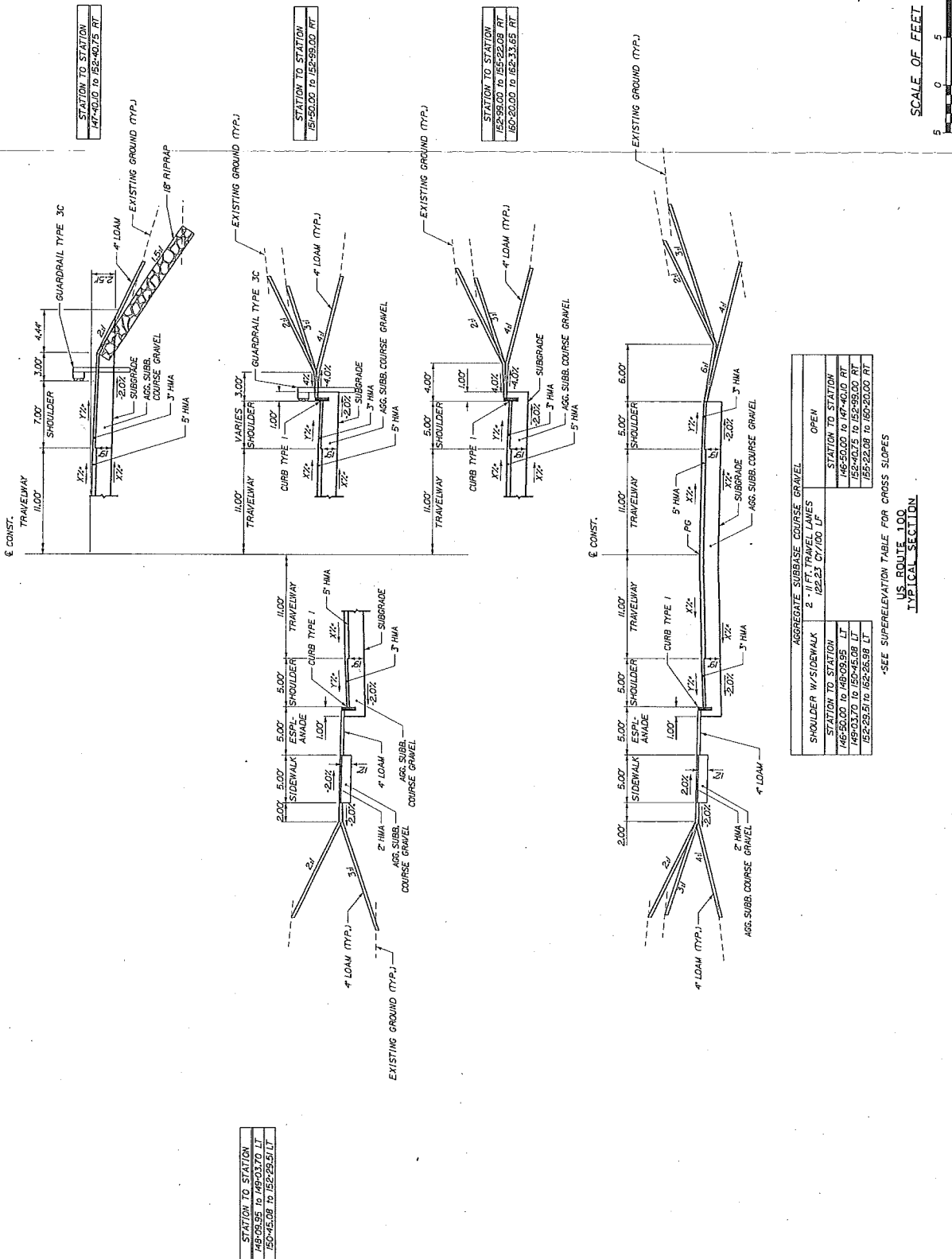
US ROUTE 100
AUXILIARY LANE
TYPICAL SECTION
STA. 13+50 TO 14+50

US ROUTE 100
TYPICAL SECTION
STA. 13+50 TO 14+50

FALMOUTH
MAINE ROUTE 100\26
TYPICAL SECTIONS

SIGNATURE	P.F. NUMBER	DATE
(Signature)	07-06-98	AB

STATE OF MAINE	WIN	WIN 21784.00	HIGHWAY PLANS
DEPARTMENT OF TRANSPORTATION			

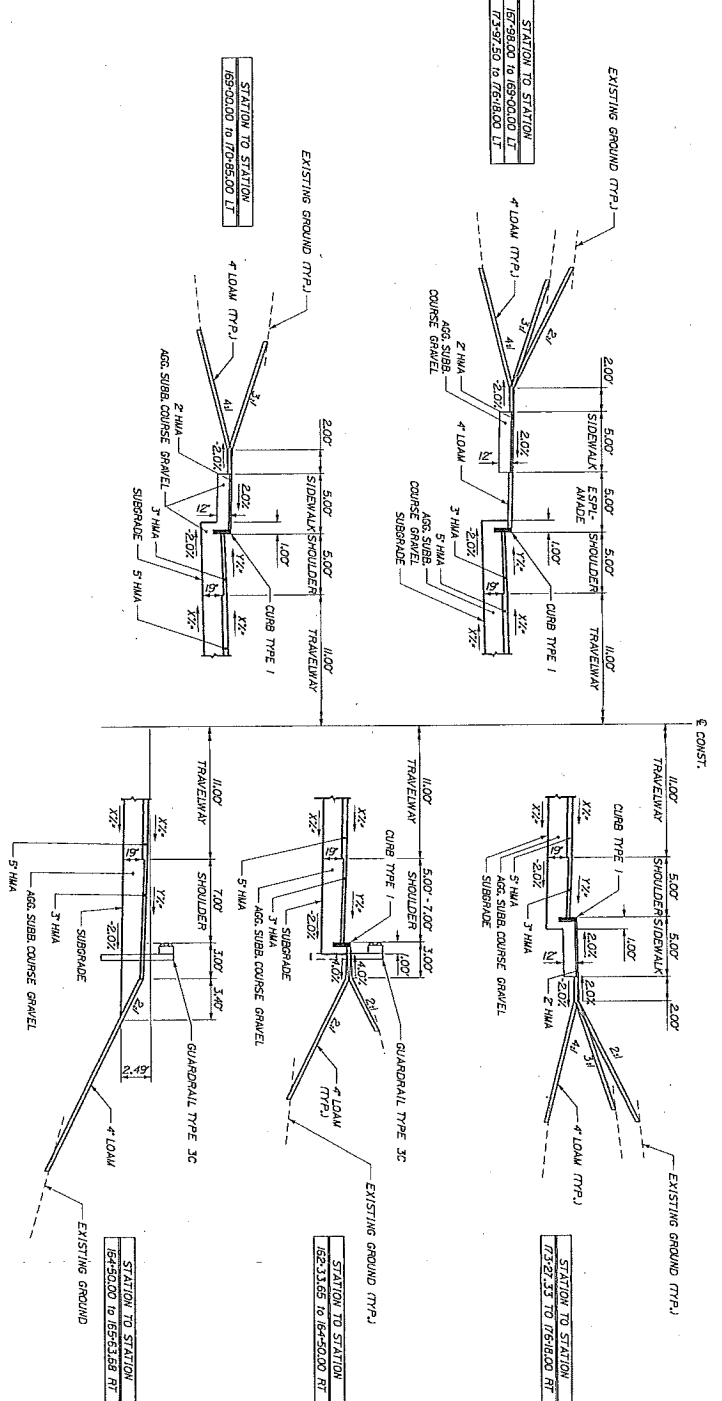
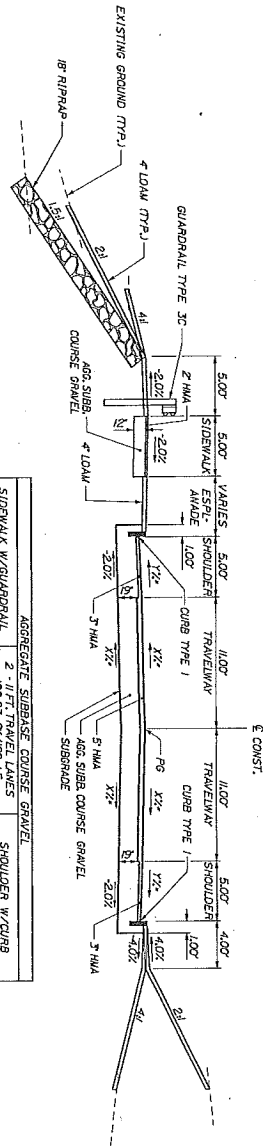


US ROUTE 100
CURBED AND GUARDRAIL TYPICAL SECTION

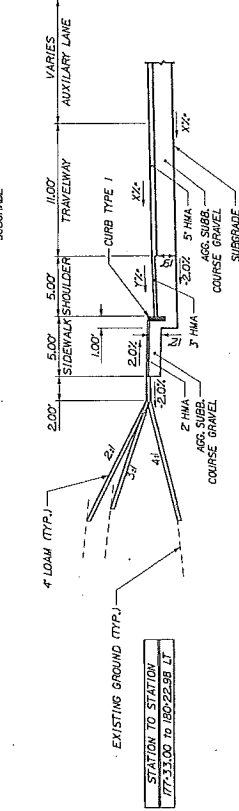
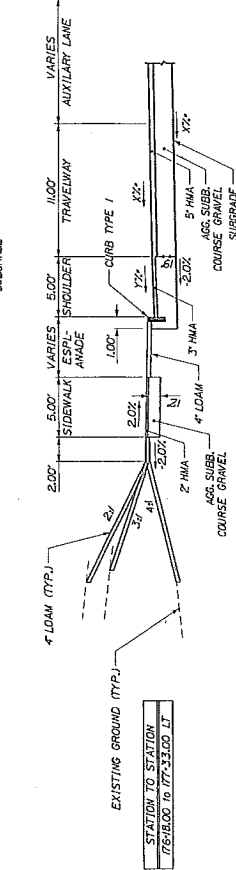
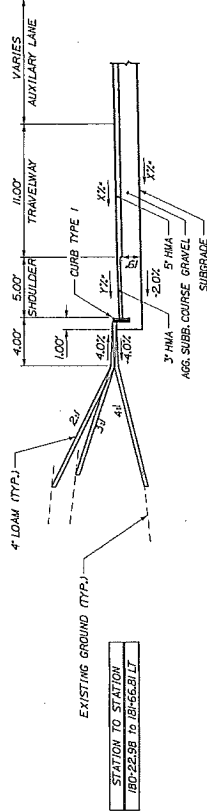
SEE SUPERELEVATION TABLE FOR CROSS SLOPES

AGGREGATE SUBBASE COURSE GRAVEL	
SIDEWALK W/GUARDRAIL	2 - 11 FT. TRAVEL LANES
STATION TO STATION	122.23 CY/100 LF
STATION TO STATION	162-26.98 TO 167-99.00 LT
STATION TO STATION	165-43.68 TO 173-27.33 RT
STATION TO STATION	170-55.00 TO 173-97.50 LT

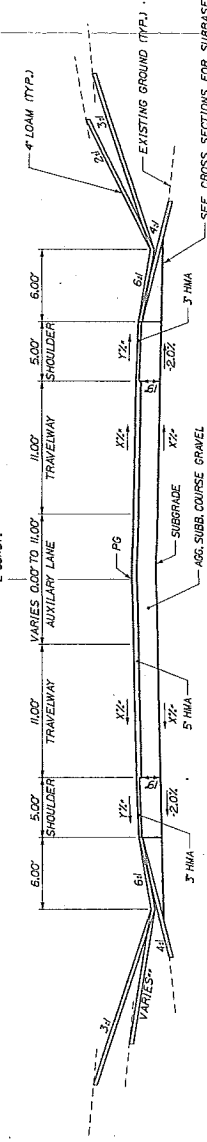
SCALE OF FEET
5 0 5 10



± CONST.



± CONST.



LEFT SHOULDER	2 - 11 FT. TRAVEL LANES	RIGHT SHOULDER
STATION TO STATION	184+55.00 LF	STATION TO STATION
184+55.00	189+33.89	189+33.89

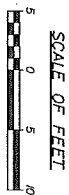
SEE SUPERELEVATION TABLE FOR CROSS SLOPES
SEE CROSS-SECTIONS FOR BACKSLOPES

US ROUTE 100
AUXILIARY LANE
TYPICAL SECTION

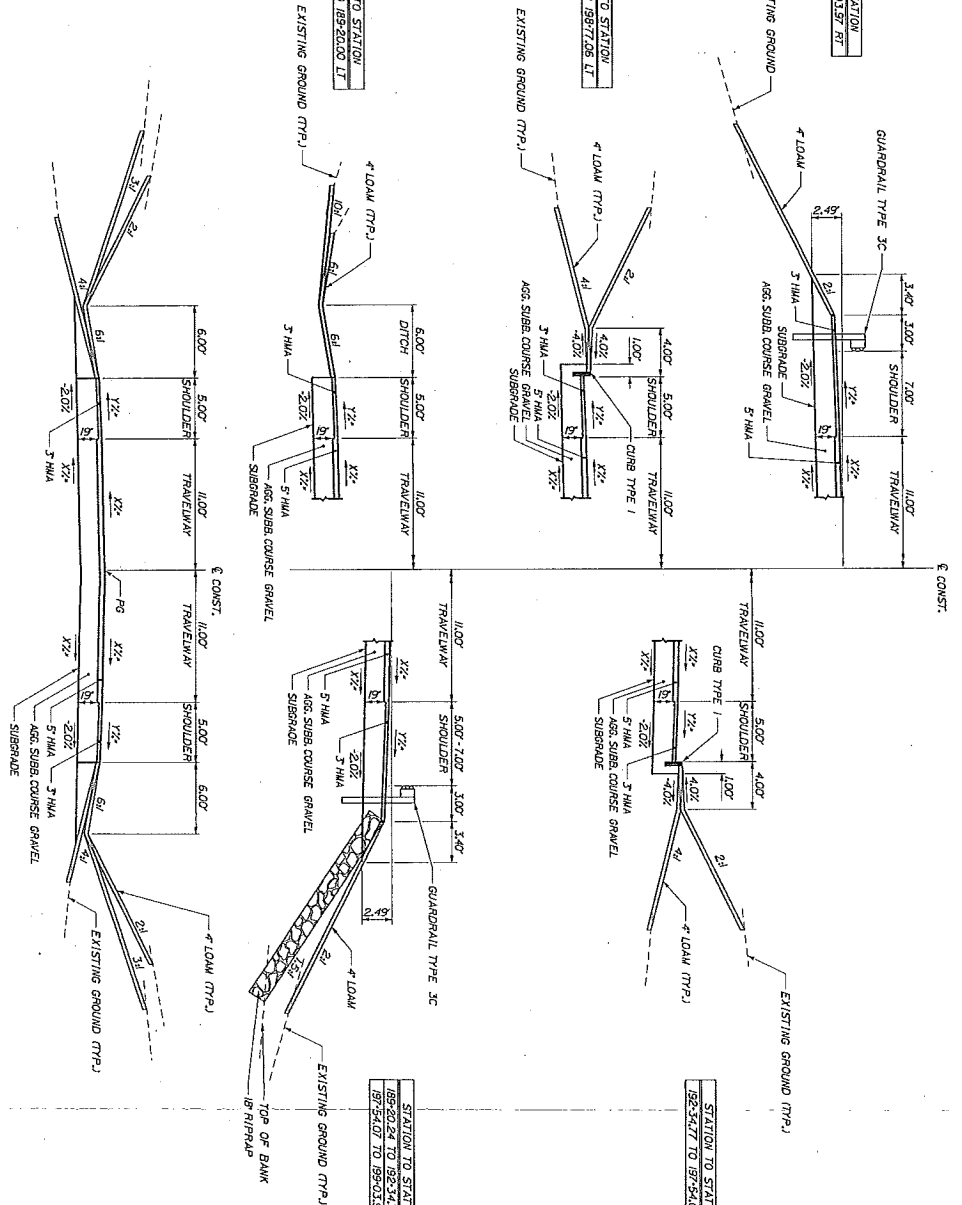


US ROUTE 100
CURBED AND GUARDRAIL TYPICAL SECTION

SEE SUPERELEVATION TABLE FOR CROSS SLOPES



AGGREGATE SUBBASE COURSE GRAVEL	
SHOULDER	2 - 11 FT. TRAVEL LANE
STATION TO STATION	122.23 CV/100 LF
189-20.00 TO 194-02.00 LT	
SHOULDER	
STATION TO STATION	
189-20.00 TO 194-02.00 LT	



