

MAINE TURNPIKE AUTHORITY

MAINE TURNPIKE

CONTRACT DOCUMENTS

CONTRACT 2021.08

PORTLAND AREA WIDENING & SAFETY IMPROVEMENTS
MM 46.4 TO MM 49.3

NOTICE TO CONTRACTORS

PROPOSAL

CONTRACT AGREEMENT

CONTRACT BOND

FINAL LIEN AND CLAIM WAIVER AND AFFIDAVIT

SPECIFICATIONS

MAINE TURNPIKE AUTHORITY
SPECIFICATIONS

The Specifications are divided into two parts:
Part I, Supplemental Specifications and Part II, Special
Provisions.

The Maine Turnpike Supplemental Specifications are additions
and alterations to the 2014 Maine Department of
Transportation Standard Specifications. See Subsection 100.1.

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MAINE TURNPIKE AUTHORITY

NOTICE TO CONTRACTORS

Sealed Proposals will be received by the Maine Turnpike Authority for:

CONTRACT 2021.08

PORTLAND AREA WIDENING & SAFETY IMPROVEMENTS

MM 46.4 TO MM 49.3

at the office of the Maine Turnpike Authority, 2360 Congress Street, Portland, ME, until 11:00 a.m., prevailing time as determined by the Authority on October 7, 2021 at which time and place the Proposals will be publicly opened and read. Bids will be accepted from Contractors **prequalified** by the Maine Department of Transportation for Highway Construction Projects. All other bids may be rejected. This Project includes a wage determination developed by the State of Maine Department of Labor.

The work consists of constructing a third travel lane northbound, a third lane southbound, and reconstructing the grassed median to a paved median on the Maine Turnpike in the Towns of South Portland and Portland, Maine, and an overhead sign structure disassembly and removal in Scarborough, Maine. The work includes embankment construction, roadway gravels and pavement construction, culvert and closed drainage installation, concrete median barrier construction, concrete median pier protection, bridge abutment slope protection, overhead sign structure removal, overhead sign structure installation, roadway signing and striping, highway lighting, guardrail, maintenance of traffic and all other work incidental thereto in accordance with the Plans and Specifications.

Plans and Contract Documents may be examined by prospective Bidders weekdays between 8:00 a.m. and 4:30 p.m. at the office of the Maine Turnpike Authority, 2360 Congress Street, Portland, Maine. **The half size Plans** and Contract Documents may be obtained from the Authority upon payment of Two hundred fifty (\$250.00) Dollars for each set, which payment will not be returned. Checks shall be made payable to Maine Turnpike Authority. The Plans and Contract Documents may also be downloaded from a link on our website at <https://www.maineturnpike.com/Projects/Construction-Contracts.aspx>.

For general information regarding Bidding and Contracting procedures, contact Nate Carll, Purchasing Manager, at (207)482-8115. For information regarding Schedule of Items, plan holders list and bid results, visit our website at <https://www.maineturnpike.com/Projects/Construction-Contracts.aspx>. For Project specific information, fax all questions to Nate Carll, Purchasing Manager, at (207) 871-7739 or email ncarll@maineturnpike.com. Responses will not be prepared for questions received by telephone. Bidders shall not contact any other Authority staff or Consultants for clarification of Contract provisions, and the Authority will not be responsible for any interpretations so obtained.

All work shall be governed by the Specifications entitled "State of Maine, Department of Transportation, Standard Specifications, Revision of November 2014", "Standard Details,

Revision of November 2014” and “Best Management Practices for Erosion and Sediment Control”, latest issue. Copies and recent updates to these publications can be downloaded at: <http://www.maine.gov/mdot/contractors/publications/> .

Proposals must be accompanied by an original bid bond, certified or cashier's check payable to the Maine Turnpike Authority in an amount not less than Five (5%) Percent of the Total Amount in the Proposal, but not less than \$500.00. The Bidder to whom a Contract is awarded will be required to furnish a Surety Corporation Bond, satisfactory to the Authority, on the standard Contract Bond form of the Authority, for a sum not less than the Total Amount of the Proposal.

Proposals must be made upon the Proposal Forms furnished by the Authority separately with the Contract Documents and must be enclosed in the sealed special addressed envelope provided therefore bearing the name and address of the Bidder, the name of the Contract, and the date and time of Proposal opening on the outside.

A pre-bid conference will be held on September 21, 2021 at 10:00 a.m. at the Maine Turnpike Authority, 2360 Congress Street, Portland, Maine.

The Authority reserves the unqualified right to reject any or all Proposals and to accept that Proposal which in its sole judgment will under all circumstances serve its best interest.

MAINE TURNPIKE AUTHORITY

Nate Carll
Purchasing Manager
Maine Turnpike Authority
Portland, Maine

Maine Turnpike Authority

MAINE TURNPIKE

PROPOSAL

CONTRACT 2021.08

PORTLAND AREA WIDENING & SAFETY IMPROVEMENTS
MM 46.4 TO MM 49.3

MAINE TURNPIKE AUTHORITY

PROPOSAL

CONTRACT 2021.08

PORTLAND AREA WIDENING & SAFETY IMPROVEMENTS
MM 46.4 TO MM 49.3

TO MAINE TURNPIKE AUTHORITY:

The work consists of constructing a third travel lane northbound, a third lane southbound, and reconstructing the grassed median to a paved median on the Maine Turnpike in the Towns of South Portland and Portland, Maine, and an overhead sign structure disassembly and removal in Scarborough, Maine. The work includes embankment construction, roadway gravels and pavement construction, culvert and closed drainage installation, concrete median barrier construction, concrete median pier protection, bridge abutment slope protection, overhead sign structure removal, overhead sign structure installation, roadway signing and striping, highway lighting, guardrail, maintenance of traffic and all other work incidental thereto in accordance with the Plans and Specifications.

This Work will be done under a Contract known as Contract 2021.08 according to the Plans and Specifications which are on file in the office of the Maine Turnpike Authority, 2360 Congress Street, Portland, Maine.

On the acceptance of this Proposal for said Work, the undersigned will give the required bond with good security conditioned for the faithful performance of said Work, according to said Plans and Specifications, and the doing of all other work required by said Specifications for the consideration herein named and with the further condition that the Maine Turnpike Authority shall be saved harmless from any and all damages that might accrue to any person, persons or property by reason of the carrying out of said Work, or any part thereof, or by reason of negligence of the undersigned, or any person or persons under his employment and engaged in said Work.

The undersigned hereby declares that he/she has carefully examined the Plans, Specifications and other Contract Documents, and that he/she will contract to carry out and complete the said Work as specified and delineated at the price per unit of measure for each scheduled item of Work stated in the Schedule of Prices as follows:

It is understood that the TOTAL AMOUNT stated by the undersigned in the following Schedule of Prices is based on approximate quantities and will be used solely for the comparison of bids, and that the quantities stated in the Schedule of Prices for the various items are estimates only and may be increased or decreased all as provided in the Specifications.

**SCHEDULE OF BID PRICES
 CONTRACT NO. 2021.08
 PORTLAND AREA WIDENING AND SAFETY IMPROVEMENTS
 MM 46.4 TO MM 49.3**

Item No	Item Description	Units	Approx. Quantities	Unit Prices in Numbers		Bid Amount in Numbers	
				Dollars	Cents	Dollars	Cents
201.11	Clearing	Acre	2.9				
201.23	Removing Single Tree Top Only	Each	1				
201.24	Removing Stump	Each	1				
202.12	Removing Existing Structural Concrete	Cubic Yard	10				
202.15	Removing Existing Manhole or Catch Basin	Each	25				
202.202	Removing Pavement Surface	Square Yard	15,790				
202.206	Removing Rumble Strips	Linear Foot	2,000				
203.20	Common Excavation	Cubic Yard	129,500				
203.21	Rock Excavation	Cubic Yard	13,550				
203.25	Granular Borrow	Cubic Yard	22,550				
203.34	Lightweight Fill	Cubic Yard	470				

CARRIED FORWARD:

Item No	Item Description	Units	Approx. Quantities	Unit Prices in Numbers		Bid Amount in Numbers	
				Dollars	Cents	Dollars	Cents
BROUGHT FORWARD:							
304.10	Aggregate Subbase Course - Gravel	Cubic Yard	29,800				
304.14	Aggregate Base Course - Type A	Cubic Yard	16,450				
403.207	Hot Mix Asphalt, 19.0 mm Nominal Maximum Size	Ton	13,400				
403.2072	19.0mm Asphalt Rich Base HMA	Ton	12,850				
403.2081	Hot Mix Asphalt, 12.5 mm (Polymer Modified) – RAP	Ton	6,750				
403.213	Hot Mix Asphalt, 12.5 mm Nominal Maximum Size (Base and Intermediate Base Course)	Ton	4,510				
409.15	Bituminous Tack Coat RS1 or RS1h - Applied	Gallon	9,800				
419.30	Sawing Bituminous Pavement	Linear Foot	49,625				
470.08	Berm Dropoff Correction - Grindings	Ton	500				
502.5651	Flowable Concrete Fill	Cubic Yard	135				
502.57	Concrete Cap	Cubic Yard	15				
513.09	Slope Protection - Portland Cement Concrete	Square Yard	200				

CARRIED FORWARD:							
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Item No	Item Description	Units	Approx. Quantities	Unit Prices in Numbers		Bid Amount in Numbers	
				Dollars	Cents	Dollars	Cents
BROUGHT FORWARD:							
514.06	Curing Box for Concrete Cylinders	Each	1				
526.301	Temporary Concrete Barrier, Type I	Linear Foot	19,250				
526.306	Temporary Concrete Barrier, Type 1 - Supplied by Authority (8,000 LF)	Lump Sum	1				
526.352	Median Barrier - Type B (11,600 LF)	Lump Sum	1				
526.353	Median Barrier - Type C (400 LF)	Lump Sum	1				
526.354	Median Barrier - Type D (1,700 LF)	Lump Sum	1				
526.361	Bridge End Post Transition Barrier	Each	4				
526.362	Type C Transition Barrier	Each	2				
526.363	Type D Transition Barrier	Each	12				
526.364	OHSS Foundation Transition Barrier	Each	2				
527.341	Work Zone Crash Cushions - TL-3	Unit	27				
602.40	Pumped Grout Fill	Cubic Yard	11				

CARRIED FORWARD:

Item No	Item Description	Units	Approx. Quantities	Unit Prices in Numbers		Bid Amount in Numbers	
				Dollars	Cents	Dollars	Cents
BROUGHT FORWARD:							
603.155	12 inch Reinforced Concrete Pipe - Class III	Linear Foot	160				
603.159	12 Inch Culvert Pipe Option III	Linear Foot	270				
603.165	15 inch Reinforced Concrete Pipe - Class III	Linear Foot	320				
603.175	18 inch Reinforced Concrete Pipe - Class III	Linear Foot	770				
603.195	24 inch Reinforced Concrete Pipe - Class III	Linear Foot	580				
603.205	30 inch Reinforced Concrete Pipe - Class III	Linear Foot	410				
603.215	36 inch Reinforced Concrete Pipe - Class III	Linear Foot	30				
603.28	Concrete Collar	Each	8				
603.47	60 inch Reinforced Concrete Pipe - Class IV	Linear Foot	55				
604.09	Catch Basin Type B1	Each	9				
604.0961	60" Catch Basin Type B1	Each	5				
604.0971	72" Catch Basin Type B1	Each	1				

CARRIED FORWARD:

Item No	Item Description	Units	Approx. Quantities	Unit Prices in Numbers		Bid Amount in Numbers	
				Dollars	Cents	Dollars	Cents
BROUGHT FORWARD:							
604.18	Adjusting Manhole or Catch Basin to Grade	Each	10				
604.182	Cleaning Existing Catch Basin and Manhole	Each	12				
604.248	Catch Basin Type F6	Each	74				
604.26	Catch Basin Type B5	Each	12				
604.266	60" Catch Basin Type B5	Each	2				
604.40	Secure Catch Basin Grate	Each	6				
605.09	6 Inch Underdrain Type B	Linear Foot	6,700				
605.11	12 Inch Underdrain Type C	Linear Foot	5,300				
605.12	15 Inch Underdrain Type C	Linear Foot	1,300				
606.1301	31" W Beam Guardrail - Midway Splice (7' Steel Post, 8" Offset Blocks, Single Faced)	Linear Foot	5,200				
606.1307	31" W-Beam Guardrail - Midway Splice Flared Terminal	Each	8				
606.1351	31" W-Beam Guardrail - Midway Splice Terminal End - Anchored End	Each	4				

CARRIED FORWARD:

Item No	Item Description	Units	Approx. Quantities	Unit Prices in Numbers		Bid Amount in Numbers	
				Dollars	Cents	Dollars	Cents
BROUGHT FORWARD:							
606.353	Reflectorized Flexible Guardrail Marker	Each	12				
606.356	Underdrain Delineator Post	Each	31				
606.3561	Delineator Post-Remove and Reset	Each	117				
606.3631	Guardrail - Remove and Dispose	Linear Foot	21,050				
607.17	Chain Link Fence - 6 Foot	Linear Foot	100				
607.183	Chain Link Snow Fence	Linear Foot	192				
610.071	Stone Fill	Cubic Yard	470				
610.08	Plain Riprap	Cubic Yard	490				
610.18	Stone Ditch Protection	Cubic Yard	600				
610.181	Temporary Stone Check Dam	Cubic Yard	420				
613.319	Erosion Control Blanket	Square Yard	47,500				
615.07	Loam	Cubic Yard	10,300				

CARRIED FORWARD:

Item No	Item Description	Units	Approx. Quantities	Unit Prices in Numbers		Bid Amount in Numbers	
				Dollars	Cents	Dollars	Cents
BROUGHT FORWARD:							
618.14	Seeding Method Number 2	Unit	850				
619.1201	Mulch - Plan Quantity	Unit	850				
619.1202	Temporary Mulch	Lump Sum	1				
620.58	Erosion Control Geotextile	Square Yard	1,800				
626.122	Quazite Junction Box (18x11)	Each	65				
626.22	Non-metallic Conduit	Linear Foot	10,700				
626.31	18 Inch Diameter Foundation	Each	7				
626.32	24 Inch Diameter Foundation	Each	54				
626.33	30 Inch Diameter, 8 Feet or Less Foundation	Each	3				
626.332	30-Inch Diameter, Greater than 8-Feet Long, All 36 Inch and 42 Inch Diameter Foundations	Cubic Yard	51				
626.34	Overhead Sign Structure Foundation	Lump Sum	1				
626.38	Ground Mounted Cabinet Foundation	Each	1				

CARRIED FORWARD:

Item No	Item Description	Units	Approx. Quantities	Unit Prices in Numbers		Bid Amount in Numbers	
				Dollars	Cents	Dollars	Cents
BROUGHT FORWARD:							
627.712	White or Yellow Pavement Marking Line	Linear Foot	128,600				
627.73	Temporary 6 Inch Pavement Marking Tape	Linear Foot	2,000				
627.731	Temporary 6 Inch Black Pavement Marking Tape	Linear Foot	2,000				
627.77	Removing Existing Pavement Marking	Square Foot	35,100				
627.78	Temporary Pavement Marking Line, White or Yellow	Linear Foot	168,000				
629.05	Hand Labor, Straight Time	Hour	200				
631.12	All Purpose Excavator (Including Operator)	Hour	200				
631.13	Bulldozer (Including Operator)	Hour	200				
631.172	Truck-Large (Including Operator)	Hour	200				
631.22	Front End Loader (Including Operator)	Hour	200				
631.32	Culvert Cleaner (Including Operators)	Hour	74				
631.36	Foreman	Hour	200				

CARRIED FORWARD:

Item No	Item Description	Units	Approx. Quantities	Unit Prices in Numbers		Bid Amount in Numbers	
				Dollars	Cents	Dollars	Cents
BROUGHT FORWARD:							
634.160	Highway Lighting	Lump Sum	1				
634.208	Remove and Reset Light Standard	Each	41				
634.231	Conventional Light Standard With LED Fixture	Each	16				
645.1099	Remove and Dispose Sign	Each	58				
645.124	Removal, Disassembly and Relocation of VMS and Supporting Structure	Lump Sum	1				
645.161	Breakaway Device Single Pole	Each	12				
645.162	Breakaway Device Multi Pole	Each	29				
645.251	Roadside Guide Sign, Type I	Square Foot	3,390				
645.271	Regulatory, Warning, Confirmation and Route Assembly Sign, Type I	Square Foot	290				
645.289	Steel H-Beam Poles	Pound	20,150				
645.501	Remove and Reset Mainline Sign No. 1	Each	1				
645.502	Remove and Reset Mainline Sign No. 2	Each	1				

CARRIED FORWARD:

Item No	Item Description	Units	Approx. Quantities	Unit Prices in Numbers		Bid Amount in Numbers	
				Dollars	Cents	Dollars	Cents
BROUGHT FORWARD:							
645.503	Remove and Reset Mainline Sign No. 3	Each	1				
645.504	Remove and Reset Mainline Sign No. 4	Each	1				
645.505	Remove and Reset Mainline Sign No. 5	Each	1				
645.506	Remove and Reset Mainline Sign No. 6	Each	1				
645.507	Remove and Reset Mainline Sign No. 7	Each	1				
645.509	Remove and Reset Mainline Sign No. 9	Each	1				
645.510	Remove and Reset Mainline Sign No. 10	Each	1				
645.511	Remove and Reset Mainline Sign No. 11	Each	1				
645.512	Remove and Reset Mainline Sign No. 12	Each	1				
645.513	Remove and Reset Mainline Sign No. 13	Each	1				
645.514	Remove and Reset Mainline Sign No. 14	Each	1				
645.515	Remove and Reset Mainline Sign No. 15	Each	1				

CARRIED FORWARD:

Item No	Item Description	Units	Approx. Quantities	Unit Prices in Numbers		Bid Amount in Numbers	
				Dollars	Cents	Dollars	Cents
BROUGHT FORWARD:							
645.516	Remove and Reset Mainline Sign No. 16	Each	1				
645.517	Remove and Reset Mainline Sign No. 17	Each	1				
645.518	Remove and Reset Mainline Sign No. 18	Each	1				
645.519	Remove and Reset Mainline Sign No. 19	Each	1				
645.520	Remove and Reset Mainline Sign No. 20	Each	1				
645.521	Remove and Reset Mainline Sign No. 21	Each	1				
645.522	Remove and Reset Mainline Sign No. 22	Each	1				
645.523	Remove and Reset Mainline Sign No. 23	Each	1				
645.524	Remove and Reset Mainline Sign No. 24	Each	1				
652.30	Flashing Arrow	Each	4				
652.312	Type III Barricades	Each	18				
652.33	Drum	Each	500				

CARRIED FORWARD:

Item No	Item Description	Units	Approx. Quantities	Unit Prices in Numbers		Bid Amount in Numbers	
				Dollars	Cents	Dollars	Cents
BROUGHT FORWARD:							
652.34	Cone	Each	200				
652.35	Construction Signs	Square Foot	4,300				
652.361	Maintenance of Traffic Control Devices	Lump Sum	1				
652.41	Portable-Changeable Message Sign	Each	6				
652.45	Truck Mounted Attenuator	Calendar Day	2,920				
652.452	Automated Trailer Mounted Speed Limit Sign	Each	5				
652.46	Temporary Portable Rumble Strip	Unit	36				
652.47	Sequential Flashing Warning Lights	Each	100				
656.50	Baled Hay, In Place	Each	20				
656.60	Temporary Berms	Linear Foot	200				
656.632	30 Inch Temporary Silt Fence	Linear Foot	23,400				
659.10	Mobilization	Lump Sum	1				

CARRIED FORWARD:

Item No	Item Description	Units	Approx. Quantities	Unit Prices in Numbers		Bid Amount in Numbers	
				Dollars	Cents	Dollars	Cents
BROUGHT FORWARD:							
TOTAL:							

Acknowledgment is hereby made of the following Addenda received since issuance of the Plans and Specifications: _____

Accompanying this Proposal is an original bid bond, cashiers or certified check on _____ Bank, for _____, payable to the Maine Turnpike Authority. In case this Proposal shall be accepted by the Maine Turnpike Authority and the undersigned should fail to execute a Contract with, and furnish the security required by the Maine Turnpike Authority as set forth in the Specifications, within the time fixed therein, an amount of money equal to Five (5%) Percent of the Total Amount of the Proposal for the Contract awarded to the undersigned, but not less than \$500.00, obtained out of the original bid bond, cashier's or certified check, shall become the property of the Maine Turnpike Authority; otherwise the check will be returned to the undersigned.

The performance of said Work under this Contract will be completed during the time specified in Subsection 107.1.

It is agreed that time is of the essence of this Contract and that I (we) will, in the event of my (our) failure to complete the Work within the time limit named above, pay to Maine Turnpike Authority liquidated damages in the amount or amounts stated in the Specifications.

The undersigned is an Individual/Partnership/Corporation under the laws of the State of _____, having principal office at _____, thereunto duly authorized.

_____ (SEAL)

_____ (SEAL)

*Affix Corporate Seal
or Power of Attorney
Where Applicable*

_____ (SEAL)

By: _____

Its: _____

Information below to be typed or printed where applicable:

INDIVIDUAL:

(Name)	(Address)
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PARTNERSHIP - Name and Address of General Partners:

(Name)	(Address)
--------	-----------

(Name)	(Address)
--------	-----------

(Name)	(Address)
--------	-----------

(Name)	(Address)
--------	-----------

INCORPORATED COMPANY:

(President)	(Address)
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(Vice-President)	(Address)
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(Secretary)	(Address)
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(Treasurer)	(Address)
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MAINE TURNPIKE AUTHORITY
MAINE TURNPIKE
YORK TO AUGUSTA
CONTRACT AGREEMENT

This Agreement made and entered into between the Maine Turnpike Authority, and sometimes termed the "Authority", and _____

_____ herein termed the "Contractor":

WITNESSETH: That the Authority and the Contractor, in consideration of the premises and of the mutual covenants, considerations and agreements herein contained, agree as follows:

FIRST: The parties hereto mutually agree that the documents attached hereto and herein incorporated and made a part hereof collectively evidencing and constituting the entire Contract to the same extent as if herein written in full, are the Notice to Contractors, the Accepted Proposal, the Specifications, the Plans, this Agreement, the Contract Bond and all Addenda to the Contract Documents duly issued and herewith enumerated:

SECOND: The Contractor for and in consideration of certain payments to be made as hereafter specified, hereby covenants and agrees to perform and execute all of the provisions of this Contract and of all documents and parts attached hereto and made a part thereof, and at his own cost and expense to furnish and perform everything necessary and required to construct and complete, ready for its intended purpose, in accordance with the Contract and such instructions as the Engineer may give, acceptable to the Authority, in the times provided, all of the Work covered and included under Contract No. _____ covering _____ as herein described.

THIRD: In consideration of the performance by the Contractor of his covenants and agreements as herein set forth, the Authority hereby covenants and agrees to pay the Contractor according to the Schedule of Prices set forth in the Proposal with additions and deductions as elsewhere herein provided in the times and in the manner stated in the Specifications. This Agreement shall insure to the benefit of, and shall be binding upon the parties hereto, and upon their respective successors and assigns; but neither party hereto shall assign or transfer his interest herein in whole or in part without the consent of the other, except as herein provided.

IN WITNESS WHEREOF the parties to this Agreement have executed the same in quintuplicate.

AUTHORITY -

MAINE TURNPIKE AUTHORITY

By: _____

Title: CHAIRMAN

Date of Signature: _____

ATTEST:

Secretary

CONTRACTOR -

CONTRACTOR

By: _____

Title: _____

Date of Signature: _____

WITNESS:

CONTRACT BOND

KNOW ALL MEN BY THESE PRESENTS that _____
of _____ in the County of _____ and 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 Maine Turnpike Authority in the sum of
_____ Dollars (\$_____.____),
to be paid to said Maine Turnpike Authority, or its successors, for which payment, well and truly
to be made, we bind ourselves, our heirs, executors, successors and assigns jointly and severally
by these presents.

The condition of this obligation is such that the Principal, designated as Contractor in the
foregoing Contract No. _____ shall faithfully perform the Contract on his part and
satisfy all claims and demands incurred for the same and shall pay all bills for labor, material,
equipment and all other items contracted for, or used by him, in connection with the Work
contemplated by said Contract, and shall fully reimburse 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.

Signed and sealed this _____ day of _____, A.D., 2020 ____

Witnesses:

CONTRACTOR

_____ (SEAL)

SURETY

_____ (SEAL)

(Surety must attach copy of Power of Attorney showing authority of Office or Agent to execute bonds)

FINAL LIEN AND CLAIM WAIVER AND AFFIDAVIT

Upon receipt of the sum of _____, which sum represents the total amount paid, including the current payment for work done and materials supplied for Project No. _____, in _____, Maine, under the undersigned's Contract with the Maine Turnpike Authority.

The undersigned, on oath, states that the Final Payment of _____ is the final payment for all work, labor, materials, services and miscellaneous (all of which are hereinafter referred to as "Work Items") supplied to the said Project through _____ and that no additional sum is claimed by the undersigned respecting said Project.

The undersigned, on oath, states that all persons and firms who supplied Work Items to the undersigned in connection with said Project have been fully paid by the undersigned for such Work Items or that such payment will be fully effected immediately upon receipt of this payment.

In consideration of the payment herewith made, the undersigned does fully and finally release and hold harmless the Maine Turnpike Authority, and its Surety, if any, from any and all claims, liens or right to claim or lien, arising out of this Project under any applicable bond, law or statute.

It is understood that this Affidavit is submitted to assure the Owner and others that all liens and claims relating to the Work Items furnished by the undersigned are paid.

(Contractor)

By: _____

Title: _____

State of MAINE
County of _____

I, _____, hereby certify on behalf of _____
(Company Officer) *(Company Name)*
its _____, being first duly sworn and stated that the foregoing representations are
(Title)
are true and correct upon his own knowledge and that the foregoing is his free act and deed in said capacity and the free act and deed of the above-named

(Company Name)

The above-named, _____, personally appeared before me this ____ day of _____ and swears that this is his free act and deed.

(SEAL)

Notary Public
My Commission Expires: _____

MAINE TURNPIKE AUTHORITY

SPECIFICATIONS

PART I – SUPPLEMENTAL SPECIFICATIONS

(Rev. November 10, 2016)

Supplemental Specifications are available at www.maineturnpike.com

MAINE TURNPIKE AUTHORITY

SPECIFICATIONS

PART II – SPECIAL PROVISIONS

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MAINE TURNPIKE AUTHORITYSPECIFICATIONSPART II - SPECIAL PROVISIONS

All work shall be governed by the Maine Department of Transportation Standard Specifications, Revision of November 2014, except for that work which applies to sections of the Maine Department of Transportation Standard Specifications which are amended by the Maine Turnpike Supplemental Specifications and the following modifications, additions and deletions.

General Description of Work

The work consists of constructing a third travel lane northbound, a third lane southbound, and reconstructing the grassed median to a paved median on the Maine Turnpike in the Towns of South Portland and Portland, Maine, and an overhead sign structure disassembly and removal in Scarborough, Maine. The work includes embankment construction, roadway gravels and pavement construction, culvert and closed drainage installation, concrete median barrier construction, concrete median pier protection, bridge abutment slope protection, overhead sign structure removal, overhead sign structure installation, roadway signing and striping, highway lighting, guardrail, maintenance of traffic and all other work incidental thereto in accordance with the Plans and Specifications.

Plans

The drawings included in these Contract Documents, and referred to as the Plans, show the general character of the work to be done under this Contract. They bear the general title "Maine Turnpike – Contract 2021.08 – Portland Area Widening & Safety Improvements, Mile 46.4 to Mile 49.3. The right is reserved by the Resident to make such minor corrections or alterations in the Plans as they deem necessary without change in the unit prices on the Schedule of Prices of the Proposal.

101.2 DefinitionHolidays

The following is added after Memorial Day in the Supplemental Specifications:

Christmas Day 2021	12:01 p.m. preceding Thursday to 6:00 a.m. the following Tuesday
New Year's Day 2022	12:01 p.m. preceding Thursday to 6:00 a.m. the following Monday
Independence Day 2022 (Fourth of July)	6:00 a.m. preceding Friday to 6:00 a.m. the following Tuesday
Christmas Day 2022	6:00 a.m. preceding Friday to 6:00 a.m. the following Tuesday

New Year's Day 2023

12:01 p.m. preceding Friday to 6:00 a.m. the following Tuesday

Independence Day 2023
(Fourth of July)

12:01 p.m. preceding Friday to
6:00 a.m. the following Thursday

103.4 Notice of Award

The following sentence is added:

The Maine Turnpike Authority Board is scheduled to consider the Contract Award on November 18, 2021.

104.3.8 Wage Rates and Labor Laws

Section 104.3.8 Wage Rates and Labor Laws has been amended as follows:

The fair minimum hourly rates determined by the State of Maine Department of Labor for this Contract are as follows:

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

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

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

2021 Fair Minimum Wage Rates
Highway & Earth Cumberland County

Occupation Title	Minimum			Occupation Title	Minimum		
	Wage	Benefit	Total		Wage	Benefit	Total
Asphalt Raker	\$ 19.80	\$ 1.01	\$ 20.81	Ironworker - Reinforcing	\$ 28.36	\$ 0.00	\$ 28.36
Backhoe Loader Operator	\$ 25.46	\$ 4.33	\$ 29.79	Laborer - Skilled	\$ 20.61	\$ 2.19	\$ 22.80
Boom Truck (Truck Crane) Operator	\$ 25.00	\$ 5.86	\$ 30.86	Laborers (Helpers & Tenders)	\$ 20.00	\$ 0.89	\$ 20.89
Bulldozer Operator	\$ 24.97	\$ 3.50	\$ 28.47	Loader Operator - Front-End	\$ 20.50	\$ 3.80	\$ 24.30
Carpenter - Rough	\$ 30.76	\$ 19.72	\$ 50.48	Mechanic- Maintenance	\$ 24.00	\$ 3.92	\$ 27.92
Cement Mason/Finisher	\$ 20.50	\$ 1.42	\$ 21.92	Millwright	\$ 25.75	\$ 5.41	\$ 31.16
Communication Equip Installer	\$ 22.00	\$ 0.00	\$ 22.00	Painter	\$ 19.50	\$ 0.00	\$ 19.50
Crane Operator =>15 Tons)	\$ 29.00	\$ 6.68	\$ 35.68	Paver Operator	\$ 30.00	\$ 5.21	\$ 35.21
Crusher Plant Operator	\$ 20.00	\$ 2.39	\$ 22.39	Pipelayer	\$ 23.90	\$ 3.50	\$ 27.40
Electrician - Licensed	\$ 28.00	\$ 5.90	\$ 33.90	Reclaimer Operator	\$ 26.83	\$ 13.25	\$ 40.08
Electrician Helper/Cable Puller	\$ 18.50	\$ 2.39	\$ 20.89	Roller Operator - Earth	\$ 19.83	\$ 0.00	\$ 19.83
Excavator Operator	\$ 24.20	\$ 4.00	\$ 28.20	Roller Operator - Pavement	\$ 23.06	\$ 4.59	\$ 27.65
Fence Setter	\$ 19.00	\$ 2.00	\$ 21.00	Screed/Wheelman	\$ 24.86	\$ 4.18	\$ 29.04
Flagger	\$ 15.50	\$ 0.00	\$ 15.50	Stone Mason	\$ 25.00	\$ 1.88	\$ 26.88
Grader/Scraper Operator	\$ 27.89	\$ 8.90	\$ 36.79	Truck Driver - Heavy	\$ 19.00	\$ 2.03	\$ 21.03
Highway Worker/Guardrail Installer	\$ 24.87	\$ 1.36	\$ 26.23	Truck Driver - Light	\$ 24.15	\$ 0.38	\$ 24.53
Hot Top Plant Operator	\$ 23.91	\$ 13.25	\$ 37.16	Truck Driver - Medium	\$ 21.00	\$ 1.64	\$ 22.64
Industrial Truck (Forklift) Operator	\$ 26.83	\$ 1.48	\$ 28.31	Truck Driver - Tractor Trailer	\$ 20.00	\$ 0.72	\$ 20.72

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

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

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

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

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

A true copy

Attest: 

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

Expiration Date: 12-31-2021
Revised 2-25-2021

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

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

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

**2021 Fair Minimum Wage Rates
 Heavy & Bridge Cumberland County**

Occupation Title	Minimum	Minimum	Total	Occupation Title	Minimum	Minimum	Total
	Wage	Benefit			Wage	Benefit	
Asphalt Raker	\$ 19.51	\$ 2.14	\$ 21.65	Ironworker - Reinforcing	\$ 29.38	\$ 6.98	\$ 36.36
Backhoe Loader Operator	\$ 28.75	\$ 12.88	\$ 41.63	Ironworker - Structural	\$ 22.00	\$ 4.94	\$ 26.94
Boom Truck (Truck Crane) Operator	\$ 25.00	\$ 5.86	\$ 30.86	Laborer - Skilled	\$ 22.50	\$ 4.46	\$ 26.96
Bulldozer Operator	\$ 23.97	\$ 3.88	\$ 27.85	Laborers (Helpers & Tenders)	\$ 21.01	\$ 1.52	\$ 22.53
Carpenter	\$ 24.75	\$ 5.90	\$ 30.65	Line Erector - Power/Cable Splicer	\$ 32.89	\$ 5.85	\$ 38.74
Carpenter - Rough	\$ 25.00	\$ 5.67	\$ 30.67	Loader Operator - Front-End	\$ 26.00	\$ 4.54	\$ 30.54
Cement Mason/Finisher	\$ 24.50	\$ 0.00	\$ 24.50	Mechanic- Maintenance	\$ 24.61	\$ 3.67	\$ 28.28
Comm Transmission Erector-Microwave/Cell	\$ 23.00	\$ 4.64	\$ 27.64	Mechanic- Refrigeration	\$ 26.50	\$ 6.58	\$ 33.08
Communication Equip Installer	\$ 19.75	\$ 3.69	\$ 23.44	Millwright	\$ 27.00	\$ 5.49	\$ 32.49
Crane Operator =>15 Tons)	\$ 31.98	\$ 6.87	\$ 38.85	Painter	\$ 35.00	\$ 0.00	\$ 35.00
Diver	\$ 32.00	\$ 4.80	\$ 36.80	Paver Operator	\$ 23.91	\$ 7.36	\$ 31.27
Dry-Wall Applicator	\$ 24.00	\$ 0.00	\$ 24.00	Pipe/Steam/Sprinkler Fitter	\$ 27.00	\$ 6.72	\$ 33.72
Dry-Wall Taper & Finisher	\$ 24.00	\$ 0.84	\$ 24.84	Pipelayer	\$ 25.50	\$ 5.90	\$ 31.40
Earth Auger Operator	\$ 27.33	\$ 5.85	\$ 33.18	Plumber (Licensed)	\$ 28.00	\$ 4.19	\$ 32.19
Electrician - Licensed	\$ 31.98	\$ 8.44	\$ 40.42	Plumber Helper/Trainee	\$ 19.25	\$ 2.10	\$ 21.35
Electrician Helper/Cable Puller	\$ 21.75	\$ 18.67	\$ 40.42	Reclaimer Operator	\$ 26.83	\$ 13.25	\$ 40.08
Elevator Constructor/Installer	\$ 61.42	\$ 41.17	\$ 102.59	Rigger	\$ 26.00	\$ 7.43	\$ 33.43
Excavator Operator	\$ 28.00	\$ 4.27	\$ 32.27	Roller Operator - Earth	\$ 20.00	\$ 1.92	\$ 21.92
Fence Setter	\$ 18.50	\$ 2.00	\$ 20.50	Roller Operator - Pavement	\$ 23.91	\$ 4.70	\$ 28.61
Flagger	\$ 15.00	\$ 0.00	\$ 15.00	Screed/Wheelman	\$ 21.00	\$ 3.61	\$ 24.61
Floor Layer	\$ 22.00	\$ 4.32	\$ 26.32	Sheet Metal Worker	\$ 22.50	\$ 5.42	\$ 27.92
Grader/Scraper Operator	\$ 23.71	\$ 4.85	\$ 28.56	Truck Driver - Heavy	\$ 23.99	\$ 1.93	\$ 25.92
Hot Top Plant Operator	\$ 23.91	\$ 10.99	\$ 34.90	Truck Driver - Light	\$ 17.00	\$ 0.52	\$ 17.52
Industrial Truck (Forklift) Operator	\$ 26.83	\$ 1.95	\$ 28.78	Truck Driver - Medium	\$ 20.95	\$ 2.02	\$ 22.97
Insulation Installer	\$ 21.00	\$ 2.12	\$ 23.12	Truck Driver - Tractor Trailer	\$ 25.00	\$ 2.57	\$ 27.57

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

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

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

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

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

A true copy

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

Expiration Date: 12-31-2021
 Revised 2-25-2021

104.4.6 Utility Coordination

This Subsection is amended by the addition of the following:

These Special Provisions outline the arrangements which have been established by the Authority for coordination of the work to be accomplished by the utilities. The scope and schedule of utility relocation work is noted herein. The Contractor shall plan and conduct his work accordingly.

General

Utility working days are Monday through Friday, conditions permitting. 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 Authority if they are exceeded.

The Contractor shall plan and conduct operations in accordance with the following utility schedule. The Contractor must comply with all OSHA regulations pertaining to work adjacent to utility wires. The Contractor shall plan and conduct work accordingly.