FALMOUTH
MAINE ROUTE 100\26
TYPICAL SECTIONS

FROM MANAGER	APPROPRIATE	BY	DATE
DESIGN-DETAILED	189-20.00	189-20.00	189-20.00
DESIGN-DETAILED	189-20.00	189-20.00	189-20.00
DESIGN-DETAILED	189-20.00	189-20.00	189-20.00
REVISIONS	1	1	1
REVISIONS	2	2	2
REVISIONS	3	3	3
REVISIONS	4	4	4
FILE CHANGE	1	1	1

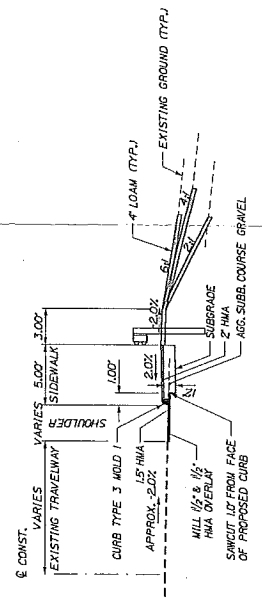
STATE OF MAINE DEPARTMENT OF TRANSPORTATION	
SIGNATURE	P.E. NUMBER
DATE	
WIN 21784.00	HIGHWAY PLANS

SHEET NUMBER
7
OF 175

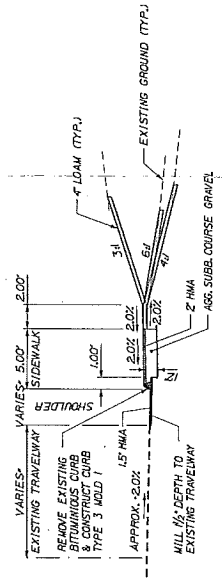
OF 175

PROJECT NUMBER	100\26
DATE	10/17/19
SIGNATURE	
DATE	

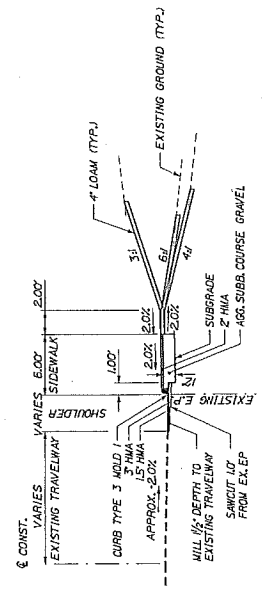
FALMOUTH
MAINE ROUTE 100\26
TYPICAL SECTIONS



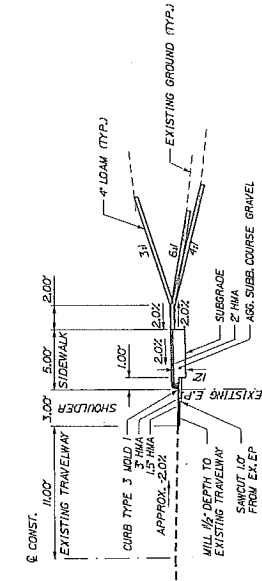
STATION TO STATION
24+30.00 TO 24+57.93 RT
LEIGHTON ROAD
TYPICAL SECTION



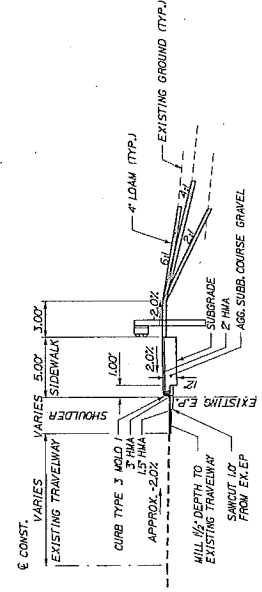
STATION TO STATION
24+58.93 TO 33+32.00 RT
LEIGHTON ROAD
TYPICAL SECTION



STATION TO STATION
20+50.00 TO 20+53.84 RT
LEIGHTON ROAD
TYPICAL SECTION

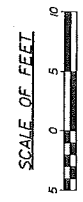


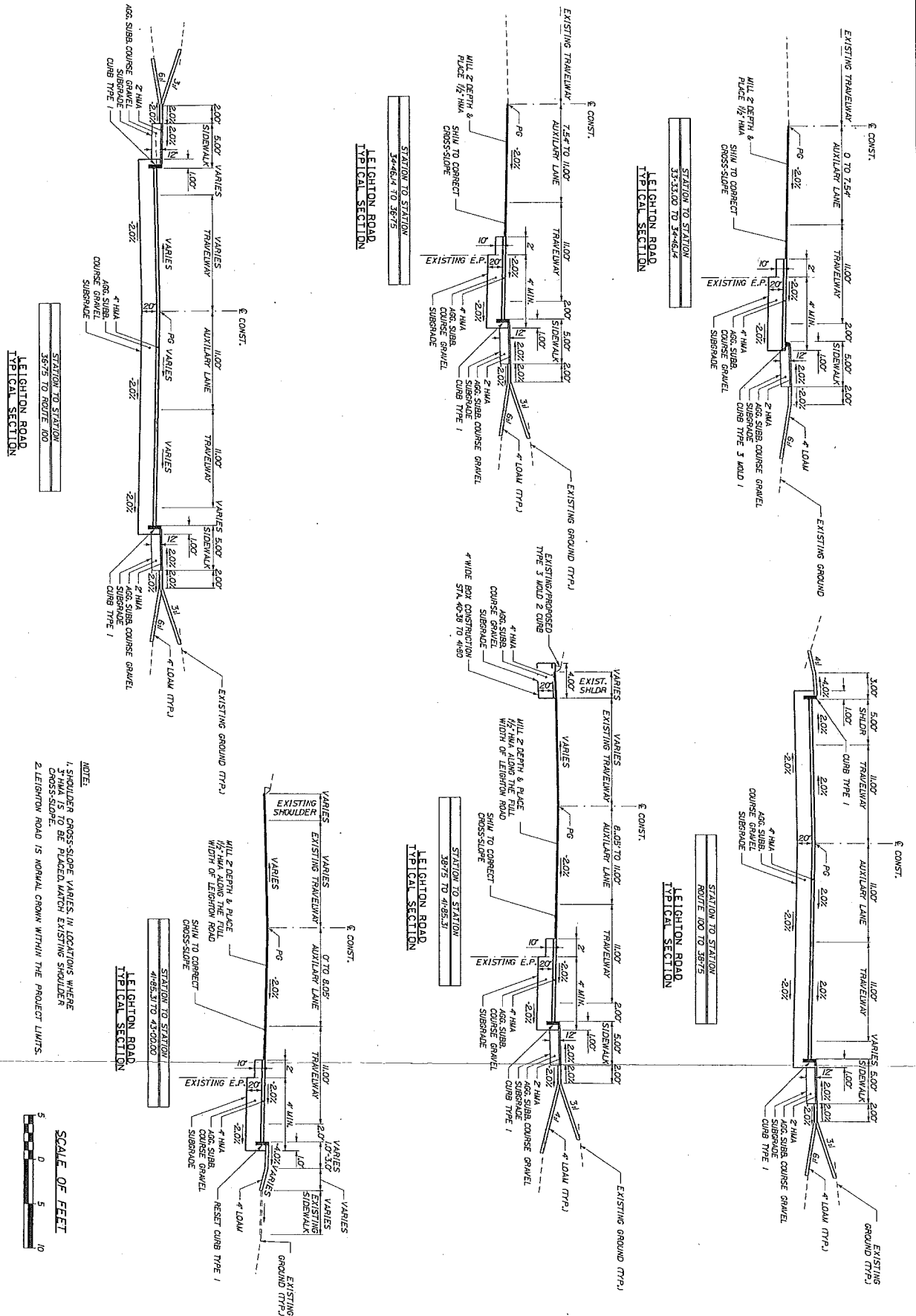
STATION TO STATION
19+71.39 TO 20+45.00 RT
LEIGHTON ROAD
TYPICAL SECTION



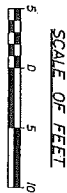
STATION TO STATION
20+45.00 TO 20+45.00 RT
LEIGHTON ROAD
TYPICAL SECTION

NOTE:
1. SHOULDER CROSS-SLOPE VARIES IN LOCATIONS WHERE EXISTING SHOULDER CANNOT BE PLACED, MATCH EXISTING SHOULDER CROSS-SLOPE.
2. LEIGHTON ROAD IS NORMAL CROWN WITHIN THE PROJECT LIMITS.





- NOTE:
1. SHOULDER CROSS-SLOPE VARIES IN LOCATIONS WHERE CROSS-SLOPE.
 2. LEIGHTON ROAD IS NORMAL CROWN WITHIN THE PROJECT LIMITS.



FALMOUTH
MAINE ROUTE 100\26
TYPICAL SECTIONS

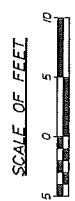
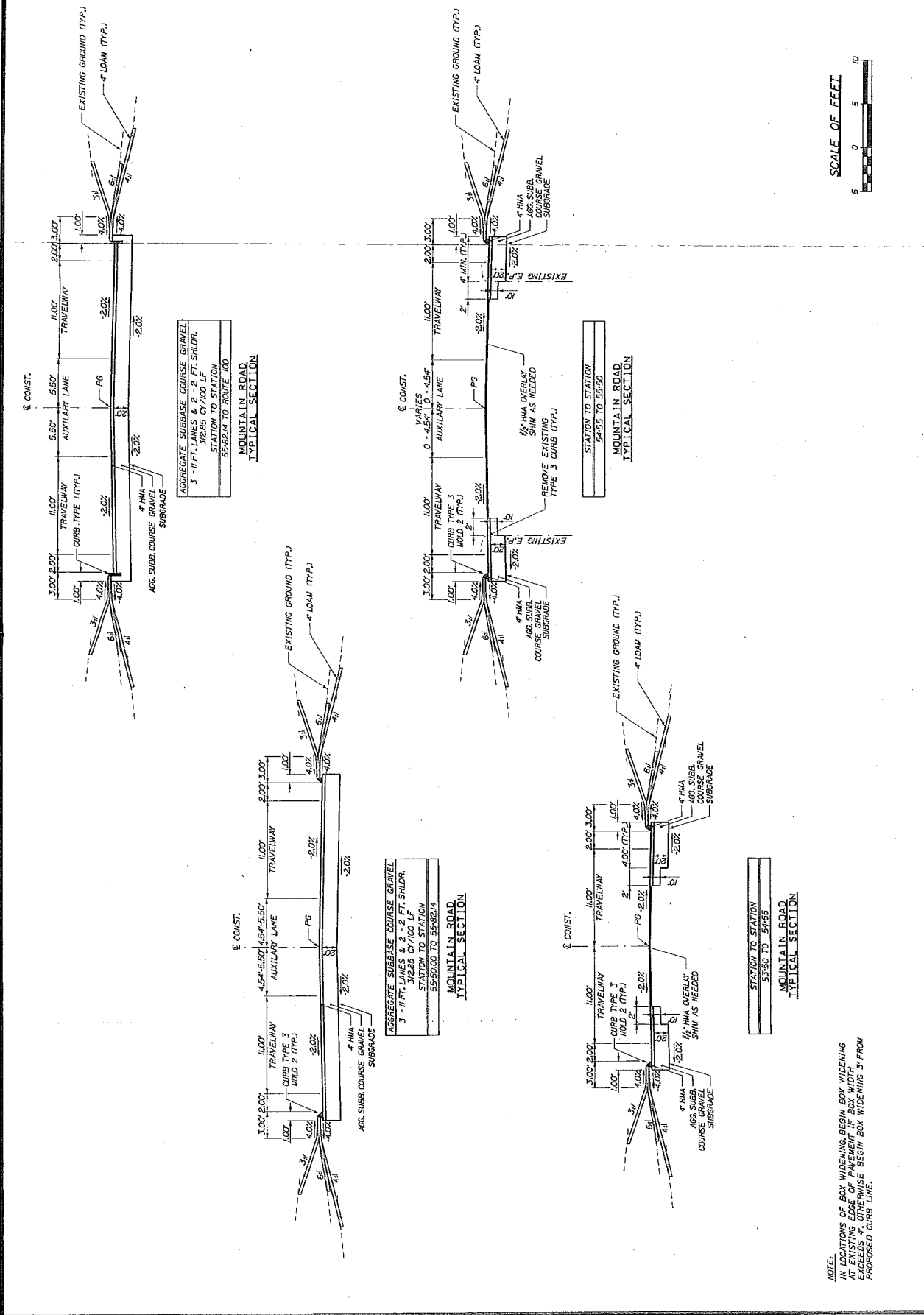
SHEET NUMBER

11

OF 175

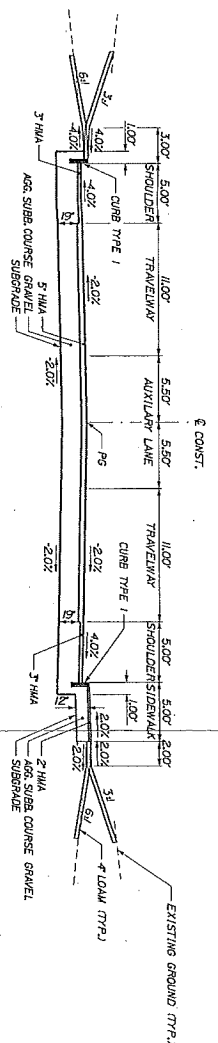
PROJ. MANAGER	PROGRAM/ANCHOR	BY	DATE
DESIGN-DETAILED	10/10/17	10/10/17	10/10/17
CHECKED-REVIEWED	10/10/17	10/10/17	10/10/17
DESIGN-DETAILED	10/10/17	10/10/17	10/10/17
CHECKED-REVIEWED	10/10/17	10/10/17	10/10/17
REVISIONS	1	10/10/17	10/10/17
REVISIONS	2	10/10/17	10/10/17
REVISIONS	3	10/10/17	10/10/17
REVISIONS	4	10/10/17	10/10/17
FIELD CHANGES	10/10/17	10/10/17	10/10/17

STATE OF MAINE DEPARTMENT OF TRANSPORTATION	
SIGNATURE	DATE
P.E. NUMBER	DATE
WIN 21784.00	HIGHWAY PLANS

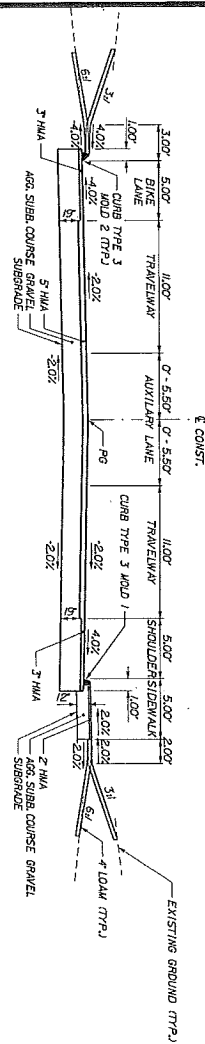


NOTE:
IN LOCATIONS OF BOX WIDENING, BEGIN BOX WIDENING
EXCEEDS 4', OTHERWISE BEGIN BOX WIDENING 3' FROM
PROPOSED CURB LINE.