The following utilities are located within the Project limits. The Contractor shall ascertain the location of the existing utilities and any other necessary information by direct inquiry at the office of the following utility owners:

AERIAL UTILITIES

The aerial utility facilities identified below are present within the project limits. Existing aerial distribution and communications cables cross the Turnpike mainline.

Temporary utility adjustments are not anticipated. If temporary relocation becomes 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 Authority 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.

The following aerial utilities are known to be present on this project, including contact information:

CENTRAL MAINE POWER COMPANY (CMPCo)

83 Edison Drive

Augusta, ME 04336

ATTN: Randy Berry

Tel: (207) 500-1407

Email: RBerry@canacre.com

160 Canco Road

Portland, ME 04103

ATTN: Alpay Balkir
 Tel: (207) 239-8372
 Email: alpay.balkir@cmpco.com

CMP has aerial crossings of the Turnpike: south of and along Congress St, north of Westbrook St, south of Rand Rd/Westbrook Arterial, and north of and along Brighton Ave.

- There are no grading concerns for crossing along Congress Street.
- There are no grading concerns for the transmission line north of Westbrook Street. The contractor shall, however, be aware of pole guys near slope limits in this location. The Contractor shall be aware that they may be working next to, or under the existing wires with limited clearance in this area. The Contractor shall be responsible for complying with M.R.S.A. Title35-A, Chapter 7-A Sections 751 -761 Overhead High-Voltage Line Safety Act. Prior to commencing any work that may come within ten (10) feet of any aerial electrical line the Contractor shall notify the aerial utilities as per section 757 of the aforementioned act. Any work within 25 feet of CMPCo's facilities will require advance coordination with CMPCo to have a CMPCo representative on-site to provide a safety watch. The CMPCo representative may stop work within the CMPCo right-of-way if they believe the work activities are unsafe or may cause damage to CMPCo's facilities. All CMPCo poles or guy wires that will have construction activities or construction traffic within 25 ft shall be protected by two sections of temporary concrete barrier. Three temporary barrier markers shall be mounted on the barrier at each location.
- Similarly, the pole guys for the Rand Road crossing are close to the slope limits; the contractor should be aware, follow the same precautions, and have the same responsibilities as noted for the Westbrook Street crossing.
- There are no grading concerns for the crossing along Brighton Avenue.
- The contractor shall provide CMP with 10 days notice of grading around all poles, guys, and push poles.
- For all locations where equipment will be within 25 feet of poles, guys, or aerial conductors, the Contractor, if requested, shall prepare and submit for approval, an equipment layout plan depicting the working area of all components of the equipment/crane and infrastructure being installed as well as the poles, guys, and conductors. The plan shall be submitted a minimum of 30 days prior to planned work adjacent to the conductors. Written approval must be received prior to work commencing.
- .
- There will be a new single phase 100-amp electrical service installed for the VMS south of Brighton Avenue. The contractor shall be responsible for coordination with CMP for connection of the new service lines and installation of the new service meter once all needed contractor provided infrastructure is in place.
- A Utility Pre-Construction meeting is required and shall be completed prior to construction.

CHARTER COMMUNICATIONS (SPECTRUM)

118 Johnson Road
 Portland, ME 04102
 ATTN: Mark Pelletier
 Tel: (207) 253-2324
 Email: Mark.pelletier@charter.com

Charter has aerial facilities on the same poles as CMP south of Congress Street and north of Brighton Avenue. Charter also has a single aerial line crossing north of Congress Street. There are

no concerns with grading at these facilities however the contractor should be aware of the slope limit being at the pole base, southbound side, just north of Congress Street. Contractor shall provide a 10-day notice of grading around poles.

CONSOLIDATED COMMUNICATIONS (FAIRPOINT)

5 Davis Farm Road, Floor 2
Portland, ME 04103
ATTN: Marty Pease
Tel: (207) 272-7993
Email: martin.pease@consolidated.com

Consolidated Communications has two aerial crossings, one at Congress Street and one in conduit attached to the Brighton Avenue bridge. There are no concerns with proposed work in either of these areas. Contractor shall provide a 10-day notice of working adjacent to these facilities.

CROWN CASTLE FIBER (LIGHTOWER)

80 Central Street
Boxborough, MA 01719
ATTN: Mark Bonnano
Tel: (617) 828-1415
Email: mbonnano@lightower.com

80 Central Street
Boxborough, MA 01719
ATTN: Chris Stevens
Tel: (978) 881-4543
Email: cstevens@lightower.com

Lightower has aerial facilities on the same poles as CMP south of Rand Road and north of Brighton Avenue. There are no concerns with proposed work in either of these areas. Contractor shall provide a 10-day notice before grading around poles, braces, or pole guys.

FEDERAL AVIATION ADMINISTRATION (FAA)

1001 Westbrook Street
Portland, ME 04102
ATTN: Jim Mello
Tel: (207) 552-1505
Tel: (207) 318-2830
Email: james.mello@faa.gov

1001 Westbrook Street
Portland, ME 04102
ATTN: Dave Simard
Tel: (207) 318-2827
Email: david.p.simard@faa.gov

1001 Westbrook Street
Portland, ME 04102
ATTN: Robert Durocher
Tel: (207) 552-1501
Email: robert.durocher@faa.gov

The Portland Jetport and Federal Aviation Administration (FAA) own a steel light bridge which crosses the turnpike at STA. 2285+50, approximately 300' south of this project limits. However, the contractor should be aware that construction activity for this Contract, especially within the Exit 46 interchange is in general vicinity of the flight path. Access to the light bridge shall be maintained at all times through all phases of construction. Underground conduits exist from the easterly tower going under the Exit 46 northbound off-ramp. Additional information can be found in the Underground Utility section of this specification. If the light bridge (or underground conduit) is contacted, the contractor shall contact the FAA and Jetport immediately. In the event of an emergency, please contact the Atlantic Operations Control Center (AOCC) at 1-866-432-2622. The FAA requires a 72-hour notice for any work in the area of their facilities.

Contractor shall review and comply with the Special Conditions contained in multiple Aeronautical Studies, numbered No. 2021-ANE-(###)-OE and Advisory Circular AC No. 70/7460-1M. These documents are contained in the Appendix. FAA has determined equipment that is 31 feet tall or less (above ground level) may be used on this project with special marking and/or lighting; see documents noted in this paragraph. Any equipment or part of equipment that exceeds 31 feet above ground level will require an additional application process, review and approval of the FAA before the equipment can be used. See Appendix for locations where equipment up to 100 feet tall is permitted without additional application to the FAA.

Contractor shall contact the FAA (Portland International Jetport) (207-756-8310), including PWM Air Traffic Control Tower at 207-552-1415 or 207-780-3396, as noted in these documents, at least 3 business days prior to use of construction equipment AND when the construction is complete.

Contractor must submit FAA Form 7460-2 Notice of Actual Construction or Alteration to the Resident within 3 days of when construction reaches its greatest height (see FAA Form 7460-2, Part 2). This applies to final pavement and roadway lighting on the Exit 46 ramps, as well as construction equipment removed from the site.

FIRSTLIGHT FIBER (OXFORD NETWORKS)

14 Resilient Circle Brunswick, ME 04011

ATTN: Michael Ellingwood
Tel: (207) 462-2759
Tel: (207) 333-3471
Email: mellingwood@firstlight.net

Firstlight has aerial facilities on the same poles as CMP south of Congress Street and north of Brighton Avenue. There are no concerns with grading at these facilities. Contractor shall provide a 10-day notice of grading around poles.

MAINECOM

16 Middle Street, 4th Floor
 Portland, ME 04101
 Attn: Mike Atwater
 Tel: (207-557-1591
 Email: MAAtwater@Tilsontech.com

MaineCom has aerial facilities on the same poles as CMP south of Congress Street. There are no concerns with grading around these poles. Contractor shall provide a 10-day notice of grading around poles.

MCI WORLD COMMUNICATIONS (VERIZON)

82B Northside Road PO Box 600
 Charlton, MA 01507
 ATTN: Tremain Fernandes
 Tel: (617) 953-9575 Email: tremain.k.fernandes@verizon.com

Verizon has aerial facilities on the same poles as CMP south of Congress Street. There are no concerns with grading around these poles. Verizon also has a crossing immediately north of the CMP crossing north of Brighton Avenue. The contractor should be aware of a push brace on the northbound side and a pole on the southbound side that exist right at the slope limit. Contractor shall contact Verizon 10 days before grading around the brace and pole.

PORTLAND FIRE DEPARTMENT

380 Congress Street
 Portland, ME 04101
 ATTN: Keith Gautreau
 Tel: (207) 874-8400
 Email: kng@portlandmaine.gov

Portland Fire Department has aerial fire alarm cables which cross the Maine Turnpike on the same poles as CMP south of Congress Street and north of Brighton Avenue. No special accommodations or work is expected for this facility. Contractor shall provide a 10-day notice of grading around poles.

UNDERGROUND UTILITIES

The underground utility facilities identified below are present within the project limits.

Unless otherwise specified, any underground utility facilities shown on the project plans represent approximate locations gathered from available information. The MTA cannot certify the level of accuracy of this data. Underground facilities indicated on the plan sheets 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.

The following underground utilities are known to be present to this project, including contact information:

BUCKEYE PARTNERS, L.P.

170 Lincoln Street
South Portland, ME 04106
ATTN: Walter Ronfeldt
Tel: (207) 274-0914
Tel: (207) 808-4511
Email: wronfeldt@buckeye.com

Buckeye Pipeline has a High Pressure Petroleum Products pipeline which is located easterly of the northbound mainline. The pipeline is within the Exit 46 infield area, crosses beneath both ramps, runs along the northbound mainline, and crosses beneath the mainline at approximately station 2308+50. The ditch crossing of the pipeline, as well as the underdrain were designed to provide a minimum of four (4) feet of cover. Buckeye requires the contractor follow a set of Construction Guidelines, labeled Buckeye Partners - Right-of-way Restrictions, see Appendix. This contains all restrictions regarding work and rock excavation near the Buckeye facilities. Buckeye requires a 15-day notice of any/all rock excavation within 500 feet of the utility.

CITY OF PORTLAND

212 Canco Road
Portland, ME 04103
ATTN: Bradley Roland, P.E.
Tel: (207) 874-8840
Email: Brad@portlandmaine.gov

The City of Portland has a 16-inch asbestos concrete sewer line inside a 42-inch casing which runs across the turnpike just north of Exit 48. The casing is approximately 155 feet long from manhole to manhole across the turnpike. Asbestos concrete lines extend out from the two manholes. The manholes will remain in place and must be built up (adjusted) to new grade. The manhole on the west side of the turnpike will be in the proposed southbound shoulder. The existing manhole to the east will be in the middle of a proposed run of new guardrail so care must be taken to avoid conflicts between guardrail posts and the manhole. The City requires a 10-day notice of any work on or adjacent to the manholes.

ELECTRIC (LIGHTING)

Maine Turnpike Authority
2360 Congress Street
Portland, ME 04102
ATTN: Shawn Laverdiere
Tel: (207) 829-3767
Email: SLaverdiere@maineturnpike.com

Maine Turnpike Authority owns highway lighting facilities within the project limits along each interchange ramp. The proposed work includes: removing existing underground infrastructure, relocating infrastructure, and installing new infrastructure (conduit, conductors, junction boxes, foundations and highway lights).

The Contractor shall coordinate with MTA at least 10-days prior to impacting lighting facilities.

GRANITE STATE GAS

325 West Road
Portsmouth, NH 03810
ATTN: Brian Chaput
Tel: (603) 294-5146
Email: chaputb@unitil.com

UNITIL

325 West Road
Portsmouth, NH 03801
ATTN: Brian Chaput
Tel: (603) 294-5146
Email: chaputb@unitil.com

Granite State & Unitil owns/operates a number of pipelines with crossings within the project limits. These crossings and adjacent runs are noted here:

- Pipeline crosses the Exit 46 southbound off ramp approximately 75 feet outside of the project limits; no concerns.
- Pipeline segment runs parallel to the Turnpike beneath Skyway Connector on the southbound side; the contractor must use caution when installing a parallel electrical line for highway lighting at this location.
- Pipeline crosses the Turnpike south of Congress Street; there are no concerns at this location.
- Pipeline segment runs parallel to the Turnpike along southbound side, in places adjacent to the proposed slope limits. There is ledge removal required north of Congress Street in close proximity to the pipeline.
- Pipeline crosses the Turnpike south of Westbrook Street; vertical information is not yet available for this location. Unitil is planning to replace this line with a horizontal directional drilled 6 inch line inside a 10 inch casing. The exact location of the drill pits and access are in early stages of development. Unitil will require access to the work zone, work laydown areas, and work areas from Sta 2334+00 to 2339+00 right and left. Construction is tentatively planned for November and December 2021 and March and April of 2022.. Additional information will be provided as it becomes available.
- Pipeline crossing at Brighton Avenue is attached to the underside of bridge so no concerns at this location.

Contractor shall provide a 10-day notice of work within 50' of the pipeline and provide a construction/excavation plan 30 days in advance of any rock removal within 50' of the pipeline. No construction shall occur within 4 feet of a pipeline without a representative from Granite/Unitil being onsite during construction.

Contractor shall coordinate with Unitil, and MTA, through a utility pre-construction meeting, to discuss construction and schedule details of the Westbrook Street line replacement.

Contractor shall have no claim against the Authority if the approximate work area is exceeded or if the tentative work windows are exceeded.

PORTLAND PIPE LINE CORPORATION (PPLC)

30 Hill Street

South Portland, ME 04106

ATTN: Randy Hughes

Tel: (207) 767-0437

Email: randy.hughes@pmpl.com

Portland Pipe Line Corporation (PPLC) has a 24-inch oil pipeline within the limits of the project with multiple points where construction is adjacent or over the pipeline. Following are a number of key areas of construction caution:

- Exit 47 southbound offramp – proposed light standards shall be installed maintaining a minimum of 10 feet clearance between the PPLC 24-inch pipeline and the proposed new or relocated light standard foundations.
- Electrical conduits should be installed to provide minimum 18 inches clearance to pipeline.
- Underdrain lines should be installed to provide minimum 18-inches clearance to pipelines near STA 2407+10.
- The federal pipeline regulations require at least 36 inches of cover over the pipelines at the highway drainage ditches, including at the proposed storm drain inlets and outlets near Exit 47 SB Off Ramp STA 92+50 TO 93+50, Southbound mainline STA 2365+00 to 2367+00 and Exit 48 NB Off Ramp STA 144+15 and STA 145+00. Stone ditch protection shall be installed over the pipelines in these locations.
- Special coordination is required for grading in the Exit 48 interchange between the Turnpike mainline and the northbound off ramp. PPLC maintains pipe vents and a cathodic protection test station at this location which must be maintained. Cover requirements shall also be maintained in this area over the pipelines. The contractor shall provide a 30-day notice of construction in this area.

PPLC requires a Pre-Construction meeting to finalize all construction details and schedule including details of heavy and vibratory equipment to be operated near and over the pipelines. In addition, the contractor must follow a set of construction guidelines, labeled Portland Pipe Line Corporation – Construction Practices for work within 1,000 feet of their facility; see Appendix. This contains general restrictions regarding work and rock excavation near the PPLC facilities. Prior to rock excavation within 1000-feet of PPLC's facility, PPLC requires a two-week notice of work, an advance copy of the rock excavation plan submittal, and monitoring requirement, to ensure that the rock excavation plan includes measures which protect and monitor the pipeline. PPLC then requires a 48-hours' notice for any work in the vicinity of its pipelines. Additionally, PPLC will have an inspector onsite during construction within 50-feet of any PPLC facilities. In case of emergency the Contractor shall contact the 24-hour/7-days a week PPLC control center, 1-866-253-7351 or 1-207-767-3231.

PORTLAND WATER DISTRICT (PWD)

225 Douglass Street P.O. Box 3553

Portland, ME 04104

ATTN: Joseph Parent

Tel: (207) 232-3851

Email: jparent@pwd.org

Portland Water District has a 12-inch main in a 24-inch casing crossing the Turnpike near Congress Street at approximately station 2303+50.

Portland Water District has a water main in a utility vault crossing the Turnpike at the following locations:

- 42-inch RCCP water main located at Station 2340+52.81 near Westbrook St.
- 42-inch CIP water main located at Station 2360+02.55 near Rand Rd.

MTA and the PWD, under Contract 2021.02, are extending utility vaults at the locations noted. For reference, the work generally consists of: installing temporary concrete barrier and traffic control, shoulder, ramp, and mainline lane closures, temporary earth support systems, construction laydown areas, temporary water main support, and temporary support systems that will protect, at all times, the 42” Cast Iron Pipe (1912, leaded joint) – at station 2360+02.55 and the 42” Reinforced Concrete Cylinder Pipe (1931, rubber and steel joint) – at station 2340+52.81, during construction of the tunnel extensions. Each water main will be removed from service by PWD during the work by closing valves on each side of the work area. Contract 2021.02 will fully complete the work on one utility vault before beginning work on the other utility vault.

MTA and PWD, under Contract 2021.02, are replacing an 8-inch main and extending it’s 24-inch casing at Exit 48 interchange, crossing the mainline at station 2407+50, southbound onramp at station 125+00, and northbound offramp at station 145+00. . For reference, the work also includes installing temporary concrete barrier and traffic control, temporary shoulder closures, ramp closures, and lane shifts, temporary earth supports, excavation, and construction laydown areas.

The work is estimated to be complete by December 17, 2021. The contractor shall have no claim for work remaining or required after December 17, 2021.

The Contractor shall provide MTA and PWD at least a 96-hour advance notice of work to be performed within the PWD’s easements or Rights-of-Way. No work shall be performed within the PWD pipeline easements or Rights-of-Way without prior approval of PWD and a PWD representative being on-site for inspection purposes.

The Portland Water District (PWD) requires a Pre-Construction meeting to finalize all construction details and schedule including details of heavy and vibratory equipment to be operated near and over the waterlines. Contractor shall provide a 10-day notice of work within 100’ of their facilities. In addition to the advanced notice, a PWD inspector will be onsite during construction within 25-feet of any PWD infrastructure. Additionally, for any rock excavation within 500’ of a PWD facility, PWD requires a two-week advance copy of the rock excavation plan submittal with the proximity to PWD’s nearest main, for their review and approval.

FEDERAL AVIATION ADMINISTRATION (FAA) AT LIMITS OF WORK

1001 Westbrook Street
 Portland, ME 04102
 ATTN: Jim Mello
 Tel: (207) 552-1505
 Tel: (207) 318-2830
 Email: james.mello@faa.gov

1001 Westbrook Street
 Portland, ME 04102
 ATTN: Dave Simard

Tel: (207) 318-2827
 Email: david.p.simard@faa.gov

1001 Westbrook Street
 Portland, ME 04102
 ATTN: Robert Durocher
 Tel: (207) 552-1501
 Email: robert.durocher@faa.gov

The Portland Jetport and Federal Aviation Administration (FAA) own a steel light bridge which crosses the turnpike at STA. 2285+50, approximately 300' south of this project limits. However, the contractor should be aware that construction activity for this Contract, especially in the Exit 46 interchange and in general vicinity of the flight path are subject to FAA requirements. Access to the light bridge shall be maintained at all times through all phases of construction. Underground conduits exist from the easterly tower going under the Exit 46 northbound off-ramp. Additional information can be found in the Aerial Utility section of this specification. If the light bridge (or underground conduit) is contacted, the contractor shall contact the FAA and Jetport immediately. In the event of an emergency, please contact the Atlantic Operations Control Center (AOCC) at 1-866-432-2622. The FAA requires a 72-hour notice for any work in the area of their facilities.

Contractor shall review and comply with the Special Conditions contained in multiple Aeronautical Studies, numbered No. 2021-ANE-(###)-OE and Advisory Circular AC No. 70/7460-1M. These documents are contained in the Appendix.

104.4.7 Cooperation With Other Contractors

This Subsection is amended by the addition of the following:

Adjacent contracts currently scheduled for the 2020 & 2021 construction season include:

- MTA Contract 2018.19 – Cummings Road Underpass Bridge Replacement, MM 44.6
- MTA Contract 2020.02 – Exit 45 Interchange Reconstruction, MM 44.9
- MTA Contract 2020.03 – Portland Area Widening & Safety Improvements, MM 43.0 to 46.4
- MTA Contract 2019.10 – Warren Avenue Overpass Bridge Replacement, MM 49.0
- MTA Contract 2021.02 – Waterline and Utility Vaults, MM 47.1, 47.6, and 48.5
- MTA Contract 2023.xx – Mainline Paving, MM43.0 to 49.0
- MaineDOT WIN 21745 Interstate 295 Over Veranda Street in Portland (for purposes of traffic management during planned I-295 closures)

105.8.2 Permit Requirements

The Project is being constructed under the Maine Department of Environmental Protection (DEP) Natural Resources Protection Act Permit and Water Quality Certification L-27726-TG-A-N. A copy of the Permit is attached in **Appendix A**. The permit expands the in-water work window at

Unnamed Stream – Capisic Brook Watershed by allowing in-water work starting on April 1 and ending on November 1; see Permit for details.

No tree cutting shall occur between June 1 and July 31.

All disturbed areas within 100 feet of a stream must be revegetated such that no exposed or unvegetated soil remains by October 1. If this is not achieved, special conditions noted in the Permit shall be followed including use of special erosion and sedimentation control measures to stabilize the areas over the winter. Follow-up requirements for these areas, also noted in the permit, shall be completed in the following growing season.

Weekly inspections of the work area adjacent to streams and wetlands will be conducted by Maine Turnpike inspectors for submittal to the MaineDEP and Maine IF&W to meet permit conditions.

The Project is being permitted under Section 404 of the Clean Water Act, through the US Army Corps of Engineers Individual Permit NAE-2019-00701. The Project is subject to the General Conditions and Special Conditions contained in the Permit. A copy of the Permit is attached in **Appendix B**. A signed copy of the Work Start Notification Form must be sent to the Army Corps Maine Project Office at least two weeks before work commences.

The Project is subject to the requirements of the Maine Pollutant Discharge Elimination System (MPDES) General Permit for Stormwater Discharge from Construction Activity, as promulgated by the US Environmental Protection Agency (US EPA) and Administrated by the Maine Department of Environmental Protection (DEP).

A Notice of Intent (NOI), accompanied by a preliminary Limit of Disturbance (LOD) plan was submitted by the Authority to the DEP for coverage under the Maine Construction General Permit (MCGP). Compliance with the erosion and sedimentation control requirements outlined in this Contract is required by the Contractor.

The Contractor shall prepare a LOD plan illustrating the Contractor's proposed limit of earthwork disturbance. The LOD plan shall show all construction access locations, field office locations, material and temporary waste storage locations, as well as include the Contract limits of earthwork disturbance. All applicable erosion and sedimentation control devices needed shall be detailed on the Contractor's LOD plan and are not limited to those devices shown on the Contract LOD plan. **This Plan shall be submitted for review and approval, to the Resident within 14 days of Contract award.** Payment for creating, revising, and completing this plan shall be incidental to Item 659.10, Mobilization.

The LOD for Contract 2021.08 which was submitted as part of the NOI, has been estimated to be **42.8 acres**.

At any time during the Contract, if the Limit of Disturbance needs to be adjusted to accommodate construction activities, the Contractor shall resubmit the LOD plan (including any additional erosion and sedimentation control measures needed) to the Resident for review and approval prior to any additional disturbance taking place:

- If the cumulative area of disturbance exceeds the estimated LOD noted above, by less than one acre, the Resident shall have a minimum of five (5) working days to approve the revised LOD plan.
- If the cumulative area of disturbance exceeds the estimated LOD noted above, by over one acre, the Resident shall first approve of the plan and then possibly resubmit the NOI for MaineDEP approval. The approval may take a minimum of 21 working days.

Compliance with the erosion and sedimentation control requirements outlined in this Contract is required by the Contractor.

The Contractor shall comply with the conditions outlined in the Army Corps Individual Permit, Maine Department of Environmental Protection NRPA Permit, the US Army Corps of Engineers General Permit, and the Maine Pollutant Discharge Elimination System General Permit for stormwater discharge associated with construction activity. The Contractor shall indemnify and hold harmless the Maine Turnpike Authority or its agents, representatives, and employees against any and all claims, liabilities or fines arising from or based on the violation of the above noted permits.

This Project is also subject to the requirements of the Maine Pollutant Discharge and Elimination System (MPDES) General Permit for the Discharge of Stormwater from MTA's Municipal Separate Storm Sewer Systems (MS4), because it is located within an Urbanized Area (UA) as defined by the 2000 census by the U.S. Bureau of the Census. MS4 compliance requires all Contractors to be properly trained in Erosion and Sedimentation Control (ESC) measures (as per Special Provision Subsections 105.8.1 and 656.07) and implement measures to reduce pollutants in stormwater runoff from construction activities.

107.1 Contract Time and Contract Completion Date

This Subsection is amended by the addition of the following:

All work shall be complete on or before October 27, 2023. All physical work, including but not limited to: construction of mainline widening, median reconstruction, median concrete barrier, highway signing, paving, pavement striping, and removal of all traffic control shall be substantially complete by October 13, 2023.

For 2021, the Contractor will be allowed to construct Phase 1A areas provided all applicable requirements of Intermediate Substantial Completion are met and construction complies with Standard Specification 203.16 Winter Construction of Embankments. Additionally, per Supplemental Specification 652.3.4, Contractor will not be allowed to have shoulder closures in place during periods of inclement weather, including but not limited to when snow removal equipment is in use. Contractor will not be allowed to start any Phase 1B construction in 2021; including but not limited to longitudinal sawcutting, pavement removal, or paving. Culvert trenches constructed in 2021, including required full depth pavement, shall be subject to paving limitations in cold weather. Accordingly, at least 10 days prior to construction, the contractor shall submit for MTA review and approval, a culvert installation plan and schedule demonstrating the work (excavation, backfill, paving, etc.) can be completed within the Specifications for cold weather work.

During the second year of construction, any Phase 1 area started shall meet intermediate substantial completion by November 18, 2022. Work may resume on the balance of Phase 1 areas after March 13, 2022 and March 12, 2023. Between November 19, 2021 and March 13, 2022 and between

November 18, 2022 and March 12, 2023, there shall be no concrete barrier on the right-hand shoulder or embankment. The shoulder shall be paved flush for all Phase 1 work areas except that all Phase 1A areas started in 2021 shall have the existing pavement backed up with Type A gravel, compacted, and graded to a 4:1 or flatter slope.

107.1.1 Substantial Completion

This Subsection is amended by the addition of the following:

Substantially complete shall be defined by the Authority as the following:

- Intermediate Substantial Completion for each Phase 1 area paving, striping and removal of MOT devices:
 - All new culverts and new drainage systems beneath the existing travel lanes and the new third lane and shoulder complete, including watertight temporary connections to existing culverts such that existing drainage systems are maintained, northbound and southbound, and trenches paved full depth
 - Final paving of Phase 1 complete (northbound and southbound)
 - Pavement striping for a two-lane mainline complete and ready for winter (northbound and southbound)
 - All interchange ramp lighting fully operational
 - Temporary traffic control devices and signage from Phase 1 shall be removed from project or setup for Phase 2 MOT and construction (northbound and southbound)
 - Temporary concrete barrier shall be removed from the mainline or setup for Phase 2 construction (northbound and southbound)
 - All disturbed slopes loamed, seeded, and mulched, and temporary erosion control installed where necessary.

- Final Substantial Completion for All work:
 - All culverts, closed drainage systems, and stormwater treatments fully functioning including all associated erosion control measures.
 - All proposed and existing travel lanes, including acceleration and deceleration lanes, shall be open to traffic in the permanent lane configuration, including shoulders, guardrail, pavement, pavement striping, and highway signage.
 - The median concrete barrier and median paving complete including contract final striping and signage.
 - Variable message signs fully functioning,
 - All temporary concrete barrier removed from the project,
 - All temporary traffic control and devices removed from the project,
 - All disturbed slopes loamed, seeded and mulched, and temporary erosion control installed where necessary.
 - Street lighting complete and operational

Supplemental Liquidated damages on a calendar day basis in accordance with Subsection 107.8 shall be assessed for each calendar day that any substantial completion, intermediate or final, is not achieved and as outlined above in this Subsection and below in Subsection 107.4.6 Prosecution of Work.

107.4.6 Prosecution of Work

The following activities must be completed by or within the date(s) specified:

- a. All mainline and ramp culverts and culvert extensions shall be complete prior to any of the Phase 1 paving above the culverts. Excavation of the proposed Phase 1 pavement is not allowed to install culverts.
- b. All Contract work that requires in-water work in the Unnamed Tributary of Capisic Brook (labeled as Unnamed Stream) shall be conducted between April 1 and November 1.
- c. No tree cutting shall occur between June 1 and July 31.
- d. All disturbed riparian areas shall be revegetated such that no exposed or unvegetated soil remains by October 1 of that construction season. All areas newly disturbed after October 1 shall be treated with erosion and sediment control measures that include placement of 6-12 inches of erosion control mulch overlain with jute matting and pinned in place before freezing occurs. This material must be removed to allow the area to revegetate during the following growing season.
- e. All construction within the Exit 46 Interchange, including maintenance of traffic layout, shall be coordinated with the MTA's Contract 2020.03 – Portland Area Widening & Safety Improvements Contractor. Contract 2020.03 may have lane shift(s) in place that require coordination of MOT, temporary concrete barrier, and construction access. Contract 2021.08 shall not setup traffic control or begin construction, within Station range 2288+50 to 2301+50, that requires any changes to Contract 2020.03 traffic control or interferes with that construction access.
- f. If the contractor plans to perform any Phase 2 work in the winter, then the contractor shall install Phase 2 Maintenance of Traffic devices, including temporary barrier and pavement markings, both northbound and southbound, without placing temporary concrete barrier on snow or ice and installing pavement markings per the manufacturer's requirements. There will be no additional compensation for snow removal, heating pavement, or drilling through frozen ground, or any other methods to install the Phase 2 MOT. Maintaining temporary pavement markings is Contractor's responsibility.
- g. At the conclusion of each Ramp Closure Duration noted, the following work, within the station ranges noted, mainline and ramp, shall be complete: all culvert and drainage infrastructure, gravels, pavement including final surface pavement, pavement striping, closure traffic control removed, and the Ramp fully opened to normal traffic flow.
- h. The contractor shall plan their Phase 1 work to allow Unitil/Granite State Gas to construct a new directional drill/jack pipeline underneath the mainline including construction of lines parallel to the mainline and cut-over connections: approximately station 2334+00 to 2339+00 right and left. Unitil/Granite State Gas are in the design stages of this crossing with no additional information at this time. The MTA will continue coordination with Unitil/Granite State Gas and provide the Contractor with more information as it becomes available. Contractor shall coordinate with Unitil, and MTA, through a utility pre-construction meeting, to discuss construction and schedule details of the Westbrook Street line replacement. All gravels and pavement within these limits shall not be constructed until after the pipe line has been installed and put into operation. The contractor must coordinate with the Utility and comply with their construction requirements for all construction over or effecting the pipeline. The contractor will be responsible for repair of and compaction of the widening embankment that may have been

disturbed during Unitil/Granite State Gas pipeline construction. Contractor shall have no claim against the Authority if the approximate work area is exceeded or the tentative work windows are exceeded.

107.4.7 Limitations of Operations

- a. Phase 1A work shall be complete through subbase course gravel compaction prior to transitioning into Phase 1B. Maintenance of traffic layout, as shown in the plans, for placement of temporary concrete barrier in Phase 1A and Phase 1B is required unless otherwise approved in writing by the MTA. Construction of Phase 1A, behind barrels, without temporary concrete barrier, will be considered providing the existing pavement is backed up daily with compacted Type A gravel at a 4:1 or flatter slope. The goal of the MTA is to limit the duration and length traffic is constrained to the 11-foot lanes with narrow shoulders required in Phase 1B. However, the MTA will consider a contractor's proposed alternate phasing (and fully detailed and dimensioned layout) of moving directly to the use of Phase 1B temporary concrete barrier if the contractor can demonstrate such use will limit the use (duration) of Phase 1B narrow lanes and shoulders to 45 days per segment, including temporary barrier setup, temporary barrier removal, and striping. Any such MTA approved alternate MOT that moves directly to the use of Phase 1B barrier will include the stipulation that Supplemental Liquidated Damages, as described in Supplemental Specification 107.8, will apply to days in excess of the stated 45 days per segment. The contractor shall consider the maximum length segment for this layout to be 4,500 feet or interchange to interchange and shall include in their proposal a station-to-station layout and a construction schedule that clearly defines work tasks during the requested period. The contractor shall consider Substantial Completion for this alternate MOT moving to Phase 1B as: work complete, traffic moved back to the Phase 1A lanes and shoulders and the temporary concrete barrier moved back to at least the Phase 1A location or removed from the project limits.
- b. If Phase 1A is utilized by the Contractor, then the duration of Phase 1B (narrower lanes and shoulders) shall be kept to an absolute minimum dictated by paving operations but in no case longer than 45 days per segment. The contractor shall consider the maximum length segment for all Phase 1B MOT setups to be 4,500 feet or interchange to interchange. Once the shift to Phase 1B has been setup, the contractor shall have the appropriate staff, equipment, and supplies on-hand and ready to complete the paving without delay. Temporary concrete barrier shall be moved, at a minimum, back to Phase 1A to provide wider lanes and shoulders as soon as paving is complete but no later than two weeks after paving. The contractor shall submit a construction plan and MOT schedule for this work 30 days prior to the proposed start of Phase 1B for review and approval. Consideration will be given to completing this work in interchange-to-interchange segments versus the entire length.
- c. Contractor may begin work on Phase 2 in areas that Phase 1 is complete on both northbound and southbound. A minimum of 800 feet will be required for the transition between phase 1 and phase 2 dependent on location; pavement marking transition layouts shall be submitted to the resident engineer for review and approval. The contractor will be allowed only one temporary barrier shifting taper at a time between Phase 1 and Phase 2.

- d. The contractor will be allowed only one temporary barrier shifting taper at a time, in one direction of travel, between the wider Phase 1A lanes and the narrower Phase 1B lanes. The intent is to avoid moving traffic from wider Phase 1A lanes to narrower Phase 1B lanes then back to wider Phase 1A lanes forcing traffic to negotiate multiple shifting tapers. If used, the shift shall be located outside of an interchange ramp acceleration or deceleration lane.
- e. The contractor shall be responsible for coordinating and scheduling work activities with adjacent contracts in overlapping work zones.
- f. Access to both the easterly and westerly towers of the FAA Light Bridge at Station 2285+50 shall be maintained at all times.
- g. Contractor shall review and comply with the Special Conditions contained in multiple Aeronautical Studies, numbered No. 2021-ANE-(###)-OE and Advisory Circular AC No. 70/7460-1M. These documents are contained in the Appendix. FAA has determined equipment that is 31 feet tall or less (above ground level) may be used on this project with special marking and/or lighting; see documents noted in this paragraph. Any equipment or part of equipment that exceeds 31 feet above ground level will require an additional application process, review and approval of the FAA before the equipment can be used. See Appendix for locations where equipment up to 100 feet tall is permitted without additional application to the FAA.
- h. Contractor shall contact the FAA (Portland International Jetport) and Air Traffic Control Tower at least 3 business days prior to use of construction equipment; contact information is in the Utility Special Provision, Sec 104.4.6.
- i. Contractor must submit FAA Form 7460-2 Notice of Actual Construction or Alteration to the Resident within 3 days of when construction reaches its greatest height (see FAA Form 7460-2, Part 2). This applies to final pavement and roadway lighting on the ramps, as well as construction equipment removed from the site.
- j. The contractor shall maintain normal downstream flow in Nasons Brook and Unnamed Stream - Capisic Brook Watershed at all times and temporary construction impacts must remain within the areas shown on the permit plans unless approved by the MTA and permitting Agencies.
- k. The Contractor shall complete the work as shown on the phasing and maintenance of traffic plans and in accordance with Section 652 of the Specifications. The MOT layouts as shown in the Plans and described in the Special Provisions provide guidance for construction that progresses from Phase 1A to Phase 1B to Phase 2. Contractor shall note that Phase 1A MOT includes work zones on both sides of interchange ramps. MOT for this work shall NOT be setup on both sides of a ramp simultaneously but instead setup sequentially. Contractor shall also note that Phase 1B layouts are shown with temporary barrier for ramp closures. This barrier shall only be in place during the actual approved ramp closure and removed immediately following the closure. All Contractor MOT layouts, including any and all changes to the Plan MOT Layouts, or changes to the Special Provisions, shall be submitted to the Resident for review and approval prior to

implementation. These will be considered a Shop Drawing Review and are required to be submitted at least 20 days prior to proposed implementation.