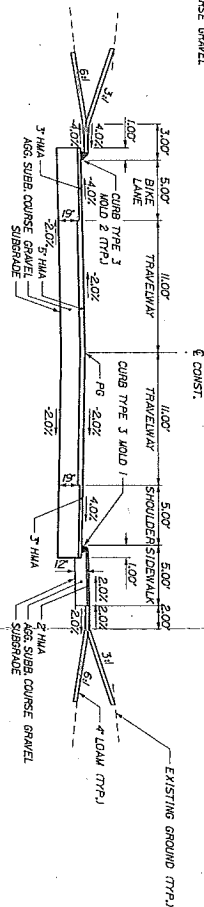
PALMOUTH ROAD - SUPERELEVATION TABLE				
LT. SHOULDER	TRAVELWAY	STATION	TRAVELWAY	RT. SHOULDER
-4.0	-2.0	ROUTE 100	-2.0	-4.0
		TO		
-4.0	-2.0	56+75	-2.0	-4.0
-4.0	-2.0	60+00	-1.2	-4.0
-4.0	-2.0	66+50	0.4	-4.0
-4.0	-2.0	61+00	2.0	-4.0
-4.0	-2.0	61+50	3.0	2.0



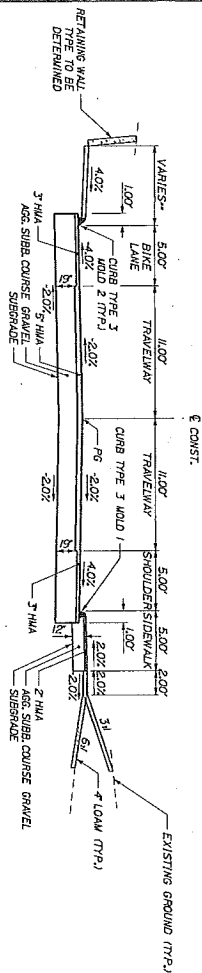
FALMOUTH ROAD WITH AUXILIARY LANE
TYPICAL SECTION



FALMOUTH ROAD WITH AUXILIARY LANE
TYPICAL SECTION



STATION TO STATION
59-55.00 TO 59-75.00
EALMOUTH ROAD
TYPICAL SECTION

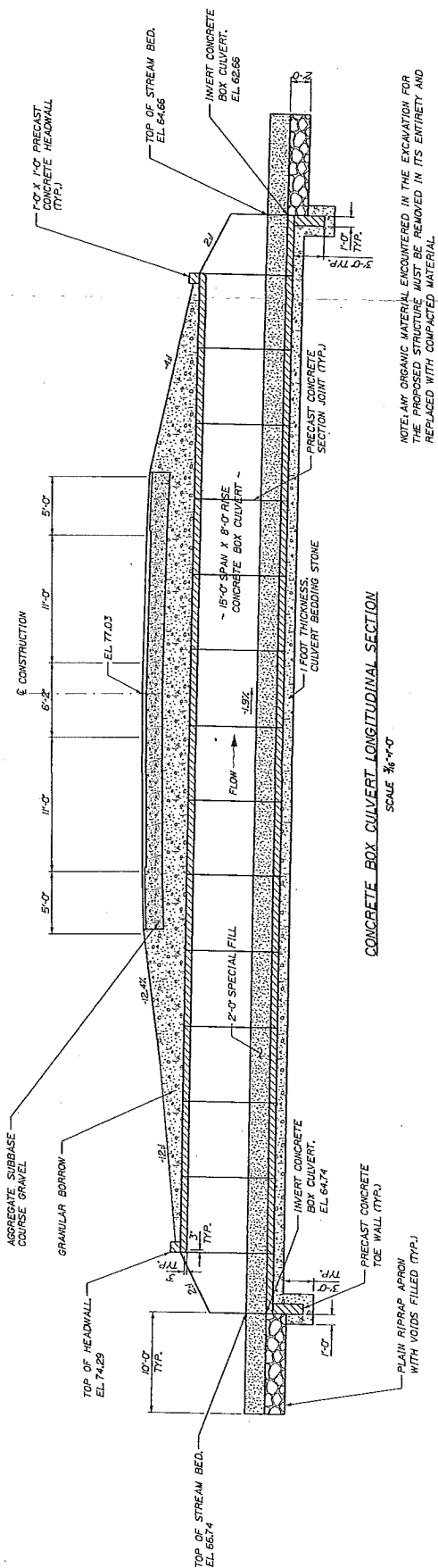


FALMOUTH ROAD WITH RETAINING WALL
TYPICAL SECTION

* SEE SUPERELEVATION TABLE FOR CROSS SLOPES
** LOCATION OF RETAINING WALL IS DEFINED
BY THE SIGHTLINE FOR THE HORIZONTAL
CURVE.

SCALE OF FEET

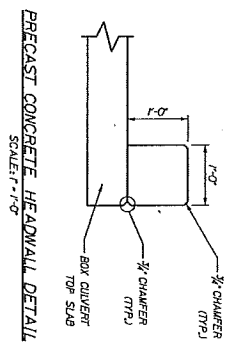




NOTE: ANY ORGANIC MATERIAL ENCOUNTERED IN THE EXCAVATION FOR THE PROPOSED STRUCTURE MUST BE REMOVED IN ITS ENTIRETY AND REPLACED WITH COMPACTED MATERIAL.

CONCRETE BOX CULVERT LONGITUDINAL SECTION

SCALE $\frac{1}{16}'' = 1'-0''$



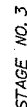
PRECAST CONCRETE HEADWALL DETAIL
SCALE: 1"=1'-0"

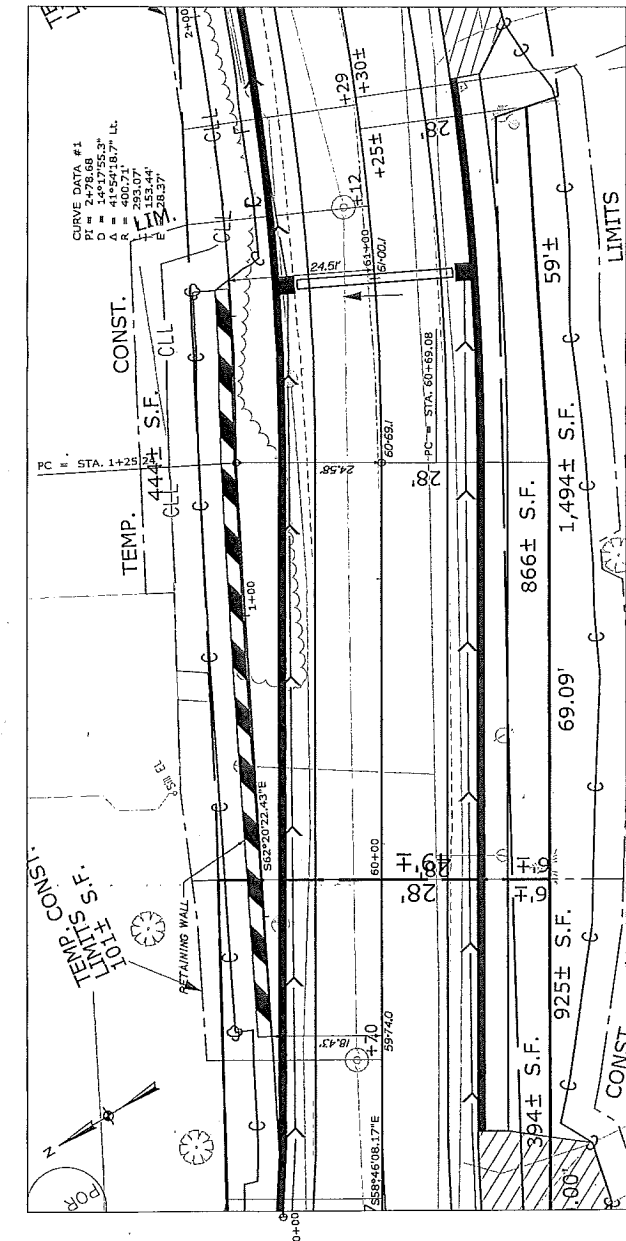
RIPRAP LAYOUT
SCALE: 1/4" = 1'-0"

STATE OF MAINE	
DEPARTMENT OF TRANSPORTATION	
WIN	
WIN 21784.00	HIGHWAY PLANS

SHEET NUMBER	FALMOUTH MAINE ROUTE 100\26
	RILEY BRIDGE, NUMBER 6570 DETAILS - STA. 184+66

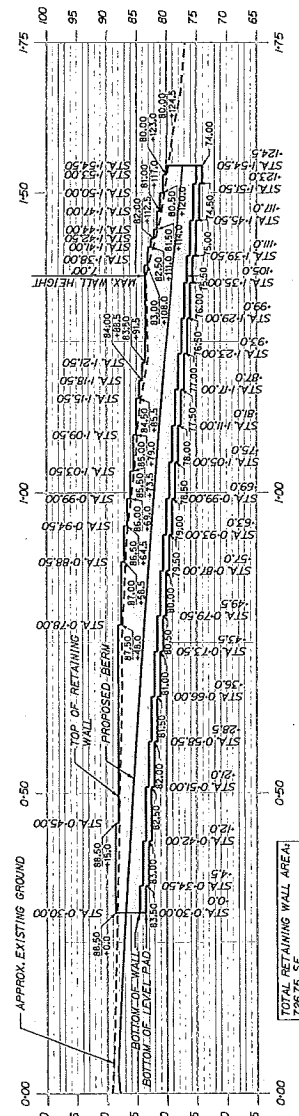
STAGE 4 -
PLACE BASE PAVEMENT. PLACE SURFACE PAVEMENT.



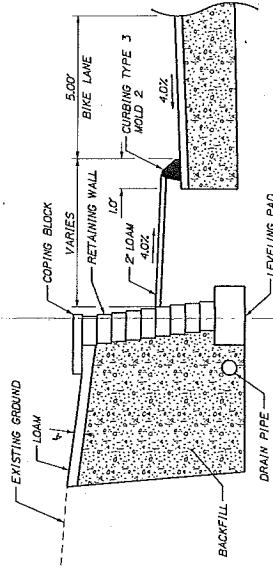


HIGHWAY PLAN

SCALE OF FEET

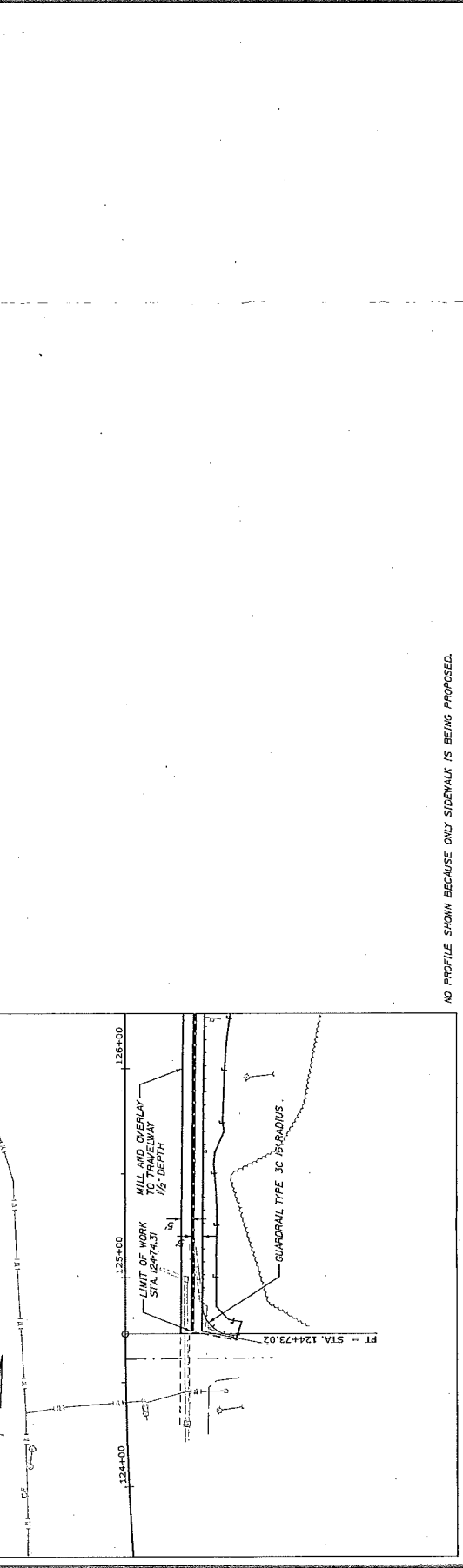
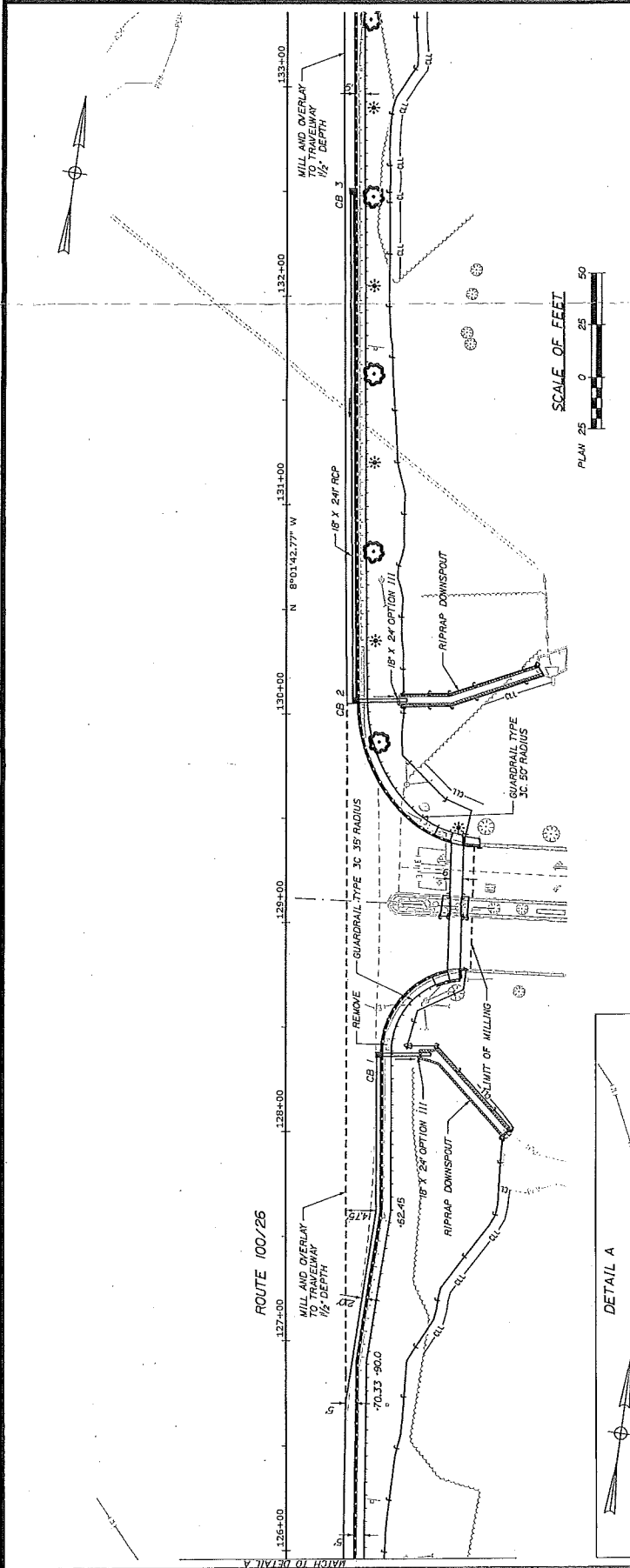


RETAINING WALL ELEVATION



TYPICAL SECTION
NOT TO SCALE

- RETAINING WALL NOTES
1. THE CONTRACTOR SHALL PROVIDE THE RETAINING WALL DESIGN. REQUIRED DESIGN SHALL BE STAMPED BY A PROFESSIONAL ENGINEER LICENSED IN THE STATE OF MAINE AND THE DESIGN SHALL BE REVIEWED BY THE MAINE DEPARTMENT OF TRANSPORTATION FOR REVIEW. PLANS DETAILS ARE SHOWN FOR ESTIMATING PURPOSES ONLY.
 2. DRAINAGE SHALL BE INCLUDED IN THE DESIGN OF THE WALL. WALL DRAINAGE SHALL BE CONSIDERED INCIDENTAL TO WALL ITEM.
 3. A MINIMUM EMBEDEDMENT DEPTH OF 2 FEET MEASURED TO THE TOP OF THE LEVELING PAD WILL BE REQUIRED.
 4. END AND STANDARD COPING NOT SHOWN ON PLAN AND ELEVATION VIEWS.
 5. PROPOSED ELEVATIONS ARE ASSUMED BASED ON BLOCK DIMENSIONS OF 16" X 8" ACTUAL ELEVATIONS MAY VARY DEPENDING UPON ACTUAL DIMENSIONS.
 6. COMMON EXCAVATION INCLUDED IN THE ESTIMATED IS FOR NECESSARY EXCAVATION OF THE BERM EXCAVATION REQUIRED BEHIND AND BELOW THE PROPOSED WALL WILL BE CONSIDERED INCIDENTAL TO THE WALL ITEM.
 7. ANY DAMAGE TO THE STRUCTURE CAUSED BY THE CONTRACTOR'S WORK OR EQUIPMENT SHALL BE REPAIRED TO THE SATISFACTION OF THE RESIDENT AT THE CONTRACTOR'S EXPENSE.



NO PROFILE SHOWN BECAUSE ONLY SIDEWALK IS BEING PROPOSED.