- l. Care shall be taken when working near catch basins to ensure foreign material and contaminants do not enter. If foreign material and/or contaminants do enter the basin they shall be removed prior to the material exiting the basin into a waterway. Removal shall be completed to the satisfaction of the Resident and payment shall be incidental to the Contract.
- m. There shall be no pile driving during non-daylight hours. Pile driving will not be allowed within 10 feet of traffic.
- n. Contractor shall not plow or otherwise cause snow or ice from within the work zone to be cast upon active travel lanes, shoulders, or ramps. The contractor should plan for MTA snowplows to push snow from the roadway, over the temporary barrier and into the work zone.
- o. The new third lane northbound and southbound shall remain closed to traffic until written notification is provided by MTA to open. If the third lane is open to traffic northbound up to Exit 46, the Contractor shall remove the Right Lane Exit Only sign, south of Exit 46 Northbound, only after the third lane northbound within this contract is complete and ready to open for three lanes of traffic.
- p. Existing signs noted to be removed and reset shall be maintained until the new location is ready for the reset. The contractor will be required to provide temporary signing for all signs that are not reset within the same day as removal. Similarly, all new signs that replace existing signs shall be set within the same day as the existing sign is removed or temporary signing shall be provided. The contractor shall submit a plan for all temporary signing, including location and support, for MTA approval.
- q. Lane closures, ramp closures, shoulder closures, and stoppages of all kinds are prohibited during an Interstate 295 closure for MaineDOT project WIN 21745, Interstate 295 over Veranda Street. The planned I-295 Closure, and weather alternate, is tentatively scheduled for either: the period Noon October 22, 2021 thru Noon October 25, 2021 with an alternate weather period of Noon October 29, 2021 thru Noon November 1, 2021, OR Noon April 15, 2022 thru Noon April 18, 2022, with an alternate weather period of Noon April 22, 2022 thru Noon April 25, 2022.
- r. The length of temporary concrete barrier installed during each Phase of work shall be limited to the Contractor's active work area, unless specifically required. The length of temporary concrete barrier setup at any one time in a direction of travel for Phase 1B shall be limited to 4,500 feet or interchange to interchange. The Contractor shall sequence the work within each Phase in a logical manner that minimizes the length of temporary barrier along one or both sides of the active mainline traffic including temporary alignments. When construction or operation in a work area are complete and new pavement matches the existing surface, the temporary barrier shall be removed or moved away from the active lane providing that a minimum 8-foot paved area can be used as an appropriate shoulder. If the temporary barrier is removed, appropriate traffic control devices shall be installed to delineate the mainline lane lines and edge of shoulder.

- s. The contractor shall maintain existing drainage during construction as needed for temporary use, prior to proposed drainage systems being functional as identified on the plans. This includes, but not limited to, making watertight temporary pipe connections between new culverts installed in Phase 1 and existing median catch basins that won't be replaced until Phase 2 construction; and temporary culvert extensions for existing culverts that drain median catch basins that are to be removed in Phase 2 construction. Payment for temporary pipe connection and temporary pipe extensions will be paid for under the appropriate Section 603 Pipe Item; no additional payment will be made for required labor, fittings, seals, etc.
- t. Pavement markings on all bridges shall be tape. Painted pavement markings will not be allowed on bridges.
- u. Ramp Closures will only be allowed at one interchange at a time, with the other two interchanges within the project limits fully open. The contractor shall also not setup a ramp closure at Exit 46 during the same time an Exit 45 ramp closure is in effect.

SPECIAL PROVISION

SECTION 202

REMOVING STRUCTURES AND OBSTRUCTIONS

(Removing Pavement Surface-Mainline)
(Removing Existing Pavement Surface)

202.01 Description

The following sentences are added:

This work shall also consist of removing the surface of the bituminous concrete pavement in all locations to the depth, width, grade, and cross section on the mainline as shown on the Plans or as directed by the Resident.

Removal of the pavement and membrane surface from the bridge decks shall be completed by scraping or other methods that will not damage the existing concrete deck surface. Milling of bridge deck pavement shall not be allowed.

Removal of approach pavement shall be completed using a milling machine meeting the requirements in the first two paragraphs of section 202.061.

Areas requiring shim pavement to reach final pavement grade shall not be milled.

This work shall also consist of construction of temporary ramps at all butt joints as shown in the MaineDOT Standard Details, November 2014 Edition – Pavement Overlay Butt Joint Detail (Roadways), Page 202(01) or as approved by the Resident. The length of the temporary ramp shall be at least 1/2 L.

The following subsection is added:

202.032 Removing Bridge Pavement Surface and Membrane

All bridge deck pavement, membrane and scrapings shall be disposed of by the Contractor off of the turnpike right-of-way in accordance with the Maine Department of Environmental Protection Solid Waste Management Requirements.

The following paragraph is added:

Extreme care shall be taken to avoid damaging the existing concrete or bituminous pavement intended to remain. All existing bituminous pavement and bridge deck concrete, intended to remain, damaged by the Contractor's removal operations shall be repaired by the Contractor as approved by the Resident at no additional cost to the Authority.

202.061 Removing Pavement Surface

This Subsection is deleted and replaced with the following:

The equipment for removing the bituminous surface, excluding bridge decks, shall be a power-operated milling machine or grinder capable of removing the bituminous concrete pavement to the required depth, transverse cross slope, and profile grade using an automated grade and slope control system. The controls shall automatically increase or decrease the pavement removal depth as required, and readily maintain desired cross slope to compensate for surface irregularities in the existing pavement course. The milling machine shall accurately establish profile grades by referencing from a fixed point such as a 30-foot minimum contact ski (floating beam), 24-foot non-contact ski (floating beam) with 3 or more sensors; or 3 non-contact sensors directly affixed to the fore, mid, and aft points of the milling machine. Systems designed to incorporate a contact sensor located at the mid-point of the milling machine in lieu of a non-contact sensor in conjunction with non-contact sensors at the fore and aft points will be permitted. Grade control sensors shall all be located on the same side. A single sensor, contact or otherwise, shall not be permitted. A copy of the automation operations manual shall be provided to the resident upon request. The equipment shall also have an effective means for removing excess material from the surface and preventing flying material in compliance with Subsections 105.2.5 Compliance with Health and Safety Laws and 105.2.6 Convenience of the Public, of the Specification.

The rotary drum on the machine shall be a minimum of 7 feet in width and utilize carbide tipped tools at a maximum 8mm tooth spacing pattern and a minimum triple wrap configuration. The difference in height from the top of any ridge to the bottom of the groove adjacent to that ridge shall not exceed $\frac{1}{4}$ inch. The carbide tipped tools on the rotary drum shall be continually maintained and shall be replaced as warranted to provide a uniform milled pavement texture. The forward operating speed shall be limited to a maximum speed of 50 feet per minute (fpm). The limited speed is not to be calculated on an average basis over time but shall be the actual limitation at any moment during the milling operation.

The track pads that the machine travel on shall all be of a uniform thickness equal to or exceeding the manufacturers recommendations. A copy of the manufacturer's recommendations shall be provided to the resident upon request.

The Contractor shall locate, identify and remove all objects in the pavement through the work area that would be detrimental to the milling machine.

The Contractor shall be responsible for the layout of the longitudinal centerline along the crown line. The contractor shall layout the site prior to any milling. Layout shall be achieved by physical measurements obtained every 50' along the length to be milled from a fixed reference point. The contractor shall transfer the measurements to the pavement surface every 50' and apply a paint mark at each location. The marks shall then be connected by a smoothed string line and subsequent paint marks applied along the string at no greater than 10' intervals. The Resident will inspect the layout line before milling activities may begin.

The finished milled surface will be inspected before being accepted, and any deviations in the profile exceeding $\frac{3}{8}$ inch under a 16-foot string line or straightedge placed parallel to the centerline will be corrected. Any deviations in the cross slope that exceed $\frac{3}{8}$ inch under a 12-foot string line or straightedge placed transversely to the centerline will be corrected. In no case shall the cross slope in a single lane width be inverted resulting in a depression as measured transverse to the direction of travel. Any cross slope inversions or depressions shall be corrected by spot shimming the area with HMA as directed by the resident prior to installing any leveling or wearing course. Any

areas requiring corrections will be subject to the same acceptable surface tolerances. These corrections shall be done with no additional expense to the Authority. Excess material that becomes bonded to the milled surface shall be removed to the Resident’s satisfaction before the area is accepted.

If a milled safety wedge is required by the contract, it shall not be removed any sooner than 24 hours prior to paving. In no case will a vertical milled edge be permitted over a weekend or holiday. The contractor shall schedule the wedge removal accordingly.

The Contractor shall deliver the cubic yards of pavement grindings as specified below to the following Maintenance Facilities. The exact location of the stockpile shall be as directed by the Resident.

<u>Name of Facility</u>	<u>Mile Marker</u>	<u>Cubic Yards</u>
None.		

All surplus pavement grindings, except for the amount specified above, shall be disposed of by the Contractor off the turnpike right-of-way. All grindings shall be disposed of in accordance with the Maine Department of Environmental Protection Solid Waste Management Requirements.

202.07 Method of Measurement

The removal of existing bituminous concrete pavement – mainline will be measured by the square yard of material removed to the required depth.

The following sentences are added:

Transporting and stockpiling of the pavement grindings at the maintenance facilities will not be measured separately for payment, but shall be incidental to the Removing Pavement Surface items.

Installation of temporary bituminous ramps will not be measured separately for payment, but shall be incidental to the Contract.

Removal of temporary bituminous ramps will not be measured separately for payment, but shall be incidental to the Contract.

Installation of and removal of longitudinal safety wedges will not be measured separately for payment, but shall be incidental to the Contract.

202.08 Basis of Payment

Removing Pavement Surface – Mainline will be paid for at unit price per square yard which price shall be full compensation for removing and disposing of the bituminous and gravel materials.

Payment will be made under:

<u>Pay Item</u>	<u>Pay Unit</u>
202.202 Removing Pavement Surface – Mainline	Square Yard

SPECIAL PROVISION

SECTION 202

REMOVING STRUCTURES AND OBSTRUCTIONS

(Removing Rumble Strips)

202.01 Description

The following paragraph is added:

This work shall consist of grinding existing rumble strip locations to a depth of 1-1/2 inches, coating vertical and horizontal surfaces with bituminous tack coat, and installing 1-1/2 inches of hot mix asphalt, 9.5 mm over the entire milled area. Locations and lengths of removal shall be as shown on the Plans or as approved by the Resident.

The following Subsections are added:

202.011 Materials

Grinding shall be done in accordance with Section 202. Bituminous tack coat shall conform to Section 409.

Hot mix asphalt, 9.5 mm shall conform to Section 401.

202.025 General

Existing rumble strips are approximately 16 inches long, seven inches wide, 1/2 inch deep, and spaced approximately every five inches.

202.07 Method of Measurement

The following paragraph is added:

Removing Rumble Strips shall be measured by the linear foot removed and accepted. Measurement shall be parallel to the baseline.

202.08 Basis of Payment

The following sentences are added:

Removing Rumble Strips shall be paid for at the Contract unit price per linear foot which includes all grinding, bituminous tack coat, pavement, equipment and labor necessary to satisfactorily complete the work.

Payment will be made under:

<u>Pay Item</u>	<u>Pay Unit</u>	
202.206	Removing Rumble Strips	Linear Foot

SPECIAL PROVISION

SECTION 203

EXCAVATION AND EMBANKMENT

203.01 Description

The following paragraph is added:

This work shall consist of cutting, removing and disposing of the full depth of existing bituminous concrete pavement at the approaches to the bridge structures within the limits of work as shown on the Plans or as approved by the Resident. The pavement shall be sawcut to the full depth of pavement at the limits of the excavation to provide a clean, vertical cut surface.

203.04 General

The following sentence is added to the end of the third paragraph.

There are no approved waste storage areas or waste areas within the Project limits unless shown on the Plans. Unsuitable materials shall be disposed of off-site in accordance with Subsection 203.06.

All excavations shall be accomplished in accordance with the applicable OSHA Standards. The Resident reserves the right to request the Contractor to prepare an excavation plan. This plan shall include, but not necessarily be limited to, the limit and depth of excavation, side slope, shoring, trench box and utility support.

203.10 Embankment Construction - General

The thirteenth and fourteenth paragraphs are deleted and replaced with the following:

All portions of the embankment shall be compacted in accordance with the designated embankment compaction requirements specified for the Project.

The existing slopes should be benched as shown on the drawings prior to placing additional fill. Embankment fill should be placed in lifts which extend laterally beyond the limits of the design side slopes such that the specified degree of compaction is achieved within the limits of the completed embankment. The slopes should then be trimmed back to design dimensions.

203.16 Winter Construction of Embankments

The word “core” is deleted from the first and second sentences in the first paragraph.

203.18 Method of Measurement

The following paragraphs are added:

There will be no additional payment for the required excavation plan, and costs shall be incidental to the Excavation items.

SPECIAL
PROVISION

SECTION 203

EXCAVATION AND EMBANKMENT

(Lightweight Fill)

203.1 Description

The following paragraph is added:

The work shall also consist of installing Ultra Lightweight Foamed Glass Aggregate (ULFGA) as shown on the Plans or as approved by the Resident. All work performed under this Special Provision shall be coordinated with the project's Geotechnical Engineer. The work also includes separating subgrade and granular fills from ULFGA by means of geotextile to prevent soil migration as described in this Special Provision.

203.2 Materials

The following paragraph is added:

The Contractor shall supply and install Lightweight backfills that consist of UL-FGA15 manufactured by AeroAggregates or an approved equivalent material. The material shall have an uncompacted moist density ranging from 15 to 19 pcf, and a maximum moist density of 21 pcf when compacted to 90% by volume of its loose density.

The following section is added

203.021 Submittals

The Contractor shall submit a plan to the Resident for approval for transporting, delivering, stockpiling (if proposed), placing and compacting ULFGA. The plan will include at a minimum:

- Name and address of the supplier,
- Laboratory testing data to show the uncompacted unit weight and internal friction angle,
- Proposed means of delivery and stockpiling (if proposed),
- Cut sheets for equipment the Contractor will be using for ULFGA placement and compaction, and
- Procedures for placing separation geotextile and placing and compacting ULFGA.

The plan shall also indicate a proposed schedule for the placement of the ULGFA. The Contractor shall provide a minimum of 3 working days' notice to the Resident prior to the

placement of any ULGFA.

203.04 General

The following paragraphs are added:

Product Handling. The contractor shall protect the ULGFA before, during, and after construction as recommended by the material manufacturer.

Installation. The contractor shall place the ULGFA as indicated on the plans. Preparation of the subgrade shall include excavation with a smooth-edged bucket in order to minimize disturbance of the subgrade materials.

The areas to be filled shall not have standing water, ice, organic or otherwise unsuitable materials present prior to placement. If encountered, these materials should be excavated and replaced with compacted fill consisting of MaineDOT 703.06 Type D Gravel compacted to 95 percent of maximum density determined by ASTM D1557 (Modified Proctor Test).

A nonwoven geotextile fabric shall be placed directly on the prepared subgrade as a separator between the ULGFA and all other materials. The geotextile shall be installed between the ULGFA and any differing adjacent material exposed by excavation or differing adjacent material being placed beside or on top of the ULGFA.

The geotextile shall consist of punched nonwoven geotextile with a minimum grab tensile strength of 160 lbs per ASTM D4632 and shall meet the requirements of Subsection 722.04 for Separation Geotextile. To limit possible degradation, the geotextile shall not be exposed to the elements for more than 14 days after placement.

ULGFA may be dumped in place and spread in place. Construction equipment, other than for placement and compaction, shall not operate on the exposed ULGFA.

The ULGFA shall be placed in lifts not exceeding 12 inches in loose thickness. Each lift shall be compacted by two to four passes of a 110-220 lb vibrating plate compactor or by similar compactive effort. Sufficient compaction has been achieved when in the judgement of the Geotechnical Engineer the material ceases to densify further with additional passes of the plate compactor. Excessive compaction shall be avoided to minimize crushing of the aggregate.

The Contractor and Geotechnical Engineer shall visually observe compaction of each lift of ULGFA for sufficient compaction.

Compaction shall be performed in the presence of the Geotechnical Engineer who will observe performance of the selected equipment and the compactive effort, and establish requirements for the number of passes, and lift thickness for specific compaction equipment

Testing. The Contractor shall measure the as-delivered loose bulk density and submit documentation of the results. At least one test shall be performed for every 500 cubic yards of

ULFGA delivered. Bulk density testing shall be performed in the presence of the Geotechnical Engineer.

203.18 Method of Measurement

The following paragraph is added:

Lightweight Fill will be measured by the cubic yard in place by cross sectional elevations.

203.19 Basis of Payment

Lightweight Fill will be paid for at the contract unit price per cubic yard, which shall be full compensation for all labor, materials, equipment, and incidentals required to supply, deliver and install the ULFGA and separation geotextile as described in this Special Provision and shown on the Plans including the creation of an approved plan. Removal and replacement of Lightweight Fill damaged by the Contractor shall be incidental to the work, as directed by the Resident and/or Geotechnical Engineer. No additional compensation shall be provided for separation geotextile.

Payment will be made under:

<u>Pay Item</u>	<u>Pay Unit</u>
203.34 Lightweight Fill	Cubic Yard

SPECIAL PROVISION

SECTION 206

STRUCTURAL EXCAVATION

206.02 Construction Methods

The following paragraphs are added:

There are no approved waste storage areas or waste areas within the Project limits. Unsuitable materials shall be disposed of off-site in accordance with Subsection 203.06.

SPECIAL PROVISIONSECTION 401HOT MIX ASPHALT PAVEMENT

Section 401 of the Maine Turnpike Authority 2016 Supplemental Specifications is modified as follows:

401.01 Description

The following paragraph is added:

A Quality Control Plan (QCP) is required.

401.02 Materials

Section 401.02 is deleted in its entirety and replaced with the following:

Aggregates for HMA Pavements Coarse Aggregate and fine aggregate for HMA pavements shall be graded such that when combined in the proper proportions, including filler if required, the resultant blend will meet the composition of mixture for the type of pavement specified. Materials shall meet the requirements specified in Section 700 – Materials:

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

Mainline Surface HMA Coarse aggregate: The material retained on the No. 4 sieve, shall consist of angular fragments obtained from crushed quarry stone and be free of dirt or other objectionable materials. Coarse aggregate shall have a Micro-Deval value of 15.0 percent or less as determined by AASHTO T 327. The crushed stone shall have a maximum of 1.5% material finer than the No. 200 mesh when tested in accordance with AASHTO T-11. Flat and elongated particles shall not exceed a maximum of 8% at a 5:1 ratio in accordance with ASTM D-4791. Coarse aggregate angularity shall be a minimum of 95/90 in accordance with AASHTO T-335.

Mainline Surface HMA Fine aggregate: The material passing the No. 4 sieve, shall be crushed manufactured sand free from dirt, clay balls, or other objectionable material. Natural sand may be incorporated into the mix at a rate no greater than 10 percent by weight of total aggregate. The unconfined void content of the fine aggregate blend shall be a 45 minimum value when tested in accordance with AASHTO T-304, method A. AASHTO T-176 sand equivalent value shall be a 45 minimum.

Asphalt Low Modulus Joint Sealer: Asphalt Low Modulus Joint Sealer shall be a modified asphalt and rubber compound designed for sealing and improving the strength and performance of

the base asphalt cement and shall conform to ASTM D6690 Type IV and the following specifications:

Cone Penetration	90-150
Flow @ 60°C [140°F]	3.0mm [1/8 in] max
Bond, non-immersed	Three 12.7mm [½ in] specimens pass 3 cycles @ 200% extension @ -29°C [-20°F]
Resilience, %	60 min
Asphalt Compatibility, ASTM D5329	pass*

* There shall be no failure in adhesion, formation of any oily exudate at the interface between the sealant and asphaltic concrete or other deleterious effects on the asphaltic concrete or sealant when tested at 60°C [140°F].

The contractor shall provide the Resident or authorized representative with a copy of the material manufacturer's recommendations pertaining to heating, application, and reheating prior to the beginning of operations or the changing of materials.

Section 401.021 Recycled Asphalt Materials

Delete the second paragraph and replace with the following:

In the event that RAP source or properties change, the Contractor shall notify the Authority of the change and submit new documentation stating the new source or properties. A plant produced test batch meeting all requirements including Hamburg Wheel Tracker results shall be produced using the new RAP source or properties.

Section 401.03 Composition of Mixtures

Section 401.03 is deleted in its entirety and replaced with the following:

HMA pavement mixtures for base, intermediate, shim and local road bridge projects shall be a currently approved MDOT design unless otherwise noted. A maximum of 20% RAP may be used. VMA shall meet the requirements listed in Table 1.

HMA pavement mixtures for Mainline surface paving projects shall conform to the following requirements:

The Contractor shall compose the Hot Mix Asphalt Pavement with aggregate, Performance Graded Asphalt Binder (PGAB), and mineral filler if required. HMA shall be designed and tested according to AASHTO R35 and the volumetric criteria in Table 1. The Contractor shall size, uniformly grade, and combine the aggregate fractions in proportions that provide a mixture

meeting the grading requirements of the Job Mix Formula (JMF). The Contractor may use a maximum of 15 percent reclaimed asphalt pavement (RAP) in any mainline surface course.

The Contractor shall submit a job mix formula (JMF) developed for each specified mixture at least 30 days prior to placement.

The JMF shall establish a single percentage of aggregate passing each sieve size within the limits shown in Subsection 703.09. The mixture shall be designed and produced, including all production tolerances, to comply with the allowable control points for the particular type of mixture as outlined in Subsection 703.09. The JMF shall state the original source, gradation, and percentage to be used of each portion of the aggregate and mineral filler if required. It shall also state the proposed PGAB content, the name and location of the refiner, the supplier, the source of PGAB submitted for approval, the type of PGAB modification if applicable, and the location of the terminal if applicable.

In addition, the Contractor shall provide the following information with the proposed JMF:

- Properly completed JMF indicating all mix properties (Gmm, VMA, VFB, etc.).
- Stockpile Gradation Summary.
- Test reports for individual aggregate consensus properties
- Design Aggregate Structure Consensus Property Summary.
- Design Aggregate Structure Trial Blend Gradation Plots (0.45 power chart).
- Trial Blend Test Results for at least three different aggregate blends.
- Selected design aggregate blend.
- Test results for the selected design aggregate blend at a minimum of three binder contents.
- Test results for final selected blend compacted to N_{max} .
- Specific Gravity for the PGAB to be used.
- Recommended mixing and compaction temperatures from the PGAB supplier.
- Data Sheets (SDS) For PGAB.
- Asphalt Content vs. Air Voids trial blend curve.
- Test report for Contractor's Verification sample.

- Summary of RAP test results (if used), including count, average and standard deviation of binder content and gradation.

At the time of JMF submittal, the Contractor shall identify and make available the stockpiles of all proposed aggregates at the plant site. There must be a minimum of 150 ton for coarse aggregate stockpiles, 75 ton for fine aggregate stockpiles before the JMF may be submitted. The Authority shall obtain samples for laboratory testing. The Contractor shall also make available to the Authority the PGAB proposed for use in the mix in enough quantity to test the properties of the asphalt and to produce samples for testing of the mixture. Before the start of paving, the Contractor and the Authority's representative shall test a production sample in the Contractor's laboratory for evaluation. If the Authority finds the mixture acceptable, an approved JMF will be forwarded to the Contractor. The Authority will then notify the Contractor that paving may commence. The first day's production shall be monitored, and the approval may be withdrawn if the mixture exhibits undesirable characteristics such as checking, shoving or displacement. The Contractor shall be allowed to submit aim changes within 24 hours of receipt of the first Acceptance test result for an individual JMF. Adjustments will be allowed of up to 2% on the percent passing the 2.36 mm sieve through the 0.075 mm and 3% on the percent passing the 4.75 mm or larger sieves. Adjustments will be allowed on the %PGAB of up to 0.2 percent. Adjustments will be allowed on GMM of up to 0.010.

Approved mix designs from the previous calendar year may be carried over, however no aim changes will be granted for a carryover mix design and the initial design must not be older than the previous paving season.

The Contractor shall submit a new JMF for approval each time a change in material source or materials properties is proposed. The same approval process shall be followed. The cold feed percentage of any aggregate except natural sand may be adjusted up to 10 percentage points from the amount listed on the JMF, however no aggregate listed on the JMF shall be eliminated. Natural sand may be adjusted up to 5 percent from the amount listed on the JMF but shall not exceed 10% by weight of total aggregates. The cold feed percentage for RAP may be reduced up to five percentage points from the amount listed on the JMF and shall not exceed the percentage of RAP approved in the JMF or for the specific application.

TABLE 1
VOLUMETRIC DESIGN CRITERIA

Design ESAL's (Millions)	Required Density (Percent of G_{mm})			Voids in the Mineral Aggregate (VMA)(Minimum Percent)				Voids Filled with Binder (VFB) (Minimum %)	Fines/Eff. Binder Ratio
				Nominal Maximum Aggregate Size (mm)					
	$N_{initial}$	N_{design}	N_{max}	19	12.5	9.5	4.75		
10 to <30	≤89.0	96.0	≤98.0	13.5	14.5	15.5	15.5	65-80	0.6-1.2

As part of the JMF submittal, there are Hamburg Wheel Tracker requirements, the Contractor shall provide the Authority the test results in accordance with AASHTO T324. The results shall be generated by a third-party independent testing laboratory as approved by the Authority. The test results for each individual specimen as well as the average shall meet the requirements of Table 1A

TABLE 1A
HAMBURG WHEEL TRACKER REQUIREMENTS

Specified PG Binder Grade	Test Temperature (°C)	Maximum Rut Depth (mm)	Minimum Number of Passes	Minimum Allowable SIP*
64-28	45	12.5	20,000	15,000
64E-28	45	8.0	20,000	15,000
70E-34	45	6.3	20,000	15,000

Section 401.031 Warm Mix Technology

Add the following to the end of the first paragraph:

Weather and seasonal limitations as outlined in section 401.06 may be reduced by a maximum 5°F with the use of WMA except for HMA being placed over bridge deck membrane.

Section 401.04 Temperature Requirements

Add the following line item after the third bullet:

- Any HMA placed over bridge deck membrane shall have a minimum temperature of 300° F measured directly behind the screed in the uncompacted mat.

Add the following paragraph:

No vehicular loads shall be permitted on newly completed pavement until adequate stability has been attained and the material has cooled sufficiently to prevent distortion or loss of fines. The newly paved area may be opened to traffic after the internal temperature of the pavement has cooled to 120° F. The Resident will test the internal temperature of the pavement and shall be the sole judge as to the opening to traffic. The period of time before opening to traffic may be extended at the discretion of the Resident. The lane closure may not be removed until the internal temperature has cooled to 120° F.

Section 401.06 Weather and Seasonal Limitations

The first paragraph shall be deleted and replaced with:

The Contractor may place Hot Mix Asphalt Pavement for use other than a traveled way wearing course, provided that the air temperature as determined by an approved thermometer (placed in the shade at the paving location) is 45°F or higher and the area to be paved is not frozen.

The Contractor may place Hot Mix Asphalt Pavement as traveled way wearing course, provided the air temperature determined as above is 50°F or higher. For the purposes of this Section, the traveled way includes truck lanes, ramps, approach roads, shoulders, and auxiliary lanes. The atmospheric temperature for all courses on bridge decks shall be 50°F or higher.

Section 401.08 Hauling Equipment Trucks for Hauling HMA

Add the following paragraphs:

The undercarriage of haul units actively hauling HMA to the site shall be relatively free of dust / mud agglomerations. Haul units found to be contaminating the paving surface shall be removed from the site and cleaned prior to returning.

The contractor shall supply enough haul units such that paving is continuous and without any delays or paver speed changes during the installation of mainline wearing course or any course placed on a bridge deck. The contractor will be charged a fee of \$1000 for every occurrence if paving is either stopped or the paver must slow down to avoid stopping due to inadequate number of haul units at the sole discretion of the Authority. In addition to the fee a Quality Control Violation as outlined in Section 106.4.6 will be issued for every shift which does not have enough haul units. The Quality Control Violation will start at the 2nd incident.

Section 401.09 Pavers

Add the following to the end of the fourth paragraph:

The forward operating speed of the paver shall be limited based on the course being placed. A shim or leveling course shall have a maximum speed of 50 feet per minute (fpm). Any base, intermediate, or surface course shall have a maximum paver speed of 40 fpm. The limited speed is not to be calculated on an average basis over time but shall be the actual limitation at any moment during the paving operation.

Section 401.091 Material Transfer Vehicle (MTV)

The first paragraph shall be deleted and replaced with:

When required by Special Provision Section 403, the paver shall be supplied mixture by a material transfer vehicle (Roadtec SB2500 or approved equal) capable of receiving and storing bituminous mixture from haul trucks, remixing, and delivering the mix to the paver hopper in a consistently uniform manner.

The fourth paragraph shall be deleted and replaced with:

The MTV shall be designed so that the mix receives additional mixing action.

Section 401.11 Preparation of Existing Surface

Add the following paragraph:

The contractor will be permitted to be generally innovative in methods to dry existing wet or damp pavement. Any method which causes damage or burning of the existing pavement, or which causes debris to fly into traffic shall be discontinued.

Section 401.111 Layout

The contractor shall layout the site prior to any pavement course or final striping. Layout shall be achieved by physical measurements obtained every 50' along the length to be paved or striped from a fixed reference point. The contractor shall transfer the measurements to the pavement surface every 50' and apply a paint mark at each location. The marks shall then be connected by a smoothed string line and subsequent paint marks applied along the string at no greater than 10' intervals. The Resident will inspect the layout line before associated activities may begin.

Section 401.165 Longitudinal Joint Density

The first paragraph shall be deleted and replaced with:

When noted in Special Provision Section 403, the Authority will measure the pavement density of longitudinal joints between adjoining mainline travel lanes in both the unconfined and confined condition as determined by the days paving operation.

The eighth paragraph shall be deleted and replaced with:

The minimum density of the completed pavement shall be 92.0 percent of the theoretical maximum density obtained. Two consecutive failing tests shall result in production shut down. Prior to resuming paving operations, the contractor quality control unit shall satisfy the Authority that the paving operation will produce joint densities in compliance with the Specifications.

The eleventh paragraph and associated table shall be deleted and replaced with:

Payment reduction will be applied to each subplot that has a density lower than 92.0% as outlined below.

PERCENT COMPACTION	PERCENT PAY
92.0 or greater	100
91.9 to 90.0	95
89.9 to 88.5	90
88.4 or less	80

Section 401.17 Joints

Delete the following sentence from the third paragraph:

“The Authority may allow feathered or "lap" joints on lower base courses or when matching existing base type pavements.”

The fourth paragraph shall be deleted and replaced with:

When required by Special Provision Section 403, Mainline Longitudinal joints shall be constructed as notched-wedge joint and constructed in a manner that will best ensure joint integrity.

Section 401.18 Quality Control

Add the following paragraph v. to the QCP requirements

v. The contractor shall provide a detailed plan outlining how the number of haul units will be determined and supplied to the project to prevent the paver from stopping on mainline wearing course and bridge deck paving over membrane

The following shall be added to section c. Quality Control Technician(s) QCT:

The QCT shall be on site during paving operations performing quality control activities. QCT's shall not act as equipment operators, trainers or laborers.

Section 401.191 Inspection/Testing

In paragraph nine delete and replace Item #8 with:

8. Secure High-Speed Internet Access

401.21 Method of Measurement

The second paragraph shall be deleted and replaced with:

A reduction in payment will occur when the voids, asphalt content, and density are other than the limits specified below for 100 percent payment. The payment reduction for voids and PGAB content and density will be based upon each subplot (500 tons) of production as specified in Subsections 401.162, 401.163, 401.164, and 401.165. The Contractor may request one retest for each failing subplot for core density only. The original core density and the recut core density shall be averaged together to determine payment for the subplot. No retest will be allowed for voids or asphalt content. The Contractor shall pay \$250.00 for each additional core tested. Pavement restoration will not be measured separately for payment but shall be incidental to the respective pay item.

SPECIAL PROVISION

SECTION 401

HOT MIX ASPHALT PAVEMENTS

(HMA using Hydrated Lime)

The following sections of Section 400 have been revised with following additional requirements.

401.01 Description

The Contractor shall compose Hot Mix Asphalt (HMA) Pavement with aggregate, Performance Graded Asphalt Binder (PGAB), hydrated lime, and mineral filler if required. Hydrated Lime shall be utilized in all mixtures so denoted in Special Provision 403 - Hot Mix Asphalt Pavement.

401.02 Materials

Materials shall meet the requirements specified.

Hydrated Lime	AASHTO 216
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401.03 Composition of Mixtures

The Contractor shall compose the Hot Mix Asphalt Pavement with aggregate, Performance Graded Asphalt Binder (PGAB), hydrated lime and mineral filler if required. HMA shall be designed and tested according to AASHTO R35 and the volumetric criteria in Table 1. The Contractor shall size, uniformly grade, and combine the aggregate fractions in proportions that provide a mixture meeting the grading requirements of the Job Mix Formula (JMF).

Hydrated lime shall be used in all HMA at a rate of one percent (1%) by weight of the total dry aggregate including RAP aggregate, if used. The Contractor shall obtain a shipping ticket for each shipment of hydrated lime. The Contractor shall provide the Resident with a copy of each shipping ticket from the supplier, including the date, time and weight of hydrated lime shipped and used in HMA production. The Contractor shall submit a material data sheet for the hydrated lime to the Resident for approval.

The Contractor shall provide the following information with the proposed JMF:

- Safety Data Sheets (SDS) for hydrated lime
- Supplier and source for Hydrated Lime

401.13 Preparation of Aggregates

The Contractor shall add water to the aggregates as required to maintain a minimum total aggregate moisture content of 3 percent. The Contractor shall mix the lime uniformly with the

aggregate before introducing the aggregate into the dryer or dryer drum. Hydrated lime introduction systems must be controlled by a proportioning device to the amount required on the JMF plus or minus 0.1% of the target.

The Contractor shall add lime to the aggregate by one of the following methods:

- A. The Contractor shall add lime to the combined cold feed aggregate using an enclosed in-line cold feed mechanical pugmill mixer. The Contractor shall use a twin-shaft, continuous mixing pugmill with mixing paddles to thoroughly blend the lime with the aggregate. The Contractor shall adjust the retention time of the mixture in the pugmill, so no unmixed lime is visible after the lime and aggregate exit the pugmill.
- B. The Contractor shall add lime to the combined cold feed aggregate by introducing the lime between aggregate layers as the aggregate flows from the cold feed bins. The Contractor shall thoroughly mix the lime and aggregate on the conveyor belt. The Contractor shall provide a lime introduction system so that no unmixed lime is visible before the lime and combined aggregate enter the drum.

The cold storage for hydrated lime shall be a separate bulk storage bin with a vane feeder or other approved feeder system which can be readily calibrated. The system shall provide a means for convenient sampling of the hydrated lime additive and verifying the quantity of lime dispensed. If the hydrated lime is to be introduced directly into the plant, then the additive equipment shall be synchronized with the cold feed controls to operate concurrently with the cold feed operation. The system will be configured to automatically adjust the hydrated lime feed to variations in the cold aggregate feed. The hydrated lime system shall have out-of-tolerance sensing ability by weight and have a means to indicate the out-of-tolerance condition.

401.14 Mixing

Hydrated lime shall be added into the HMA aggregate mixture prior to the aggregate blend mixing with the PGAB. Aggregate feed rate, or pugmill mixing times shall be adjusted to ensure complete blending of Hydrated Lime and aggregate before the PGAB is added.

401.18 Quality Control

The Contractor shall provide a written supplement to the project specific QCP outlining the proposed methods of adding and mixing the hydrated lime for approval by the Authority. This written summary shall also provide information describing how the Contractor will perform quality control on the addition of hydrated lime, specifically the method of introduction and how the lime use will be measured to assure that the specified percentage is consistently added, and appropriately mixed. The supplemental QCP covering hydrated lime introduction shall be provided to the Authority at least one week prior to the prepave meeting.

SPECIAL PROVISIONDIVISION 401HOT MIX ASPHALT PAVEMENTS

(Asphalt Rich Base Mixture)

Section 401 of the Maine Turnpike Authority 2016 Supplemental Specification is modified as follows:

401.01 Description

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

401.02 Materials

This section has been modified with the following revision:

The Asphalt Rich Base HMA shall be designed for an Air Void Target of 2.5% at 65 Gyration.

401.03 Composition of Mixtures

This section has been modified with the following revision: The Asphalt Rich Base HMA shall meet the following design criteria.

DESIGN CRITERIA

Gradation	PGAB Minimum
9.5mm mixture	7.0 %
12.5mm mixture	6.5 %
19.0mm mixture	5.8 %

The mixture shall meet the gradation requirements of a current MaineDOT approved 9.5mm, 12.5mm, or 19.0mm 65 Gyration JMF, as required by the contract, and the minimum PGAB content noted above. The Acceptance Limit targets for gradation will be as specified on the JMF.

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 +/-4%
Passing 0.60 mm	Target +/-3%
Passing 0.30 mm to 0.075 mm sieve	Target +/-2%
PGAB Content	Target +/-0.4%
Air Voids	2.5% +/-1.5%
Fines to Effective Binder	0.4 to 1.2
Voids in the Mineral Aggregate	LSL Only from Table 1
Voids Filled with Binder	72 -87.0 *
% TMD (In place density)	96.0% +/- 2.5%

*A production tolerance of 4.0% will apply for the USL.

401.21 Method of Measurement

The following replace the pay tables in section 401.21

<u>CORE DENSITY VS. CORE THEORETICAL MAXIMUM DENSITY</u> <u>COMPACTION 93.5-98.5 PERCENT</u>	
<u>PERCENT COMPACTION</u>	<u>PERCENT PAYMENT</u>
93.5 – 98.5	100
92.5-93.4, 98.6 – 99.0	95
92.4-91.5, 99.1 – 99.5	85
<91.5, > 99.5	75
Note: Percent compaction is the percentage of the field core density as compared to the Theoretical Maximum Density (TMD) of that core.	

<u>AIR VOIDS – 1.0 – 4.0 PERCENT</u>	
<u>VOIDS</u>	<u>PAYMENT PERCENT</u>
1.0 to 4.0	100
0.5-0.9, 4.1-4.5	90
<0.5, >4.5	75
Note: Voids are based on the average of the test specimens fabricated at the plant for each subplot (500 tons).	

Payment for PGAB content shall be based on the JMF aim with an allowable production tolerance of +/-0.4% except that test results which fall below the minimum PGAB content shall not be permitted:

Gradation	PGAB Minimum
9.5mm mixture	7.0 %
12.5mm mixture	6.5 %
19.0mm mixture	5.8 %

9.5 mm Asphalt Rich Base PGAB CONTENT	
% PGAB	% PAYMENT
JMF Aim \pm 0.4	100
JMF Aim + 0.5 , - 0.5 , < 7.0	95
JMF Aim + 0.6 , - 0.6 , < 6.9	90
JMF Aim + 0.7 , - 0.7 , < 6.8	85
<u>Note:</u> PGAB content is based on samples tested at the plant for each 500 Ton subplot	

12.5 mm Asphalt Rich Base PGAB CONTENT	
% PGAB	% PAYMENT
JMF Aim \pm 0.4	100
JMF Aim + 0.5 , - 0.5 , < 6.5	95
JMF Aim + 0.6 , - 0.6 , < 6.4	90
JMF Aim + 0.7 , - 0.7 , < 6.3	85
<u>Note:</u> PGAB content is based on samples tested at the plant for each 500 Ton subplot	

19.0 mm Asphalt Rich Base PGAB CONTENT	
% PGAB	% PAYMENT
JMF Aim \pm 0.4	100
JMF Aim + 0.5 , - 0.5 , < 5.8	95
JMF Aim + 0.6 , - 0.6 , < 5.7	90
JMF Aim + 0.7 , - 0.7 , < 5.6	85
<u>Note:</u> PGAB content is based on samples tested at the plant for each 500 Ton subplot	

Payment will be made under:

<u>Pay Item</u>		<u>Pay Unit</u>
403.2102	9.5mm Asphalt Rich Base HMA	Ton
403.2132	12.5mm Asphalt Rich Base HMA	Ton
403.2072	19.0mm Asphalt Rich Base HMA	Ton

SPECIAL PROVISIONSECTION 403HOT MIX ASPHALT PAVEMENT403.01 Description

This work shall also consist of the construction, maintenance and removal of all temporary bituminous ramps at locations as shown on the Plans or as directed by the Resident.

403.02 General

The Contractor shall compose the Hot Mix Asphalt Pavement with aggregate, Performance Graded Asphalt Binder (PGAB), and mineral filler if required. The Performance Graded Asphalt Binder (PGAB) shall be polymer modified as detailed in this special provision and shall conform to the requirements of AASHTO M 332 (including Appendix 1). The PG64E-28 Binder shall contain a minimum of 2.25% Styrene-Butadiene-Styrene (SBS) polymer {BWT} in a homogeneous blend with a minimum average percent recovery of 75% as determined by AASHTO T350 @ 3.2 kPA (R3.2) on RTFO residue at 64°C to assure significant polymer load and performance. The stability of the modified binder shall be verified in accordance with ATSM D7173 using the Dynamic Shear Rheometer (DSR). The DSR $G^*/\sin(\delta)$ results from the top and bottom sections of the ATSM D7173 test shall not differ by more than 10%. The results of ASTM D7173 shall be included on the Certified Test Report.

When required PG70E-34 Binder shall be modified with Styrene-Butadiene-Styrene (SBS) polymer {BWT} in a homogeneous blend with a minimum average percent recovery of 75% as determined by AASHTO T350 @ 3.2 kPA (R3.2) on RTFO residue at 70°C to assure significant polymer load and performance. The stability of the modified binder shall be verified in accordance with ATSM D7173 using the Dynamic Shear Rheometer (DSR). The DSR $G^*/\sin(\delta)$ results from the top and bottom sections of the ATSM D7173 test shall not differ by more than 10%. The results of ASTM D7173 shall be included on the Certified Test Report.

403.03 Construction

All areas which have been milled or overlaid shall have a minimum length temporary ramp constructed as determined by the Resident at the milled or overlaid limits prior to opening the roadway to traffic. Temporary ramps shall be constructed using the same material as being placed on that day or as directed by the Resident. All temporary ramps are to be constructed on a sand joint. The Contractor shall be responsible for all repairs and maintenance required for the temporary ramps.

The Contractor shall be responsible for the layout of the longitudinal centerline between the travel lanes.

The sand and loose debris adjacent to the median guardrail shall be removed and disposed of by the Contractor off of Turnpike property.

The forty-five-degree pavement safety edge needed between lanes 1 and 2 shall be incidental to the 202 pay items.

A minimum test strip of 100 tons placed at a nominal depth of 1 ½ inches, full lane width, shall be required. It shall be evaluated under testing requirements for mix volumetric and density. The exact location will be identified by the Authority. Prior to placement of the test strip, a leveling course (Item 403.211) shall be placed at the chosen location. A fog coat of Item 409.15, Bituminous Tack Coat, shall be applied to the level course prior to the placement of the HMA surface course, payment to be made under the 409.15 pay item. The test strip will be excluded from the remainder of the projects' QA analysis. The Contractor shall notify the Authority at least 48 hours in advance of placing the test strip. The test strip is intended to allow the Contractor to establish a method of compaction and adjust plant settings prior to mainline plant production.

403.04 Method of Measurement

The construction and removal of temporary ramps on sand joints and maintaining the ramps will not be measured separately for payment but shall be incidental to Items 403.

The removal of sand and loose debris will not be measured separately for payment but shall be incidental to paving items.

Hot Mix Asphalt, 12.5 mm (Polymer Modified pavement with (up to) 15% RAP, placed as a wearing surface will be measured under Item 403.2081 Hot Mix Asphalt, 12.5 mm (Polymer Modified) - RAP.

403.05 Basis of Payment

Hot Mix Asphalt, 12.5 mm (Polymer Modified) pavement with (up to) 15% RAP, placed as a wearing surface will be paid under Item 403.2081 Hot Mix Asphalt, 12.5 mm (Polymer Modified) – RAP.

The following pay items are added:

<u>Pay Item</u>	<u>Pay Unit</u>
403.2081 Hot Mix Asphalt, 12.5 mm (Polymer Modified) – RAP	Ton

SPECIAL PROVISIONSECTION 403HOT MIX ASPHALT PAVEMENT

Course	HMA Grading	Item Number	Total Thickness	No. of Layers	Complimentary Notes
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Northbound and Southbound Mainline and Shoulder Construction

Intermediate	12.5mm	403.2081	1.5"	1	A,D,E,I,J,K
Base	19.0mm	403.207	2.5"	1	C,I
Base	19.0 mm	403.2072	4.5"	2	,I

Northbound and Southbound Median Construction

Intermediate	12.5mm	403.213	1.5"	1	C,I,
Base	19.0mm	403.207	2.5"	1	C,I

Mainline – Ramp Prior to Merge with Mainline at Physical Gore

Intermediate	12.5mm	403.2081		1.5"	1	A,D,E,I,J,K
Intermediate	12.5mm	403.213		1.5"	1	C,I
Base	19.0mm	403.207		2.5"	3	C,I

Mainline – Mill & Overlay

Intermediate	12.5mm	403.2081		1.5"	1	A,D,E,I,J,K
Intermediate	12.5mm	403.213		1.5"	1	C,I

COMPLEMENTARY NOTES

- A. The required PGAB for this mixture shall be **64E-28**.
- B. RAP may not be used.
- C. The Maine DOT will conduct the job mix verification. The aggregate qualities shall meet the design traffic level of 10 to <30 million ESALS for mix placed under this contract. Minimum and Maximum PGAB content limits from 401.21 shall not apply.
- D. The MTA will conduct the job mix verification. The aggregate qualities shall meet the design traffic level of 10 to <30 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**. (N design)
- E. A material transfer vehicle (MTV) shall be used for the placement of Hot Mix Asphalt wearing surface on all roadways including acceleration and deceleration lanes and all ramps.
- F. Joints shall be constructed as the “notched wedge” type in accordance with Subsection 401.17.
- G. Joint density will be measured in accordance with Subsection 401.165.
- H. PGAB shall conform to the provisions of 403.02 – Polymer Modified PGAB for HMA

- I. The contractor shall furnish a quality control technician equipped with an approved densometer to ensure density requirements are met.
- J. Hydrated Lime shall be incorporated into the mixture.
- K. The antistrip additive Zycotherm manufactured by Zydex Industries shall be incorporated into the PGAB at a rate of 0.1%.

SPECIAL PROVISION

SECTION 409

BITUMINOUS TACK COAT

409.01 Description

This Subsection is deleted and replaced with the following:

This work consists of furnishing and applying one uniform application of Emulsified Asphalt RS-1 or RS-1h conforming to the specifications of AASHTO M-140. The application rate shall be 0.04 gal/yd²

409.05 Equipment

Add “or as determined by the Resident”, after the words “gal/yd²” in the fourth line of the second paragraph of this Subsection.

409.06 Preparation of Surface

The following paragraph is added:

All existing pavement and shoulder areas on which bituminous concrete mixtures are to be placed shall receive a tack coat. The surface area where the tack coat is to be applied shall be dry and cleaned of all dirt, sand, and loose material. Cleaning shall be accomplished by use of revolving brooms or mechanical sweepers. Undesirable material not removed by the above means shall be cleaned by hand sweeping or scraping, or a combination of both. Small areas otherwise inaccessible may be swept with hand brooms. The tack coat shall be applied only when the existing surface is dry.

409.08 Method of Measurement

The following paragraphs are added:

Measurement will be based on delivery slips made out in duplicate by the Contractor and signed by the Resident, or his representative, at the point of delivery. One of these slips shall be retained by the Resident and one by the Contractor. Delivery slips shall be furnished by the Contractor and shall provide space for identifying the vehicle and driver, for stating the volume of material carried, the source of the material, the date, and the Resident or his representative's signature.

Material included in the delivery slips and not used or rejected shall be deducted from the amount being measured for payment. Each day's delivery slips shall be reconciled by the Contractor and the Resident within 24-hours.

Cleaning of the surface area where tack coat is to be applied shall be incidental to Bituminous Tack Coat Item.

409.09 Basis of Payment

The following pay items are added:

<u>Pay Item</u>		<u>Pay Unit</u>
409.15	Bituminous Tack Coat RS-1 or RS1h– Applied	Gallon

SPECIAL PROVISIONSECTION 419SAWING AND SEALING JOINTS IN BITUMINOUS PAVEMENT

(Sawing Bituminous Pavement)

419.01 Description

This work consists of sawing bituminous concrete pavement as shown on the Plans, as specified herein or as approved by the Resident.

419.02 General

The bituminous concrete pavement to be sawed shall be accurately marked before cutting. The marking shall be in accordance with the locations as shown on the Plans or as approved by the Resident. Cutting shall be with an approved power-driven saw with an abrasive blade.

Unless otherwise noted or directed, the sawcut shall be vertical, a minimum of 3/8 inch wide, and extend to the depth as shown on the Plans.

Residue or debris from the sawing operation shall be removed immediately and legally disposed of by the Contractor.

419.03 Method of Measurement

Sawing Bituminous Pavement will be measured by the linear foot of pavement actually cut and accepted. No additional payment will be made for variations in the pavement thickness.

419.04 Basis of Payment

Sawing Bituminous Pavement will be paid for at the Contract unit price per linear foot which shall be full compensation for all materials, tools, equipment labor, and all incidentals necessary for the completion of the work to the satisfaction of the Resident. The disposal of sawcut residue shall be incidental to this item.

Payment will be made under:

<u>Pay Item</u>	<u>Pay Unit</u>
419.30 Sawing Bituminous Pavement	Linear Foot

SPECIAL PROVISIONSECTION 470BERM DROP OFF CORRECTION

(Berm Dropoff Correction - Grindings)
(Berm Correction)

470.01 Description

This work shall consist of furnishing and placing bituminous grindings to eliminate the berm drop-off along the inside and outside shoulder edges at all locations, including guardrail sections at locations shown on the plans or as directed by the Resident.

The work shall also consist of removing materials at the inside and outside shoulder edges at all locations, including guardrail sections at locations shown on the plans or as directed by the Resident.

470.02 Bituminous Materials

The recycled bituminous pavement shall be reprocessed (crushed) to meet the following gradations:

Sieve Designation	Percentage by Weight Passing Square Mesh Sieve
¾"	100
½"	95-100
No. 4	50-80
No. 50	18-28
No. 200	3-10

470.03 Method of Construction

Work under this item shall be in accordance with the details as shown on the Plans or as directed by the Resident.

At a minimum, a walk behind plate compactor shall be used for compaction. Other methods may be used upon approval by the Resident.

470.04 Method of Measurement

Berm Dropoff Correction – Grindings will be measured by the ton of Pavement grindings delivered and installed.

Material included in the delivery slips and not used or rejected shall be deducted from the amount being measured for payment.

Berm Correction will be measured by the linear foot for material removed.

470.05 Basis of Payment

The accepted quantity of “Berm Dropoff Correction – Grindings” will be paid for at the contract unit price per ton, which price shall include all materials, crushing to gradation range, weighing, transportation, placement, labor, equipment, and all incidentals necessary to accomplish the work.

The accepted quantity of “Berm Correction” will be paid for at the contract unit price per linear foot, which price shall include removing all materials, grading, transportation, labor, equipment, and all incidentals necessary to accomplish the work.

Payment will be made under:

<u>Pay Item</u>		<u>Pay Unit</u>
470.08	Berm Dropoff Correction – Grindings	Ton
470.081	Berm Correction	Linear Foot

SPECIAL PROVISION

SECTION 502

STRUCTURAL CONCRETE

(Median Barrier Concrete)

502.05 Composition and Proportioning

This first paragraph is added to the beginning of the section:

Concrete for precast median barrier components shall be a Self-Consolidating Concrete Mix meeting Supplemental Specification Requirements 502.05, Composition and Proportioning, for Class P Concrete.

In addition, the following requirements shall supersede those listed on Table 1 Master Limits Table in Section 502.05, Composition and Proportioning, of Supplemental Specification 502 Structural Concrete:

- Minimum Compressive Strength of 5,000 psi
- Minimum Cementitious Content 704 lbs with 50% slag and 50% cement
- Water Cement Ratio 0.31 +- 0.02
- Slump shall be waived for Self-Consolidating Concrete (SCC) Mix
- Spread 25"-30"
- Air Entrainment 5.5-7.5%

Notes 3,4, and 5 in Table 1 Master Limits Table Section 502.05 apply.

SPECIAL PROVISIONSECTION 502STRUCTURAL CONCRETE

(Flowable Concrete Fill)

502.01 Description

This work shall consist of furnishing all labor, equipment, and materials to place Flowable Concrete Fill between pier protection barrier at pier locations as designated on the Plans.

502.02 Materials

Materials shall conform to the requirements specified in the following Subsections of Division 700 — Materials:

- | | |
|-----------------------------|-----------------------|
| ▪ Portland Cement | 701.01 |
| ▪ Water | 701.02 |
| ▪ Air Entraining Admixtures | 701.03 |
| ▪ Water Reducing Admixtures | 701.04 |
| ▪ Fly Ash | 701.10 |
| ▪ Fine Aggregate | 703.01 |
| ▪ Accelerating Admixtures | AASHTO M-194 Type “C” |

502.03 Composition and Proportioning

Flowable concrete fill shall be composed of a homogeneous mixture of Portland Cement and/or pozzolans, fine aggregate, water, and chemical admixtures proportioned according to these Specifications.

The flowable concrete fill shall be proportioned to produce a 28 day compressive strength of 30-110 psi and a maximum 90-day compressive strength of 200 psi.

The water cement ratio for flowable concrete fill shall not be high enough to cause segregation of the mix.

Air content of five to 15 percent is the target. Higher air contents may be acceptable but will increase set time. All flowable concrete fill shall be air entrained by the addition of an air entraining admixture or other chemical admixtures.

At least 30 days prior to the first placement, a flowable concrete fill mix design shall be submitted by the Contractor to the Resident for approval. No flowable concrete fill shall be placed on the Project until the mix design is approved by the Resident. At a minimum, the mix design submitted by the Contractor shall include the following:

- A. Target water cement ratio
- B. Target strength
- C. Target air content

502.04 Quality Control

Process control measurements of air content, mix temperature, and slump shall be performed on the portion or portions of flowable concrete fill batches delivered to the site. At least one (1) set of measurements for air content, temperature, and slump of flowable concrete fill mix

shall be performed per placement or per day, whichever is less frequent. Test cylinders will not be required.

Air content shall be measured following the requirements of AASHTO T152 utilizing Type B equipment.

Slump shall be measured by Modified Slump Test as described below.

Apparatus:

Scoop, measuring tape, flat edge, 3 in. x 6 in. cylinder mold open at both ends, and a flat non-absorbent surface.

Procedure:

1. Set cylinder upright on flat non-absorbent surface.
2. Scoop representative sample of flowable concrete fill.
3. Fill the cylinder, with the sample in one lift without tamping. Strike-off the top with the flat edge to form a level surface.
4. Clear any residue from around the bottom of the cylinder.
5. During a count of three seconds, lift the cylinder straight up allowing the sample to spread on the flat surface.
6. Measure the spread diameter to the nearest 1/2 inch. A spread of nine to 14 inches is considered flowable.

502.05 Batching

Measuring and batching of materials shall be performed at an approved batching plant, either commercial or otherwise.

502.06 Mixing and Delivery

The Contractor shall provide a Certificate of Compliance as described in Standard Specification Section 502, Structural Concrete, Subsection 502.0501, Quality Control METHOD C, for each truckload of flowable concrete fill.

502.05 Method of Measurement

Flowable Concrete Fill satisfactorily placed and accepted will be measured by the cubic yard based on the volume required between pier protection barrier as shown on the Plans.

502.06 Basis of Payment

The accepted quantity of Flowable Concrete Fill will be paid for at the Contract unit price per cubic yard. Payment will be full compensation for furnishing and placing Flowable Concrete Fill, including all labor, materials, equipment, bulkhead formwork, and necessary incidentals.

Payment will be made under:

<u>Pay Item</u>	<u>Pay Unit</u>
502.5651 Flowable Concrete Fill	Cubic Yard

SPECIAL PROVISION

SECTION 502

STRUCTURAL CONCRETE

(Concrete Cap)

502.01 Description

This section is deleted and replaced with the following:

This work shall consist of furnishing all labor, equipment, and materials to construct a concrete cap between pier protection barrier at pier locations, and on top of flowable concrete fill, as detailed on the Plans. Concrete shall contain synthetic fiber reinforcement as described in the materials section of this specification.

The work shall also include the application of Clear Protective Coating for Concrete Surfaces to all surfaces of the concrete exposed in the final condition, in accordance with Supplemental Specification 515.

502.02 Materials

The following is added to this section:

- Concrete shall conform to Supplemental Specification 502, Class A Concrete.
- Concrete shall contain 3 LB/CY of synthetic fiber reinforcing in accordance with Special Provision 503.

Clear Protective Coating for Concrete Surfaces shall be in accordance with Supplemental Specification 515.

502.05 Method of Measurement

The following is added to this section:

Concrete Cap satisfactorily placed and accepted will be measured by the cubic yard based on the volume required between pier protection barrier as shown on the Plans.

The application of Clear Protective Coating for Concrete Surfaces will not be measured for payment separately but shall be incidental to the Concrete Cap pay item.

502.06 Basis of Payment

The following is added to this section:

The accepted quantity of Concrete Cap will be paid for at the Contract unit price per cubic yard. Payment will be full compensation for furnishing and placing the Concrete Cap, including all labor, materials, equipment, bulkhead formwork, synthetic fiber reinforcing and necessary incidentals.

Payment will be made under:

<u>Pay Item</u>		<u>Pay Unit</u>
502.57	Concrete Cap	Cubic Yard

SPECIAL PROVISION

SECTION 503

REINFORCING STEEL

(Synthetic Fiber Reinforcement)

The following Subsection shall be added:

503.01 Description

This work shall consist of furnishing synthetic fiber reinforcement to be used as temperature and shrinkage reinforcement in the concrete cap between pier protection barrier at pier locations as indicated on the plans.

503.02 Materials

The following sentence shall be added:

Synthetic fibers shall be STRUX 90/40 as manufactured by W. R. Grace & Co. or an approved equal.

The following Subsection shall be added:

503.03 Dosage

The dosage rate for synthetic fibers shall be three lbs per cubic yard of concrete.

SPECIAL PROVISION

SECTION 513

SLOPE PROTECTION

(Slope Protection – Portland Cement Concrete)

513.01 Description

The following sentence is added:

This work shall also include the replacement of existing concrete slope protection removed as required for roadway widening, as well as the resetting of existing concrete slope protection as shown in the Contract Plans. This work shall also include grading and gravel borrow required to reset the existing slope pavement and install the new slope pavement.

This work shall also include applying pigmented protective coating in accordance with Special Provision 515 where slope pavement modifications expose areas of the abutments in the final condition that are not exposed in the existing condition. The protective coating shall be applied to the newly exposed concrete surface to 1 foot below proposed finished grade using a color matching the color of the existing pigmented coating.

513.02 Materials

The following sentences are added:

Welded steel wire fabric and other embedded steel components shall be epoxy coated meeting the requirements of ASTM A884.

513.03 Portland Cement Concrete

Prior to placing new concrete slope protection, the surfaces of the existing slope pavement be in contact with the new slope protection shall be cleaned to remove dirt, loose particles, and foreign matter.

Joints in the reset or replaced concrete slope pavement at the Exit 48 underpass bridge shall be sealed after placement with a polyurethane sealant such as Sikaflex 1a or approved equal.

513.07 Basis of Payment

The following sentence is added:

Payment for Portland Cement concrete slope protection shall also be full compensation for granular borrow required for placement of the slope protection in accordance with the Plans. Payment shall also include full compensation for the application of pigmented protective coating where specified. Payment shall also include cleaning of existing surfaces and sealing joints as noted in the Contract Plans.

SPECIAL PROVISIONSECTION 515PROTECTIVE COATING FOR CONCRETE SURFACES

(Pigmented Concrete Protective Coating)

Section 515, Protective Coating for Concrete Surfaces, is deleted in its entirety and replaced with the following:

515.01 Description

The work shall include the surface preparation and application of a pigmented concrete protective coating system, consisting of a pigmented penetrating sealer, to protect new and existing concrete and masonry structures. The coating system shall be applied in accordance with the manufacturer's published recommendations.

Where pigmented protective coatings are already present on concrete surfaces specified to receive new protective coatings, the work shall also include removing areas of existing protective coating that are blistered, flaking, peeling, or otherwise loosely adhered to the concrete substrate prior to application of the new coating. The removal of loosely adhered pigmented protective coatings shall be completed by high-pressure washing.

515.02 Materials

The pigmented penetrating sealer system shall be a one-coat system consisting of ChemMasters TextureDOT Smooth, as manufactured by ChemMasters, Inc., or an approved equal, consisting of the following:

- The coating shall be an acrylic silane polymer blend or an approved equal. This primer shall provide the main protection against the ingress of water borne chlorides and sulfates.

The products shall comply with regulations limiting the Volatile Organic Compound (VOC) content of architectural and industrial maintenance coatings.

The Contractor shall submit the product data sheets, material safety data sheets and recommended instructions for application of the ChemMasters Texture DOT Smooth coating.

The pigmented penetrating sealer color shall be Concrete Gray, Federal Number 16492.

Materials shall be delivered to the site in original packages or containers bearing the manufacturer's labels and identification.

515.021 Substitute Materials

The Contractor shall submit a written request for approval of proposed substitute material naming the proposed manufacturer and product. This request shall be accompanied by:

1. Test data from an independent testing laboratory stating that the proposed substitute meets or exceeds the specified requirements as listed and has been tested in accordance with the specified test standards.
2. Documentation that the proposed material has a proven record of performance when used in the intended application as confirmed by actual field tests and successful installations in place on at least five similar projects.
3. Certification that if two or more types of products are intended to be used as part of a system, they will be supplied by the same manufacturer to ensure compatibility of materials, and to maintain single source manufacturer responsibility.

The Resident reserves the right to require additional testing to evaluate any proposed substitute product at no additional cost to the Authority. The Resident's decision as to the acceptability or non-acceptability of the proposed product shall be final.

515.03 Surface Preparation

The surface shall be prepared in accordance with the instructions of the approved manufacturer. Surface shall be fully cured, dry, and free from contamination such as coatings, oil, grease, loose particles, decaying matter, moss, algae growth, and curing compounds. The Contractor shall lightly sandblast the surface to achieve an adequate surface roughness for coating adhesion, in accordance with manufacturer's recommendations. After sandblasting, all surfaces shall be rinsed by pressure washing, and allowed to air dry for a minimum of 48 hours. Once the surface preparation has been completed to the satisfaction of the Resident, the Contractor may apply the protective coating.

All caulking, patching, and joint sealant shall be installed and cured prior to application of the protective coating.

Existing form tie hole plugs which are loose or deteriorated shall be completely removed. The holes shall be reamed to sound concrete. All open form tie holes, new and existing shall be filled with an approved non-shrinking mortar, and after setting, rubbed level to the adjacent surface. Filled holes shall be cured for at least two (2) days prior to the application of the protective coating.

Grass and vegetation adjacent to surfaces to be coated shall be removed or trimmed closely to permit proper preparation and application of the protective coating.

Where protective coatings are specified to be applied to concrete surfaces that have been previously covered with pigmented coating, the Contractor shall remove any protective coating that, in the judgement of the Resident, is blistered, flaking, peeling, or otherwise loosely adhered to the concrete substrate. Loosely adhered coating shall be generally defined as any coating that can be removed by vigorously scraping the concrete surface using a 3" steel putty knife and firm pressure. The goal of the removal work is to remove areas of flaking, missing or otherwise compromised coating systems; protective coatings that are tightly adhered to the concrete substrate need not be removed.

The removal of existing protective coatings shall be completed using high pressure washing. The specific pressure, flow rate, nozzle and standoff distance for the high-pressure washing operation shall be selected by the Contractor to remove loosely adhered coatings as specified. After high-pressure washing, the Resident shall verify all loosely adhered coatings have been removed from the specified areas by scraping the surfaces with a putty knife. The Contractor will be required to complete additional pressure washing to remove any remaining loosely adhered coatings identified by the Resident.

The Contractor may use, when required, appropriate cleaning materials recommended by the sealer manufacturer in conjunction with high pressure washing. Following removal of existing coating systems, all surfaces of the substructure unit to be coated shall be lightly sandblasted to achieve a surface roughness adequate for coating adhesion, then shall be cleaned and rinsed by pressure washing.

The Contractor will be responsible for controlling and filtering runoff resulting from the pressure washing operations in accordance with Supplemental Specification 656, and all local, state and federal requirements.

515.04 Application

The materials shall be mixed and applied in strict accordance with the instructions of the approved manufacturer. **Apply the coating** at the recommended application rate. If the surface is very absorbent, the **coating** should be applied until surface is saturated per the manufacturer's written instructions. All areas not to receive coating shall be marked with straight, even lines as the limit lines.

The Contractor shall, in the presence of the Resident, apply the materials on a sample area which is representative of a jobsite application. When color and application methods are approved, the sample area shall serve as a standard of acceptance for all further work.

The coating shall not be applied in direct sunlight when the air or surface temperature is greater than 90°F, or when air or surface temperature is below 45°F.

Coating material shall be applied per the manufacturer's recommended application rate and in strict accordance with the manufacturer's written instructions. The coating shall provide consistent color without light spots or shadows. The Resident reserves the right to have the Contractor recoat coating if the dried coat lacks consistent color or shows light spots or shadows.

For surfaces that have previously received pigmented coating, the coating shall be applied to the complete limits of pigmented coating application as described on the Contract Plans, not just the area of old coating removal.

Regardless of the application method used (sprayer, roller or brush) the Contractor shall be responsible for achieving 100% coverage of the concrete including the interior surfaces of concrete voids, recesses, or other depressions on the concrete surface.

Protect plants, grass, sealant, asphalt, traffic, etc. during application from spray.

515.05 Method of Measurement

Pigmented Protective Coating for Concrete Surfaces will not be measured separately for payment but shall be incidental to related Contract pay items.

SPECIAL PROVISION
SECTION 515

PROTECTIVE COATING FOR CONCRETE SURFACES

(Clear Concrete Protective Coating)

Section 515, Protective Coating for Concrete Surfaces, is deleted in its entirety and replaced with the following:

515.01 Description

The work shall include the surface preparation and application of a clear protective coating on concrete surfaces to protect new cast-in-place concrete, precast concrete and masonry structures. The coating system shall be applied to median barrier, pier protection barrier, and associated transitions in accordance with the Plans, Specifications and the manufacturer's published recommendations.

515.02 Materials

The penetrating sealer shall be StandOff® SLX100 Water & Oil Repellent, as manufactured by ProSoCo, Inc., or an approved equal. The sealer shall have the following properties:

Active Substance:	modified alkyl alkoxy silane
Active Content:	> 90%
Form:	clear liquid
VOC:	< 3.5 pounds per gallon

The product shall comply with regulations limiting the Volatile Organic Compound (VOC) content of architectural and industrial maintenance coatings.

The Contractor shall submit the ProSoCo's product data sheets, material safety data sheets and recommended instructions for application of the StandOff® SLX100.

Materials shall be delivered to the site in original packages or containers bearing the manufacturer's labels and identification.

515.021 Substitute Materials

The Contractor shall submit a written request for approval of proposed substitute material naming the proposed manufacturer and product. This request shall be accompanied by:

1. Test data from an independent testing laboratory stating that the proposed substitute meets or exceeds the specified requirements as listed and has been tested in accordance with the specified test standards.

2. Documentation that the proposed material has a proven record of performance when used in the intended application as confirmed by actual field tests and successful installations in place on at least five similar projects.
3. Certification that if two or more types of products are intended to be used as part of a system, they will be supplied by the same manufacturer to ensure compatibility of materials, and to maintain single source manufacturer responsibility.

The Resident reserves the right to require additional testing to evaluate any proposed substitute product at no additional cost to the Authority. The Resident's decision as to the acceptability or non-acceptability of the proposed product shall be final.

515.03 Surface Preparation

All caulking, patching, and joint sealant shall be installed prior to application of the sealer. On new surfaces to be treated, all voids shall be dressed by dry rubbing to remove form marks and blemishes to present a neat appearance. Concrete and masonry surfaces shall be cleaned free of dust, surface dirt, oil, efflorescence and contaminants to ensure penetration of the sealer. The surface may be slightly damp at the time of treatment.

The Contractor may use, when required, appropriate cleaning materials recommended by the sealer manufacturer in conjunction with high pressure water for cleaning the concrete or masonry.

515.04 Application

The Contractor shall apply the clear concrete protective coating in strict accordance with the manufacturer's published recommendations.

The application shall not be conducted when surface and air temperatures are below 40°F or above 90°F. The work shall not be conducted when there is a chance of the surface temperature falling below 40°F in the 24-hours following application; nor should it be applied on hot, windy days.

The treatment shall not be applied during rain to wet surfaces or when there is a chance of rain within 24-hours after application. After treatment, surfaces should be protected from rain for not less than 48-hours. It shall not be applied when winds are sufficient to carry airborne chemicals to unprotected surfaces.

Prior to applying the sealer, the Contractor shall protect all surrounding non-masonry/non-concrete surfaces, landscape and lawn areas, and surfaces not designated for treatment, from contact with the penetrating sealer, and prevent overspray of the penetrating sealer caused by wind drift.

The Contractor shall ensure that all safety equipment, facilities and precautions recommended by the product manufacturer are furnished and/or strictly adhered to.

The sealer material shall be applied in the manner and with the equipment recommended by the product manufacturer. Coverage will vary depending on condition, texture and porosity of the surfaces. Pre-testing is required.

Sealer shall be applied as packaged without dilution or alteration. The sealer shall be applied with low pressure (20 psi) airless spray equipment or with a heavily saturated brush or roller unless otherwise permitted by the Resident. Sufficient material shall be applied to thoroughly saturate the surface making sure to brush out excess material that does not penetrate.

When the sealer is applied to horizontal surfaces, it shall be applied in a single saturating application with sufficient material and applied so the surface remains wet for one to two minutes before penetration into the concrete. Surface residues, pools and puddles shall be broomed-out thoroughly until they completely penetrate into the surface.

When the sealer is applied to vertical and sloped surfaces, it shall be applied in a "wet-on-wet" application for best results on most porous materials. In the case of extremely dense concrete, it may be necessary to restrict the amount of material applied to one saturating application in order to prevent surface darkening. Apply from the bottom up with sufficient material to thoroughly coat the surface and create a slight rundown below the spray pattern. Allow the first application to penetrate the concrete surface, and within a few minutes after the first coat appears dry, reapply in the same saturating manner.

When the sealer is applied to vertical and sloped surfaces, it shall be applied in two applications, 10 minutes apart, with a low pressure (20 psi) airless sprayer.

515.05 Method of Measurement

Clear Protective Coating for Concrete Surfaces will not be measured separately for payment but shall be incidental to related Contract items.

SPECIAL PROVISION

SECTION 526

CONCRETE BARRIER

(Temporary Barrier Markers)

526.01 Description

The following paragraphs are added:

This work shall consist of furnishing, installing and maintaining temporary barrier markers on all temporary barrier supplied by the Contractor and the Authority.

526.02 Materials

The following paragraphs are added:

Temporary barrier markers shall be "Big Dog" barrier markers manufactured by Custom Products Corporation or approved equal. Markers shall be bi-directional with a minimum effective reflective area of 96 square inches (48 square inches each side) as approved by the Resident. The reflectors shall meet MUTCD reflectivity requirements and shall be orange in color.

526.03 Construction Requirements

The following paragraphs are added:

Temporary barrier markers shall be mounted as follows:

1. One on every sixth barrier in tangents and one on every two barriers in tapers, including all barrier furnished by the Contractor.
2. Delineators shall be physically adhered to withstand the force of throw from a snowplow.
3. If more than 25% of delineators in any 200-foot section of barrier fall off for any reason, the Contractor will be responsible for reinstalling all the delineators in that run at that their own cost.
4. Contractor is required to submit the installation method for review and approval to the Resident.

526.04 Method of Measurement

The following paragraphs are added:

Temporary barrier markers shall not be measured for payment separately but shall be incidental to the temporary barrier item.

526.05 Basis of Payment

The following paragraphs are added:

Temporary barrier markers shall not be paid for separately but shall be incidental to the temporary barrier item.

SPECIAL PROVISION

SECTION 526

CONCRETE BARRIER

(Temporary Concrete Barrier Type I)

526.01 Description

The following paragraphs are added:

The work also includes supplying connecting pins and furnishing and mounting retro-reflective delineators, per Subsection 526.02 and 526.03.

526.02 Materials

The following paragraphs are added:

- f. Delineators shall be bi-directional with a minimum effective reflective area of eight square inches as approved by the Resident. The reflectors shall be methyl methacrylate and the housing of acrylonitrile butadiene styrene. Color shall be in accordance with the MUTCD.
- g. Temporary traffic barrier shall be one of the barriers included under FHWA's Roadside Hardware Policy and Guidance for crashworthy longitudinal barriers, at the Contractor's discretion, unless otherwise specified. The type of temporary traffic barrier shall be provided to the Resident Engineer prior to use. All temporary traffic barrier and corresponding connections shall meet, unless otherwise specified in the Plans, Test Level 3 (TL-3) criteria as defined in NCHRP Report 350 or the AASHTO Manual for Assessing Safety Hardware (MASH) based on date of manufacture; all temporary concrete barrier manufactured after 12/31/19 shall meet MASH requirements. The appropriate resource shall be determined as described in the MASH publication. The Contractor shall supply the FHWA approval letter, manufacturer approved shop drawings and connection and anchorage details (if applicable), date of manufacture, and catalogue cuts for each barrier type to the resident engineer for approval. The manufacturer's shop drawings shall specify the maximum deflection distance the product is approved for. The Contractor's shop drawing submittal shall specify the available distance between the back or non-roadway side of the barrier to the closet fixed object or edge of open excavation being protected for each location of differing available deflection distance.

526.03 Construction Requirements

The following paragraphs are added:

Concrete barrier placed at roadway low points shall be shimmed on 1" by 2" by 2' long wood planks to allow drainage to pass under the barrier. In addition, the Resident may direct the Contractor to shim the concrete barrier at other locations to provide for proper roadway drainage.

All labor, material, and equipment necessary to shim the barrier will not be measured separately for payment but shall be incidental to the Concrete Barrier.

The removal of concrete barrier from adjacent to the travel lane may be conducted without a lane closure if it is accomplished in accordance with the following requirements:

- Barrier is removed from the trailing end and the workmen and equipment involved in the operation are always behind the barrier. No workmen or equipment shall enter the travel lane.
- Barrier shall be dragged away from the travel lane to at least a 30-degree angle by the use of a cable.
- Barrier shall be lifted no more than six inches while within 10 feet of the travel lane.