WIN	
WIN 21784.00	HIGHWAY PLANS

PROJ. MANAGER	SPRAC. MANAGER	BY	DATE	SIGNATURE	P.E. NUMBER	DATE
DESIGN-DETAILED	DESIGNER	DRAWER	PROJ. DATE			
CHECKED-REVIEWED	CHECKED BY	CHECKED BY	CHECKED DATE			
DESIGN-DETAILED	DESIGNER	DRAWER	PROJ. DATE			
DESIGN-DETAILED	DESIGNER	DRAWER	PROJ. DATE			
REVISIONS 1	REVISION	REVISION	REVISION DATE			
REVISIONS 2	REVISION	REVISION	REVISION DATE			
REVISIONS 3	REVISION	REVISION	REVISION DATE			
REVISIONS 4	REVISION	REVISION	REVISION DATE			
FIELD MANAGER	FIELD ENGINEER	FIELD DATE				

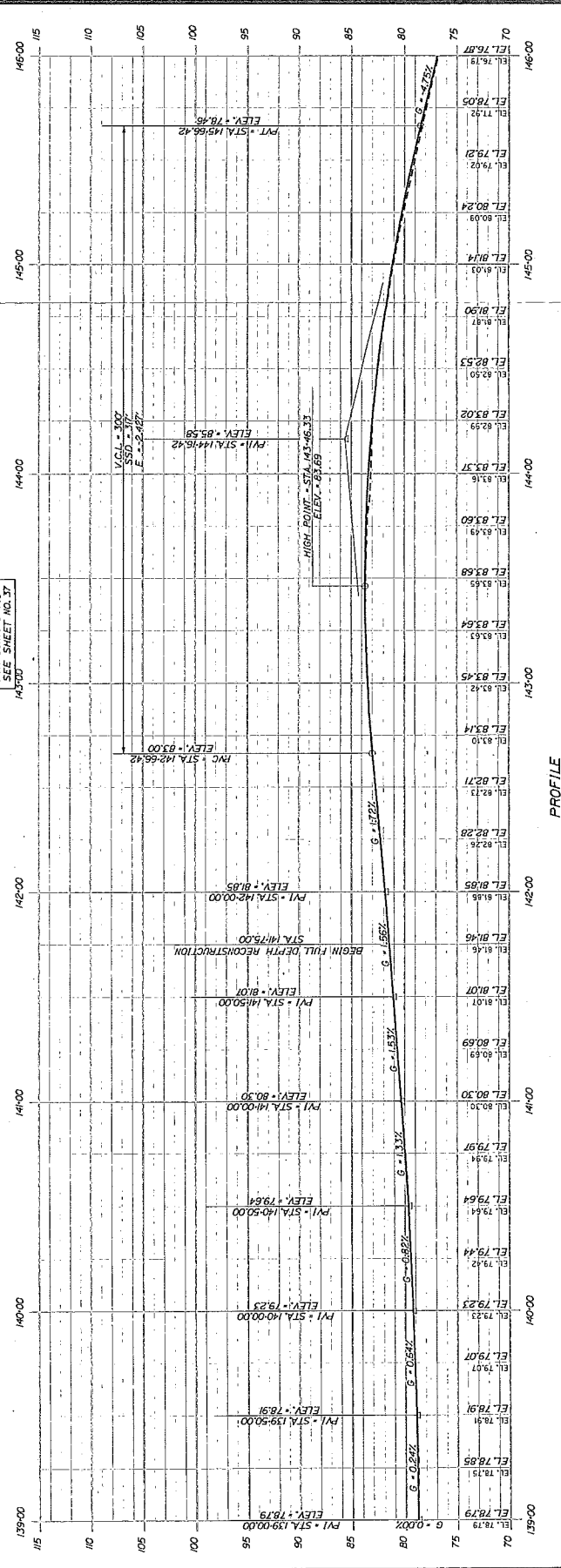
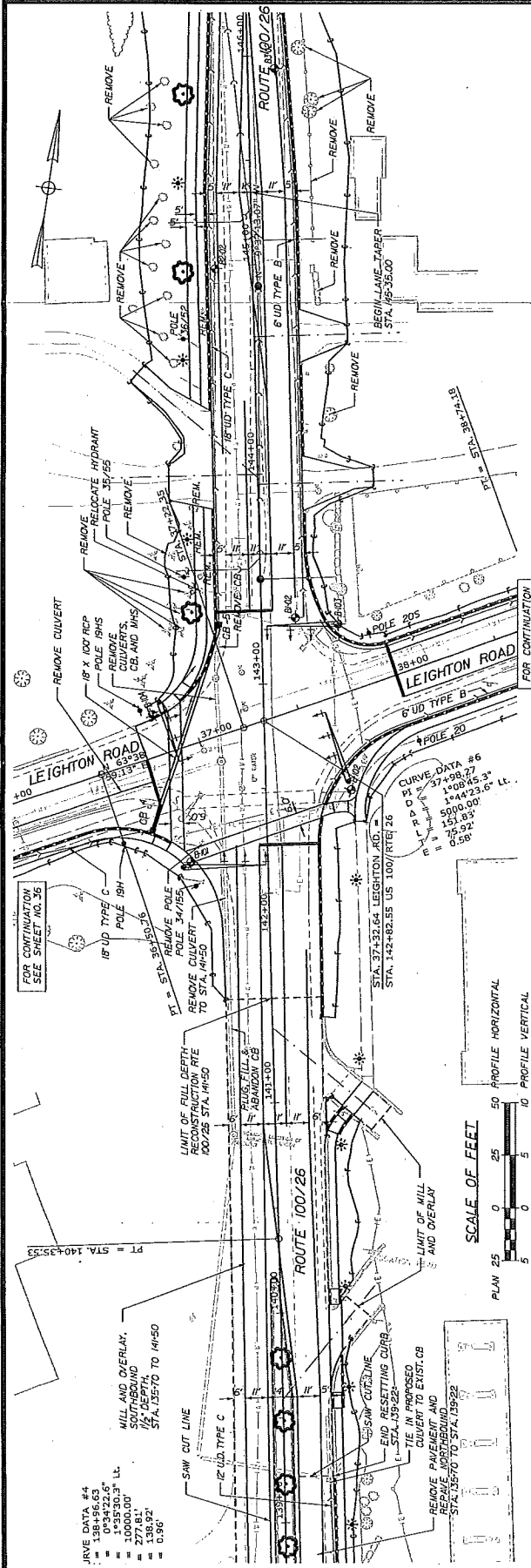
PLANS

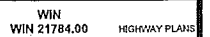
23
OF 175

DATE	BY	DATE	BY
DESIGNED	ENGINEER	DESIGNED	ENGINEER
CHECKED	ENGINEER	CHECKED	ENGINEER
APPROVED	ENGINEER	APPROVED	ENGINEER
DATE	BY	DATE	BY
PROJECT NUMBER	PROJECT NUMBER	PROJECT NUMBER	PROJECT NUMBER
SIGNATURE	SIGNATURE	SIGNATURE	SIGNATURE

FALMOUTH
MAINE ROUTE 100\26
PLANS

SHEET NUMBER
24
OF 175

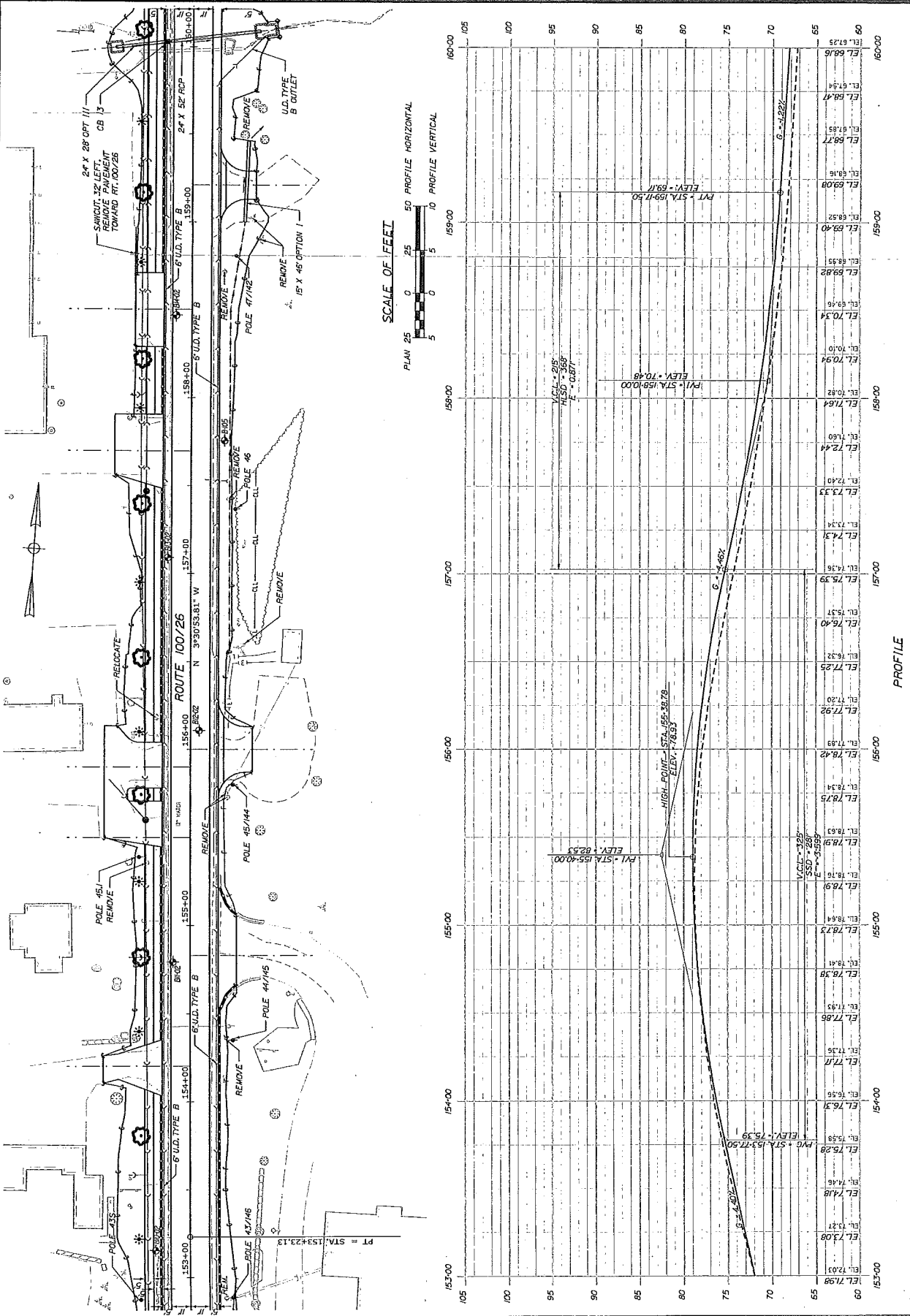




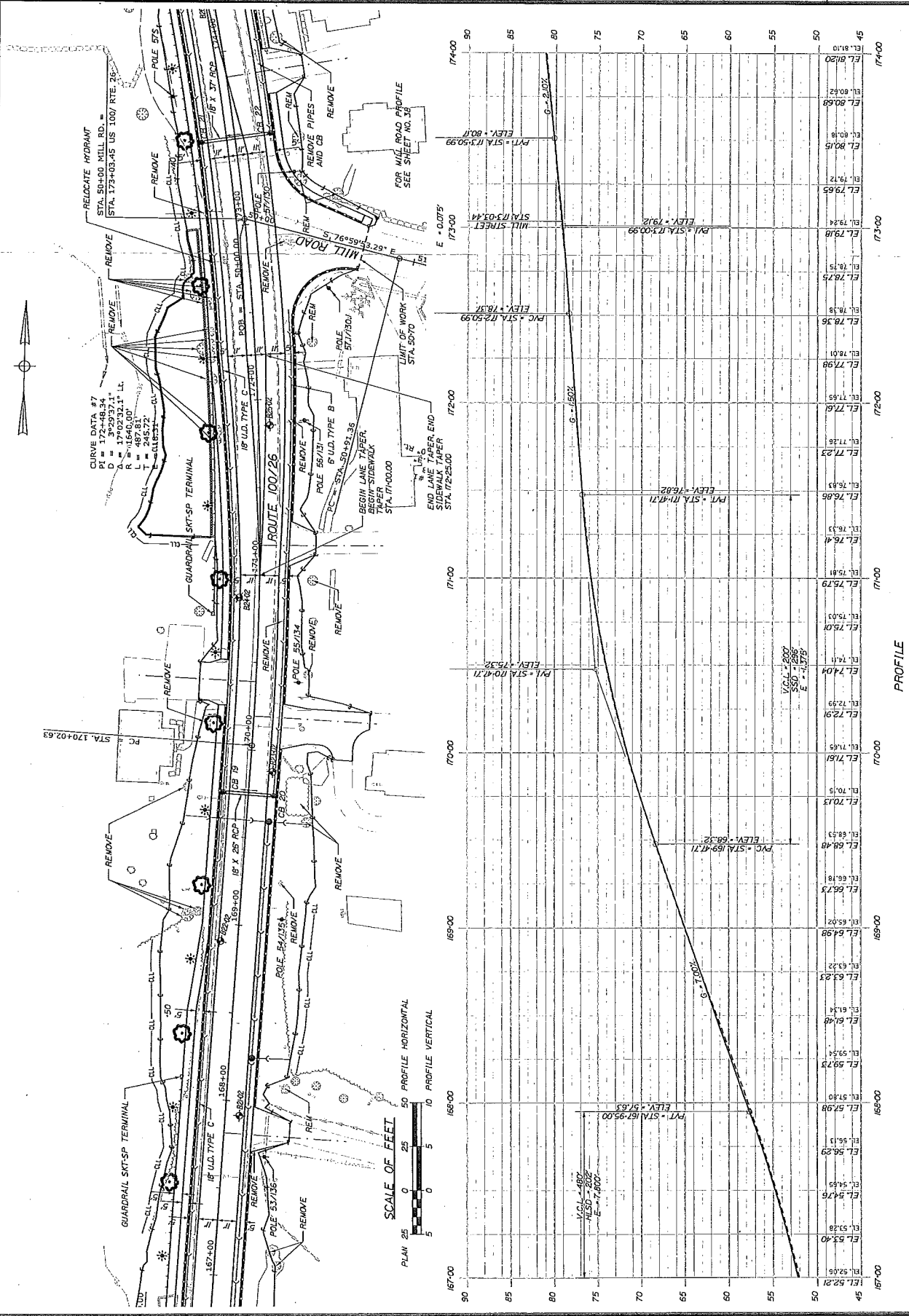
PLANS

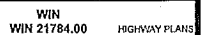
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STATE OF MAINE DEPARTMENT OF TRANSPORTATION	WIN WIN 21784.00 HIGHWAY PLANS
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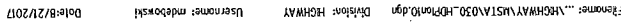