Retro-Reflective Delineators shall be mounted as follows:

- One on top of each barrier.
- One on the traffic side of every barrier used in a taper.
- One on the traffic side of every other barrier at regularly spaced intervals and locations.
- Delineators shall be installed on both sides of the barrier if barrier is used to separate opposing traffic.
- Delineators shall be physically adhered to withstand the force of throw from a snowplow.
- If more than 25% of delineators in any 50-foot section of barrier fall off for any reason, the Contractor will be responsible for reinstalling all the delineators in that run at that their own cost.
- Contractor is required to submit the installation method for review and approval to the Resident.

526.04 Method of Measurement

The following paragraphs are added:

Payment for furnishing, installing and maintaining retro-reflective delineators will not be measured for payment separately but shall be incidental to the Temporary Concrete Barrier Pay Item.

Payment will be made under:

<u>Pay Item</u>	<u>Pay Unit</u>
526.301 Temporary Concrete Barrier, Type I	Linear Foot

SPECIAL PROVISIONSECTION 526CONCRETE BARRIER

(Temporary Concrete Barrier Type I - Supplied by Authority)

526.01 Description

The following paragraphs are added:

This work shall consist of loading, transporting, setting, resetting, removing, transporting and stacking Temporary Concrete Barrier Type I – Supplied by Authority. The barrier shall have attachments allowing individual sections to be connected into a continuous barrier.

The work also includes supplying connecting pins and furnishing and mounting retro-reflective delineators, per Subsection 526.02 and 526.03.

Concrete barriers supplied by Authority shall be available at the following location(s):

<u>Maintenance Area</u>	<u>Linear Feet of Barrier</u>
Mile 25.5 Northbound (Old Kennebunk Hotel Site)	1,900
Crosby Maintenance Area Mile 45.8 Southbound	3,900
Mile 98 Northbound (Old Service Plaza Site)	2,200

Upon substantial completion of work, the Contractor shall remove and transport the barrier back to its maintenance area of origin. All barrier shall be returned, sorted, and stacked according to type in locations directed by the project Resident or maintenance area foreman.

526.02 Materials

The following paragraphs are added:

- e. Delineators shall be bi-directional with a minimum effective reflective area of eight square inches as approved by the Resident. The reflectors shall be methyl methacrylate and the housing of acrylonitrile butadiene styrene. Color shall be in accordance with the MUTCD.

526.021 Acceptance

The Resident shall have the authority to accept or reject all Temporary Concrete Barrier Type I – Supplied by Authority used on the Project that does not meet the requirements of this specification

526.03 Construction Requirements

The following paragraphs are added:

The Contractor shall notify the Resident prior to the scheduled pick-up and delivery of concrete barrier. No barrier shall be removed from or stacked at the Turnpike Maintenance Area without approval of the Resident.

The Contractor shall move and place barrier-utilizing methods that will not damage the barrier. Barrier that is damaged by the Contractor by failing to use proper methods shall be replaced by the Contractor at no additional cost to the Maine Turnpike Authority.

Concrete barrier supplied by the Authority consists of several different styles. Not all barriers may be compatible. The Contractor shall utilize caution when setting barrier to use identical barrier types as adjacent barrier. Non-compatible barrier that cannot be attached together shall be overlapped by a minimum of 10 feet with the blunt end on the non-traffic side of the barrier. This work will not be measured separately for payment but shall be incidental to the concrete barrier.

Concrete barrier placed at roadway low points shall be shimmed on 1" by 2" by 2' long wood planks to allow drainage to pass under the barrier. In addition, the Resident may direct the Contractor to shim the concrete barrier at other locations to provide for proper roadway drainage. All labor, material, and equipment necessary to shim the barrier will not be measured separately for payment but shall be incidental to the Concrete Barrier.

The removal of concrete barrier from adjacent to the travel lane may be conducted without a lane closure if it is accomplished in accordance with the following requirements:

1. Barrier is removed from the trailing end and the workmen and equipment involved in the operation are always behind the barrier. No workmen or equipment shall enter the travel lane.
2. Barrier shall be dragged away from the travel lane to at least a 30-degree angle by the use of a cable.
3. Barrier shall be lifted no more than six inches while within 10 feet of the travel lane.

Retro-Reflective Delineators shall be mounted as follows:

4. One on top of each barrier.
5. One on the traffic side of every barrier used in a taper.
6. One on the traffic side of every other barrier at regularly spaced intervals and locations.
7. Delineators shall be installed on both sides of the barrier if barrier is used to separate opposing traffic.
8. Delineators shall be physically adhered to withstand the force of throw from a snowplow.
9. If more than 25% of delineators in any 50-foot section of barrier fall off for any reason, the Contractor will be responsible for reinstalling all the delineators in that run at that their own cost.
10. Contractor is required to submit the installation method for review and approval to the Resident.

526.04 Method of Measurement

The following paragraphs are added:

Temporary Concrete Barrier Type I – Supplied by Authority shall be measured for payment by the lump sum.

The loading, transporting, setting, resetting, removing, transporting, sorting and stacking of the barrier, the furnishing, installation and maintenance of the barrier delineators, and furnishing and installing connector pins will not be measured separately for payment, but shall be incidental to the cost of the Barrier. Temporary storage of Concrete Barrier between construction phases, if required, will not be measured separately for payment, but shall be incidental to the cost of the Barrier. All equipment required to load, unload, transport and stack Concrete Barrier shall be supplied by the Contractor.

Any Barrier lost or damaged by the Contractor shall be replaced by the Contractor at no additional cost to the Authority.

526.05 Basis of Payment

The second and fifth paragraph are deleted and not replaced.

The following paragraphs are added:

Temporary Concrete Barrier Type I – Supplied by Authority will be paid for at the Contract lump sum price, complete in place. Such payment shall be full compensation for loading, transporting, setting, resetting, temporary storage, removing, transporting and stacking at the area designated, furnishing all materials, and all other incidentals necessary to complete the work. Temporary Concrete Barrier Type I – Supplied by Authority and all connecting pins shall remain the property of the Authority and shall be returned to the Turnpike Maintenance Area as designated in Subsection 526.01.

Payment of Temporary Concrete Barrier, Type I – Supplied by Authority shall be based on a percentage of the work accomplished during that pay period.

Payment will be made under:

<u>Pay Item</u>	<u>Pay Unit</u>
526.306 Temporary Concrete Barrier, Type I – Supplied by Authority	Lump Sum

SPECIAL PROVISIONSECTION 526CONCRETE BARRIER

(Median Barrier – Type B)
 (Median Barrier – Type C)
 (Median Barrier – Type D)
 (Bridge Endpost Transition Barrier)
 (Type C Transition Barrier)
 (Type D Transition Barrier)
 (OHSS Foundation Transition Barrier)

526.01 Description

This Section is deleted and replaced with the following:

This work shall consist of furnishing, constructing, erecting, and setting permanent concrete barrier and associated elements on granular base material in accordance with these Specifications and the lines and grades shown on the Plans or established by the Resident. The length of each precast barrier segment shall be in accordance with the parameters shown on the Plans.

The Contractor shall be responsible for installing the barrier to the elevations shown on the plans, and with the required depth of embedment required to achieve the specified elevation. The Contractor is advised that the finished pavement elevation on either side of the barrier will not be equal at all locations, and that the depth of barrier embedment will vary.

The work shall also be completed in accordance with Supplemental Specification 502, Structural Concrete, and Standard Specification 534, Precast Structural Concrete, as referenced herein.

The work shall also include the application of Clear Protective Coating for Concrete Surfaces to all concrete surfaces exposed in the final condition, including the ends of barrier segments, in accordance with Supplemental Specification 515. Clear protective coating shall be applied all required repairs and final finishing of the barrier is complete and accepted.

The work shall also include the removal and disposal of the existing guardrail transition barrier located south of the Warren Ave Bridge.

Median Barrier – Type B – Double faced single slope precast concrete barrier 2'-3³/₄" wide at the base, 47¹/₂" high with a 36" minimum reveal, and variable embedment depth, as shown on the Plans. A structural tube and I-beam connection detail is provided at each end.

Median Barrier – Type C – Single face single slope precast concrete barrier 1'-9³/₈" wide at the base, 59¹/₂" high, and 54" reveal as shown on the Plans. A structural tube and I-beam connection detail is provided at each end.

Median Barrier – Type D – Single face single slope concrete barrier 1'-11" wide at the base, 82" high, 54" reveal and an 87" footing as shown on the Plans. Barrier may be cast-in-place or precast at the Contractor's option. A structural tube and I-beam connection detail shall be provided at each end.

Bridge Endpost Transition Barrier – Cast-in-place concrete barrier transition section installed to transition from precast Median Barrier – Type B to existing F-shape bridge endposts as shown on the Plans. A structural tube and I-beam connection detail is provided at one end and a slotted opening to accept dowels from existing endposts is provided at the other end. The slotted opening shall be grouted after barrier installation.

Type C Transition Barrier – Precast concrete barrier transition section installed to transition from precast Median Barrier – Type B to Median Barrier – Type C, shown on the Plans. A structural tube and I-beam connection detail is provided at each end.

Type D Transition Barrier – Barrier transition section installed to transition from Median Barrier – Type B to Median Barrier – Type D as shown on the plans. Barrier may be cast-in-place or precast at the Contractor's option. A structural tube and I-beam connection is provided at one end.

OHSS Foundation Transition Barrier – Barrier transition section installed to transition from Median Barrier – Type B to existing overhead sign structure foundations as shown on the plans. A structural tube and I-beam connection details is provided at both ends.

526.02 Materials

The second paragraph is deleted in its entirety and replaced with the following:

Concrete for precast components shall be in accordance with Special Provision 502 Median Barrier Concrete.

Concrete for cast-in-place components shall be Class AAA (without synthetic reinforcement) in accordance with Supplemental Specifications, Section 502.05, Composition and Proportioning, with a minimum compressive strength of 4,500 psi and an air entrainment of 6.5% ±1%.

Steel components and hardware for barrier connection assemblies shall be in accordance with MaineDOT Standard Specification 504. All barrier connection assemblies shall be hot dip galvanized after fabrication in accordance with ASTM A123 or A153, as applicable.

All reinforcing steel for concrete barrier shall be epoxy coated. Reinforcing steel shall be fabricated and placed in accordance with the Standard Specifications, Section 503.

Reflective delineators for concrete median barrier shall meet the requirements of Special Provision 645, Highway Signing.

Clear Protective Coating for Concrete Surfaces shall be in accordance with Supplemental Specification 515.

Grout for filling slotted openings at the end of Bridge Endpost Transition Barrier sections shall be a product selected from MaineDOT's qualified list of Prepackaged Concrete Mixes.

526.03 Construction Requirements

The first paragraph, including items "a" through "c", and the second paragraph are deleted and replaced with the following:

All cast in place components shall be constructed in accordance with the provisions of Supplemental Specification 502, Section 502.05, Composition and Proportioning, through Section 502.15, Curing Concrete, inclusive. Concrete barrier shall not be formed using slip forming methods.

All precast components shall be constructed in accordance with the provisions of Standard Specification 534, Section 534.05, Facilities for Inspection, through Section 534.10, Forms, inclusive, as well as Section 534.12, Inserts, through Section 534.20, Installation of Precast Units, inclusive. The provisions of Standard Specification Section 712.061, Structural Precast Concrete Units, exclusive of material requirements, shall apply. Concrete barrier shall not be formed using slip forming methods.

The following paragraphs are added after the fourth paragraph:

- d. Sections of barrier shall be uniform in color and in good condition, free from cracked or spalled surfaces.
- e. Defects shall be divided into two categories, minor defects and major defects. Minor defects in the barrier may be repaired in the field. Major defects shall be cause for rejection of the section or, at the Authority's sole discretion, the section shall be repaired in a manner directed by the Resident.

Minor defects are defined as holes, honeycombing or spalls which are 6 inch or less, in diameter, and which do not expose the outermost surface of the steel reinforcement. Surface voids 3/8 inch, or less, in diameter and 3/8 inch, or less, in depth are not considered defects and do not require repair.

Major defects are defined as any defect which does not meet the definition of a minor defect or minor defects which, in aggregate, comprise more than 1% of the surface area of the barrier section.

The repair of hardened concrete shall be completed prior to the application of clear protective coating and shall be completed as follows:

- Minor Defect Repair: Repairs shall be made with a fast set non-shrink patching material included on MaineDOT's list of prequalified materials. Methods of repair shall be acceptable to the Resident. The color of the repaired portion shall match as nearly as practicable, the color of the surrounding concrete. Repaired portions shall match shape and tolerance requirements.
- Major Defect Repair: Major defect repair shall be submitted for review and approval and shall not commence unless pre-approved by the Engineer.

The following paragraphs are added at the end of this section:

- f. All barrier segments, whether precast or cast-in-place, shall be uniform in color and in good condition, free from cracked or spalled surfaces and free from excessive surface air voids.

The layout and placement of the concrete barriers shall be to the alignment and elevations shown on the Plans, approved working drawings, or as directed by the Resident. Before any barrier or transitions may be placed, the subbase shall be compacted to 95 percent density and fine graded to a tolerance of $\pm 1/2$ inch of the true grade at any location under the barrier. The following placement tolerances shall be met:

- Elevation tolerance: $\pm 1/4$ " from plan elevation
- Longitudinal placement tolerance: $\pm 1/2$ " from plan location
- Transverse placement tolerance: $\pm 1/2$ " from plan location

The Contractor shall be responsible for installing the barrier to the elevations shown on the plans, and with the required depth of embedment required to achieve the specified elevation. The Contractor is advised that the finished pavement elevation on either side of the barrier will not be equal at all locations, and that the depth of barrier embedment will also vary.

All Cast-in-Place barrier connecting to adjacent existing or precast barrier shall include hardware necessary to allow for barrier connections as detailed in the Plans.

Clear protective coating shall be applied all required repairs and final finishing of the barrier is complete and accepted.

Grout for filling slotted openings at the end of Bridge Endpost Transition Barrier sections shall be mixed, placed and cured in strict accordance with the manufacturer's recommendations

526.031 Submittals

The Contractor shall collect any necessary field data to supplement the Plans, including ground survey and field measurements, required for the development of shop drawings. The Contractor shall submit shop drawings, for approval by the Resident, showing the fabrication details and quantities of each proposed barrier section in accordance with Section 105.7, Working Drawings, and Section 526.031, Submittals. Additionally, working drawings for precast elements shall be submitted in accordance with Standard Specification 535.03, Drawings. The shop drawings shall include information covering materials and their properties, lifting devices, storage and handling requirements, reinforcing layout, protective coating information, geometric dimensions, quantity of pieces, overall length of pieces, and all other information necessary to fabricate the pieces in accordance with the Plans and Specifications.

526.04 Method of Measurement

The following paragraphs are added:

All Median Barrier, Types B, C, and D will be measured for payment by the lump sum satisfactorily completed and in place as shown on the Plans.

Cast-in-place end wall sections will not be measured for payment separately, but shall be incidental to the Median Barrier – Type D pay item.

Type C Transition Barrier, Type D Transition Barrier, OHSS Foundation Transition Barrier, and Bridge Endpost Transition Barrier will be measured by each barrier piece satisfactorily fabricated and installed as shown on the Plans. Grout for filling slotted openings at the end of Bridge Endpost Transition Barrier sections will not be measured for payment separately, but shall be incidental to the Bridge Endpost Transition Barrier pay item.

Removal of the existing guardrail transition piece at the Warren Ave Bridge shall be incidental to related median barrier pay items.

The application of Clear Protective Coating for Concrete Surfaces will not be measured for payment separately but shall be incidental to the related barrier pay items.

Stone Fill, Concrete Fill, and Concrete Cap between barrier shall be paid for separately under respective pay items.

526.05 Basis of Payment

The following paragraphs are added:

The Contract Lump Sum price for median barrier Types B, C, and D shall be full compensation for: shop drawings; field layout; furnishing all materials, supplies, and equipment; casting; delivery; excavation; bedding material; grading; installation; reflective delineators; application of Clear Protective Coating for Concrete Surfaces; and other all incidentals necessary to complete the work.

The unit price for each for Type C Transition Barrier, Type D Transition Barrier, OHSS Foundation Transition Barrier, and Bridge Endpost Transition Barrier section shall be full compensation for: shop drawings; field layout; furnishing all materials, supplies, and equipment; casting; delivery; excavation, bedding material grading; installation; grouting; reflective delineators; application of Clear Protective Coating for Concrete Surfaces; and other all incidentals necessary to complete the work.

Payment will be made under:

<u>Pay Item</u>		<u>Pay Unit</u>
526.352	Median Barrier – Type B	Lump Sum
526.353	Median Barrier – Type C	Lump Sum
526.354	Median Barrier – Type D	Lump Sum
526.361	Bridge Endpost Transition Barrier	Each
526.362	Type C Transition Barrier	Each
526.363	Type D Transition Barrier	Each
526.364	OHSS Foundation Transition Barrier	Each

SPECIAL PROVISION

SECTION 527

ENERGY ABSORBING UNIT

(Work Zone Crash Cushion)

527.01 Description

The first paragraph is deleted in its entirety and replaced with the following:

The Contractor shall furnish and install work zone crash cushions where shown on the Plans, as specified herein, in Special Provision 652, or as approved by the Resident. Work zone crash cushions are required at each exposed end of temporary concrete barrier or guardrail.

The exposed end of the concrete barrier within 30 feet of the mainline travel lane shall be protected at all times. Barrier shall not be reset until after the work zone crash cushion(s) has been set to protect the exposed end of the barrier.

527.02 Materials

The following paragraph is added:

Only work zone crash cushions meeting the MASH TL-3 crash test requirements may be used on the turnpike and local roadways with posted speeds of 45 MPH or greater. Work zone crash cushions meeting the MASH TL-2 crash test requirements may be used on local roadways with posted speeds of 40 MPH or less. The Contractor shall provide the Resident with documentation of the proposed work zone crash cushion's MASH Crash Test Results prior to installation at the jobsite.

527.03 Construction Requirements

The following is added to the end of the first paragraph:

The design speeds for work zone crash cushions shall be 45 mph for local road and 70 mph for turnpike roadways unless otherwise noted on the Plans.

527.04 Method of Measurement

Replacement barrels, after collisions, will be paid for as a percentage of the individual barrels damaged to the total barrels in the complete system. The removal of impacted barrels and debris will be considered incidental to the replacement barrels. Barrels on hand, but unused will not be paid for directly.

527.05 Basis of Payment

Payment will be made under:

<u>Pay Item</u>		<u>Pay Unit</u>
527.341	Work Zone Crash Cushions – TL-3	Unit
527.3411	Work Zone Crash Cushions – TL-3, Left in Place	Unit

SPECIAL PROVISIONSECTION 602PIPE LINING

(Pumped Grout Fill)

602.01 Description

This work shall consist of furnishing all labor, equipment, and materials to place Pumped Grout Fill into abandoned underground pipes at the locations designated on the Plans. The material shall be capable of flowing over long distances without segregation or separation of the grout materials.

602.02 Materials

Materials shall conform to the requirements specified in the following Subsections of Division 700 — Materials:

▪ Portland Cement	701.01
▪ Water	701.02
▪ Fly Ash	701.10
▪ Fine Aggregate	703.01
▪ Chemical Admixtures	701.04

Pumped Grout Fill shall meet the following properties:

Range of Cast Density, PCF	65 minimum
Compressive Strength, PSI	110 – 500

602.03 Submittals

- The Contractor shall submit a mix design for Pumped Grout Fill for review and approval prior to installation. The mix design, at a minimum, shall include materials to be used with source information, batch tests or historical test data if reusing a mix design, targets for grout density, water cement ratio, 28-day compressive strength, and air content.
- The contractor shall submit a placing plan that provides equipment and placement methods, for review and approval prior to placing. The plan shall include: equipment specifications that demonstrate sufficient capacity to place grout in a single operation, pumping port and air vent locations, target pumping pressure, description of how the pipe end bulkheads will be formed to contain and support the pumped grout, and testing procedure(s).

602.04 Placing Pumped Grout Fill

Pumped Grout Fill shall not be placed until bulkhead forms, pump injection port(s), and air vent(s) have been checked and approved.

Pumped Grout Fill shall be placed before it has taken its initial set and shall be placed in such a manner as to avoid separation and segregation of the grout materials.

Placement of Pumped Grout Fill to fill abandoned pipes shall require a pressurized pump system with PVC piping for adequate air venting. A gauge to monitor grout pressure shall be attached immediately adjacent to each injection port. Threaded injection ports shall be suitable to withstand maximum pumping pressures. A minimum of one air vent shall be installed on the upstream bulkhead form to ensure the abandoned pipe is filled in its entirety.

Unit weight density tests may be taken at the discretion of the Resident to confirm the cast density.

602.05 Method of Measurement

Pumped Grout Fill satisfactorily placed and accepted will be measured by the cubic yard based on the volume of the pipe.

602.06 Basis of Payment

The accepted quantity of Pumped Grout Fill will be paid for at the Contract unit price per cubic yard. Payment will be full compensation for furnishing and placing Pumped Grout Fill, including all labor, materials, equipment, bulkhead formwork, pumping ports and vents, dewatering and necessary incidentals.

Payment will be made under:

<u>Pay Item</u>	<u>Pay Unit</u>
602.40 Pumped Grout Fill	Cubic Yard

SPECIAL PROVISION

SECTION 603

PIPE CULVERTS AND STORM DRAINS

(Reinforced Concrete Pipe)
(Concrete Collar)
(Corrugated Polyethylene Pipe)

603.01 Description

The following paragraphs are added:

This work shall also consist of furnishing and installing Class III, IV or Class V reinforced concrete pipe at the locations as shown on the Plans or as approved by the Resident.

This work also consists of furnishing and installing a concrete collar to join existing concrete pipe to the proposed concrete or Corrugated High Density Polyethylene (HDPE) pipe in accordance with the details as shown on the Plans. The Contractor shall note that the concrete pipe ends may be of different sizes and may not fit snugly together.

This work shall also consist of furnishing and installing various sizes of corrugated HDPE pipe, including a dual wall adaptor fitting by Hancor or an approved equal as shown on the plans. No other pipe types within the Option III alternatives will be accepted.

This work shall also consist of furnishing and installing various sizes of Class III RCP or corrugated HDPE pipe for temporary pipe connections and temporary pipe extensions to temporarily maintain existing drainage.

603.02 Materials

All Corrugated High-Density Polyethylene (HDPE) pipe for storm water and drainage systems shall meet the requirements of Subsection 706.06.

603.11 Method of Measurement

The following paragraph is added:

The Concrete Collar shall be measured by each unit installed, complete in place and accepted. This shall be full compensation for furnishing labor and materials to construct a Concrete Collar to connect the existing and proposed pipe ends in a working like manner.

Dual Wall Adapter Fitting shall be included for payment as three additional linear feet of the largest pipe involved.

Temporary pipe connections and temporary pipe extensions will be measured by the linear foot of the type specified, installed and accepted.

603.12 Basis of Payment

Concrete Collars will be paid for at the Contract unit price each regardless of the size of the existing and proposed pipes.

Corrugated HDPE pipe will be paid for under the appropriately sized Culvert Pipe Option III pay items

Temporary pipe connections and temporary pipe extensions will be paid for at the contract unit price per linear foot in place, and shall be full compensation for furnishing all labor, equipment and materials necessary to complete the work consisting of, but not necessarily limited to, the installation, temporary connections, excavation and backfill, disassembly, and all other items necessary to maintain and disassemble temporary drainage or as approved by the Resident.

Payment will be made under:

<u>Pay Item</u>		<u>Pay Unit</u>
603.155	12-inch Reinforced Concrete Pipe - Class III	Linear Foot
603.165	15-inch Reinforced Concrete Pipe - Class III	Linear Foot
603.1653	15-inch Reinforced Concrete Pipe - Class V	Linear Foot
603.175	18-inch Reinforced Concrete Pipe - Class III	Linear Foot
603.1753	18-inch Reinforced Concrete Pipe - Class V	Linear Foot
603.195	24-inch Reinforced Concrete Pipe - Class III	Linear Foot
603.1953	24-inch Reinforced Concrete Pipe - Class V	Linear Foot
603.205	30-inch Reinforced Concrete Pipe - Class III	Linear Foot
603.2053	30-inch Reinforced Concrete Pipe - Class V	Linear Foot
603.215	36-inch Reinforced Concrete Pipe - Class III	Linear Foot
603.2153	36-inch Reinforced Concrete Pipe - Class V	Linear Foot
603.225	42-inch Reinforced Concrete Pipe - Class III	Linear Foot
603.2253	42-inch Reinforced Concrete Pipe - Class V	Linear Foot
603.235	48-inch Reinforced Concrete Pipe - Class III	Linear Foot
603.2353	48-inch Reinforced Concrete Pipe - Class V	Linear Foot
603.245	54-inch Reinforced Concrete Pipe - Class III	Linear Foot
603.2453	54-inch Reinforced Concrete Pipe - Class V	Linear Foot
603.255	60-inch Reinforced Concrete Pipe - Class III	Linear Foot
603.2553	60-inch Reinforced Concrete Pipe - Class V	Linear Foot
603.265	66-inch Reinforced Concrete Pipe - Class III	Linear Foot
603.2653	66-inch Reinforced Concrete Pipe - Class V	Linear Foot
603.275	72-inch Reinforced Concrete Pipe - Class III	Linear Foot
603.2753	72-inch Reinforced Concrete Pipe - Class V	Linear Foot
603.28	Concrete Collar	Each

SPECIAL PROVISION

SECTION 604

MANHOLES, INLETS AND CATCH BASINS

604.02 Materials

The following sentences are added:

Elastomeric sealer shall be Sikaflex 1a as manufactured by Sika or an approved equal.

Class AAA concrete shall conform to Subsection 502.05; except that the minimum cement factor shall be 750 pounds per cubic yard and the coarse aggregate size shall conform to ASTM C33 Grading 7.

The third paragraph should be deleted and replaced with:

Catch Basin Frames and Grates shall be as outlined below and be manufactured by EJ Company of Brockton, Massachusetts or an approved equal and shall meet or exceed the AASHTO M306 Loading Requirements.

Catch Basin Frames shall be manufactured by EJ Company of Brockton, Massachusetts (or an approved equal) with the following product numbers:

5521Z - 8 Inch Frame Product Number 00552111

5546Z - 6 Inch Frame Product Number 00554611

5544Z - 4 Inch Frame Product Number 00554411

Catch Basin Frames shall be 8" frames unless otherwise specified by the plans or approved by the resident.

Catch Basin Grates shall be a square holed grate as manufactured by EJ Company of Brockton, Massachusetts (or an approved equal) with the following product number:

5520M5 (170 Pound) Grate Product Number 00552060

If a cascade catch basin grate is specified on the plans then it shall be manufactured by EJ Company of Brockton, Massachusetts (or an approved equal) with the following product numbers depending on the direction of flow:

5520M8 Product Number 00552084 or 5520M8 Product Number 00552085

Manhole frames and covers shall be as manufactured by EJ Company of Brockton, MA or an approved equal and shall meet or exceed the AASHTO M306 Loading Requirements. Covers shall be badged, hinged and lockable. Contractor shall submit for review and approval.

604.04 Altering, Adjusting, and Rebuilding Catch Basins and Manholes

The following sentences are added:

Brick and mortar shall NOT be used to alter, adjust, or rebuild catch basins and manholes; concrete shall be used.

Any frame or grate damaged by the Contractor’s operations shall be replaced by the Contractor at no additional cost to the Authority. Replacement frame and grate shall meet the requirements of Subsection 604.02. Damaged frames and grates shall become the property of the Contractor and shall be removed from Turnpike property.

604.06 Basis of Pavement:

This section shall be amended with the addition of the following:

Payment will be made under:

<u>Pay Item</u>		<u>Pay Unit</u>
604.0961	60” Catch Basin Type B1	Each
604.0971	72” Catch Basin Type B1	Each
604.266	60” Catch Basin Type B5	Each

SPECIAL PROVISION

SECTION 604

MANHOLES, INLETS, AND CATCH BASINS

(Secure Catch Basin Grate)

604.01 Description

This work shall consist of removing existing catch basin grates in the existing four-foot paved shoulder, or other locations noted on the plans, cleaning existing frames, furnishing and applying elastomeric sealer to frame seats, and furnishing and installing new grates. This work shall be completed prior to opening paved shoulders to traffic.

604.02 Materials

The following sentences are added:

Catch Basin Grates shall be a square holed grate meeting or exceed the AASHTO M306 Loading Requirements and be manufactured by EJ Company of Brockton, Massachusetts (or an approved equal) with the following product number:

5520M5 Grate Product Number 00552060

Elastomeric sealer shall be Sikaflex 1a as manufactured by Sika or an approved equal.

604.03 Construction Requirements

The following paragraphs are added:

The contractor is required to remove and dispose of all old frames and grates.

After removal of an existing grate, the frame shall be cleaned to accept elastomeric sealer. Sealer shall be placed in a continuous bead over horizontal and vertical surfaces in accordance with the manufacturer's recommendations. Installed grates shall be preloaded and allowed to set for a minimum of 1.5-hours before receiving traffic loads to assure adequate adhesion of the sealer. The old grates shall be transported to the Crosby Maintenance Area Southbound and stacked at a location designated by the Resident.

New grates shall remain in place at the completion of construction and shall become the property of the Maine Turnpike Authority.

The Contractor is required to have two additional grates on-site at all times for use as backup devices. Unused grates shall become the property of the Authority and shall be stacked at Crosby Maintenance Area Mile 45.8 North/Southbound.

604.05 Method of Measurement

The following sentence is added:

Secure Catch Basin Grate will be measured for payment by each unit secured and accepted.

604.06 Basis of Payment

The following paragraphs are added:

The accepted quantity of Secure Catch Basin Grate will be paid for at the Contract unit price each. This price shall be full compensation for removing the existing grate, cleaning the horizontal and vertical surfaces, applying the elastomeric sealer, furnishing and installing the new grate, transporting and stacking the old grate, and all other labor, equipment, and materials required to complete the work.

Unused backup grates stacked at Crosby Maintenance Area will be paid for at the Contract unit price each under the Secure Catch Basin Grate item.

Payment will be made under:

<u>Pay Item</u>	<u>Pay Unit</u>
604.40 Secure Catch Basin Grate	Each

SPECIAL PROVISION

SECTION 606

GUARDRAIL

- (31" W-Beam Guardrail – Mid-way Splice (7' Steel Posts, 8" Offset Blocks, Single Faced)
- (31" W-Beam Guardrail – Mid-way Splice (8' Steel Posts, 8" Offset Blocks, Single Faced)
- (31" W-Beam Guardrail – Mid-way Splice (7' Steel Posts, 8" Offset Blocks, Double Faced)

606.01 Description

The section is amended by the addition of the following:

This work shall consist of furnishing and installing guardrail components the required locations in accordance with the Specifications and in reasonably close conformity with the lines and grades shown on the Plans. The types of guardrail are designated as follows:

- 31" W-Beam Guardrail – Mid-way Splice (7' Steel Posts, 8" Offset Blocks)
- 31" W-Beam Guardrail – Mid-way Splice (8' Steel Posts, 8" Offset Blocks)

606.02 Materials

The section is amended by the addition of the following:

Steel posts shall be 7 feet, or 8 feet long as specified in the plans.

The guardrail elements shall be per the Components' List found on Sheet No. 2 of 2 of draft Drawing SGR47 – 31" W-Beam Guardrail with Standard 8" Offset Block in the Task Force 13 Report noted above and/or as noted in the Contract Documents unless noted otherwise.

606.04 Rails

The section is amended by the addition of the following:

Height of top of rail shall be 31" measured from final grade. Height transition from 31" W-Beam, mid-spliced guardrail to existing guardrail shall occur over a 34'-4^{1/2}" length.

606.08 Method of Measurement

The section is amended by the addition of the following:

31" W-Beam Guardrail – Mid-way Splice (7' Steel Posts, 8" Offset Blocks) and 31" W-Beam Guardrail – Mid-way Splice (8' Steel Posts, 8" Offset Blocks) will be paid for at the contract unit price per linear foot of rail satisfactorily installed and accepted.

606.09 Basis of Payment

The section is amended by the addition of the following:

The accepted quantity of 31” W-Beam Guardrail – Mid-way Splice (7’ Steel Posts, 8” Offset Blocks) and 31” W-Beam Guardrail – Mid-way Splice (8’ Steel Posts, 8” Offset Blocks) will be paid for at the contract unit price per linear foot of rail and shall be full compensation for furnishing all labor, equipment and materials necessary to complete the work.

Payment will be made under:

<u>Pay Item</u>		<u>Pay Unit</u>
606.1301	31” W-Beam Guardrail – Mid-way Splice (7’ Steel Posts, 8” Offset Blocks, Single Faced)	Linear Foot
606.131	31” W-Beam Guardrail – Mid-way Splice (8’ Steel Posts, 8” Offset Blocks, Single Faced)	Linear Foot
606.132	31” W-Beam Guardrail – Mid-way Splice (7’ Steel Posts, 8” Offset Blocks, Double Faced)	Linear Foot

SPECIAL PROVISION

SECTION 606

GUARDRAIL

(31" W-Beam Guardrail – Mid-way Splice Flared Terminal)

606.01 Description

The following sentences are added:

This work shall consist of furnishing and installing a MFLEAT (MASH-compliant Flared Energy Absorbing Terminal) for use with the 31" W-Beam Guardrail – Mid-way Splice (7' Steel Posts, 8" Offset Blocks, Single Faced) as manufactured by Road Systems, Inc., 3616 Old Howard County Airport Road, Big Spring, Texas 79720, (432) 263-2435, and retroreflective adhesive sheeting in accordance with these Specifications and the manufacturer's installation instructions, and in reasonably close conformity with the lines and grades as shown on the Plans or as approved by the Resident.

606.02 Materials

The following sentence is added:

31" W-Beam Guardrail – Mid-way Splice Flared Terminal components shall be comprised of those shown in the manufacturers installation instructions. 8" blocks shall be used.

Reflective sheeting shall meet the requirements of Subsection 719.01, Reflective Sheeting – minimum ASTM Type XI; 3M™ Diamond Grade™ DG³ Reflective Sheeting Series 4000 or approved equal, color white.

The following Subsections are added:

606.045 Offset Blocks

8" Non-wood offset blocks shall be used.

606.035 Construction Requirements

The Contractor shall submit a set of installation drawings to the Resident for approval. The system shall be installed in accordance with the manufacturer's recommendation and the installation drawings.

A reflective adhesive sheeting shall be applied to the nose of the MFLEAT System after installation.

606.041 Reflective Sheeting

The color for the reflective sheeting shall be silver (white) when installed on the right shoulder and shall be black chevron on yellow background only when installed on the left shoulder.

606.08 Method of Measurement

The second paragraph is amended by the addition of: “31” W-Beam Guardrail – Mid-way Splice Flared Terminal, ” after the words “Terminal section, ”.

606.09 Basis of Payment

The first paragraph is amended by the addition of: “31” W-Beam Guardrail – Mid-way Splice Flared Terminal, ” after the words “Terminal section, ”.

The second paragraph is amended by the addition of: “, 31” W-Beam Guardrail – Mid-way Splice Flared Terminal, ” after the words “NCHRP 350 end treatments ”.

The retroreflective sheeting will not be measured separately for payment but shall be incidental to the 31” W-Beam Guardrail – Mid-way Splice Tangent Terminal item.

Payment will be made under:

<u>Pay Item</u>	<u>Pay Unit</u>
606.1307 31” W-Beam Guardrail – Mid-way Splice Flared Terminal	Each

SPECIAL PROVISION

SECTION 606

GUARDRAIL

(31” W-Beam Guardrail – Mid-way Splice Terminal End – Anchored End)

606.01 Description

The section is amended by the addition of the following:

This work shall consist of furnishing and installing Terminal End – Anchored End – 31” W-Beam Guardrail end treatment in accordance with these Specifications and Plan Sheet details, the AASHTO-AGC-ARBTA Joint Committee Task Force 13 Report: A Guide to Standardized Highway Barrier Hardware, Drawing SEW31 in AASHTO Manual for Assessing Safety Hardware (MASH) approval letter B-256; and in reasonably close conformity with the lines and grades as shown on the Plans or as approved by the Resident.

606.02 Materials

The following sentences are added:

The guardrail elements shall be per the Components’ List found on Sheet No. 2 & 3 of 3 of Drawing SEW31 – Trailing-end Anchorage System in the Task Force 13 Report noted above and/or as noted in the Contract Documents. The component RWM14a shall be modified to a length of 9’-4½” measured from the center of the Mid-way Splice to the center of the last guardrail post.

606.042 Terminal End - Anchored End

The following sentences are added:

Installation of the Terminal End – Anchored End - 31” W-Beam Guardrail end treatment shall be in accordance with these plans and specifications, the AASHTO-AGC-ARBTA Joint Committee Task Force 13 Report and the Details on Sheet No. 1 of 3 of Drawing SEW31 – Trailing-End Anchorage System.

606.08 Method of Measurement

The second paragraph is amended by the addition of: “, Terminal End - Anchored End – 31” W-Beam Guardrail, ” after the words “Terminal section, ”.

606.09 Basis of Payment

The first paragraph is amended by the addition of: “, Terminal End - Anchored End – 31” W-Beam Guardrail, ” after the words “Terminal section, ”.

The second paragraph is amended by the addition of: “, Terminal End - Anchored End – 31” W-Beam Guardrail, and ” after the words “NCHRP 350 end treatments ”.

Payment will be made under:

<u>Pay Item</u>	<u>Pay Unit</u>
606.1351 31” W-Beam Guardrail – Mid-way Splice Terminal End – Anchored End	Each

SPECIAL PROVISIONSECTION 606GUARDRAIL

(Delineator Post – Remove and Reset)

606.01 Description

The following paragraphs are added:

This work shall also consist of furnishing and installing new delineator posts and/or removing and resetting existing delineator posts within the Contract limits. The existing reflectorized delineator panels shall be removed and replaced with new reflectorized delineator panels as required by the Resident.

Existing and new delineator posts shall be located as follows, with the indicated panel:

Outside Shoulder:

- One at guardrail trailing ends (green delineator).
- Two at guardrail approach ends (one red delineator on first post and one red delineator on angle points.)

Median:

- One at guardrail trailing ends (green delineator, facing traffic).
- Two at guardrail approach ends (one red delineator on first post of CAT units, green on guard rail side, red on median opening side; and one red (both sides) delineator at angle point.)
- One at all other median guardrail angle points (red on both sides)

Other Locations:

- One at culvert outlets (green delineator).
- Twenty per mile evenly spaced at the edge of outside shoulder (white delineator).
- One at electrical junction boxes not associated with another item (red delineator).
- One at communication only junction boxes not associated with another item (orange delineator).

Delineator posts that do not exist in the locations described above, shall be supplied and installed by the Contractor. The installation of the delineator post shall include the demountable reflectorized delineator panel.

White edge delineators shall not be installed on any portion of the widened shoulder for Guardrail Flared Terminal installations and shall not be installed behind the Guardrail Flared Terminal rail segments.

606.02 Materials

The following paragraphs are added:

Non-guardrail Delineator Posts shall conform to Subsection 606.02 paragraph 3.

The seventh through ninth sentences of the fourth paragraph are deleted and replaced with the following:

Reflectorized flexible guardrail markers shall be a minimum of 2-inches in diameter, a maximum of 36" in length, ovalized at the top of the post to allow application of 3 inch by 9 inch high intensity reflective sheeting and shall be capable of recovering from repeated impacts. The flexible guardrail delineator markers shall be grey and capped at the top with a flexible rubber cap; Safe-Hit Flexible Guardrail Delineator or approved equal. Reflective material shall meet the requirements of ASTM Type IX Diamond Grade VIP (Visual Impact Performance).

The demountable reflectorized delineator panels shall meet the material requirements of Subsection 719.06. The delineator panel shall be rectangles measuring 9" x 3".

606.03 Posts

The following paragraphs are added:

The top of delineator posts shall be installed 4' - 6" (54")) above edge of pavement elevation. Delineators shall be installed four feet from edge of pavement except those delineating end treatments, culverts and electrical items.

Mile marker posts shall be mounted on breakaway supports. The bottom of the sign shall be 5' - 0" (60") above the pavement at the solid white line and shall be offset five feet from the edge of pavement.

A mock-up of the guardrail delineator posts shall be submitted to the Resident for approval prior to installation.

Any materials damaged by the Contractor's operations shall be replaced at no additional cost to the Authority.

Top of the delineator panel shall be flush with the top of post.

606.08 Method of Measurement

The following paragraphs are added:

Delineator Posts shall be measured by each unit satisfactorily installed. Delineator Post-Removed and Reset will be measured by each unit satisfactorily removed and reset or disposed, including installation of new panel. All delineator posts not suitable for reuse, as determined by the Resident, shall become the property of the Contractor and (disposed) removed from the MTA property.

Mile Marker post shall be measured for payment as Underdrain Delineator Post. The breakaway supports shall be incidental to the Underdrain Delineator Post pay item.

606.09 Basis of Payment

The following sentences are added:

The accepted quantity of Delineator Posts will be paid for under the Underdrain Delineator Post item, at the Contract unit price per each which price shall be full compensation for the post and specified delineator or mile marker panel, complete in place.

The accepted quantity of Delineator Post - Removed and Reset will be paid for at the Contract unit price each, which price shall be full compensation for removing and resetting the delineator panel or mile marker panel and post, including new delineator panel, and all incidentals necessary to complete the work.

Disposal of unused delineator posts shall be incidental to Delineator Post - Remove and Reset pay items.

Payment will be made under:

<u>Pay Item</u>	<u>Pay Unit</u>
606.3561 Delineator Post - Remove and Reset	Each

SPECIAL PROVISION

SECTION 606

GUARDRAIL

(Guardrail – Remove and Dispose)

606.01 Description

The following paragraph is added:

This work shall consist of removing and disposing of existing single and double guardrail elements, component parts and hardware as approved by the Resident. All removed guardrail elements, posts, component parts and hardware shall become the property of the Contractor and shall be removed from turnpike property.

606.08 Method of Measurement

The following paragraph is added:

Guardrail remove and dispose will be measured on a linear foot basis of guardrail satisfactorily Removed and Disposed whether single rail or double rail. Double twisted end sections will be measured for payment on a linear foot basis as 25 feet of guardrail removed.

606.09 Basis of Payment

The following paragraphs are added:

The accepted quantity of guardrail remove and dispose will be paid for at the Contract unit price bid per linear foot, which price shall be full compensation for removing, transporting, and disposing all guardrail elements, component parts and hardware, equipment, labor, and all incidentals necessary to complete the work. No additional payment will be made for double rail.

Payment will be made under:

<u>Pay Item</u>		<u>Pay Unit</u>
606.3631	Guardrail – Remove and Dispose	Linear Foot

SPECIAL PROVISION

SECTION 607

FENCES

(Chain Link Snow Fence)

607.01 Description

The following paragraph is added:

This work shall consist of furnishing all materials for, and the construction of, chain link snow fence extensions at the locations specified on the plans. The chain link snow fence shall be constructed in accordance with the details shown on the Plans, and as directed by the Resident.

607.02 Materials

The following paragraphs are added:

Posts, rail, and brace piping shall be manufactured by one of the following methods with steel conforming to ASTM A1011 or ASTM A1008 and shall have a minimum yield strength of 50 ksi:

- Furnace butt welded, continuous welded
- Cold rolled and electric resistance welded
- Seamless

All piping shall conform to the following dimensions:

Nominal Diameter In.	Outside Diameter In.	Minimum Wall Thickness In.	Mass Lb/Ft.
1 ½	1.900	.145	2.72
2 ½	2.875	.203	5.79

Hardware shall be hot dipped galvanized in accordance with AASHTO M 232 (ASTM A 153) or AASHTO M 298 Class 50 (ASTM B 695 Class 50).

The chain link fabric shall be 9-gauge steel, zinc coated conforming to AASHTO M 181 Type 1 Class D (ASTM A 392), aluminum-coated conforming to AASHTO M181 Type II (ASTM A 491), or 6-gauge aluminum alloy conforming to AASHTO M 181 Type III (ASTM F 1183). Chain-link fabric shall be knuckled on top and bottom. The size of the wire mesh shall be 1 inch. Wire ties shall be standard round 9-gauge zinc or aluminum coated steel or 6-gauge aluminum alloy conforming to ASTM F 626. All ties shall be wrapped around chain-link fabric twice (double pigtailed) at both ends. Space ties @ 6" o.c. to bottom rail and @ 12" o.c. at all posts and other rails.

607.06 Method of Measurement

The following paragraph is added:

Chain link snow fence will be measured by the lump sum unit accepted in place and in conformity with the details shown on the Plans or as directed by the Resident.

607.07 Basis of Payment

The following paragraph is added:

This work will be paid for at the contract unit price per lump sum, complete and accepted in place. Such price will be compensation for furnishing all materials, labor, equipment, coatings, and incidentals to complete the work.

Payment will be made under:

<u>Pay Item</u>	<u>Pay Unit</u>
607.183 Chain Link Snow Fence	Linear Foot

SPECIAL PROVISION

SECTION 610

STONE FILL, RIPRAP, STONE BLANKET, AND STONE DITCH PROTECTION

(Stone Fill)

610.01 Description

This work shall consist of furnishing all labor, equipment, and materials to place Stone Fill between pier protection barrier at the locations designated on the Plans.

610.02 Materials

Materials shall conform to the requirements specified in the following Subsections of Division 700 — Materials:

- Type 4 Stone Ballast 703.33

The provisions set forth in Section 703.33, paragraphs two, three and four shall not apply

610.05 Method of Measurement

Stone Fill satisfactorily placed and accepted will be measured by the cubic yard based on the volume of material required between pier protection barrier as shown on the plans.

610.06 Basis of Payment

The accepted quantity of Stone Fill will be paid for at the Contract unit price per cubic yard. Payment will be full compensation for furnishing and placing Stone Fill, including all labor, materials, equipment, and necessary incidentals.

Payment will be made under:

<u>Pay Item</u>	<u>Pay Unit</u>
610.071 Stone Fill	Cubic Yard

SPECIAL PROVISION

SECTION 610

STONE FILL, RIPRAP, STONE BLANKET AND STONE DITCH PROTECTION

(Temporary Stone Check Dams)

610.01 Description

Paragraph (g) is added as follows:

(g) Stone Check Dams – Machine placed stone, including the placement, removal and storage of the stone used for temporary stone check dams.

610.032.e. Stone Check Dams

The following paragraph is added:

Stone check dams shall be constructed in accordance with the details as shown on the Plans, detailed in the MaineDOT's latest Best Management Practices, or as approved by the Resident. The stone shall be placed in one operation without special handling or handwork except to create a low point along the top gradient above the ditch flow lines.

The following Subsection is added:

610.033 Removing Stone

The stone for temporary stone check dams shall be removed after vegetation has been established in the ditches as approved by the Resident.

Any damage to the slopes and ditches caused by the removal of the stone check dams shall be repaired by the Contractor at his own expense.

The area directly under the temporary stone check dams shall be loamed, seeded and mulched immediately after the removal of the stone check dams. The loam, seed and mulch will be measured for payment under the appropriate pay items.

Stone used for temporary stone check dams shall be removed and stored and shall become the property of the Contractor at the completion of the Project.

The following Subsection is added:

610.034 Maintenance

Stone check dams shall be maintained by the Contractor. Sediment deposits behind check dams shall be removed when the depth of sediment reaches 50 percent of the check dam height.

610.05 Method of Measurement

The following paragraphs are added:

Stone for Temporary Stone Check Dams will be measured by the cubic yard complete in place. The removal and storage of the stone will not be measured separately for payment but shall be incidental to the Temporary Stone Check Dam item. This shall include the transporting and unloading of the stone. If this stone is reused on the Project, it will be measured separately for payment under the appropriate pay item.

The removal and disposal of sediment from behind the Temporary Stone Check Dams will not be measured separately for payment but shall be incidental to the Temporary Stone Check Dam pay item.

610.06 Basis of Payment

The following sentences are added:

The accepted quantities of stone for Temporary Stone Check Dams will be paid for at the Contract unit price per cubic yard.

Payment will be made under:

<u>Pay Item</u>		<u>Pay Unit</u>
610.181	Temporary Stone Check Dam	Cubic Yard

SPECIAL PROVISION

SECTION 613

EROSION CONTROL BLANKET

613.01 Description

This work shall also include seeding, mulching and watering the median swale and/or longitudinal flow line to the limits and width as shown on the Plans or as directed by the Resident.

613.02 Materials

The following sentences are added:

Seeding shall meet the requirements of Section 618, Seeding, Method Number 2.

Mulch shall meet the requirements of Section 619.

The following Subsection is added:

613.041 Maintenance and Acceptance

See Section 618.10 for maintenance and acceptance of seeding.

613.042 Mulch

All mulch shall be placed after the area has been seeded and prior to the installation of the Erosion Control Blanket.

613.09 Basis of Payment

The following "and mulch" is added after the words "initial seeding" in the second sentence.

SPECIAL PROVISION

SECTION 619

MULCH

(Mulch – Plan Quantity)
(Temporary Mulch)

619.01 Description

The first paragraph is modified by the addition of the following:

“as a temporary or permanent erosion control measure” after the word “mulch”.

Add the following sentence at the end of the first paragraph:

Refer to Section 656 Temporary Soil and Water Pollution Control, for more information on Temporary Mulch.

619.03 General

The first paragraph is deleted and replaced with the following:

Cellulose fiber mulch shall not be used within 200 feet of a wetland or stream. The limits shall be 200 feet up station and down station of the wetland or streams as well as the slopes adjacent to the stream. The application of hay or straw mulch with an approved binder shall be used at these locations to prevent erosion.

The use of cellulose fiber mulch will only be allowed at other areas with the approval of the Resident. The Contractor may be required to demonstrate that the material may be applied in a manner that will prevent erosion and will aid in the establishment of permanent vegetation. The Resident reserves the right to require the use of hay or straw mulch at all locations if he determines that the cellulose mulch is ineffective. Cellulose fiber mulch is not acceptable for winter stabilization.

619.06 Method of Measurement

The following sentence is added:

Temporary Mulch will be paid for by the lump sum.

619.07 Basis of Payment

Temporary Mulch will be paid for at the Contract price per lump sum which shall be full compensation for furnishing and spreading the Temporary Mulch as many times as necessary as determined by the Contractor’s operations and staging. The price shall also include the additional mulch netting and snow removal necessary during the winter months.

Payment will be made under:

Pay Item

619.1201 Mulch – Plan Quantity
619.1202 Temporary Mulch

Pay Unit

Unit
Lump Sum

SPECIAL PROVISIONSECTION 626FOUNDATIONS, CONDUIT, AND JUNCTION BOXES FOR HIGHWAY SIGNING,
LIGHTING, AND SIGNALS626.031 Conduit

The third paragraph shall be deleted and replaced with:

All junction or pull boxes shall be vehicle rated with a minimum design load of 22,000lbs and installed as shown on the plans. Junction boxes for the traffic signal and communication conduit associated with the project shall be polymer concrete as manufactured by QUAZITE® a division of Hubbell Power Systems, or an approved equal. The boxes shall be 36" x 24" and 21" deep. The words TRAFFIC SIGNAL or COMMUNICATION shall be stamped on the cover as noted in the Plans or directed by the Resident. All existing junction boxes in useable condition shall be removed and stacked as directed by the Resident Engineer.

Junction boxes for the electrical associated with highway lighting shall be polymer concrete as manufactured by QUAZITE® a division of Hubbell Power Systems or an approved equal. The boxes shall be 18" x 11" and 18" deep. New boxes shall have the word LIGHTING stamped on the cover as noted in the Plans or directed by the Resident. The boxes shall have a 15,000-lb. load rating.

The fourth paragraph shall be deleted and replaced with:

Where conduits enter exposed junction boxes, they shall be sloped to drain towards the conduit entrance holes, unless otherwise directed. All conduit ends in exposed junction boxes or in concrete foundations shall be fitted with bell ends. Weep holes of ¼ inch diameter shall be placed in all pull boxes, junction boxes, and fuse boxes. A 3-inch PVC drain pipe shall be installed projecting 3" into the gravel bedding and extend until daylight at a minimum of 0.5% slope draining away from the junction box.

626.033 Polyvinylchloride Conduit Installation

The following paragraph shall be added:

Exposed conduit shall be rigidly and securely fastened with acceptable fasteners or supports, as indicated on the plans or approved. Fasteners or supports shall not be placed more than 6 feet apart on centers, except as otherwise authorized. Conduits shall generally be supported by an approved spacer at the point of support, so that there is an air space between the conduit and the supporting surface. Ends of conduit runs terminating in any box without a threaded hub shall be provided with a metallic locknut and insulated bushings on the inside of the box.

626.034 Concrete Foundations

The following paragraphs shall be added after the 10th paragraph:

The above grade portion of concrete foundation surfaces shall receive an application of Type 1C penetrating silane concrete sealer from the MaineDOT Qualified Products List. The application rate and method of application shall be in accordance with manufacturer’s published recommendations.

On surfaces to be treated, all voids shall be filled with mortar and the entire surface shall be dressed by dry rubbing to remove marks and blemishes to present a neat appearance. The silane application shall not be done until 14 days minimum after casting. Surfaces shall be free from laitance, oil, dirt, grease, dust, curing compound or any other deleterious material. The temperature of the concrete shall be above 40 degrees F and below 90 degrees F at the time of application or per manufacturer’s published recommendations.

Any concrete foundation that is damaged during placement or doesn’t meet design requirements will be replaced. No repairs to the foundations will be allowed.

All precast foundations in satisfactory condition as determined by the Resident shall be stacked at the MTA Crosby Maintenance Area. All cast in place foundations, and precast foundation in unsatisfactory condition shall become property of the contractor and disposed of by the Contractor off the turnpike right-of-way.

626.04 Method of Measurement

The following sentence is added:

Quazite junction box shall be measured by each unit in place and accepted existing or new and shall include 3-inch pvc drain pipe as shown in the plans.

Precast junction box shall be measured by each unit in place and accepted existing or new plans.

626.05 Basis of Payment

The following sentence shall be added to the third paragraph:

Payment of non-metallic conduit shall also include furnishing, installation, routing, termination, splices and connection of the wire per the plans and specifications.

The words, “polymer concrete” shall be added after the words, “precast concrete” in the second sentence of the second paragraph.

Payment will be made under:

<u>Pay Item</u>	<u>Pay Unit</u>
626.121 Quazite Junction Box (36X24)	Each
626.122 Quazite Junction Box (18X11)	Each

SPECIAL PROVISIONSECTION 626FOUNDATIONS, CONDUIT, AND JUNCTION BOXES FOR HIGHWAY SIGNING,
LIGHTING, AND SIGNALS

(Overhead Sign Structure Foundation)

626.01 Description

The following paragraph is added:

This work shall consist of furnishing and installing the concrete foundations, conduits, and junction boxes for the overhead sign structure relocated from just North of Two Rod Road over the southbound travel way to the proposed location shown on the Plans.

626.034 Concrete Foundations

This section is deleted and replaced with the following:

The Contractor shall construct each Overhead Sign Structure Foundation in accordance with the Plans and these Specifications.

Drilled shafts shall not be permanently cased, except for the top 3.0 feet; concrete shall be cast directly on bedrock and surrounding soil. If soil conditions differ materially from those described on the boring logs, the Contractor shall stop work on that foundation and contact the Resident.

All unsuitable material (including but not limited to peat, organic material, and material that has been disturbed and/or dumped) within the limits of a foundation shall be removed to the limits directed by the Resident.

The entire bottom area of the drilled shafts shall bear onto sound bedrock. Final bar length shall be coordinated with actual bottom of shaft. Estimated bottom of drilled shaft elevation is provided. The resident engineer will be present on site to ascertain the actual top of sound rock during drilling. All drilled shaft bottoms shall be inspected and approved by the Resident Engineer prior to placement of the reinforcing cage. All drilled shaft bottoms shall be sounded with a weighted tape at a minimum of five locations including one at the center of the shaft and four around the perimeter of the shaft at 90-degree intervals. Determination of sound rock shall be established by the Resident Engineer.

Rock-anchored foundation system shall be constructed as shown on the Plans. Grout used for rock-anchored foundations shall have a minimum compressive strength of 5 ksi and be non-shrink grout listed on the MaineDOT Qualified Products List and approved by the Resident. The reinforcing used as rock anchors shall be ASTM A615, Grade 75, epoxy coated.

Drilled shaft shall be constructed so that the axis of the shaft, measured at the top of the shaft, is within 1.0 inch of the plan location. Drilled shaft shall be plumb to within 1 percent of the length

based on the total length of the shaft. Cutoff elevation for the drilled shafts shall be plus or minus one half (1/2) inch from the top of the shaft elevation shown in Contract Drawings. Drilled shaft reinforcing bars shall be no higher than zero inches above or one (1) inch below the elevation shown in the Plans. The reinforcing cage shall be concentric with the drilled shaft excavation within a tolerance of 1 inch. The diameter of the drilled shaft shall not be less than the diameter shown on the Plans.

Drilled shaft reinforcing steel shall extend to the final authorized tip elevation and the bottom of reinforcing cage shall be no more than 6 inches above the bottom of drilled shaft, regardless of the final tip elevation.

The Contractor shall provide temporary dewatering of excavations for foundations such that the concrete is placed in the dry. Concrete for drilled shafts shall be placed by tremie methods 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 shall be placed as soon after excavation as practicable to prevent debris from collecting in the excavated area. Concreting in the dry is permitted when there is 3 inches of water or less at the bottom of excavation and after demonstrating seepage of 12 inches per hour or less after pumping entire water from the excavated hole.

Concrete for drilled shafts and other foundation elements shall be Class AAA in accordance with the Plans. Precast foundations will not be permitted.

Before placing concrete, the required elbows of entrance conduits, reinforcing steel, and anchor bolts shall be carefully positioned. The anchor bolt size and bolt circle diameter shall be as shown in the Plans. When the anchor bolt template is removed, the threads of the anchor bolts shall be greased and protected with metal sleeve, held in position with nuts and washers to be furnished with the bolts. This thread protection shall remain in place until the pole or other equipment is installed.

626.04 Method of Measurement

The following paragraphs are added:

The overhead sign structure foundation will be measured by lump sum. All structural excavation and backfill shall be considered incidental.

626.05 Basis of Payment

The following paragraphs are added:

Payment for the Overhead Sign Structure Foundation will be paid for at the Contract Lump Sum price, as specified, complete in in place. Payment shall include drilling and grouting for the installation of reinforcing anchored to bedrock, anchor bolts, reinforcing steel, concrete, conduit within the foundation and extending 12 inches from the foundation, loam, seeding, mulching, and all incidentals necessary to complete the work.

Steel tube vertical supports for the Overhead Sign Structure shall be paid for under item 645.124 Removal, Disassembly and Relocation of VMS and Supporting Structure.

Payment will be made under:

<u>Pay Item</u>	<u>Pay Unit</u>
626.34 Overhead Sign Structure Foundation	Lump Sum

SPECIAL PROVISION

SECTION 627

PAVEMENT MARKINGS

(White or Yellow Pavement Marking Line)

627.01 Description

The following sentences are added:

This work shall consist of furnishing and placing the final pavement markings at locations as shown on the Plans or as directed by the Resident.

This work shall consist of furnishing, placing, and maintaining pavement marking paint and temporary pavement marking paint at locations as shown on the Plans or as directed by the Resident.

627.02 Materials

The following is added before the last paragraph:

The paint for pavement markings shall be 100% acrylic water base paint.

627.04 General

The following is added to the third paragraph:

Dotted white lines (DWL) shall consist of alternate 3-foot painted line segments and 9-foot gaps.

Permanent pavement marking paint shall be applied at the end of each work week prior to opening the work area to traffic or as approved by the Resident.

Temporary pavement marking paint and temporary pavement markers shall be applied daily prior to opening the work area to traffic during non-work hours or as approved by the Resident. Temporary pavement markings shall be maintained, including restriping as required to provide clearly visible and useful lines at all times.

627.05 Preparation of Surface

The following is added:

Surface preparation for application of pavement marking paint shall conform to the manufacturer's recommendations including weather and temperature limitations. The surface shall not be frozen or covered in frost.

627.08 Removing Lines and Markings

The last sentence is deleted and is not replaced.

627.09 Method of Measurement

The second and third sentences in the second paragraph are deleted and replaced with the following:

The measurement of broken white lines, both permanent and temporary and dotted white lines, will include the gaps when painted. Temporary painted pavement marking lines will be measured for payment by the linear foot.

627.10 Basis of Payment

This Subsection is deleted and replaced with the following:

The accepted quantity of white or yellow pavement marking lines will be paid at the Contract price per linear foot. This price shall include all labor and materials to furnish and install the paint line.

The accepted quantity of broken and dotted white pavement marking lines will be paid at the Contract price per linear foot. This price shall include all labor and materials to furnish and install the paint line.

The accepted quantity of temporary white or yellow pavement marking lines will be paid at the Contract price per linear foot. This price shall include all labor and materials to furnish, install, and maintain the paint marking, including restriping as determined by the resident engineer.

Payment will be made under:

<u>Pay Item</u>	<u>Pay Unit</u>
627.712 White or Yellow Pavement Marking Line	Linear Foot

SPECIAL PROVISION

SECTION 627

PAVEMENT MARKINGS

(Temporary 6 Inch Pavement Marking Tape)
(Temporary 6 Inch Black Pavement Marking Tape)

627.01 Description

The following sentence is added:

This work shall also consist of furnishing, placing, maintaining and removing temporary pavement marking tape at locations shown on the Plans or as directed by the Resident.

This work shall also consist of furnishing, placing, maintaining and removing temporary black pavement marking tape at locations shown on the Plans or as directed by the Resident. Temporary 6 Inch Black Pavement Marking Tape shall be used to cover conflicting existing pavement marking paint.

627.02 Materials

The following paragraph is added:

Temporary pavement marking tape shall be Stamark Wet Reflective Removable Pavement Marking Tape Series 710 as manufactured by 3M of St. Paul, Minnesota or an approved equal.

Temporary pavement marking tape shall be Stamark Removable Black Line Mask Tape Series 715 as manufactured by 3M of St. Paul, Minnesota or an approved equal.

627.04 General

The following paragraphs are added:

Work under this item shall be in accordance with the manufacturer's recommendations. A factory representative from 3M shall be present for the first application of all temporary pavement marking tape to insure proper application and product performance.

The pavement markings shall be applied mechanically to clean dry pavement as recommended by the manufacturer and approved by the Resident.

Temporary pavement markings shall consist of applying six-inch solid white, six inches broken white, and six-inch yellow reflectorized pavement marking tape for traffic maintenance during construction as shown on the Plans or as directed by the Resident.

Temporary pavement marking tape that loses reflectivity, becomes broken, dislodged or missing during the life of the Contract shall be replaced by the Contractor at no additional cost to

the Authority.

627.06 Application

The following paragraphs are added:

For application of the tape, when the pavement temperature is below 50°F, heat shall be applied to the pavement surface, if deemed necessary by the factory representative or as directed by the Resident, at no additional cost to the Authority. Proper primer for the temperatures shall be used as directed by the manufacture.

The pavement mark tape shall be rolled over with a vehicle once application is complete and then scored every 20 feet when placed in long runs to prevent full length unraveling.

627.08 Removing Lines and Markings

The following sentence is added:

Removal of temporary pavement marking tape shall be accomplished without the use of heat, solvents, grinding or sandblasting and in such a manner that no damage to the pavement results.

627.09 Method of Measurement

The following paragraph is added:

Temporary Pavement Markings - Tape will be measured for payment by the linear foot. The measurement of broken lines will not include the gaps.

627.10 Basis of Payment

The following paragraphs are added:

Payment for the Temporary Pavement Markings - Tape will be made at the Contract bid price per linear foot, which price shall include furnishing, installing, maintaining and removing the temporary tape and all materials, labor, equipment and incidentals necessary to accomplish the work. Replacement of Temporary Pavement Markings - Tape, as described above, will be incidental and no separate payment will be made.

Payment for the Temporary 6 Inch Black Pavement Marking Tape will be made at the Contract bid price per linear foot installed, which price shall include furnishing, installing, maintaining and removing the temporary tape and all materials, labor, equipment and incidentals necessary to accomplish the work. Replacement of 6 Inch Black Temporary Pavement Marking Tape, as described above, will be incidental and no separate payment will be made.

Payment will be made under:

<u>Pay Item</u>		<u>Pay Unit</u>
627.73	Temporary 6 Inch Pavement Marking Tape	Linear Foot
627.731	Temporary 6 Inch Black Pavement Marking Tape	Linear Foot

SPECIAL PROVISION

SECTION 634

HIGHWAY LIGHTING

(Replacement LED Fixture)
(Remove and Reset Light Standard)
(Remove and Stack Light Standard)
(Conventional Light Standard with LED Fixture)

634.01 Description

The following paragraphs are added:

The work shall consist of verifying the voltage of existing luminaires and circuits, removing the existing luminaires and, if called for on the plans, furnishing and installing new LED luminaires with all new associated appurtenances at locations shown.

The work shall consist of removing existing light standards, luminaires, and any breakaway devices and resetting with associated appurtenances and wiring systems on new concrete foundations with new LED luminaires at locations as shown on the Plans.

The work shall consist of removing existing light standards, luminaries, and any breakaway devices, and their associated foundations. All existing light standards and associated appurtenances removed and not reset by the Contractor shall be delivered and stacked at the Authority's Crosby Maintenance Facility. All LED luminaires removed shall be reused and all non-LED luminaires removed, unless otherwise noted, will become the property of the contractor.

The work shall consist of furnishing and installing new conventional light standards with LED fixtures, including all appurtenances at locations shown. All new highway lights will have photoelectric sensors for each individual light. All new light standards shall be 35 feet tall with a 2-foot riser by 8-foot offset arm.

Existing lighting shall remain operational at all times until new luminaires are installed and operational. Existing luminaires, conduit and lighting standards shall be protected until approved by the Resident to be removed. Any temporary lighting that may be needed during removing and resetting of existing light standards shall be incidental to the 634 items.

634.02 General

The following paragraphs are added:

All Contract work shall be overseen by a Maine licensed Master Electrician. The lead person for the field installations shall be either a Maine licensed Master Electrician, or a Maine licensed Journeyman Electrician. Apprentice Electricians, Helper Electricians, Journeyman-In-Training Electricians, and helpers may work under the Master or Journeyman Electrician as permitted under the law.

The Contractor shall comply with National Electrical Code (NFPA 70) as applicable to construction and installation of electrical cable, wire and connectors; provide electrical cable, wire and connectors, which have been listed and labeled by Underwriters Laboratories, and comply with National Electrical Manufacturers Association/Insulated Power Cable Authorities Association Standards publications pertaining to materials, construction and testing wire cable, where applicable.

At a minimum the Contractor shall provide the following field quality control:

- Prior to energizing, check wire for continuity of circuitry and for short circuits with ohmmeter type testing equipment. Correct malfunction when detected.
- Subsequent to wire hook-ups, energize circuitry and demonstrate functioning in accordance with requirements.

634.021 Materials

The following paragraphs are added:

Disconnect fuse kits in pole bases shall be Ideal SLK Disconnect Fuse Kit 30-S2212, or similar approved Ideal SLK Disconnect Fuse Kit, matched to the pole wiring configuration.

The 120-277V Conventional Multi-Tap LED fixtures shall be one of the following:

- Model # ATB2-60BLEDE70-MVOLT-R3-NL-PCLL, as manufactured from American Electric Lighting
- Model # ATB2-80BLEDE70-MVOLT-R3-NL, as manufactured from American Electric Lighting

The 480V Conventional LED fixtures shall be one of the following:

- Model # ATB2-60BLEDE70-480VOLT-R3-NL, as manufactured from American Electric Lighting
- Satellite Series # SAT-96M-7-R-T3- 600GY-1-A-NS, as manufactured by LED Roadway Lighting of Halifax, Nova Scotia; (877) 533-5755
- LEDway Series # STR-LWY 3M HT 08 E UH SV 700 R, as manufactured by CREE, Inc., 4600 Silicon Drive, Durham, NC 27703
- Signify/Lumec Roadview LED Series RVS-135W80LED4K-LE3-HVU-GY3, as manufactured by Signify/Lumec,

The Contractor may submit an alternate LED fixture for review and acceptance or rejection. Alternate LED fixtures will need to meet or exceed the performance and efficiency of the specified fixtures. Should the Authority not accept the Contractor's proposed substitution the Contractor shall provide the specified fixture at no additional cost to the Authority.

Splices in junction boxes shall be made with Burndy UGS350ULDB Direct Burial/Submersible Splice Wire Range #12 AWG – 350KCMIL connectors for the appropriate wire count only.

The Manufacturer shall provide a minimum 5-year warranty on all fixtures, installed and spares, from the Project Completion date.

Each luminaire shall be provided with a 3 pin NEMA receptacle, a photocell and a shorting cap. All "spare" photocells and shorting caps shall become property of the Authority.

All fixtures shall be submitted and approved before the fixtures are ordered. Submittals shall include Product Data sheets clearly identifying the product and accessories being proposed, Test Reports and Certifications, and Product Warranties.

This item shall include the providing and installation of all AWG XHHW grade wire for highway lighting, as described herein, including grounding wires (where applicable), for all locations called for in the plans/specifications. All wire installed in conduit must be copper and direct burial grade, suitable for wet locations. Payment for all wiring for highway lighting will be incidental to the 634 items.

634.04 Cable Installation

The reset light standards that do not have a disconnect fuse kit or have a damaged or unsuitable disconnect fuse kit in the pole base, shall have a new disconnect fuse kit installed. The work will be included in the payment for reset light standard.

The reset light standards where the existing wire(s) at the luminaire or base are brittle and there is insufficient slack in the wire(s) to cut out the brittle portions of wire(s) and properly reset the light standard, shall have new wire(s) installed from the LED fixture to the (existing or new) disconnect fuse kit in the pole base. The work will be included in the payment for reset light standard.

634.051 Removing Light Standards

The first paragraph is deleted and replaced with the following:

Before removing light standards, the luminaires shall be removed from the light standard and stacked.

The Contractor will not be allowed to remove the existing light standards until all new foundations, wiring, conduits and junction boxes have been installed. Existing light levels shall be maintained while new light standards are being installed and made fully operational. New breakaway devices and mounting hardware shall be required on all reset and proposed light standards. If breakaway devices do not exist on the existing light standard, new breakaway devices shall be supplied and installed. For all entrance ramp, exit ramp, interchange, and toll plaza lighting locations, the Contractor will be allowed the daylight hours within one (1) working day to remove and reset a light standard, including installing the luminaire and testing.

634.06 Luminaires

The second paragraph is revised to read:

The connections between the luminaires and connector kits shall be made with number 10 wires AWG copper stranded XHHW, minimum size. A 14-inch-long Teflon sleeve shall be placed over each end of each conductor in the luminaire.

634.092 Method of Measurement

The following sentence is added:

Verifying the voltage of the existing luminaire(s) before installing the new LED luminaire(s) will not be paid separately but shall be incidental to the Replacement LED Fixture pay item.

Confirming if the existing pole(s) have a disconnect fuse kit in the base, providing and installing if none present, will not be paid separately, but shall be incidental to the Replacement LED Fixture, Remove and Rest Light Standard, and Conventional Light Standard pay item.

Replacement LED Fixture, Remove and Reset Light Standard, Remove and Stack Light Standard, and Conventional Light Standard with LED Fixture will be measured by the single unit, complete in place and accepted.

634.093 Basis of Payment

The following paragraphs are added:

Payment for furnishing and installing Replacement LED Fixture will be made for the accepted quantity at the Contract unit price per each, which shall include verifying the existing fixture and circuit voltage, removing and disposing the existing luminaire, confirming if the existing pole has a disconnect fuse kit in the base, new disconnect fuse kit if needed, furnishing and installing the new LED fixture, and all incidentals necessary to complete the work.

Payment for Remove and Reset Light Standard will be paid at the Contract unit price each for the number of units that are removed and reset. Payment shall be full compensation for the removal and resetting of the light standard, including luminaires, new breakaway device installed, new pole wires, new disconnect fuse kit, removal and delivering existing precast foundations suitable for reuse to the MTA Crosby Maintenance Facility, and all incidentals necessary to provide a complete and working light standard as shown on the plans.

Payment for Remove and Stack Light Standard will be made for the Contract unit price each for the accepted quantity. Payment shall be full compensation for removing the light standard and delivering to the MTA Cumberland Maintenance Facility and removal and delivering existing precast foundations suitable for reuse to the MTA Crosby Maintenance Facility. Foundations removed and not suitable for reuse shall become the property of the contractor and payment incidental to the Remove and Stack Light Standard item.

Payment for Conventional Light Standard with LED Fixture will be made for the accepted quantity at the Contract unit price each. Payment shall be full compensation for the light standard, breakaway device, bracket arm, new LED fixture, ballast, lamp, fixture mounted photocell, disconnect fuse kit and all incidentals to complete the work.

Payment will be made under:

<u>Pay Item</u>		<u>Pay Unit</u>
634.175	Replacement LED Fixture	Each
634.208	Remove and Reset Light Standard	Each
634.2083	Remove and Stack Lighting Standard	Each
634.231	Conventional Light Standard with LED Fixture	Each

SPECIAL PROVISIONSECTION 645HIGHWAY SIGNING

(Barrier Reflector)

645.01 Description

This Section is deleted and replaced with the following:

This work consists of furnishing and installing new barrier reflectors on the top portion of the precast concrete median barrier in accordance with these specifications and as shown on the plans, details, or as established; including all labor material, equipment and incidentals necessary to complete the work, in conjunction with the rest of the project.

645.02 Materials

The reflectors shall be designed to be affixed to the top of the precast concrete median barrier by non-mechanical means, and when covered with reflective sheeting provides a directional visual cue to the location of the barrier wall and roadway. The design of the reflector shall provide twelve (12) square inches of surface area for application of retro-reflective sheeting of a specified grade during manufacture.

The T-shaped reflector shall consist of a flat rigid upper panel, to which is affixed retro-reflective sheeting, and a rigid base plate. Connecting these two components shall be a clear, UV-stabilized, flexible polyurethane hinge at least 0.5” in height. The polyurethane hinge shall be both mechanically and chemically attached to both the base plate and top panel. All materials shall be new.