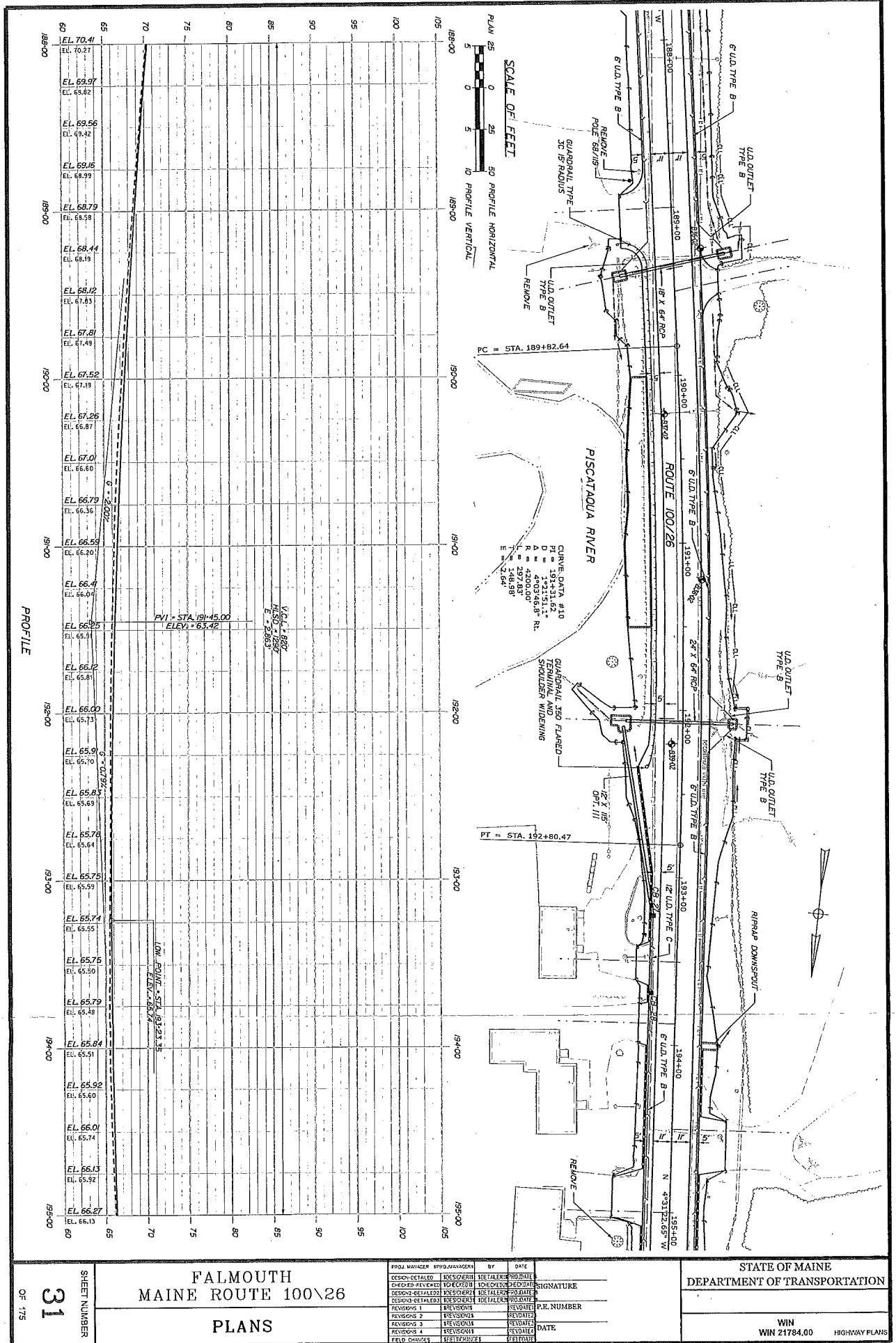






DEPARTMENT OF TRANSPORTATION STATE OF MAINE	WIN WIN 21784.00 HIGHWAY PLANS
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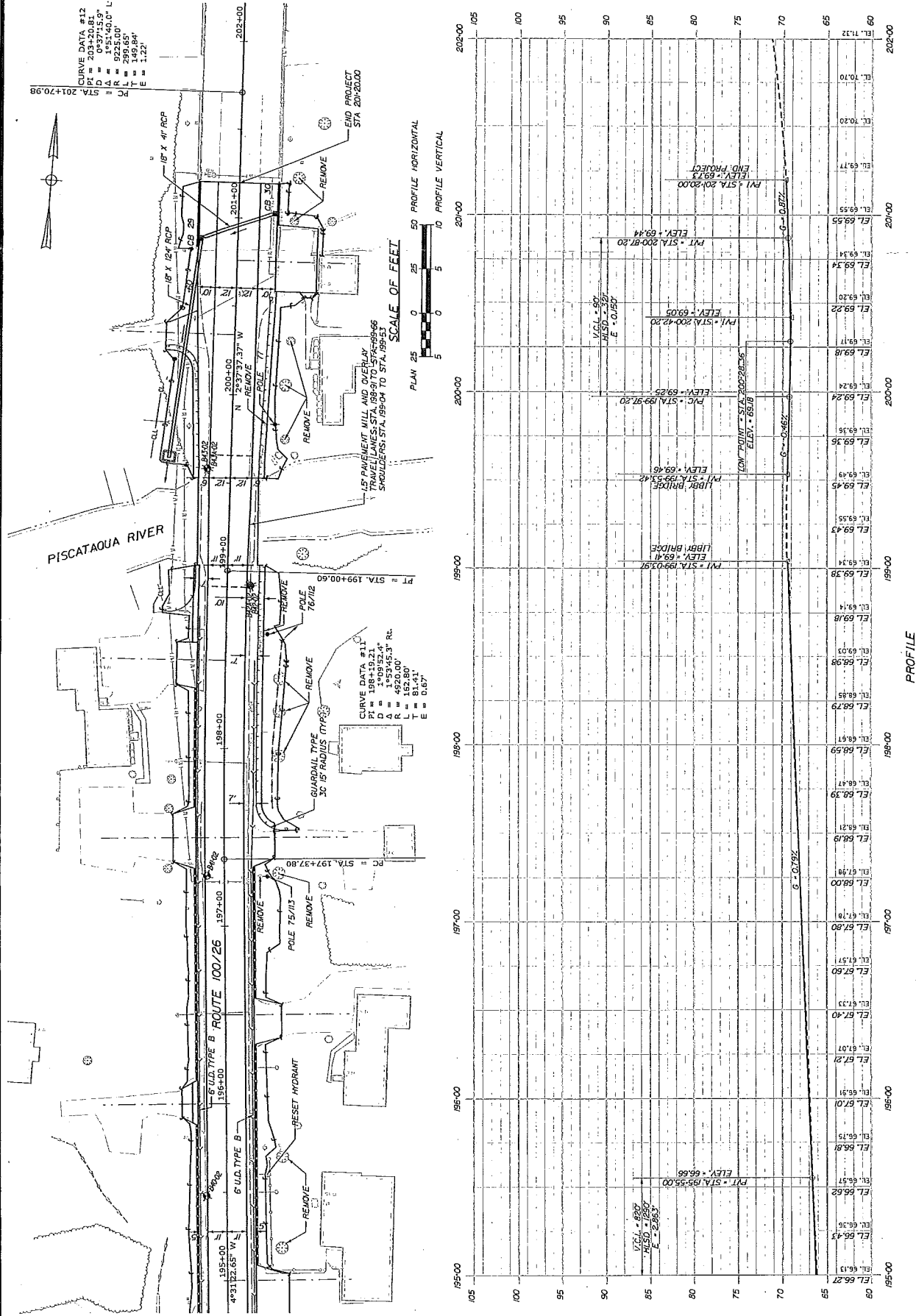




PLANS

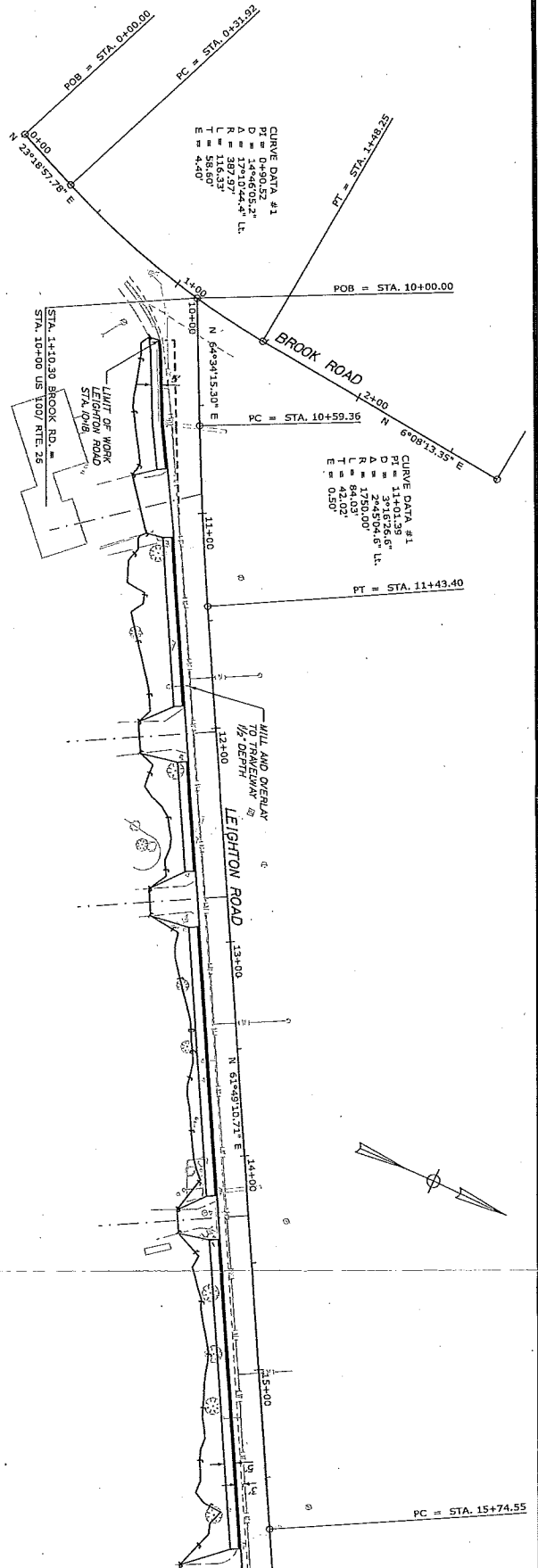
DATE	P.F. NUMBER	SIGNATURE
1975-01-01	1975-01-01	1975-01-01
1975-01-02	1975-01-02	1975-01-02
1975-01-03	1975-01-03	1975-01-03
1975-01-04	1975-01-04	1975-01-04
1975-01-05	1975-01-05	1975-01-05
1975-01-06	1975-01-06	1975-01-06
1975-01-07	1975-01-07	1975-01-07
1975-01-08	1975-01-08	1975-01-08
1975-01-09	1975-01-09	1975-01-09
1975-01-10	1975-01-10	1975-01-10
1975-01-11	1975-01-11	1975-01-11
1975-01-12	1975-01-12	1975-01-12
1975-01-13	1975-01-13	1975-01-13
1975-01-14	1975-01-14	1975-01-14
1975-01-15	1975-01-15	1975-01-15
1975-01-16	1975-01-16	1975-01-16
1975-01-17	1975-01-17	1975-01-17
1975-01-18	1975-01-18	1975-01-18
1975-01-19	1975-01-19	1975-01-19
1975-01-20	1975-01-20	1975-01-20
1975-01-21	1975-01-21	1975-01-21
1975-01-22	1975-01-22	1975-01-22
1975-01-23	1975-01-23	1975-01-23
1975-01-24	1975-01-24	1975-01-24
1975-01-25	1975-01-25	1975-01-25
1975-01-26	1975-01-26	1975-01-26
1975-01-27	1975-01-27	1975-01-27
1975-01-28	1975-01-28	1975-01-28
1975-01-29	1975-01-29	1975-01-29
1975-01-30	1975-01-30	1975-01-30
1975-01-31	1975-01-31	1975-01-31

STATE OF MAINE
T OF TRANSPORTATION



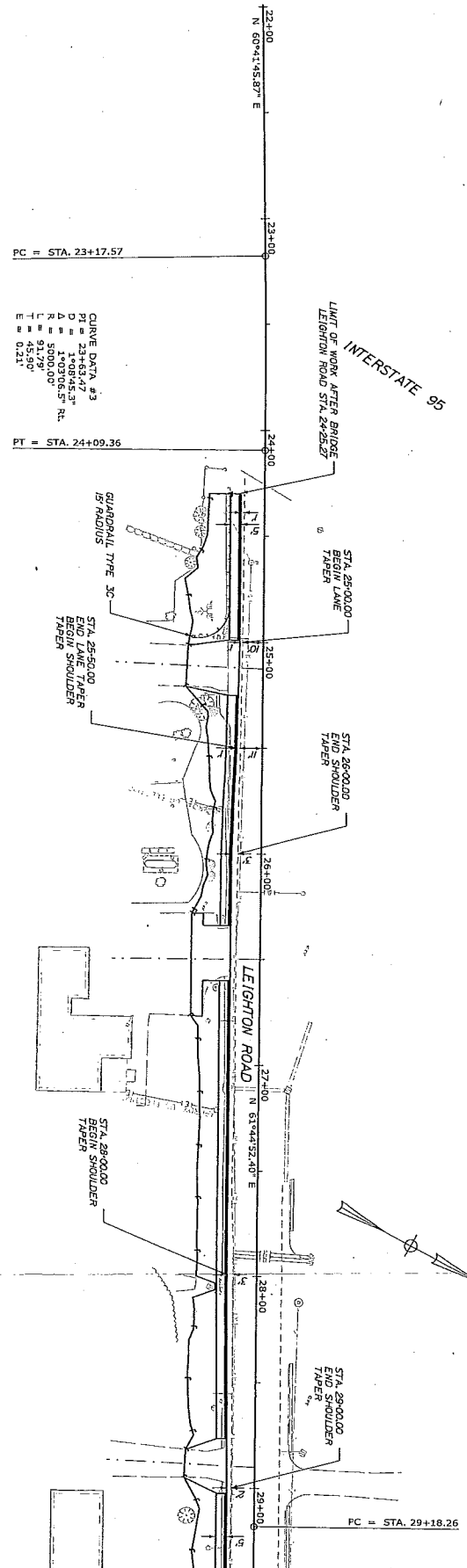
NO PROFILE SHOWN BECAUSE ONLY SIDEWALK IS BEING PROPOSED.

SCALE OF FEET
PLAN 25
0 25 50

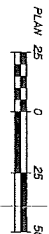


SHEET NUMBER 33 OF 175	FALMOUTH MAINE ROUTE 100\26 PLANS		STATE OF MAINE DEPARTMENT OF TRANSPORTATION	
	PROJECT MANAGER: BFOUJAN/ACER DESIGN-DETAILED: BFOUJAN/ACER CHECKED-PLANNING: BFOUJAN/ACER DESIGN-DETAILED: BFOUJAN/ACER DESIGN-DETAILED: BFOUJAN/ACER REVISIONS: 1 REVISIONS: 2 REVISIONS: 3 REVISIONS: 4 ZOO CHANGES: BFOUJAN/ACER		BY: BFOUJAN/ACER DATE: 8/21/2017 SIGNATURE: _____ P.E. NUMBER: _____ DATE: _____	
	WIN 21784.00 HIGHWAY PLANS		WIN 21784.00 HIGHWAY PLANS	
	WIN 21784.00 HIGHWAY PLANS		WIN 21784.00 HIGHWAY PLANS	

NO PROFILE SHOWN BECAUSE ONLY SIDEWALK IS BEING PROPOSED.



SCALE OF FEET



SHEET NUMBER

35

OF 175

FAIMOUTH
MAINE ROUTE 100\26

PLANS

PROJ. MANAGER	SPROJ.MANAGER	BY	DATE	
DESIGN-DETAILED	DESIGNER	METALURGY	PROJ.MANAGER	
CHECKED-REVIEWED	CHECKED	DESIGNER	PROJ.MANAGER	SIGNATURE
DESIGN-DETAILED	DESIGNER	METALURGY	PROJ.MANAGER	
DESIGN-DETAILED	DESIGNER	METALURGY	PROJ.MANAGER	P.E. NUMBER
REVISION 1	REVISION	REVISION	REVISION	
REVISION 2	REVISION	REVISION	REVISION	
REVISION 3	REVISION	REVISION	REVISION	
REVISION 4	REVISION	REVISION	REVISION	DATE
FIELD CHANGES	FIELD CHANGES	FIELD CHANGES	FIELD CHANGES	

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

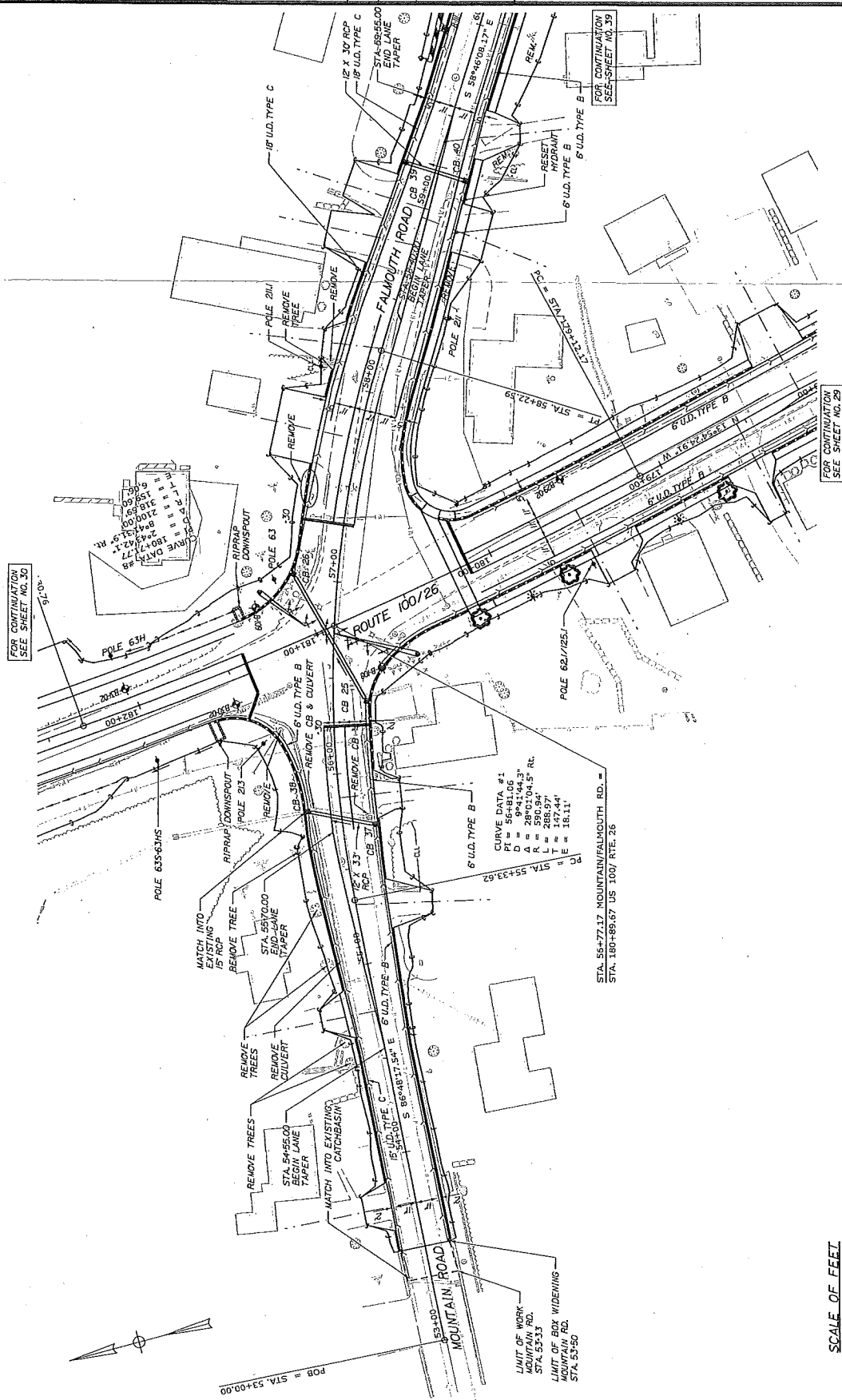
WIN
WIN 21784.00
HIGHWAY PLANS

A GRADING PLAN WILL BE PROVIDED IN LIEU OF A PROFILE IN FINAL DESIGN.