The reflector units shall be constructed of a UV-stabilized, high-impact rigid thermo-plastic alloy conforming to the following material specifications:

Property	ASTM Test	Results
Tensile Strength @ Yield (min psi)	D638	6,400
Impact Strength @ 73F (Ft#/in) notched izod	D256	2.9
Impact Strength @ -4F (Ft#/in) notched izod	D256	2.3
Flexural Strength @ 73F (psi)	D790	12,000
Flexural Modulus @ 73F (psi)	D790	400,000

The “hinge” portion shall be constructed of a UV-stabilized, flexible thermo-plastic polyurethane conforming to the following material specifications:

Property	ASTM Test	Results
Specific Gravity (min.)	D 792	1.19
Hardness (min.)	D 2240	80 A
Tensile Strength @ yield, (min PSI)	D 412	4,600
Ultimate Elongation (min)	D 412	330
Compression Set (22 hrs. @ 70° C)	D 396	65
Tear Strength (min PLI)	D 624, Die C	600
Taber Abrasion (CS17 Wheel)	100 cycles	3 mg

The polyurethane “hinge” of the reflector shall have the following minimum dimensions in relation to rigid top panel and base sections:

- Wall thickness of the rigid top panel and base sections shall be min. 0.090”.
- Wall thickness of the polyurethane hinge section shall be min. 0.090”.
- Total surface area of the connection of the hinge to the upper top panel shall be minimum of 0.500”.
- Total surface area of the connection of the hinge to the lower base plate shall be a minimum of 0.400”.
- The polyurethane hinge shall protrude vertically into the top panel.
- The polyurethane hinge shall also protrude down into the base plate.
- The un-encapsulated section of the poly-urethane hinge shall be no less than 0.100” thick and 0.130” tall.

The reflectors shall be constructed of UV-stabilized polymers white in color. The color shall be solid throughout and stabilized to resist UV degradation. The polyurethane “hinge” shall be natural/clear in color.

All reflectors shall have retro-reflective sheeting applied to both sides of the top panel. Reflective sheeting shall be yellow and shall conform to the material requirements of Section 719.01 – Reflective Sheeting, for high intensity reflective sheeting. The sheeting shall be factory-applied to the reflector by the manufacturer.

645.03 Construction Requirements

The Contractor shall note that it is the Department’s intention for barrier reflector installation to occur concurrently with the linear installation of the precast concrete median barrier, however, the contractor may perform this work on their timing, with Resident approval. All maintenance of traffic is incidental.

There will be no separate payment for the furnishing and installation of the new barrier reflectors but shall be considered incidental to the lump sum Pay Item 526.35 – Precast Concrete Median Barrier.

Final location for the installation of the barrier reflectors shall be in accordance with Table 1 – Spacing of Reflectors as shown on the Plans, and as approved by the Resident.

The Contractor shall operate in a manner which prevents damage to the barrier reflectors during installation. The Contractor shall be responsible for replacement and reinstallation of

barrier reflectors damaged during the Contractor's operations. No additional payment shall be made for replacement and reinstallation of barrier reflectors damaged as a result of the Contractor's operations.

645.04 Method of Measurement

The quantity of Barrier Reflectors shall not be measured for payment but shall be considered incidental to Pay Item 526.35 – Precast Concrete Median Barrier.

645.05 Basis of Payment

No separate payment will be made. Payment shall be considered incidental to the related pay items for Median Barrier, Bridge Endpost Median Barrier Transition, and Guardrail Median Barrier Transition.

SPECIAL PROVISION

SECTION 645

HIGHWAY SIGNING

(Protection of Signs with Type XI Sheeting)

645.04 Fabrication of Type I Guide Signs

The following paragraphs are added after the second paragraph in part b. Reflective Sheeting:

The Contractor and Sign Fabricator shall exercise all due caution to avoid any creases, bends, tears, punctures, or other damage to any Type XI sign sheeting, perceptible or not. Sign sheeting shall be protected at all times following application to the extruded aluminum surface. Any defect which becomes perceptible either under direct, indirect or no light conditions shall be cause for rejection of the sign panel.

Following the application of the sign legend and borders, the sign panel shall be protected from all hazards that may cause a defect to the sign sheeting (either background, legend or borders) in accordance with the manufacturer's recommendations. Fabricated signs shall not be stacked during storage, transport, or erection such that concentrated pressure is placed on one area of the sign face that is not uniform across the full sign face.

645.08 Method of Measurement

The fifth (5th) paragraph is deleted and replaced by the following paragraph:

The area of roadside guide signs, regulatory, warning, confirmation and route marker assembly signs of the respective types, will be measured by the area in square feet, computed to the nearest hundredth of a square foot (0.01 SF), as determined by the overall height multiplied by the overall width. Any defect in the surface area of the sign that becomes perceptible under direct, indirect, or no light conditions shall be cause for rejection of the whole sign panel.

SPECIAL PROVISIONSECTION 645HIGHWAY SIGNING

(Remove and Stack Sign)
(Remove and Reset Sign)
(Remove and Dispose Sign)

645.02 General

The following paragraph is added:

Existing signs noted to be removed and reset shall be maintained until the new location is ready for the reset. The contractor will be required to provide temporary signing for all signs that are not reset within the same day as removal. Similarly, all new signs that replace existing signs shall be set within the same day as the existing sign is removed or temporary signing shall be provided. The contractor shall submit a plan for all temporary signing, including location and support, for MTA approval.

645.07 Demounting and Reinstalling Existing Signs and Poles

The following paragraphs are added:

At locations noted on the Plans, existing ground-mounted signs are designated to be removed and reset. This work differs from work noted as “Remove and Reset Mainline Signs”. This work shall consist of removing the sign panels, removing and resetting or disposing of the existing wood post and resetting the sign panels on a new wood post if required in the appropriate specified location. The Resident will determine if a new wood post is required.

At locations as shown on the Plans, existing ground-mounted signs are designated to be removed and stacked. This work shall consist of removing and delivering existing sign panels, posts, concrete foundations and breakaway devices to the MTA Sign Shop at Mile 58 NB. Excavations shall be backfilled, and ground restored to the satisfaction of the Resident.

All other signs shown to be removed and disposed (signs less than 12 feet wide) shall consist of demounting and removing the existing sign panels and disposed by the Contractor. Steel supports, precast foundations in good condition, and breakaways that are removed with signs that are removed and disposed shall be stacked in the same manner as supports for signs that are removed and stacked. Other foundations shall be disposed of by the contractor.

Any existing signs not shown on the Plans are to remain in their existing condition unless directed otherwise by the Resident.

Steel H-beam supports salvaged to the Authority shall be labeled by size, shape, and length and stacked by approximate sizes at the Sign Shop as directed by the Authority. The label shall also note if the post has been drilled for mounting a breakaway kit (lower half) or breakaway splice plate (either lower half or upper half).

645.08 Method of Measurement

The following sentences are added:

Removing and Resetting existing ground-mounted signs shall be measured as complete units each, removed, reset and accepted.

Removing and stacking existing signs shall be measured as complete units each removed and stacked.

Removing and disposing existing signs shall be measured as complete units each removed and disposed.

645.09 Basis of Payment

The following paragraphs are added:

The accepted signs removed and stacked shall be paid for at the Contract unit price each as specified. Such price shall include removing, disassembling, and stacking sign panels and supports, and precast foundations in good condition at the location specified. Payment shall also include disposing of other foundations. Ground restoration shall be paid for under the appropriate contract pay items.

The accepted signs Removed and Reset will be paid for at the Contract unit price each as specified. Such price will include removing and resetting sign panels, removing and resetting or disposing existing wood post and resetting the sign panels on the existing or new wood post and new hardware as required to complete the sign installation. Any signs or supports damaged by the Contractor shall be replaced by him with new signs or supports conforming to the applicable Specifications at no additional cost to the Authority.

The accepted signs Removed and Disposed shall be paid for at the Contract unit price each as specified. Such price shall include demounting, removing, and disposing the sign panels, removing, disassembling, and stacking the sign supports, breakaways, hardware, and precast foundations that are not reused and in good condition at the location specified. Payment shall also include disposing of other foundations. Ground restoration shall be paid for under the appropriate contract pay items.

Payment will be made under:

<u>Pay Item</u>		<u>Pay Unit</u>
645.105	Remove and Stack Sign	Each
645.109	Remove and Reset Sign	Each
645.1099	Remove and Dispose Sign	Each

SPECIAL PROVISION
SECTION 645
HIGHWAY SIGNING

(Removal, Disassembly and Relocation of VMS and Supporting Structure)

645.01 Description

The following paragraph is added:

This work shall consist of the removal, disassembly, and relocation of the Variable Message Sign (VMS) and portions of the supporting overhead sign structure as specified herein and as shown on the Plans. The existing VMS is located just north of Two Rod Road over the southbound travelway and shall be moved to south of Brighton Avenue (Station 2383+00) over the southbound travelway. This work includes the following:

- Disassembly of the existing overhead VMS and supporting structure, walkway, removal of wiring from the controller cabinet, and relocation of the flashing 45 speed limit sign at Two Rod Road in Scarborough.
- The flashing 45 speed limit sign shall be relocated to an Authority provided pole on the southbound Two Rod roadway side slope. The Authority shall provide a new pole mounted controller cabinet. Contractor shall provide a new foundation, conduit, wiring of appropriate size and type, and be responsible for tying into existing service.
- The existing controller cabinet at Two Rod Road shall be relocated to the new VMS location.
- The existing vertical VMS structural support members shall become property of the contractor and be removed and disposed accordingly. The contractor shall fabricate, deliver, and install new vertical members (HSS Support Columns) as detailed in the Plans.
- Removal of existing VMS and cabinet concrete foundations to 24 inches below existing grade.
- All conduits running from the existing cabinet to the sign and service shall be removed to within two feet of the cabinet, all wiring shall be removed, and the conduits shall be capped.
- Storage and transport of the VMS, cabinet, and horizontal members of the supporting structure to proposed site in Portland.
- Installation of the sign structure with new vertical support members, VMS, relocated controller cabinet, and all labor, materials, and equipment required for the VMS to be in working condition. This includes all trenching, conduit installation, backfill, wiring, and electrical work from the new service pole, to the relocated controller cabinet, to the VMS.
- Repairing or replacing galvanized metal conduit, lightning suppression system, and grounding on the relocated sign structure and VMS. The Contractor shall bring the current lighting suppression system up to current.
- Installing and connecting utility power, configuring, and system testing the existing variable message sign (VMS), VMS controller, ground mounted control cabinet, in its new location as shown on the plans.

The VMS and associated controls shall be fully operational within 3 weeks after the VMS erection at the Brighton Avenue site in Portland.

The VMS support foundations are specified elsewhere in the Contract Documents.

645.02 General

The following paragraphs are added:

Relocating the existing overhead highway VMS shall be completed in accordance with the details as shown on the Plans and provided in the Specifications.

Overhead relocations shall be performed at night only, in accordance with Specification 652- Maintenance of Traffic.

All materials required for installing and connecting to utility power and configuring the relocated VMS shall be new. The Contractor shall take special care as not to damage existing overhead VMS. Any damage caused to existing sign, controller cabinet, sign structure, or sign material shall be repaired or replaced by the Contractor at no additional cost to the Authority.

Workmanship shall conform to the requirements of: NEC, NESC, ASTM Standards, and the ANSI, the local Utility Companies, the State of Maine, manufactures Specifications, and any local ordinances that may apply except when otherwise noted on the Plans or in the Special Provisions.

645.021 Materials

The following is added:

Structural Steel	713.01
Heavy-Hex Structural Bolts, Washers, Nuts and DTI's	713.02
Steel Conduit	715.02
Non-metallic Conduit	715.03
Conductors	718.12

All bolts, nuts, connectors and miscellaneous hardware required for reinstallation of the sign structure shall be new and of the same size, class, and type as those removed and as approved re-use of materials shall be in accordance with the provisions of Section 504 - Structural Steel.

All replacement structural steel shall be in accordance with the materials listed in the Plans and shall be hot-dip galvanized in accordance with the requirements of Section 504 – Structural Steel.

Electrical materials shall meet the standards herein, local and public utility codes, and the National Electrical Code (NEC).

All grounding and electrical installations shall meet the requirements of NEC, as well as all applicable state, local, and applicable public utility codes. All grounding shall meet the requirements of the manufacturers of the devices installed on the project. If the manufacturers' requirements are more stringent than those of the national, state, and local codes, then the manufacturers' grounding requirements shall apply.

All lightning suppression material and installation shall meet the most current NFPA 780 standards.

The Contractor shall furnish and install Transient Voltage Surge Suppression (TVSS) device(s) for all power and communications conductors leaving the equipment cabinets, and ITS equipment, including but not limited to power service, and power and communications for all devices that are external to the cabinet.

645.023 Support Structures

The following paragraph shall replace the second paragraph under section b. Bridge, Cantilever, and Butterfly Type Sign Supports:

Signs shall be placed on the support structure to accommodate the minimum height requirement shown on the Plans – see Standard Specification Section 645.06. The Contractor shall use the Contract Drawings in order to determine the approximate horizontal placement of signs. Installation shall be in accordance with Section 645.06 – Installation of Type I Signs. The overhead sign structure foundations have been designed with the assumption that the installed signs represent the maximum sign design areas for the respective structures. There shall be no allowance for future sign area increase.

645.071 Removing and Reinstalling Existing Sign Structure

The Contractor shall furnish a written plan and procedures to the Authority for the removal and disassembly of the structure, the erection of the installation and tightening of anchor bolts and shall be signed and stamped by a Professional Engineer registered in the State of Maine. The installation of anchor bolts shall be in accordance with:

1. AASHTO “Standard Specifications for Structural Supports for Highway Traffic Signs, Luminaries and Traffic Signals”;
2. and follow FHWA Guidelines for the Installation, Inspection, Maintenance and Repair of Structural Supports for Highway Signs, Luminaires, and Traffic Signals.

Contractor shall remove existing concrete VMS and cabinet foundations to 24 inches below grade.

Existing galvanized sign conduit shall be reinstalled and repaired or replaced in accordance with Section 626, if needed.

Any existing corrosion and damage caused by the contractor to the galvanized coating shall be touched up after the erection of the truss, walkway, and sign, as directed by the Resident. Repairs to galvanizing shall be in accordance with ASTM A 780, *Standard Practice for Repair of*

Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings (A 780), Annex A1 or A3. Zinc-rich paints for repairs may only be used with approval of the Engineer.

Maine Turnpike Authority will allow the contractor to transport the sign structure as an overlength load on the Turnpike during nighttime hours if requested by the Contractor. The Maine Turnpike Authority will provide state police to escort the load.

The Contractor shall be responsible for and shall repair all damage caused to underground drainage structures, utilities or lighting conduit, which are encountered during construction.

645.072 Conduit & Wire Installation

The Contractor shall furnish and install conduit and trenching in accordance with Section 626.

The Contractor shall install pull-lines in all conduits. The ends of the lines shall be secured in such manner as to prevent accidental withdrawal of the wire. All conduit ends shall be capped with watertight conduit caps.

Ground Mounted Cabinet Foundation shall be constructed per section 626 of the Standard Specifications and Standard Detail 626(05). Power and communication feeds to the ground mounted VMS cabinet foundation shall include Three (3) - 3" and one (1) - 4" PVC conduits from the Brighton Avenue overpass bridge to the VMS cabinet foundation and two (2) - 2" PVC conduits for power and communication from the VMS Cabinet foundation to the adjacent highway advisory radio cabinet foundation. Embedded conduit stubs shall not be paid for separately but are included in the ground mounted cabinet foundation item.

The Contractor shall provide a detectable marking tape located 12" below grade at all underground conduits.

Cable Installation shall be in accordance with Section 634.04 – Cable Installation.

Contractor shall be responsible for contacting Dig-Safe prior to excavating.

Testing shall be in accordance with Section 645.074 – Testing. Once the electrical and operational testing has been successfully performed by the Contractor in the presence of the Resident, the Contractor shall provide a minimum of 48 hours of notice to Maine Turnpike tolling system personnel in order for them to complete acceptance testing of the VMS operation.

645.073 AC Power Systems

The Contractor shall provide utility power systems to VMS systems as indicated in the Contract Documents.

- a. The Contractor shall make the necessary arrangements with the utility company to ensure having needed utility service available at the time of equipment testing and turn-on. Any utility energization, connection, or disconnection delays will not be a valid reason for a time extension. The Contractor shall be responsible

for all utility charges, including connection and monthly service charges, until System Acceptance.

b. The Contractor shall adhere to all applicable NEC, IEEE 1100-1992, UL 1459, and UL 1950 standards and practices.

c. The metered service shall include a 100-amp main disconnect.

645.074 Testing

The Contractor shall provide testing on all components of the system. The testing shall meet the following requirements:

- a. The Contractor shall propose a test plan for the VMS system and submit the test plan(s) and procedures as detailed herein. Each of the test plans shall contain the following elements:
 - i. Proposed date, time, and location of the testing
 - ii. Names and credentials of the Contractor personnel who will be conducting the testing
 - iii. Descriptive overview of the proposed test procedure
 - iv. List of test equipment required to perform the testing
 - v. Test cases and test logging forms which detail every step of the test procedure
- b. Test logging forms shall be presented in tabular format, with separate columns for each of the following:
 - i. Test case description detailing the test step to be performed.
 - ii. Expected result
 - iii. Actual result
 - iv. Pass/fail
 - v. Comments
- c. The Contractor shall supply separate test logging forms at the time of testing for each test plan, and for each device location. The test logging forms shall show the device location, date, and the start and end times of the test.
- d. At the end of each test logging form, there shall be signature and date locations for each of the following:
 - i. Contractor personnel conducting the test
 - ii. Engineer representative witness
 - iii. Authority Resident
- e. Signatures on the test logging form will signify only that the test was performed and witnessed, not that it passed or failed.
- f. The detailed Test Plans shall be submitted to the Engineer no later than thirty (30) days prior to the beginning of each test phase.

- g. The Contractor shall have approved test plans prior to submitting a request to schedule the start of any test activities. The Contractor shall notify the Resident no less than seven (7) days prior to the beginning of any equipment or systems testing.
- h. Testing shall provide verification and documentation that all requirements as detailed in this Section and the Plans are met. The Test Plans shall be developed by the Contractor to provide a mechanism that ensures that all contract requirements have been met and tested successfully and verified.
- i. If any deviations or changes to the approved Test Plans arise, it shall be resubmitted for review and approval by the Engineer at least fourteen (14) calendar days prior to any planned test activity stage. No tests shall be conducted until the Engineer has approved the test plan.
- j. A summary of all tests shall be produced at the completion of each testing phase of the project to ensure that all requirements defined by the system are satisfied.

645.075 VMS Ground Mounted Control Cabinet (Reuse Existing)

The existing VMS Control Cabinet shall be mounted and installed at the location shown in the Plans, and in conformance with all requirements shown in the Plans. This work shall include all wiring, cabling, and connecting from the VMS cabinet to the VMS panel.

- a. A 54-inch x 36-inch x 4-inch concrete work pad shall be installed in front of the cabinet door. The pad shall be placed on a minimum of four inches of compacted granular material. The pad shall be set with at least one percent grade such that any water on the pad shall flow away from the cabinet. The VMS cabinet shall be secured to the concrete foundation provided by the Contractor as shown in the Contract Documents. Where the work pad is installed on a slope, the depth of the pad shall be increased such that there is at least two inches of the concrete pad below grade.
- b. All exposed, high voltage electrical terminals shall be insulated with non-conducting material such as rubber boots or silicon/rubber caulking.
- c. The VMS cabinet shall be electrically bonded to all of its associated metallic VMS support structure grounding systems, as described elsewhere in this document or in the Contract Documents.
- d. The Contractor shall furnish a watertight container a control cabinet-wiring diagram. Three sets of identical wiring diagrams shall be furnished for each cabinet.

645.08 Method of Measurement

Removal, disassembly, and relocation of VMS and Supporting Structure will be measured by the lump sum for a fully operational system in place in accordance with the Contract Plans and these Specifications.

645.09 Basis of Payment

The accepted quantity of removal, disassembly and relocation of VMS and supporting structure will be paid for at the contract lump sum price, which price shall be full compensation for the following:

All materials, equipment, labor and hardware necessary to remove, disassemble, relocate and install the VMS and support structure in accordance with the Specifications and details as shown on the Plans.

Fabrication and installation of the HSS vertical supports as shown on the Plans.

Payment shall also include removing existing concrete foundations to below grade, relocation of the flashing 45 MPH sign to a pole mounted structure on the southbound Two Rod Road side slope., galvanized steel sign conduit, furnishing and installing underground PVC conduits and pull-line for conduit including trenching. Trenching for conduit will be incidental and shall include excavating, furnishing and placing screened sand and backfilling.

VMS installation, configuration and electrical and communication testing, associated with existing VMS board and the VMS controller in its new location including full compensation for furnishing, installing, erecting, and testing: wiring in underground conduit, VMS wiring, junction boxes, and all other wiring, transformer, enclosures, all identification tags, and all materials, labor, equipment, tools, miscellaneous hardware and incidentals necessary to complete the work. No separate payment will be made for bonding, grounding and ground rods including the relocation of the existing lightning suppression and grounding system.

Furnishing installing utility power and communication, all utility connections, attachments, hardware, meters, disconnects, associated cabling and all equipment required to install utilities associated with VMS installation.

Construction of VMS structure support foundations and ground mounted cabinet foundation will be paid for separately under 626 pay items.

Relocation of the existing VMS Ground Mounted Control Cabinets. The VMS ground mounted control cabinet foundations will be measured in accordance with Section 626.

No additional compensation will be made for items replaced as a result of damage occurring during the modification or relocating of existing overhead signs. Drilled shaft foundations and the controller cabinet foundations are paid for separately.

Final payment will not be made until the system is fully operational, tested, and accepted by Maine Turnpike.

Payment will be made under:

<u>Pay Item</u>	<u>Pay Unit</u>
645.124 Removal, Disassembly and Relocation of VMS and Supporting Structure	Lump Sum

SPECIAL PROVISION

SECTION 645

HIGHWAY SIGNING

(Remove and Reset Mainline Sign)

645.01 Description

The following paragraphs are added:

This work shall consist of removing and resetting the existing highway guide signs as shown on the Plans. The work includes a combination of the following: removal, resetting, modifying, furnishing and disposal of concrete foundations, steel posts, wood posts, and breakaway foundations. Existing materials from the existing sign installation may be reused to reset the existing sign or another sign.

This work shall consist of removing and resetting the existing overhead guide signs as shown on the Plans. The work includes unbolting and removing the existing sign from sign structure and reattaching the existing sign to the sign structure. Existing materials from removing the existing sign may be reused to reset the existing sign.

The signs' message shall remain visible to turnpike drivers at all times unless other provisions have been approved.

645.02 General

The following sentences are added:

New concrete foundations shall conform to the requirements of Section 626 and shall be in conformance with the Maine Department of Transportation Standard Details in conjunction with the information shown on the Plans.

Breakaway devices shall be B525 or B650 as manufactured by Transpo Industries, Inc. (www.transpo.com).

645.05 Signs

The following paragraphs are added:

The removal and resetting of the mainline signs shall be completed in accordance with the details as shown on the Plans. The Contractor shall keep all signs visible to turnpike drivers except for the period of time necessary to actually complete the relocation; not to exceed one day. The sign panel shall not be removed and relocated until after the proposed sign support system (foundation and posts) have been installed in the final location. One (1) calendar day is allowed for the sign relocation.

The Contractor may elect to utilize all new materials or reuse materials from other sign locations that have previously been reset. The cutting of structural steel post shall be accomplished by mechanical means. The use of burning to cut shall not be allowed. One single connection will be allowed to extend a post to the required length. A full penetration weld or a bolted splice shall be required for the connection. The Contractor shall submit his proposed connection method to the Resident for approval. Any damaged area shall be repaired with two coats of zinc-rich chromium paint. Material removed from an existing sign location and not reused at a proposed sign location shall become the property of the Contractor.

All signs posts on breakaway foundations shall be installed in accordance with the Specifications for breakaway devices. Multipost signs shall be constructed with the required splice as in accordance with the Plans.

645.08 Method of Measurement

The following sentence is added:

Remove and Reset Overhead Mainline Sign shall be measured for payment as one lump sum for each sign number as shown on the Plans.

Remove and Reset Mainline Sign shall be measured for payment as one lump sum for each sign number as shown on the Plans.

645.09 Basis of Payment

The payment for Remove and Reset Mainline Sign and Remove and Reset Overhead Mainline Sign shall be at the Contract lump sum price for each sign number. This payment shall be full compensation for furnishing all new materials, removing, modifying resetting existing material and signs, and all labor and equipment necessary to complete the installation in accordance with the details as shown on the Plans. This may include furnishing and installing new, or reusing existing materials such as structural steel, concrete foundations, conduit and wiring and single and multipole breakaway devices. Compensation for the excavation and backfill for the concrete foundation, as well as removal of the concrete foundation, shall be included in this item.

Payment will be made under:

<u>Pay Item</u>		<u>Pay Unit</u>
645.501	Remove and Reset Mainline Sign No. 1	Lump Sum
645.502	Remove and Reset Mainline Sign No. 2	Lump Sum
645.503	Remove and Reset Mainline Sign No. 3	Lump Sum
645.504	Remove and Reset Mainline Sign No. 4	Lump Sum
645.505	Remove and Reset Mainline Sign No. 5	Lump Sum
645.506	Remove and Reset Mainline Sign No. 6	Lump Sum
645.507	Remove and Reset Mainline Sign No. 7	Lump Sum
645.508	Remove and Reset Mainline Sign No. 8	Lump Sum
645.509	Remove and Reset Mainline Sign No. 9	Lump Sum
645.510	Remove and Reset Mainline Sign No. 10	Lump Sum

645.511	Remove and Reset Mainline Sign No. 11	Lump Sum
645.512	Remove and Reset Mainline Sign No. 12	Lump Sum
645.513	Remove and Reset Mainline Sign No. 13	Lump Sum
645.514	Remove and Reset Mainline Sign No. 14	Lump Sum
645.515	Remove and Reset Mainline Sign No. 15	Lump Sum
645.516	Remove and Reset Mainline Sign No. 16	Lump Sum
645.517	Remove and Reset Mainline Sign No. 17	Lump Sum
645.518	Remove and Reset Mainline Sign No. 18	Lump Sum
645.519	Remove and Reset Mainline Sign No. 19	Lump Sum
645.520	Remove and Reset Mainline Sign No. 20	Lump Sum
645.521	Remove and Reset Mainline Sign No. 21	Lump Sum
645.522	Remove and Reset Mainline Sign No. 22	Lump Sum
645.523	Remove and Reset Mainline Sign No. 23	Lump Sum
645.524	Remove and Reset Mainline Sign No. 24	Lump Sum

SPECIAL PROVISIONSECTION 652MAINTENANCE OF TRAFFIC

(October 8, 2020)

MaineDOT Standard Specification 2014 Edition Section 652 – Maintenance of Traffic and the Maine Turnpike Authority 2016 Supplemental Specification Section 652 – Maintenance of Traffic are deleted in their entirety and replaced with the following:

652.1 Description

This work shall consist of furnishing, installing, maintaining and removing traffic control devices necessary to provide reasonable protection for motorists, pedestrians and construction workers in accordance with these Specifications, the applicable provisions of Section 105.4.5 - Special Detours, and the plans.

Traffic control devices include signs, signals, lighting devices, markings, barricades, channelizing, and hand signaling devices, portable light towers, truck mounted impact attenuators, traffic officers, and flaggers.

652.2 Materials

All traffic control devices shall conform to the requirements of the latest edition of the MUTCD, NCHRP 350 guidelines **and all Traffic control devices shall meet Manual for Assessing Safety Hardware (MASH) 16 guidelines if date of manufacture was after December 31, 2019.**

All signs shall be fabricated with high intensity fluorescent retroreflective sheeting conforming to ASTM D 4956 - Type VII, Type VIII, or Type IX (prismatic). All barricades, drums, and vertical panel markers shall be fabricated with high intensity orange and white fluorescent retroreflective sheeting conforming ASTM D 4956 - Type VII, Type VIII, or Type IX (prismatic).

Construction signs shall be fabricated from materials that are flat, free from defects, retroreflectorized, and of sufficient strength to withstand deflections using a wind speed of 80 miles/hr.

652.2.2 Signs

Only signs with symbol messages conforming to the design of the Manual of Uniform Traffic Control Devices(MUTCD) shall be used unless the Resident approves the substitution of word messages.

Any proposed use of temporary plaques to cover text or to change text shall be approved by the resident. All signs or proposed plaques shall have a uniform face and be constructed from similar sheeting.

All signs shall be new, or in like new condition and maintained in like new condition throughout the project duration. Signs shall be cleaned just prior to installation and throughout the project utilizing a method that will not damage the reflective sign sheeting.

652.2.3 Flashing Arrow Board

Flashing Arrow Boards must be of a type that has been submitted to AASHTO's National Transportation Product Evaluation Program (NTPEP) for evaluation and placed on the Maine Department of Transportation's Approved Products List of Portable Changeable Message Signs & Flashing Arrow Panels.

Flashing Arrow Boards units shall meet requirements of the current Manual on Uniform Traffic Control Devices (MUTCD) for Type "C" panels as described in Section 6F.56 - Temporary Traffic Control Devices. Flashing Arrow Boards shall have matrix of a minimum of 15 low-glare, sealed beam, Par 46 elements capable of either flashing or sequential displays as well as the various operating modes as described in the MUTCD, Chapter 6-F. If a Flashing Arrow Board consisting of a bulb matrix is used, each element should be recess-mounted or equipped with an upper hood of not less than 180 degrees. The color presented by the elements shall be yellow.

Flashing Arrow Board elements shall be capable of at least a 50 percent dimming from full brilliance. Full brilliance should be used for daytime operation and the dimmed mode shall be used for nighttime operation. Flashing Arrow Board shall be at least 96 inches x 48 inches and finished in non-reflective black. The Flashing Arrow Board shall be interpretable for a distance not less than 1 mile.

Operating modes shall include, flashing arrow, sequential arrow, sequential chevron, flashing double arrow, and flashing caution. In the three arrow signals, the second light from the arrow point shall not operate.

The minimum element on-time shall be 50 percent for the flashing mode, with equal intervals of 25 percent for each sequential phase. The flashing rate shall be not less than 25 nor more than 40 flashes per minute. All on-board circuitry shall be solid state.

Primary power source shall be 12 volt solar with a battery back-up to provide continuous operation when failure of the primary power source occurs, up to 30 days with fully charged batteries. Batteries must be capable of being charged from an onboard 110 volt AC power source and the unit shall be equipped with a cable for this purpose.

Controller and battery compartments shall be enclosed in lockable, weather-tight boxes.

The Flashing Arrow Board shall be mounted on a pneumatic-tired trailer or other suitable support for hauling to various locations, as directed. The minimum mounting height of an arrow panel should be 7 feet from the roadway to the bottom of the panel.

The face of the trailer shall be delineated on a permanent basis by affixing retro-reflective material, known as conspicuity material, in a continuous line as seen by oncoming drivers.

A portable changeable message sign may be used to simulate an arrow panel display.

652.2.4 Other Devices

Vertical panel markers shall be orange and white striped, 8 inches wide by 24 inches high. On the Interstate System, vertical panel markers shall be orange and white striped, 12 inches wide by 36 inches high.

Cones shall be orange in color, a minimum of 28 inches high, and retro-reflectorized. Retro-reflection shall be provided by a white bands of retro-reflective sheeting conforming to the MUTCD. **All cones utilized on the project shall be new or in like new condition and shall have a consistent design/appearance.**

Drums shall be of plastic or other yielding material and shall be a minimum of 36 inches high and a minimum of 18 inches in diameter. There shall be at least two retro-reflectorized orange and at least two retro-reflectorized white stripes a minimum of 4 inches wide on each drum. **All drums utilized on the project shall be new or in like new condition and shall have a consistent design/appearance.**

Flaggers shall use a STOP / SLOW handheld paddle as the primary and preferred hand signaling device. Flags shall only be limited to emergencies. STOP / SLOW paddles shall have high intensity prismatic retro reflective sheeting, 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.

STOP / SLOW paddles shall also incorporate either white or red flashing lights on the STOP face and white or yellow flashing lights on the SLOW face of the paddle and always be in use.

Paddles must conform to any of the following patterns:

- A. Two white or red lights (colors shall be all white or all red), one centered vertically above and one centered vertically below the STOP legend; and/or two white or yellow lights (colors shall be all white or all yellow), one centered vertically above and one centered vertically below the SLOW legend.
- B. Two white or red lights (colors shall be all white or all red), one centered horizontally on each side of the STOP legend; and/or two white or yellow lights (colors shall be all white or all yellow), one centered horizontally on each side of the SLOW legend.
- C. One white or red light centered below the STOP legend; and/or one white or yellow light centered below the SLOW legend.
- D. A series of eight or more small all white or all red lights no larger than 1/4 inch in diameter along the outer edge of the paddle, arranged in an octagonal pattern at the eight corners of the border of the STOP face; and/or a series of eight or more small all white or all yellow lights no larger than 1/4 inch in diameter along the outer edge of the paddle, arranged in a diamond pattern along the border of the SLOW face; or

- E. A series of white lights forming the shapes of the letters in the legend. Flashing light patterns shall be compliant with Section 6E.03 Hand Signaling Devices in the most current version of the Manual on Uniform Traffic Control Devices.

All flashing light patterns on the STOP / SLOW paddle shall be visible from a minimum distance of 1000 feet.

Type I barricades shall be 2 feet minimum, 8 feet maximum in length with an 8 inch wide rail mounted 3 feet minimum above the ground. Type II barricades shall be 2 feet in length with two 8 inch wide rails, and the top rail shall be mounted 3 feet minimum above the roadway. Type III barricades shall be 8 feet in length with three 8 inch wide rails, and the top rail shall be mounted 5 feet minimum above the roadway. The cross members of all barricades shall be of ½ or ⅝ inch thick plywood or other lightweight rigid material such as plastic, fiberglass or fiber wood as approved by the Resident. The predominant color for supports and other barricade components shall be white, except that unpainted galvanized metal or aluminum components may be used.

652.2.5 Portable Changeable Message Sign

Portable-Changeable Message Signs (PCMS) will be furnished by the Contractor and shall be Ver-Mac PCMS-1210 or an approved equal. **The face of the PCMS trailer shall be delineated on a permanent basis by affixing retro-reflective material, known as conspicuity material, in a continuous line as seen by oncoming drivers.** PCMS's shall be located and relocated to locations approved by the Resident within the Project limits for the duration of the Project.

Features to the Ver-Mac PCMS shall include:

- An all-LED display.
- Be legible from a distance of 1,000 feet.
- Have three (3) lines available for messages.
- Be NTCIP compliant (NTCIP 1203 & 1204).
- Be capable of being programmed by a remote computer via a data (IP over Cell) cellular modem connection.
- Have GPS location capability by adding on a GPS device capable of providing GPS location remotely to the MTA Communications' Center.
- Be programmable by Vanguard Software by Daktronics.

The Contractor shall complete and/or provide the following:

- Submit a catalog cut shop drawing to the Resident of all proposed equipment for review and approval.
- Establish and pay for a data cellular account so that PCMS may be remotely programmed and operated from the MTA Communications' Center.

- Provide to the Authority technical support from the PCMS manufacturer that may be necessary to integrate the PCMS into the MTA software platform (Vanguard Software by Daktronics).
- Provide the manufacturer's software necessary to change the PCMS messages remotely from the MTA Communications' Center and the Resident's computer if necessary or requested.
- Provide training on the operation of the PCMS to the Resident and the MTA Communications' Center representative.
- Make all PCMS on the Project work site available to the MTA for any/all emergency situations as defined by the MTA. This shall include the preemption of any messages running at the time of need as approved by the MTA and the Resident.

The Contractor shall also:

- Furnish, operate, relocate and maintain the PCMS as approved or requested by the Resident.
- Be responsible for the day-to-day programming and operation of the PCMS for Project purposes.

The PCMS(s) shall be on-site, with data cellular account established, GPS location capable, and all training required complete within one month after mobilization or seven days prior to implementing traffic shifts, detours or stoppages, whichever is sooner. Implementation of traffic shifts, detours, or stoppages of traffic will not be allowed without PCMS boards on-site with the specified MTA Communications' Center Software Platform integration and training.

652.2.5 Truck Mounted Attenuator

When a pay item for a Truck Mounted Attenuator (TMA) is included in the contract or otherwise required in contract at least one TMA will be required in use on the project. If at least one is not used as described above, then it will be considered a Traffic Control Plan violation and result in a reduction of payment as outlined in Section 652.

The truck mounted attenuator system shall conform to the following requirements:

- Truck and attached attenuator shall conform to the NCHRP Report 350, Test Level 3 criteria **or MASH if manufactured after 2019**.
- Amber strobe lights with 360-degree visibility.
- An arrow light bar fixed to the vehicle.
- The attenuator shall be mounted to a vehicle with a minimum weight of 10,000 lbs.
- **The attenuator shall be mounted to a vehicle with a minimum weight of 24,000 lbs. for Items 652.4501 – Truck Mounted Attenuator – 24, 000 LB.**

The Contractor shall manage the operation of the truck mounted attenuator. The truck mounted attenuator should be utilized in lane closures and other construction operations where workers are exposed to traffic and not protected by positive means. The operation of the vehicle

shall be in accordance with the Manual of Uniform Traffic Control Devices and the manufacturer's recommendation.