PLANS

[illegible]

DEPARTMENT OF TRANSPORTATION	WIN	WIN 21784.00	HIGHWAY PLANS
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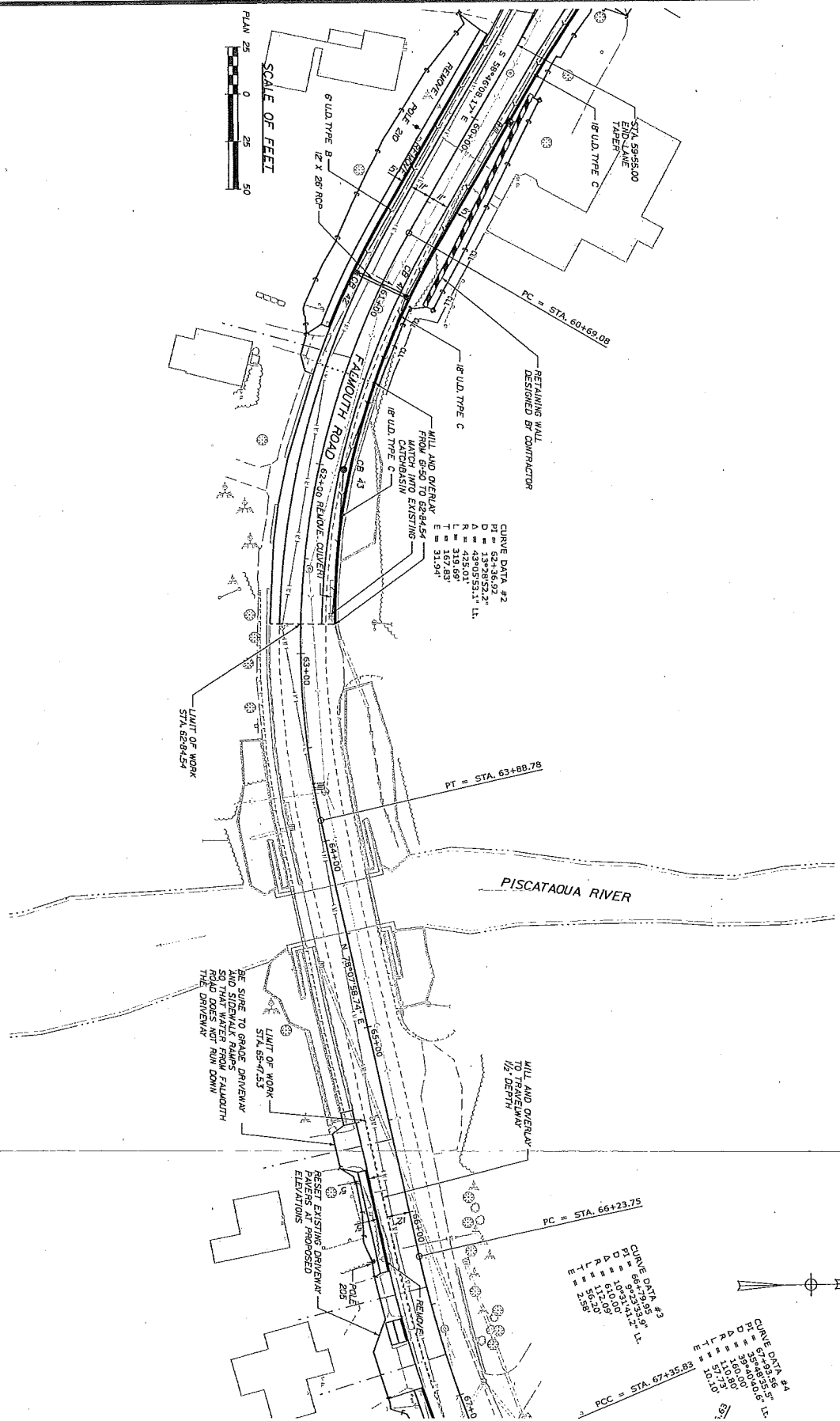


SCALE OF FEET

PLAN 25 0 25 50

SEE SHEET 38 FOR MOUNTAIN ROAD PROFILE
SEE SHEET 39 FOR FALMOUTH ROAD PROFILE

FALMOUTH ROAD PROFILE SHOWN ON SHEET 39.

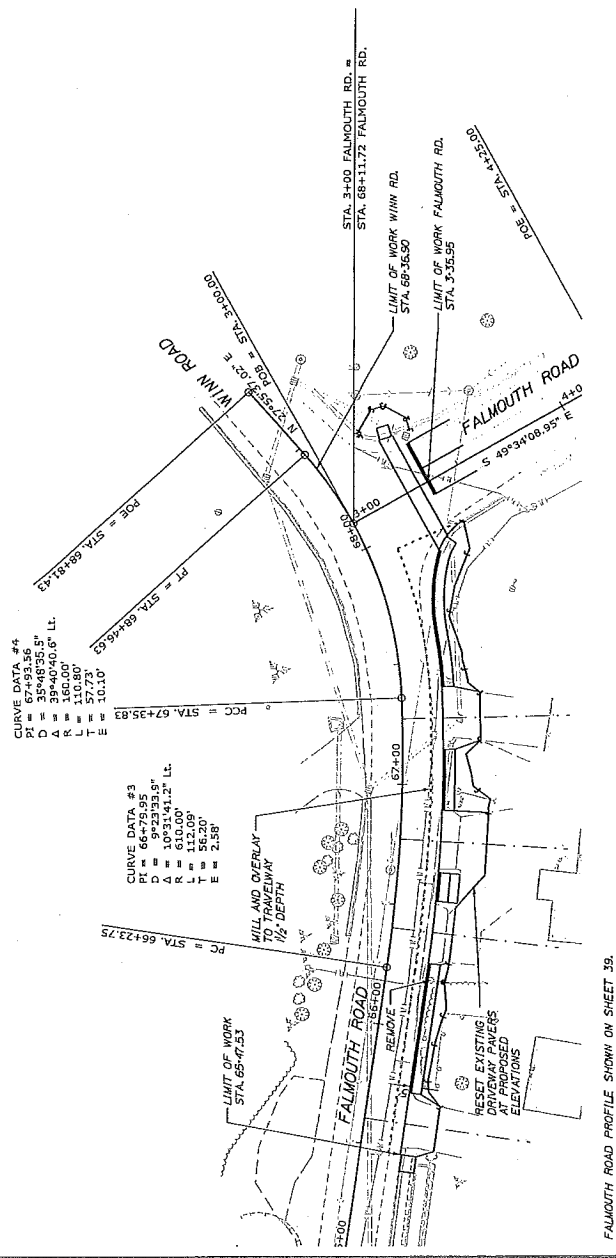


SHEET NUMBER
39
 OF 175

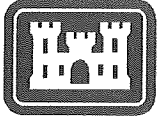
FALMOUTH
 MAINE ROUTE 100\26
 PLANS

PROJ MANAGER	PROJ MANAGER	BY	DATE	
DESIGN-DETAILED	DESIGNER	DATE	DATE	
CHECKED-REVIEWED	DESIGNER	DATE	DATE	SIGNATURE
DESIGN-DETAILED	DESIGNER	DATE	DATE	
DESIGN-DETAILED	DESIGNER	DATE	DATE	
REVISIONS 1	REVISION	REVISION		P.E. NUMBER
REVISIONS 2	REVISION	REVISION		
REVISIONS 3	REVISION	REVISION		
REVISIONS 4	REVISION	REVISION		DATE
FIELD CHANGES	REVISION	REVISION		

STATE OF MAINE
 DEPARTMENT OF TRANSPORTATION
 WIN
 WIN 21784.00 HIGHWAY PLANS



FALMOUTH ROAD PROFILE SHOWN ON SHEET 39.



**US Army Corps
of Engineers®**
New England District

(Minimum Notice: Permittee must sign and return notification
within one month of the completion of work.)

COMPLIANCE CERTIFICATION FORM

Permit Number: NAE-2017-02640

Project Manager Clement

Name of Permittee: Town of Falmouth

Permit Issuance Date: 1/18/18

Please sign this certification and return it to the following address upon completion of the activity and any mitigation required by the permit. You must submit this after the mitigation is complete, but not the mitigation monitoring, which requires separate submittals.

* MAIL TO: U.S. Army Corps of Engineers, New England District *
* Permits and Enforcement Branch C *
* Regulatory Division *
* 696 Virginia Road *
* Concord, Massachusetts 01742-2751 *

Please note that your permitted activity is subject to a compliance inspection by an U.S. Army Corps of Engineers representative. If you fail to comply with this permit you are subject to permit suspension, modification, or revocation.

I hereby certify that the work authorized by the above referenced permit was completed in accordance with the terms and conditions of the above referenced permit, and any required mitigation was completed in accordance with the permit conditions.

Signature of Permittee

Date

Printed Name

Date of Work Completion

() _____
Telephone Number

() _____
Telephone Number



**US Army Corps
of Engineers®**
New England District

**GENERAL PERMIT
WORK-START NOTIFICATION FORM**
(Minimum Notice: Two weeks before work begins)

* MAIL TO: U.S. Army Corps of Engineers, New England District *
* Permits and Enforcement Branch *
* Regulatory Division *
* 696 Virginia Road *
* Concord, Massachusetts 01742-2751 *

Corps of Engineers Permit No. NAE-2017-02640 was issued to the Town of Falmouth on January 18, 2018. This work is located in unnamed streams and in adjacent freshwater wetlands off Route 100/26 at Falmouth, Maine. The permit authorized the permittee to place temporary and permanent fill in order to reconstruct a 1.3 mile section of Route 100/26 with associated culvert replacements and reconstruction of portions of Leighton and Mountain Roads. The project will result in approximately 1,258 s.f. of permanent and 255 s.f. of temporary stream bed impact; and 8,015 s.f. of permanent wetland impact.

The people (e.g., contractor) listed below will do the work, and they understand the permit's conditions and limitations.

PLEASE PRINT OR TYPE

Name of Person/Firm: _____

Business Address: _____

Telephone Numbers: () _____ () _____

Proposed Work Dates: **Start:** _____ **Finish:** _____

Permittee/Agent Signature: _____ **Date:** _____

Printed Name: _____ **Title:** _____

Date Permit Issued: _____ **Date Permit Expires:** _____

FOR USE BY THE CORPS OF ENGINEERS

PM: Clement **Submittals Required:** No

Inspection Recommendation: Inspect as convenient



STATE OF MAINE
DEPARTMENT OF ENVIRONMENTAL PROTECTION
17 STATE HOUSE STATION AUGUSTA, MAINE 04333-0017

DEPARTMENT ORDER

IN THE MATTER OF

TOWN OF FALMOUTH) NATURAL RESOURCES PROTECTION ACT
Falmouth, Cumberland County) STREAM ALTERATION
ROADWAY IMPROVEMENTS) FRESHWATER WETLAND ALTERATION
L-27620-L6-A-N (approval)) WATER QUALITY CERTIFICATION
L-27620-TB-B-N (approval)) FINDINGS OF FACT AND ORDER

Pursuant to the provisions of 38 M.R.S. §§ 480-A–480-JJ, Section 401 of the Federal Water Pollution Control Act (33 U.S.C. § 1341), and Chapters 310, 315 and 335 of Department rules, the Department of Environmental Protection has considered the application of TOWN OF FALMOUTH with the supportive data, agency review comments, and other related materials on file and FINDS THE FOLLOWING FACTS:

1. PROJECT DESCRIPTION:

A. Summary: The applicant proposes roadway improvements that will widen the travel way of several roads in Falmouth. Maine Route 100/26 will have a widened travel lane with the addition of shoulders, sidewalks, guardrails, ditches, and a bike lane. Underground utilities will also be installed under the road base. Leighton Road's travel lane will be widened and 500 feet of sidewalk will be added. Mountain Road will be widened along 350 feet at the intersection with Route 100/26. Falmouth Road will be widened along 1,100 feet of travel lane. The widening of Route 100/26 includes the relocation of an approximately 50-foot long section of intermittent stream. The current stream alignment is within the fill limits of the project; therefore, the applicant proposes to relocate the stream channel to the west. Streambed material from the existing stream will be removed and stockpiled for later use to recreate the stream bottom. The relocated stream will be constructed with a trapezoidal shape, a five-foot wide channel bottom, and 2H:1V side slopes. The side slopes will be loamed and seeded. The applicant is also proposing to realign approximately 15 feet of Hobbs Creek to more closely match the natural course of the stream. The existing four-foot wide culvert will be replaced by a 15-foot wide culvert. Approximately 8,015 square feet of wetlands will be impacted by the road improvement project. The proposed project is shown on a set of plans, the first of which is titled "Falmouth Maine Route 100/26", dated August 21, 2017, prepared by State of Maine Department of Transportation. The project site is located in the Town of Falmouth along Maine Route 100/26, Falmouth Road, Mountain Road, and Leighton Road.

B. Current Use of the Site: The project roadways are frequently traveled public roads. The project area consists of a mix of residential and commercial development.

2. EXISTING SCENIC, AESTHETIC, RECREATIONAL OR NAVIGATIONAL USES:

The Natural Resources Protection Act (NRPA), in 38 M.R.S. §480-D(1), requires the applicant to demonstrate that the proposed project will not unreasonably interfere with existing scenic, aesthetic, recreational and navigational uses.

In accordance with Chapter 315, *Assessing and Mitigating Impacts to Scenic and Aesthetic Uses* (06-096 C.M.R. ch. 315, effective June 29, 2003), the applicant submitted a copy of the Department's Visual Evaluation Field Survey Checklist as Appendix A to the application along with a description of the property and the proposed project. The applicant also submitted several photographs of the proposed project site and surroundings.

The proposed project is located near an unnamed intermittent stream and Hobbs Creek which are not scenic resources visited by the general public, in part, for the use, observation, enjoyment and appreciation of their natural and cultural visual qualities. The applicant proposes to vegetate the relocated stream bank and the existing vegetation along Hobbs Creek will be left to the greatest extent practicable.

The Department did not identify any issues involving existing recreational and navigational uses.

The Department finds that the proposed activity will not unreasonably interfere with existing scenic, aesthetic, recreational or navigational uses of the protected natural resource.

3. SOIL EROSION:

The NRPA, in 38 M.R.S. §480-D (2), requires the applicant to demonstrate that the proposed project will not cause unreasonable erosion of soil or sediment nor unreasonably inhibit the natural transfer of soil from the terrestrial to the marine or freshwater environment.

Any in-stream work will be done within the approved in-stream work window from July 15-September 30. A combination of best management practices (BMPs) will be used during construction. Work will be sequenced to avoid large areas of exposed soils. Prior to any forecasted storm event, the contractor will stabilize exposed soils and any recently disturbed areas. Sediment barriers will be installed prior to any soil disturbance in accordance with Maine Department of Transportation (MDOT) BMPs.

The Department finds that the activity will not cause unreasonable erosion of soil or sediment nor unreasonably inhibit the natural transfer of soil from the terrestrial to the marine or freshwater environment.

4. HABITAT CONSIDERATIONS:

The NRPA, in 38 M.R.S. §480-D(3), requires the applicant to demonstrate that the proposed project will not unreasonably harm significant wildlife habitat, freshwater wetland plant habitat, threatened or endangered plant habitat, aquatic or adjacent upland habitat, travel corridor, freshwater, estuarine or marine fisheries or other aquatic life.

The project site is a combination of undeveloped and developed areas. The project corridor has freshwater forested, scrub-shrub, and emergent wetlands. There are six streams in the project area, including the Piscataqua River, Hobbs Creek, and an unnamed tributary to the Piscataqua River.

The Maine Department of Inland Fisheries and Wildlife (MDIFW) reviewed the proposed project and stated that there are no Essential or Significant Wildlife Habitats at the project site. MDIFW did note documented occurrences of spotted turtles (*Clemmys guttate*) and wood turtles (*Clemmys insculpta*) within the vicinity of the project and were concerned with any new crossings of the Piscataqua River. The project does not propose any new crossings of the Piscataqua River nor any work on existing crossings of the river.

The Department finds that the activity will not unreasonably harm any significant wildlife habitat, freshwater wetland plant habitat, threatened or endangered plant habitat, aquatic or adjacent upland habitat, travel corridor, freshwater, estuarine or marine fisheries or other aquatic life.

5. WATER QUALITY CONSIDERATIONS:

As discussed in Finding 3, the applicant proposes to use erosion and sediment control during construction to minimize impacts to water quality from siltation.

The Department does not anticipate that the proposed project will violate any state water quality law, including those governing the classification of the State's waters.

6. WETLANDS AND WATERBODIES PROTECTION RULES:

The applicant proposes to directly alter 8,015 square feet of freshwater wetland, relocate a 50-foot long section of stream, and realign Hobbs Creek to construct the proposed roadway improvements.

The *Wetlands and Waterbodies Protection Rules*, 06-096 C.M.R. ch. 310 (last amended January 26, 2009), interpret and elaborate on the Natural Resources Protection Act (NRPA) criteria for obtaining a permit. The rules guide the Department in its determination of whether a project's impacts would be unreasonable. A proposed project would generally be found to be unreasonable if it would cause a loss in wetland area, functions and values and there is a practicable alternative to the project that would be less damaging to the environment. Each application for a NRPA permit that involves a

freshwater wetland alteration must provide an analysis of alternatives in order to demonstrate that a practicable alternative does not exist.

A. Avoidance. An applicant must submit an analysis of whether there is a practicable alternative to the project that would be less damaging to the environment and this analysis is considered by the Department in its assessment of the reasonableness of any impacts. The applicant submitted an alternatives analysis for the proposed project completed by Stantec Consulting Services, Inc. and dated September 13, 2017. The project purpose is to make improvements to Route 100/26 and associated side roads to improve motor vehicle, bicycle, and pedestrian safety. As Route 100/26 is a major regional traffic corridor, there is no alternative to improving the existing roads.

B. Minimal Alteration. In support of an application and to address the analysis of the reasonableness of any impacts of a proposed project, an applicant must demonstrate that the amount of freshwater wetland to be altered will be kept to the minimum amount necessary for meeting the overall purpose of the project. The applicant minimized wetland impacts by using steeper side slopes in wetland impact areas, using steeper side slopes with guard rails and a narrow shoulder width in one wetland impact location.

C. Compensation. In accordance with Chapter 310 §5(C)(6)(b), compensation may be required to achieve the goal of no net loss of stream or wetland functions and values. This project will not result in over 300 feet of shoreline of a stream impact, nor over 15,000 square feet of freshwater wetland impacts which are the thresholds over which compensation is generally required. Further, the proposed project will not have an adverse impact on marine resources or wildlife habitat as determined by the Department. For these reasons, the Department determined that compensation is not required.

The Department finds that the applicant has avoided and minimized wetland and stream impacts to the greatest extent practicable, and that the proposed project represents the least environmentally damaging alternative that meets the overall purpose of the project.

7. OTHER CONSIDERATIONS:

The Department finds, based on the design, proposed construction methods, and location, the proposed project will not inhibit the natural transfer of soil from the terrestrial to the marine environment, will not interfere with the natural flow of any surface or subsurface waters, and will not cause or increase flooding. The proposed project is not located in a coastal sand dune system, is not a crossing of an outstanding river segment, and does not involve dredge spoils disposal or the transport of dredge spoils by water.

BASED on the above findings of fact, and subject to the conditions listed below, the Department makes the following conclusions pursuant to 38 M.R.S. §§ 480-A–480-JJ and Section 401 of the Federal Water Pollution Control Act:

- A. The proposed activity will not unreasonably interfere with existing scenic, aesthetic, recreational, or navigational uses.
- B. The proposed activity will not cause unreasonable erosion of soil or sediment.
- C. The proposed activity will not unreasonably inhibit the natural transfer of soil from the terrestrial to the marine or freshwater environment.
- D. The proposed activity will not unreasonably harm any significant wildlife habitat, freshwater wetland plant habitat, threatened or endangered plant habitat, aquatic or adjacent upland habitat, travel corridor, freshwater, estuarine, or marine fisheries or other aquatic life.
- E. The proposed activity will not unreasonably interfere with the natural flow of any surface or subsurface waters.
- F. The proposed activity will not violate any state water quality law including those governing the classifications of the State's waters.
- G. The proposed activity will not unreasonably cause or increase the flooding of the alteration area or adjacent properties.
- H. The proposed activity is not on or adjacent to a sand dune.
- I. The proposed activity is not on an outstanding river segment as noted in 38 M.R.S. § 480-P.

THEREFORE, the Department *APPROVES* the above noted application of TOWN OF FALMOUTH to make improvements including roadway improvements along Route 100/26 and associated roadways as described in Finding 1, **SUBJECT TO THE ATTACHED CONDITIONS**, and all applicable standards and regulations:

- 1. Standard Conditions of Approval, a copy attached.
- 2. The applicant shall take all necessary measures to ensure that its activities or those of its agents do not result in measurable erosion of soil on the site during the construction of the project covered by this approval.

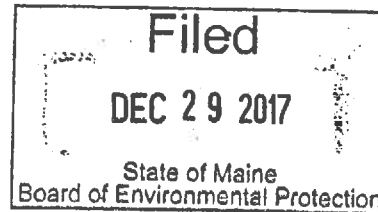
3. Severability. The invalidity or unenforceability of any provision, or part thereof, of this License shall not affect the remainder of the provision or any other provisions. This License shall be construed and enforced in all respects as if such invalid or unenforceable provision or part thereof had been omitted.

THIS APPROVAL DOES NOT CONSTITUTE OR SUBSTITUTE FOR ANY OTHER REQUIRED STATE, FEDERAL OR LOCAL APPROVALS NOR DOES IT VERIFY COMPLIANCE WITH ANY APPLICABLE SHORELAND ZONING ORDINANCES.

DONE AND DATED IN AUGUSTA, MAINE, THIS 29th DAY OF December, 2017.

DEPARTMENT OF ENVIRONMENTAL PROTECTION

BY: Melanie Ryz
For: Paul Mercer, Commissioner



PLEASE NOTE THE ATTACHED SHEET FOR GUIDANCE ON APPEAL PROCEDURES.

AA/L27620ANBN/ATS#82302,82610



Natural Resources Protection Act (NRPA) Standard Conditions

THE FOLLOWING STANDARD CONDITIONS SHALL APPLY TO ALL PERMITS GRANTED UNDER THE NATURAL RESOURCES PROTECTION ACT, 38 M.R.S. § 480-A ET SEQ., UNLESS OTHERWISE SPECIFICALLY STATED IN THE PERMIT.

- A. Approval of Variations From Plans. The granting of this permit is dependent upon and limited to the proposals and plans contained in the application and supporting documents submitted and affirmed to by the applicant. Any variation from these plans, proposals, and supporting documents is subject to review and approval prior to implementation.
- B. Compliance With All Applicable Laws. The applicant shall secure and comply with all applicable federal, state, and local licenses, permits, authorizations, conditions, agreements, and orders prior to or during construction and operation, as appropriate.
- C. Erosion Control. The applicant shall take all necessary measures to ensure that his activities or those of his agents do not result in measurable erosion of soils on the site during the construction and operation of the project covered by this Approval.
- D. Compliance With Conditions. Should the project be found, at any time, not to be in compliance with any of the Conditions of this Approval, or should the applicant construct or operate this development in any way other the specified in the Application or Supporting Documents, as modified by the Conditions of this Approval, then the terms of this Approval shall be considered to have been violated.
- E. Time frame for approvals. If construction or operation of the activity is not begun within four years, this permit shall lapse and the applicant shall reapply to the Board for a new permit. The applicant may not begin construction or operation of the activity until a new permit is granted. Reapplications for permits may include information submitted in the initial application by reference. This approval, if construction is begun within the four-year time frame, is valid for seven years. If construction is not completed within the seven-year time frame, the applicant must reapply for, and receive, approval prior to continuing construction.
- F. No Construction Equipment Below High Water. No construction equipment used in the undertaking of an approved activity is allowed below the mean high water line unless otherwise specified by this permit.
- G. Permit Included In Contract Bids. A copy of this permit must be included in or attached to all contract bid specifications for the approved activity.
- H. Permit Shown To Contractor. Work done by a contractor pursuant to this permit shall not begin before the contractor has been shown by the applicant a copy of this permit.

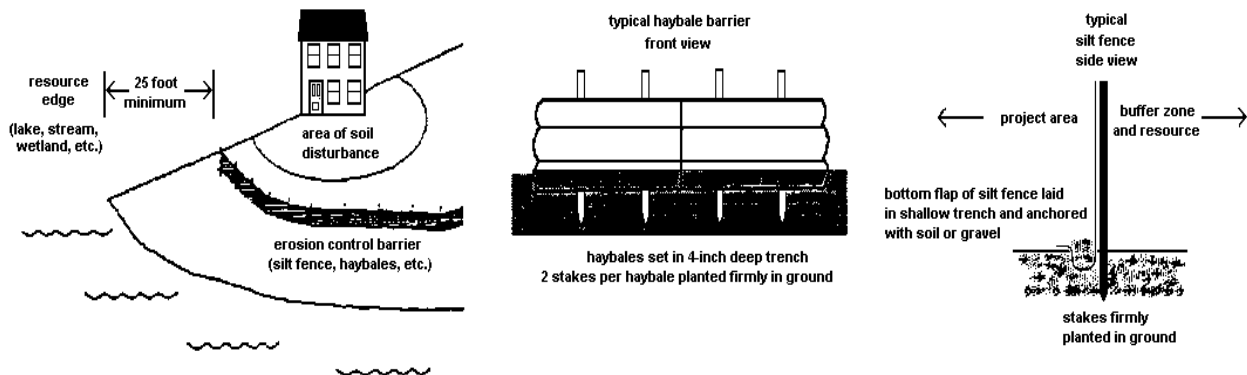


STATE OF MAINE
DEPARTMENT OF ENVIRONMENTAL PROTECTION
 17 STATE HOUSE STATION, AUGUSTA, MAINE 04333

Erosion Control for Homeowners

Before Construction

1. If you have hired a contractor, make sure you discuss your permit with them. Talk about what measures they plan to take to control erosion. Everybody involved should understand what the resource is, and where it is located. Most people can identify the edge of a lake or river. However, the edges of wetlands are often not so obvious. Your contractor may be the person actually pushing dirt around, but you are both responsible for complying with the permit.
2. Call around to find where erosion control materials are available. Chances are your contractor has these materials already on hand. You probably will need silt fence, hay bales, wooden stakes, grass seed (or conservation mix), and perhaps filter fabric. Places to check for these items include farm & feed supply stores, garden & lawn suppliers, and landscaping companies. It is not always easy to find hay or straw during late winter and early spring. It also may be more expensive during those times of year. Plan ahead -- buy a supply early and keep it under a tarp.
3. Before any soil is disturbed, make sure an erosion control barrier has been installed. The barrier can be either a silt fence, a row of staked hay bales, or both. Use the drawings below as a guide for correct installation and placement. The barrier should be placed as close as possible to the soil-disturbance activity.
4. If a contractor is installing the erosion control barrier, double check it as a precaution. Erosion control barriers should be installed "on the contour", meaning at the same level or elevation across the land slope, whenever possible. This keeps stormwater from flowing to the lowest point along the barrier where it can build up and overflow or destroy the barrier.



During Construction

1. Use lots of hay or straw mulch on disturbed soil. The idea behind mulch is to prevent rain from striking the soil directly. It is the force of raindrops hitting the bare ground that makes the soil begin to move downslope with the runoff water, and cause erosion. More than 90% of erosion is prevented by keeping the soil covered.
2. Inspect your erosion control barriers frequently. This is especially important after a rainfall. If there is muddy water leaving the project site, then your erosion controls are not working as intended. You or your contractor then need to figure out what can be done to prevent more soil from getting past the barrier.

3. Keep your erosion control barrier up and maintained until you get a good and healthy growth of grass and the area is permanently stabilized.

After Construction

1. After your project is finished, seed the area. Note that all ground covers are not equal. For example, a mix of creeping red fescue and Kentucky bluegrass is a good choice for lawns and other high-maintenance areas. But this same seed mix is a poor selection for stabilizing a road shoulder or a cut bank that you don't intend to mow. Your contractor may have experience with different seed mixes, or you might contact a seed supplier for advice.
2. Do not spread grass seed after September 15. There is the likelihood that germinating seedlings could be killed by a frost before they have a chance to become established. Instead, mulch the area with a thick layer of hay or straw. In the spring, rake off the mulch and then seed the area. Don't forget to mulch again to hold in moisture and prevent the seed from washing away or being eaten by birds or other animals.
3. Keep your erosion control barrier up and maintained until you get a good and healthy growth of grass and the area is permanently stabilized.

Why Control Erosion?

To Protect Water Quality

When soil erodes into protected resources such as streams, rivers, wetlands, and lakes, it has many bad effects. Eroding soil particles carry phosphorus to the water. An excess of phosphorus can lead to explosions of algae growth in lakes and ponds called blooms. The water will look green and can have green slime in it. If you are near a lake or pond, this is not pleasant for swimming, and when the soil settles out on the bottom, it smothers fish eggs and small animals eaten by fish. There many other effects as well, which are all bad.

To Protect the Soil

It has taken thousands of years for our soil to develop. Its usefulness is evident all around us, from sustaining forests and growing our garden vegetables, to even treating our septic wastewater! We cannot afford to waste this valuable resource.

To Save Money (\$\$)

Replacing topsoil or gravel washed off your property can be expensive. You end up paying twice because State and local governments wind up spending your tax dollars to dig out ditches and storm drains that have become choked with sediment from soil erosion.



DEP INFORMATION SHEET

Appealing a Department Licensing Decision

Dated: March 2012

Contact: (207) 287-2811

SUMMARY

There are two methods available to an aggrieved person seeking to appeal a licensing decision made by the Department of Environmental Protection's ("DEP") Commissioner: (1) in an administrative process before the Board of Environmental Protection ("Board"); or (2) in a judicial process before Maine's Superior Court. An aggrieved person seeking review of a licensing decision over which the Board had original jurisdiction may seek judicial review in Maine's Superior Court.

A judicial appeal of final action by the Commissioner or the Board regarding an application for an expedited wind energy development (35-A M.R.S.A. § 3451(4)) or a general permit for an offshore wind energy demonstration project (38 M.R.S.A. § 480-HH(1)) or a general permit for a tidal energy demonstration project (38 M.R.S.A. § 636-A) must be taken to the Supreme Judicial Court sitting as the Law Court.

This INFORMATION SHEET, in conjunction with a review of the statutory and regulatory provisions referred to herein, can help a person to understand his or her rights and obligations in filing an administrative or judicial appeal.

I. ADMINISTRATIVE APPEALS TO THE BOARD

LEGAL REFERENCES

The laws concerning the DEP's *Organization and Powers*, 38 M.R.S.A. §§ 341-D(4) & 346, the *Maine Administrative Procedure Act*, 5 M.R.S.A. § 11001, and the DEP's *Rules Concerning the Processing of Applications and Other Administrative Matters* ("Chapter 2"), 06-096 CMR 2 (April 1, 2003).

HOW LONG YOU HAVE TO SUBMIT AN APPEAL TO THE BOARD

The Board must receive a written appeal within 30 days of the date on which the Commissioner's decision was filed with the Board. Appeals filed after 30 calendar days of the date on which the Commissioner's decision was filed with the Board will be rejected.

HOW TO SUBMIT AN APPEAL TO THE BOARD

Signed original appeal documents must be sent to: Chair, Board of Environmental Protection, c/o Department of Environmental Protection, 17 State House Station, Augusta, ME 04333-0017; faxes are acceptable for purposes of meeting the deadline when followed by the Board's receipt of mailed original documents within five (5) working days. Receipt on a particular day must be by 5:00 PM at DEP's offices in Augusta; materials received after 5:00 PM are not considered received until the following day. The person appealing a licensing decision must also send the DEP's Commissioner a copy of the appeal documents and if the person appealing is not the applicant in the license proceeding at issue the applicant must also be sent a copy of the appeal documents. All of the information listed in the next section must be submitted at the time the appeal is filed. Only the extraordinary circumstances described at the end of that section will justify evidence not in the DEP's record at the time of decision being added to the record for consideration by the Board as part of an appeal.

WHAT YOUR APPEAL PAPERWORK MUST CONTAIN

Appeal materials must contain the following information at the time submitted:

1. *Aggrieved Status.* The appeal must explain how the person filing the appeal has standing to maintain an appeal. This requires an explanation of how the person filing the appeal may suffer a particularized injury as a result of the Commissioner's decision.
2. *The findings, conclusions or conditions objected to or believed to be in error.* Specific references and facts regarding the appellant's issues with the decision must be provided in the notice of appeal.
3. *The basis of the objections or challenge.* If possible, specific regulations, statutes or other facts should be referenced. This may include citing omissions of relevant requirements, and errors believed to have been made in interpretations, conclusions, and relevant requirements.
4. *The remedy sought.* This can range from reversal of the Commissioner's decision on the license or permit to changes in specific permit conditions.
5. *All the matters to be contested.* The Board will limit its consideration to those arguments specifically raised in the written notice of appeal.
6. *Request for hearing.* The Board will hear presentations on appeals at its regularly scheduled meetings, unless a public hearing on the appeal is requested and granted. A request for public hearing on an appeal must be filed as part of the notice of appeal.
7. *New or additional evidence to be offered.* The Board may allow new or additional evidence, referred to as supplemental evidence, to be considered by the Board in an appeal only when the evidence is relevant and material and that the person seeking to add information to the record can show due diligence in bringing the evidence to the DEP's attention at the earliest possible time in the licensing process or that the evidence itself is newly discovered and could not have been presented earlier in the process. Specific requirements for additional evidence are found in Chapter 2.

OTHER CONSIDERATIONS IN APPEALING A DECISION TO THE BOARD

1. *Be familiar with all relevant material in the DEP record.* A license application file is public information, subject to any applicable statutory exceptions, made easily accessible by DEP. Upon request, the DEP will make the material available during normal working hours, provide space to review the file, and provide opportunity for photocopying materials. There is a charge for copies or copying services.
2. *Be familiar with the regulations and laws under which the application was processed, and the procedural rules governing your appeal.* DEP staff will provide this information on request and answer questions regarding applicable requirements.
3. *The filing of an appeal does not operate as a stay to any decision.* If a license has been granted and it has been appealed the license normally remains in effect pending the processing of the appeal. A license holder may proceed with a project pending the outcome of an appeal but the license holder runs the risk of the decision being reversed or modified as a result of the appeal.

WHAT TO EXPECT ONCE YOU FILE A TIMELY APPEAL WITH THE BOARD

The Board will formally acknowledge receipt of an appeal, including the name of the DEP project manager assigned to the specific appeal. The notice of appeal, any materials accepted by the Board Chair as supplementary evidence, and any materials submitted in response to the appeal will be sent to Board members with a recommendation from DEP staff. Persons filing appeals and interested persons are notified in advance of the date set for Board consideration of an appeal or request for public hearing. With or without holding a public hearing, the Board may affirm, amend, or reverse a Commissioner decision or remand the matter to the Commissioner for further proceedings. The Board will notify the appellant, a license holder, and interested persons of its decision.

II. JUDICIAL APPEALS

Maine law generally allows aggrieved persons to appeal final Commissioner or Board licensing decisions to Maine's Superior Court, see 38 M.R.S.A. § 346(1); 06-096 CMR 2; 5 M.R.S.A. § 11001; & M.R. Civ. P. 80C. A party's appeal must be filed with the Superior Court within 30 days of receipt of notice of the Board's or the Commissioner's decision. For any other person, an appeal must be filed within 40 days of the date the decision was rendered. Failure to file a timely appeal will result in the Board's or the Commissioner's decision becoming final.

An appeal to court of a license decision regarding an expedited wind energy development, a general permit for an offshore wind energy demonstration project, or a general permit for a tidal energy demonstration project may only be taken directly to the Maine Supreme Judicial Court. See 38 M.R.S.A. § 346(4).

Maine's Administrative Procedure Act, DEP statutes governing a particular matter, and the Maine Rules of Civil Procedure must be consulted for the substantive and procedural details applicable to judicial appeals.

ADDITIONAL INFORMATION

If you have questions or need additional information on the appeal process, for administrative appeals contact the Board's Executive Analyst at (207) 287-2452 or for judicial appeals contact the court clerk's office in which your appeal will be filed.

Note: The DEP provides this INFORMATION SHEET for general guidance only; it is not intended for use as a legal reference. Maine law governs an appellant's rights.

TOWN OF FALMOUTH UTILITY RECEIVABLE AGREEMENT

Project Location: Falmouth, Maine
State WIN #: 21744.00

Estimated Agreement Amount:

Town of Falmouth Signed Date: October 10, 2018
Forecasted Agreement End Date: September 1, 2020

THIS AGREEMENT, in duplicate originals entered into the last date signed herein at the end of this agreement, between the **Town of Falmouth, Maine** (hereafter the "Town") and **Portland Water District**, duly authorized and existing under the Laws of the State of Maine and having an office in the City of Portland, County of Cumberland (the "Utility") (the Town and the Utility are collectively referred to as the "Parties").

1. The Town is implementing a transportation project identified as WIN: 21784.00 (the "Project") for highway improvements in the Town of Falmouth, Cumberland County;
2. In connection with the Project, the Town has prepared plans and specification for the Project that resulted in the following determination:

The Town has identified the locations of existing utility facilities owned and maintained by the Utility and lawfully installed within the limits of the public highway right-of-way and the impact limits of the Project that must be relocated to accommodate the Project (the "Affected Facilities")

3. The Affected Facilities consist of water lines, fire hydrants, and water services;
4. The Utility has prepared and provided to the Town the scope of work necessary for relocating or installing the Affected Utilities (the "Utility Work") and the estimated costs associated therewith, which are outlined in **Appendix A**, attached hereto and made a part hereof. The costs associated with the Utility Work are the sole responsibility of the Utility.
5. The Parties wish to establish a process for including the Utility Work in the Town's construction contract for the Project.

NOW, THEREFORE, the Parties agree as follows:

6. Plans, Specifications and Estimate:

- a. The Utility shall, at its own expense, perform and provide all engineering, design and related services related to the Utility Work necessary to enable the Town and/or its consultant to generate construction plans, specifications and an estimate of material

quantities for the Utility Work to be included in the Project contract. The Utility will be responsible for locating and recording the location of all Utility Work, including services and other appurtenances within the Project area. To the extent possible and consistent with laws, practices and policies of the Town and the industry, the Utility Work shall be performed in accordance with the plans and specifications provided by the Utility and, if applicable, the most recent version of the Town's Standard Specifications.

- b. All plans shall be on sheets of the same size used by the Town and be reproducible by black and white printing. Specifications shall be on 8 ½ x 11-inch paper, suitable for binding with the Town's specifications. The estimate of quantities shall be in the form prescribed by the Town. In the event of field changes to the Utility Work, the Utility shall prepare any additional plans and specifications and the Town shall prepare a Project change order and amend this Agreement incorporating any changes therein. All plans and specifications will be marked with the Federal Aid Project Number referenced in this Agreement.
- c. The Utility will provide the Town with the plans, specifications and an updated estimate as described in Appendix A no later than one month prior to the scheduled advertise date for the Project.
- d. The Utility shall be responsible for obtaining a Utility Location Permit from the Town in accordance with Title 35-A M.R.S.A. Chapter 25 and for recording the location of all utilities in a manner and form to be specified by the Town.
- e. The Town will prepare the Project contract documents to include the Utility Work specified in Appendix A. The Utility agrees to have these items included in the Town's Project construction contract. Bidders will be required to bid both the Project work and the Utility Work. The Utility Work will be paid for by the Utility, and any changes that increase the Utility Work estimate or amount will be paid for through a written modification of this agreement approved by both the Utility and the Town.

7. Inspection:

- a. The Utility shall be responsible for providing all engineering and inspection associated with the Utility Work including computing quantities for payment and other incidental and related work unless otherwise stated herein. By the end of each work day, whenever Utility Work is performed, the Utility will provide the Town's on-site representative with an itemized summary of all the Utility Work completed.
- b. The Town shall provide inspection of the quality and compaction of backfill installed in connection with the construction contract, excluding bedding and other special backfills and materials used in the installation of the Utility Work.
- c. If the Utility Work is included in the Project contract pursuant to Section 6.e. above, the Utility agrees to the following:

- i. Should the Utility find the Project contractor's materials or workmanship to be insufficient in any way, the Utility agrees to inform the Town's on-site representative as soon as possible, but no later than the end of the day in which the problem is identified.
 - ii. As administrator to the construction contract, the Town's on-site representative shall be responsible for authorizing all payments relating to the Utility Work, issuing all directives to the Project's contractor and making the final determination in the event of any disagreements.
8. **Ownership of Completed Utilities:** Upon completion of the Utility Work the Utility shall assume complete ownership of, and responsibility for, the utility facilities installed in connection with the Utility Work.
9. **Claims:** The Utility shall be responsible for the prompt review and settlement of any claims arising from or related to the Utility Work or its impact on the Project.
10. **Indemnification:** The Utility shall indemnify, defend and hold harmless the Town and its officers, employees, agents and assigns, from and against any and all claims, liability or expenses, including but not limited to reasonable attorney's fees and litigation costs (the "Claims"), to the extent such Claims are caused, or alleged to have been caused, by acts or omissions of the Utility or any of its officers, employees, agents, representatives, supervisors, contractors, subcontractors or consultants in connection with the performance of its obligations under this Agreement. Nothing in this Agreement is intended or shall be construed to waive any defense, immunity or limitation of liability that may be available to the Town or the Utility pursuant to the Maine Tort Claims Act (14 M.R.S. § 8101 *et seq.*) or any other privileges or immunities provided by law. The terms outlined in this section shall survive any termination or expiration of this Agreement.
11. **Subsequent Excavations and/or Installations:** Except in the case of an emergency, the Utility acknowledges and agrees to refrain from applying for a permit for the excavation of the highway within the limits of the Project for a period of at least 5 years following the completion of the Project, and agrees to make all necessary notifications to abutters and occupants of the highway as otherwise required of any municipal government under the provisions of 23 M.R.S.A. § 3351. In all cases, whether an excavation moratorium as described above applies, or as in the case of Light Capital Paving projects where no excavation moratorium applies, the Utility further acknowledges and agrees that all subsequent excavations and/or installations within the right-of-way of the Project limits shall be regulated and controlled in the manner specified by the most recent version of the Town's "Utility Accommodation Rules", which are incorporated and made a part hereof by reference. The terms outlined in this section shall survive any termination or expiration of this Agreement.
12. **Non-Appropriation and Termination:** Anything herein to the contrary notwithstanding, the Utility acknowledges and agrees that, although the execution of this Agreement by the Town manifests the Town's intent to honor its terms and to seek funding to fulfill any obligations arising hereunder, by law any such obligations are subject to available budgetary

appropriations by the Maine Legislature and, therefore, this Agreement does not create any obligation on behalf of the Town in excess of such appropriations. In the event of unanticipated impacts on the Project, such as, changes in the Project design, or a loss in Project funding, or a delay in advertising or awarding of the contract, the Town may postpone, suspend, abandon or otherwise terminate this Agreement upon thirty (30) days written notice to the Utility and in no event shall any such action be deemed a breach of contract.

13. **Payment:** If the Utility Work is included in the Project contract pursuant to Section 6.e. above, the Utility agrees to reimburse the Town for the full amount of the cost of the utility work. A detailed breakdown of the anticipated cost of the Utility Work is attached hereto and incorporated herein as Appendix A. The Town will issue a final invoice after all the Utility Work is complete, all quantities are verified and any required adjustments have been made. The Town, at its sole discretion, may issue periodic invoices for portions of the Utility Work as it is being completed. The final invoice will include any remaining costs or credits. The Utility shall submit payment to the Town within 30 days from the invoice date.

14. Contact Information:

For the Town:

Name: Jay Reynolds
Address: 101 Woods Road, Falmouth, ME 04105
E-mail: jreynolds@falmouthme.org
Telephone: (207) 699-5374

For the Utility:

Name: Joe Parent
Address: 225 Douglass St, Portland, ME 04104
E-mail: jparent@pwd.org
Telephone: (207) 232-3851

15. No Relief of Responsibilities: Nothing in this agreement is intended, nor shall be interpreted, to relieve the Utility of any responsibilities or duties imposed upon it by law.

IN WITNESS WHEREOF, the Parties hereto have executed this Agreement in duplicate on the day and year first above written by its duly authorized representatives.

IN THE PRESENCE OF:

[Signature]
Witness

UTILITY/DISTRICT/MUNICIPALITY

By: [Signature]

Print Name: Carrie Lewis

General Manager
Duly Authorized

DATE: 10/4/18

TOWN OF FALMOUTH

[Signature]
Witness

By: [Signature]

Print Name: Nathan Poore

Town Manager
Duly Authorized

DATE: 10/10/18

APPENDIX A
PROJECT SCOPE
TOWN OF FALMOUTH
UTILITY RECEIVABLE AGREEMENT
PORTLAND WATER DISTRICT
 Falmouth, Maine

STATE PROJECT IDENTIFICATION NUMBER (WIN) 21784.00

Project Scope: Water lines, water services, fire hydrants

ESTIMATE OF UTILITY WORK:

Item #	Pay Item	Estimated Quantity	Unit	Unit Price	Utility Cost
203.25	Granular Borrow	250	CY		
502.56	Concrete Fill	8	CY		
625.01	Water Line System – Temporary	1	LS		
629.05	Hand Labor, Straight Time	10	HR		
631.12	All Purpose Excavator, Including Operator	10	HR		
631.172	Truck – Large (Including Operator)	10	HR		
631.22	Front End Loader (Including Operator)	10	HR		
652.38	Flagger- Water Main	1000	HR		
822.3605	12" CL 52 DI Pipe Push On Joint Pipe	950	LF		
822.3606	12" DR 11 HDPE Pipe	240	LF		
823.31	12" Gate Valve	3	EA		
823.3101	12" Gate Valve Cut-In	2	EA		
823.341	Air Release Valve – 1"	7	EA		
824.3	Fire Hydrant Assembly	2	EA		
824.32	Relocate Hydrant	7	EA		
824.31	Remove Fire Hydrant	2	EA		
825.334	1-in Copper Service – Long Side	27	EA		
825.335	1-in Copper Service – Short Side	22	EA		
827.32	Concrete Excavation	8	CY		
825.57	Reconnect 1" Copper Service	3	EA		
825.571	Retire 1" Water Service	1	EA		
823.3101	12" Cut-In Offset Water Main	16	EA		
823.3250	8" Cut-In Offset Fire Service	1	EA		
823.3310	6" Cut-In Offset Fire Service	1	EA		
653.22	2" Extruded Polystyrene Insulation	250	EA		
659.1	Mobilization (10% of bid price total)	1	LS		
		Total Cost:			