Installation: The chart below identifies the distance from the work zone or hazard where the TMA shall be deployed. If the work zone is within a marked lane closure, the barrier truck distances shall apply and if the work is mobile, then shadow truck distances shall apply. The TMA shall not be located in the buffer zone. The shadow vehicle shall have its front wheels turned away the work area and from traffic, have parking brake set, and be put in park if an automatic transmission; or if a manual transmission it shall have its front wheels turned away the work area and from traffic, have parking brake set and should be placed in gear and shut off if possible while still maintaining warning lights. If length of time or weather are a concern for the battery since the warning lights must be maintained the engine should be started and run periodically for battery recharging. No other vehicles or equipment shall park in front of the shadow vehicle or within the buffer space behind the shadow vehicle. For placement details, reference the Manual of Uniform Traffic Control Devices (MUTCD).

Weight of Truck	Barrier Truck Distance from Work Zone of Hazard	Shadow Truck Distance from Work Vehicle or Work Zone
10,000 lbs	250 ft	300 ft
15,000 lbs	200 ft	250 ft
>24,000 lbs	150 ft	200 ft

652.2.6 Sequential Flashing Warning Lights

When included in contracts as a bid item Sequential Flashing Warning Lights on drums used for merging tapers and shifting tapers during nighttime operation for project use. The purpose of these lights is to assist the motorist in determining which direction to merge or shift and to reduce the number of late merges resulting in devices being struck and having to be reset to maintain positive guidance at the merge point. The successive flashing of the lights shall occur from the upstream end of the taper to the downstream end of the taper in order to identify the desired vehicle path.

The Sequential Flashing Warning Lights shall meet all of the requirements for warning lights within the current edition of the MUTCD. Each light unit shall be capable of operating fully and continuously for a minimum of 500 hours when equipped with a standard battery set. Each light in sequence shall be flashed at a rate of not less than 55 times per minutes and not more than 75 times per minute. The flash rate and flash duration shall be consistent throughout the sequence.

Sequential Flashing Warning Lights shall be "Pi-Lit" Sequential Barricade Warning Lamps or an approved equal.

Sequential Flashing Warning lights are to be used for merging and shifting tapers that are in place during the nighttime hours (12-hours when ambient light is dimmed). These lights shall flash sequentially beginning with the first light and continuing until the final light at the beginning of a tangent section.

The Sequential Flashing Warning Lights shall automatically flash in sequence when placed on the drums that form the merging or shifting tapers.

The number of lights used in the drum taper shall equal one half the number of drums used in the taper.

Drums are the only channelizing device permitted for mounting the Sequential Flashing Warning Lights.

The Sequential Flashing Warning Lights shall be weather independent and visual obstruction shall not interfere with the operation of the lights.

The Sequential Flashing Warning Lights shall automatically sequence when placed in line in an open area with a distance between lights of 25 to 150 feet. A 10-foot stagger in the line of lights shall have no adverse effect on the operation of the lights.

If one light fails, the flashing sequence shall continue. Non-sequential flashing is prohibited.

652.2.7 Automated Trailer Mounted Speed Sign

When included in the contract as a pay item Automated Trailer mounted speed signs requires furnishing, operating, and maintaining an Automated Trailer Mounted Radar Speed Limit Sign for project use. When a pay item for an Automated Trailer Mounted Radar Speed Limit Sign is included in the Contract at least one will be required on the project when there is a Work Zone Speed Limit in place. The Contractor shall furnish, operate, and maintain the Automated Trailer Mounted Radar Speed Limit Signs during the project operations

Trailer mounted speed limit signs shall be self-contained units including sign assembly, flashing lights, directional radar to measure speed limits, a regulatory speed limit sign, and power supply specifically constructed to operate as a trailer-mounted sign. The preferred color of the unit shall be “construction orange”.

Base material for the regulatory speed limit signs shall be weatherproof, rigid substrate specifically manufactured for highway signing and meet the retro-reflective sheeting application requirements of the sheeting manufacturer.

Sign text shall consist of the letters, digits and symbols either applied by stick-on or silk screen, to conform to the dimensions and designs indicated in the Contract, MUTCD and/or FHWA Standard Highway Signs. The materials and methods shall be in accordance with standard commercial processes.

“Work Zone” construction signs shall be mounted on the trailer unit above the regulatory speed limit sign. (see attached graphic details).

Signs and secondary signs shall follow the MUTCD for minimum mounting heights.

The power supply shall be either full battery power with solar panel charging (capable of maintaining a charged battery level) and 135 amperes, 12-volt deep cycle batteries, or diesel powered generator with a fuel capacity sufficient for 10 hours of continuous operation.

Each unit shall be equipped with two mono-directional flashing lights, placed in accordance with the MUTCD, with amber lenses and reflectors, which are visible through a range of 120 degrees when viewed facing the sign. The lights shall be a minimum of **8-inch diameter**, either LED, halogen, or incandescent lamps, and shall be visible for a minimum distance of one mile under daylight conditions and shall have a minimum flash rate of 40 flashes per minute. An “On” indicator light shall be mounted on the back of the signs, which is visible for at least 500 feet to provide confirmation that the flashing lights are operating.

The directional radar shall monitor approaching traffic only. The radar shall be capable of measuring speeds from 5 to 70 MPH at a distance of up to 1500 feet and shall have a high speed cut off threshold. **Speed data shall be recorded and stored on the sign and must be made available to the Authority as requested.**

All existing speed limit signs, which conflict with the construction zone trailer mounted speed limit signs shall be covered completely when the work zone speed limit is in place.

Automated Trailer Mounted Speed Limit Signs shall only be used when a work zone speed limit is in place. The Contractor shall manage the utilization and operation of the Automated Trailer Mounted Speed Limit Signs and if at least one is not used when work zone speed limits are in place then it will be considered a Traffic Control Plan violation and result in a reduction of payment as outlined in Section 652.

The Resident will record the actual time and location for the signs on a daily basis when the Automated Trailer Mounted Speed Limit Signs are in use.

The Automated Trailer Mounted Radar Speed Limit Sign may be placed as shown on the plans, or may replace the posted regulatory speed limit signs, or may be placed at a location within the closed lane that has a reduced speed limit.

Automated Trailer Mounted Speed Limit Signs shall be delineated with retro-reflective temporary traffic control devices while in use and shall also be delineated by affixing a retro-reflective material directly on the trailer.

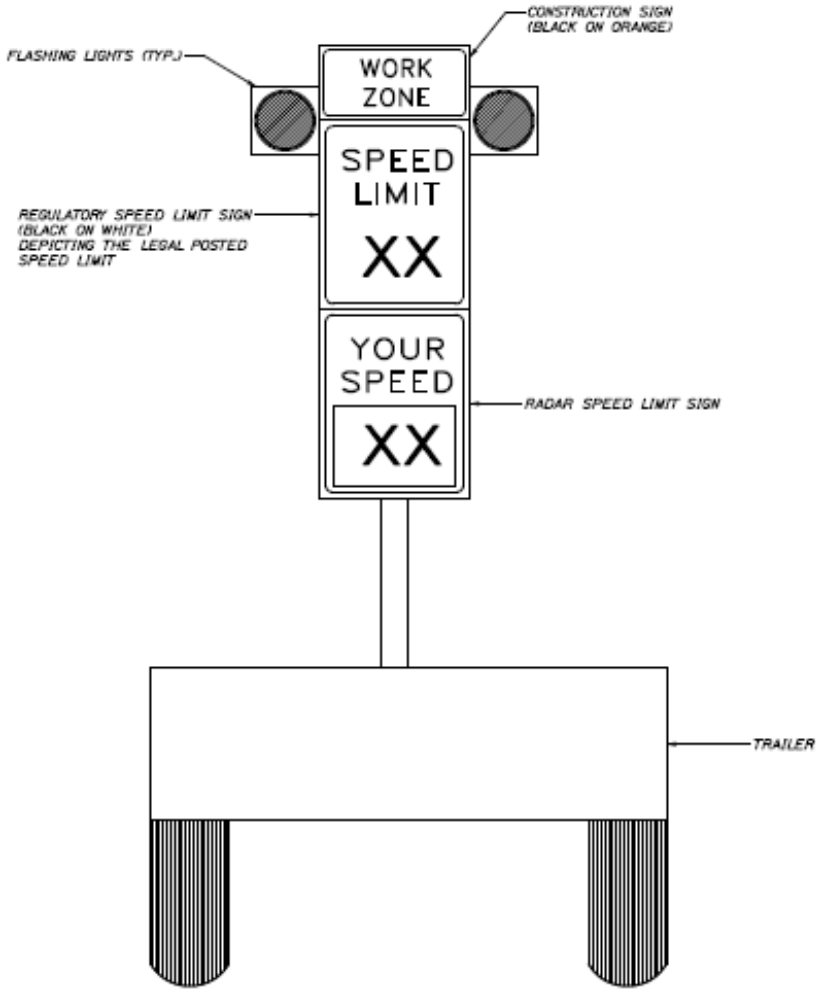
Upon delivery of the Automated Trailer Mounted Speed Limit Sign and before acceptance by the Authority, the Contractor shall have a representative of the manufacturer review the condition and notify the Resident in writing, of all deficiencies noted.

The Contractor shall arrange to have all necessary repairs performed at no cost to the Authority.

To avoid impairing driver vision, the Contractor shall dim the lighted speed limit readings by 50 percent during nighttime use and restore full power lighting during daytime operation.

Date: 2/13/2018

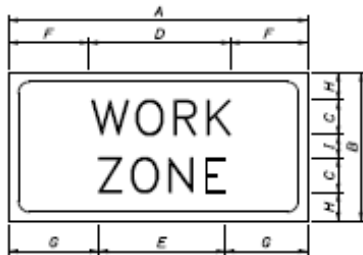
Filename: Trailer Mounted Speed Limit.dgn



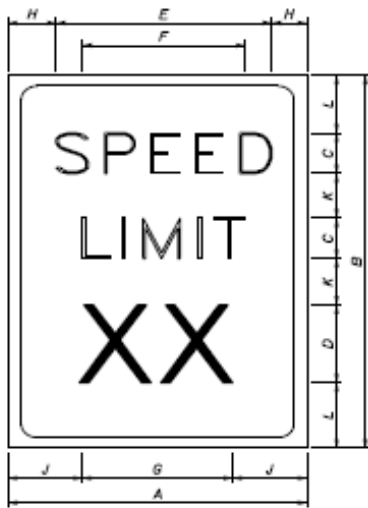
HNTB
FEBRUARY 2018

AUTOMATED TRAILER MOUNTED
SPEED LIMIT SIGN

Date: 2/13/2018



SIGN #1
 1.25" BORDER, 0.75" INDENT,
 BLACK ON ORANGE, BB GRADE PLYWOOD SIGN



SIGN #2
 1.25" BORDER, 0.75" INDENT,
 BLACK ON WHITE, BB GRADE PLYWOOD SIGN

DIMENSIONS (INCHES) / LETTER FONTS												
	A	B	C	D	E	F	G	H	I	J	K	L
*1	48	20	5D	10 1/8	16 1/8	14 1/8	15 1/8	4	2	N/A	N/A	N/A
*2	48	60	8E	16E	30 1/4	29 1/4	29 1/2	4 1/2	9 1/2	9 1/4	8	6



Filename: Trailer Mounted Speed Limit.dgn



HNTB
 FEBRUARY 2018

TRAILER MOUNTED CONSTRUCTION ZONE
 SPEED LIMIT SIGN

652.2.8 Temporary Portable Rumble Strips

If a pay item is included in the contract or the Contract desires to utilize Temporary Portable Rumble Strips this work consists of furnishing and placing temporary portable rumble strips RoadQuake 2F TPRS or an approved equal. Furnishing a temporary portable rumble strip system includes a method to transport and move these to on-site locations where they will be used. The Contractor shall submit for approval, literature and all necessary certifications to the Maine Turnpike prior to procurement of the product.

If used, Temporary Portable Rumble Strips may not be practicable in areas where the roadway has more than two travel lanes, where volume windows do not allow for breaks in traffic to set up and monitor and adjust, or during nighttime lane closures.

Provide rumble strips where the plans show or as directed by the Resident as follows:

Prior to placing rumble strips, clean the roadway of sand and other materials, that may cause slippage.

Place one end of the rumble strips 6 inches from the roadway centerline. Extend the strips perpendicular to the direction of travel. Ensure strips lay flat on the roadway surface.

Only one series of rumble strips, placed before the first work zone, is required per direction of travel for multiple work zones spaced 1 mile or less apart. Work zones spaced greater than 1 mile apart require a separate series of rumble strips. Each lane shall use one group of temporary rumble strips.

Bracketed "Rumble Strip Ahead" and "Bump" signs shall be utilized and will be paid for under the respective construction sign pay items.

Maintain rumble strips as follows:

If rumble strips slide, become out of alignment, or are no longer in the wheel path of approaching vehicles during the work period, thoroughly clean both sides of the rumble strips and reset on a clean roadway.

Repair or replace damaged rumble strips immediately.

652.3.1 Responsibility of the Authority

The Authority will provide Project specific traffic control requirements and traffic control plans for use by the Contractor. The specific traffic control requirements for the Project are identified in Special Provision Section 652, Maintenance of Traffic (Specific Project Maintenance of Traffic Requirements). No revisions to these requirements or Plans will be permitted unless the Contractor can thoroughly demonstrate an overall benefit to the public and a Contract Modification is approved.

The Maine Turnpike Authority may erect lane closures on the mainline within the Project area to collect survey, provide layout, and for any other reasons deemed necessary by the Authority.

652.3.2 Responsibility of the Contractor

The Contractor shall provide continuous and effective traffic control and management for the Project that is appropriate to the construction means, methods, and sequencing allowed by the Contract and selected by the Contractor:

The Contractor shall ensure all jobsite personnel shall wear a safety vest labeled as ANSI 107-2004 standard performance for Class 3 risk exposures at all times. This requirement also applies to truck drivers and equipment operators when out of an enclosed cab.

652.3.3 Submittal of Traffic Control Plan

The Contractor shall provide continuous and effective traffic control and management for the Project that is appropriate to the means, methods and sequencing allowed by the Contract; and consistent with the Traffic Control Plans and Maintenance of Traffic Specifications. The Contractor is responsible for ensuring a safe environment for the Contract workforce, local road users, and turnpike users; and maintaining the safe efficient flow of traffic through the construction zone at all times during the Contract. The protocols and requirements outlined in the Contract shall be strictly enforced. The Contractor shall submit, at or before the Preconstruction Meeting, a Traffic Control Plan (TCP) that provides the following information to the Authority:

- a. The name, telephone number, and other contact numbers (cellular phone, pager, if any) of the Contractor's Traffic Control Supervisor (TCS). The TCS is the person with overall responsibility for ensuring the contractor follows the TCP, and who has received Work Zone Traffic Control Training commensurate with the level of responsibility shown in the requirements of the Contract, and who is empowered to immediately resolve any work zone traffic control deficiencies or issues. Provide documentation that the Traffic Control Supervisor has completed a Work Zone Traffic Control Training Course (AGC, ATSSA, or other industry- recognized training), and a Supervisory refresher training every 5 years thereafter. Submit training certificates or attendance roster that includes the course name, training entity, and date of training. **State how the traffic control devices will be maintained including a frequency of inspection for both temporary and permanent traffic control devices.**

Traffic Control Training Course curriculum must be based on the standards and guidelines of the MUTCD and must include, at a minimum, the following:

1. Parts of Temporary Traffic Control Zone
2. Appropriate use and spacing of signs
3. Use and spacing of channelizing devices
4. Flagging basics
5. Typical examples and applications

The Traffic Control Supervisor, or designee directly overseeing physical installation, adjustment, and dismantling of work zone traffic control, will ensure all personnel performing those activities are trained to execute the work in a safe and proper manner,

in accordance with their level of decision-making and responsibility. The emergency contact list shall contain a listing of individuals who may be contacted during non-work hours and shall adequately respond to the request.

- b. Proposed revisions to the construction phasing or sequencing that reasonably minimizes traffic impacts.
- c. A written narrative and/or plan explaining how traffic and pedestrians will be moved through the Project Limits, including transitions during the change from one phase of construction to the next, as applicable.
- d. Temporary traffic control treatments at all intersections with roads, rail crossings, businesses, parking lots, pedestrian ways, bike paths, trails, residences, garages, farms, and other access points, as applicable.
- e. A list of all Contractor or Subcontractor certified flaggers to be used on the Project, together with the number of flaggers which will be used for each type of operation that flagging is needed. If the Contractor is using a flagging Subcontractor, then the name and address of the Subcontractor may be provided instead of a list of flaggers.
- f. A procedure for notifying the Resident of the need to change the traffic control plan or the need to remove a lane restriction.
- g. A description of any special detours including provisions for constructing, maintaining, signing, and removing the detour or detours, including all temporary bridges and accessory features and complete restoration of the impacted land.
- h. The maximum length of requested contiguous lane closure. The Contractor shall not close excessive lengths of traffic lane to avoid moving traffic control devices.
- i. The proposed temporary roadway surface conditions and treatments. The Contractor shall provide an adequate roadway surface at all times; taking into account traffic speed, volume, and duration.
- j. The coordination of appropriate temporary items (drainage, concrete barriers, barrier end treatments, impact attenuators, and traffic signals) with the TCP.
- k. The plan for unexpected nighttime work, the contractor shall provide a list of emergency nighttime lighting equipment and safety personnel available on-site or have the ability to have them on site within an hour of the time of need.
- l. The plan for meeting any project specific requirements contained in special provision 105 and/or 107, and/or Section 656
- m. The lighting plan if night work is anticipated.

The Authority will review the TCP for completeness and conformity with Contract provisions, the current edition of the MUTCD, and Authority policy and procedures. The Authority will review and provide comments to the Contractor within 14 days of receipt of the TCP. No review or comment by the Authority, or any failure to review or comment, shall operate to absolve

the contractor of its responsibility to design and implement the plan in accordance with the Contract, or to shift any responsibility to the Authority. If the TCP is determined by the Authority to be operationally ineffective, the Contractor shall submit modifications of the TCP to the Authority for review and shall implement these changes at no additional cost to the Contract. Nothing in this Section shall negate the Contractor's obligations set forth in Section 110 - Indemnification, Bonding, and Insurance. The creation and modification of the TCP will be considered incidental to the related 652 items.

652.3.4 General

Prior to starting any work on any part of the project adjacent to or being used by the traveling public, the Contractor shall install the appropriate traffic control devices in accordance with the plans, specifications and the latest edition of Manual of Uniform Traffic Control Devices, Part VI. The Contractor shall continuously maintain the traffic control devices in their proper position, and they shall be kept clean, legible and in good repair throughout the duration of the work. If notified that the traffic control devices are not in place or not properly maintained, the Contractor may be ordered to immediately suspend work until all deficiencies are corrected.

No equipment or vehicles of the Contractor, their subcontractors, or employees engaged in work on this contract shall be parked or stopped on lanes carrying traffic, or on lanes or shoulders adjacent to lanes carrying traffic, at any time, except as required by ongoing work operations. Contractor equipment or vehicles shall never be used to stop, block, or channelize traffic.

Vehicles parked on the shoulder shall be located so all portions of the vehicle(s) are a minimum of one foot from the traveled way. No operation shall be conducted on or near the traveled lanes or shoulders without first setting up the proper lane closure and traffic control devices. These precautions shall be maintained at all times while this Work is being performed. The Contractor shall keep all paved areas of the highway as clear as possible at all times. No materials shall be stored on any paved area of the highway or within 30 feet of the traveled way (unless protected by concrete barriers and specifically approved by the Resident). Private vehicles owned by Contractor's employees shall be parked close together in a group no closer than 30 feet from the traveled way in pre-approved areas.

Channelization devices shall include Vertical Panel Markers, Barricades, Cones, and Drums shall be in accordance with the MUTCD. These devices shall be installed and maintained at the spacing determined by the MUTCD through the work area.

The Contractor shall maintain existing guardrails and/or barriers until removal is necessary for construction. The Contractor shall use a temporary barrier or appropriate channelizing devices, as approved by the Resident, while the guardrails and/or barriers are absent. Permanent guardrails and barriers shall be installed as soon as possible to minimize risk to the public.

When Contractor operations or shoulder grading leave a continuous 3 inch or less exposed vertical face at the edge of the traveled way, **including the shoulder, or when traffic is shifted into the shoulder adjacent to the edge of pavement where an existing 3 inch or less exposed vertical face creates a safety hazard**, channelization devices should be placed 2 feet outside the edge of the pavement at intervals not exceeding 600 feet and, depending on type and location of the exposed vertical face, a 48 inch by 48 inch W8-9 Low Shoulder, or W8-11 Uneven Lane, and/or a W8-17P Shoulder Drop-Off sign should be placed at a maximum spacing of ½ mile. When

Contractor operations or shoulder grading leave greater than a 3-inch exposed continuous vertical face at the edge of the traveled way, **including the shoulder, or when an existing condition of an exposed vertical face of 3 inches or more is adjacent to active traffic shifted into shoulder**, the Contractor shall place shoulder material at a slope not exceeding 3 horizontal to 1 vertical to meet the pavement grade, before the lane is opened to traffic.

Special Detours and temporary structures, if used, shall meet applicable AASHTO standards, including curve radii and grade.

Maine Turnpike Traffic Control Requirements

This Section outlines the minimum requirements that shall be maintained for working on, over, or adjacent to the Maine Turnpike roadway.

General

Two travel lanes in each direction (each direction being 24 feet wide including/excluding shoulder) in the two lane portion of the turnpike, and three travel lanes in each direction (each direction being 36 feet wide including/excluding shoulder) in the three lane portion of the turnpike (Mile 0.0 to mile 44.3) shall be maintained at all times except while performing work in a designated lane, directly over or adjacent to traffic, and during the placement and removal of traffic control devices.

Unless otherwise specified in the contract documents the minimum main line width for a single travel lane shall be 14 ft and minimum ramp widths of 16 ft which must be maintained at all times, from ½ hour before sunrise and ½ hour after sunset as indicated on the Sunrise/Sunset Table at: <http://www.sunrisesunset.com/usa/Maine.asp> . If the Project town is not listed, the closest town on the list will be used as agreed at the Preconstruction Meeting.

Shoulder closures, lane closures, and lane shifts meeting the MUTCD guidelines, other than those shown in the plans, must be submitted for approval from the MTA prior to use in the construction operations.

No lane closures will be allowed during non-working hours, weekends and/or holiday periods unless included in the Contract as long-term traffic control requirement as outlined in Section 652 – Specific Project Maintenance of Traffic Requirements **unless written permission is obtained from the Authority.**

Any special signs, barricades or other devices deemed necessary by the Resident shall be furnished and maintained by the Contractor. Extra care shall be taken so that the traffic flow will not be disturbed. The use of construction signs and warning devices not shown on the Plans or in the MUTCD is prohibited unless approved by the Resident

The Contractor's personnel and equipment shall avoid crossing traffic whenever possible. No Contractor's vehicle may slow down or stop in a traffic lane unless said lane has previously been made safe with signs and barricades as required by the Resident.

No vehicle will move onto the traveled way at such a time or in such a manner so as to cause undue concern or danger to traffic approaching from either direction. The Contractor or his employees are not empowered to stop traffic.

The Contractor shall take necessary care at all times, in all operations and use of his equipment, to protect and facilitate traffic. During periods of idleness, the equipment shall not be left in a way to obstruct the traffic artery or to interfere with traffic.

The Contractor shall furnish approved signs reading "Construction Vehicle - Keep Back" to be used on trucks hauling to the Project. The signs shall be a minimum of 30-inch by 60-inch, Black and Orange, and meet construction sign retro reflectivity requirements

All vehicles used on the Project shall be equipped with amber flashing lights, by means of a single or multiple, flashing LED or strobe lights mounted so as to be visible 360 degrees. **In addition, vehicles operating under direction of the Maine Turnpike Authority may be equipped with auxiliary lights that are green, white or amber or any combination of green, white or amber.** Auxiliary lighting shall have sufficient intensity to be visible at 500 feet in normal daylight and a flash rate between 1Hz and 4Hz. The vehicle flashing system shall be in continuous operation while the vehicle is on any part of the project and positioned or mounted in such a way to not be obstructed by vehicle mounted or other equipment. Dump trucks, **concrete trucks** and utility trucks **at a minimum** shall have a strobe light mounted on each side of the vehicle. **The use of motorcycles is not permitted within a construction site or as a means to arrive at or leave a work zone.**

Where space is available pavement striping for all tapers shall create a minimum buffer of 250 feet to the point where the temporary concrete barrier taper ends and becomes parallel to the travelway. Temporary concrete barrier shall be tapered at a minimum 8:1 unless space is available and then it should be tapered at 15:1 or 100 feet whichever is longest.

Milling and paving of interchange ramps shall be done between 9:00 p.m. and 5:00 AM, unless otherwise shown on the Maintenance of Traffic Phasing Plans or as directed by the MTA. Only a single ramp at an interchange may be closed at once. Ramp closures will not be permitted the day before or after holidays, on holidays, or on Saturdays or Sundays. The Contractor shall request approval from the Resident/Authority two weeks prior for all ramp closures. Portable changeable message signs shall be used to provide advance notice and warning of the ramp closure. PCMS's shall be operational a minimum of 1 week prior to ramp closure to notify Patrons. The contractor shall coordinate PCMS locations with the Resident and the MTA.

Access to, and egress from, the construction area shall be with the direction of travel without crossing traffic. Construction vehicles are prohibited from merging with mainline traffic during the AM and PM peak traffic hours unless approved in writing from the MTA. The contractor shall develop work zone access/egress with acceleration and deceleration areas and should utilize interchange ramp areas whenever feasible.

Temporary Mainline Lane Closures

A lane closure may be required whenever personnel will be actively working within four feet of a travel lane.

Loading/unloading trucks shall not be closer than six feet from an open travel lane. Temporary lane closures will only be allowed at the times outlined in Special Provision, Section 652, Specific Project Maintenance of Traffic Requirements. These hours may be adjusted based on the traffic volume each day by the Resident.

A lane closure is required when a danger to the traveling public may exist. The following is a partial list of activities requiring lane closures. Lane closures may be required for other activities as well:

- Milling and Paving Operations
- Bridge work
- Drainage Installation and/or Adjustment
- Clear Zone Improvements
- Pavement Markings Layout and Placement
- **Work directly over traffic within six feet of a travel lane as measured from the painted pavement marking line or traffic control device will require a lane closure. This work includes but is not limited to the following:**
 1. **Unbolting structural steel**
 2. **Removing structural steel**
 3. **Erecting structural steel**
 4. **Erecting or moving sign panels on bridges or sign structures**
 5. **Bolting structural steel**
 6. **Loading and unloading trucks**
 7. **Light pole removal or installation**
 8. **Snow fence installation**

Lane closures shall be removed if work requiring the lane closure is not ongoing unless included in the Contract as a long-term traffic control requirement or approved by the Resident.

During adverse weather condition when the speed limit on the Maine Turnpike has been reduced to 45 MPH, or during fog or when there is less than ½ mile of visibility, shoulder/lane closures cannot be set up and any currently in place shall be removed. Only work on the turnpike mainline that is behind temporary concrete barrier will be allowed when speed is reduced to 45 MPH or fog/visibility conditions exist.

Daytime lane closures shall be a maximum of three (3) miles. Only one daytime lane closure will be permitted per direction. Nighttime lane closures may extend through the entire length of the Project.

Temporary single lane closures are allowed upon approval of the Resident. **Lane and/or ramp** closure setup may not begin until the beginning time specified. Closures that are setup early or that remain in place outside of the approved time period shall be subject to a lane rental fee of **\$1,000** per five minutes for every five minutes outside of the approved time. The installation of

the construction signs will be considered setting up the lane closure. Removal of the last construction sign will be considered removal of the closure. Construction signs shall be installed immediately prior to the start of the closure and shall be promptly removed when no longer required. The installation and removal of a closure, including signs, channelizing devices, and arrow boards shall be a continuous operation. The Authority reserves the right to order the removal of an approved closure.

The Authority desires to minimize the number of daytime lane closures and the number of times that a complete stoppage of traffic is required. The Contractor is encouraged to schedule work so that the interference with the flow of traffic will be minimized. Lane closures will not be allowed until traffic associated with complete stoppages of traffic has cleared. Complete stoppages of traffic or lane closures may not be allowed on a particular day if another complete stoppage of traffic has been previously approved for another project.

The Resident is required to receive approval from the Maine Turnpike Authority for all lane closures. **The Resident is required to submit a request for lane closures by noon on Thursday for any lane closures needed for the following week.** The Contractor shall plan the work accordingly.

Mainline Shoulder Closures

Shoulder closures are anticipated at locations where Contractor access to the mainline is required.

Shoulder closures with plastic drums shall be removed at the end of the workday. Temporary shoulder closures with plastic drums will not be allowed during periods of inclement weather as determined by the Authority.

The location (limits) of shoulder closures with concrete barrier are shown on the Plans. The barrier must be placed prior to the start of the work requiring concrete barrier and shall remain in place until the work activity is complete.

Equipment Moves

The complete stoppage of traffic for an equipment move (including delivery of materials to the median) will be considered for approval if the action cannot reasonably be completed with the erection of a lane closure. Contractor shall be responsible for the installation of Signs CS-3, "Expect Stopped Traffic" and Signs W3-4 "Be Prepared to Stop", in accordance with the Single Lane Closure Detail immediately prior to the equipment move. **Signs will be required on any adjacent ramps within proximity to the stoppage.** These signs shall be covered when not applicable.

State Police will be used to stop traffic. Cost for State Police will be the responsibility of the Authority. The times requested for trooper assisted equipment moves by on-duty troopers cannot be guaranteed. The MTA will not be held responsible for any delays or costs associated with the delay, postponement or cancellation of an on-duty trooper assisted equipment move.

The maximum time for which traffic may be stopped and held for an equipment move at any single time shall be five (5) minutes. The duration shall be measured as the time between the

time the last car passes the Resident until the time the Resident determines that all travel lanes are clear. The traffic shall only be stopped for the minimum period of time required to complete the approved activity. The Contractor shall reimburse the Authority at a rate of \$500 per minute for each minute in excess of the five-minute allowance.

Unapproved movement of equipment or materials across the travel lanes shall be considered a violation of the Maintenance of Traffic Requirements and is subject to a minimum fine of \$500 per occurrence with an additional \$500 per minute thereafter.

Request for Complete Stoppage of Traffic

A request for a complete stoppage of traffic must be submitted to the Resident for approval. The Resident is required to receive approval from the Maine Turnpike Authority for all stoppages. The request shall be submitted to the Authority by the Resident at least five (5) working days prior to the day of the requested stoppage of traffic and two (2) days for a stoppage less than five minutes. All requests must be received by 12:00 p.m. noon to be considered as received on that day. Requests received after 12:00 p.m. shall be considered as received the following day. The Contractor shall plan the work accordingly.

During the erection or removal of overhead structures or signs traffic shall be stopped and may be held for periods of up to 25 minutes during these operations. Before the roadway is reopened, all materials shall be secured so they will not endanger traffic passing underneath. The Contractor will reimburse the Authority at the rate of \$2,500.00 per five-minute period for each roadway not reopened (northbound and southbound), in excess of the 25-minute limit. Total penalty shall be deducted from the next pay estimate.

Blasting of Ledge, The maximum time for which traffic may be stopped at any single time shall be six (6) minutes. This duration shall be measured as the time between the time that the last car passes the Resident, until the time the Resident determines that all travel lanes are cleared of blast debris. The Contractor shall reduce the size of the blast, change the design and method of the blast, use more mats, or otherwise alter the blasting so that the traffic is not stopped for more than six minutes. If, due to the throw of rock onto the highway or other blasting related activities, traffic is stopped for more than six minutes, the Contractor shall pay a penalty of \$1,000.00 per minute for every minute traffic is stopped in excess of the six-minute limit. The penalty shall be measured separately on the northbound and southbound roadway (or eastbound and westbound roadway). Total penalties will be deducted from the next pay estimate. Whenever the volume of traffic is excessive such that a six-minute interruption would cause objectionable congestion, in the opinion of the Authority, the hours during which blasting may occur may be further restricted. A detailed blasting plan shall be submitted as required in Supplemental Specific or Special Provision Sections 105 or 107.

652.3.5 Installation of Traffic Control Devices

All traffic control devices shall be in conformance with NCHRP 350 requirements **and MASH 16 requirements if manufactured after December 31, 2019** and installed as per manufactures recommendations.

Portable signs shall be erected on temporary sign supports approved crashworthy devices so that the bottom of the sign is either 1) 12 inches or 2) greater than 5 feet above the traveled way. **The bottom of all regulatory signs and ramp exit signs shall be a minimum of 5 feet above the traveled way.** Post-mounted signs shall be erected so the bottom of the sign is no less than 5 feet above the traveled way, and 7 feet above the traveled way in business, commercial, and residential areas. Post-mounted signs must be erected so that the sign face is in a true vertical position. All signs shall be placed so that they are not obstructed in any manner and immediately modified to ensure proper visibility if obstructed.

The bottom of mainline and ramp traffic control signs intending to remain longer than 3 days, except as provided in 2009 MUTCD Section 6F.03 paragraph 12, shall be mounted 5 feet or greater above the edge of pavement on posts or portable sign supports.

The Resident will verify the exact locations of the construction signs in the field.

Construction signs behind guardrail shall be mounted high enough to be visible to traffic.

Vertical panel markers shall be mounted with the top at least 4 feet above the traveled way.

Drums shall not be weighted on the top. Drain holes shall be provided to prevent water from accumulating in the drums. During winter periods, drums shall be placed on the grass shoulder or removed from the roadway so winter maintenance operations will not be impacted. This requires the placement of drums behind the median guardrail. Drums shall not be placed on snowbanks.

The Contractor shall operate and maintain the flashing arrow board unit and for dependable service during the life of the contract. The units shall remain in continuous night and day service at locations designated until the Resident designates a new location or discontinuance of service.

The Contractor shall maintain the devices in proper position and clean them as necessary. Maintenance shall include the covering and uncovering of all signs when no longer applicable (even if for a very short duration). The sign shall be considered adequately covered when no part of the sign face is visible either around or through the covering.

The Contractor shall replace damaged traffic control devices with devices of acceptable quality, as directed by the Resident.

The Contractor is required to cover all existing signs, including regulatory and warning signs, within the Work zone which may conflict with the proposed construction signs. The Contractor is also required to cover all permanent construction signs when they conflict with a daily traffic control setup. The method of covering existing signs must be approved by the Resident. The use of adhesives on the sign face is prohibited.

Work Zone Speed Limits

Work Zone Speed (Fines Doubled) is a regulatory speed limit that indicates the maximum legal speed through a work zone which is lower than the normal posted speed. The speed limit shall be displayed by black on white speed limit signs in conjunction with a black on orange "Work Zone" plate. Speed limit signs shall be installed at each mile within the work zone. Any existing

regulatory speed limit signs within the reduced speed zone shall be covered once the reduced speed signs have been erected.

Two orange fluorescent flags shall be attached to all speed limit signs that are uncovered for a period of time exceeding one week. This work shall be incidental. Signs that are covered and uncovered on a regular basis are not required to have the supplemental flags.

The reduced speed limit signs shall be used when workers are adjacent to traffic, when travel lane(s) are closed, when indicated on Maintenance of Traffic Control Plans provided or other times as approved by the Resident:

The signs shall be covered or removed when not applicable. The covering and uncovering of signs shall be included for payment under Maintenance of Traffic. Signs relating to reduced speed shall be installed in accordance with the details. **The Contractor shall note that all signs including those behind concrete barrier or guardrail are required to be clearly visible to all drivers at all times.**

Lane Closure Installation and Removal Procedure

The Contractor will follow the following procedures when closing any travel lanes on the turnpike roadways:

1. The sign package shall be erected starting with the first sign and proceeding to the start of the taper. The sign crew shall erect signs with the vehicle within the outside shoulder.
2. Position the arrow board with the proper arrow at the beginning of the taper; and,
3. When arrow board is in place, continue with the drums/cones to secure the work area.

To dismantle the lane closure, start with last drums/cone placed and work in reverse order until all the drums are removed. The arrow board which was installed first shall be the final traffic control device removed, excluding the sign package. The remaining sign package shall be picked-up starting with the first sign placed and continuing in the direction of traffic and with the vehicle in the outside shoulder.

Trucking Plan

The Contractor shall submit a trucking plan to the Resident within 10 working days of the award of the Contract. The trucking plan shall consist of at least the following:

- Date of anticipated start of work per each location.
- Haul routes from plant/pit to work area and return.
- Haul routes from work area to disposal area and return.
- Entering / exiting the work area.
- Vehicle safety equipment and Vehicle inspection.

- Personal safety equipment.
- Communications equipment and plan.

The trucking plan will not be paid for separately but shall be incidental to the Contract.

652.3.6 Traffic Control

The existing travel way width shall be maintained to the maximum extent practical.

Vertical panel markers, drums, cones, or striping shall be used to clearly delineate the roadway through the construction area. Two-way traffic operation shall be provided at all times that the Contractor is not working on the project. One- way traffic shall be controlled through work areas by flaggers, utilizing radios, field telephones, or other means of direct communication.

The traffic control devices shall be moved or removed as the work progresses to assure compatibility between the uses of the traffic control devices and the traffic flow.

Pavement markings shall be altered as required to conform to the existing traffic flow pattern. Repainting of pavement marking lines, if required to maintain the effectiveness of the line, shall be considered **incidental to the** maintenance of traffic control devices, no separate payment will be made. Inappropriate pavement markings shall be removed whenever traffic is rerouted, and temporary construction pavement markings shall be placed. Removal of non-applicable markings and **initial** placement of temporary construction pavement markings will be paid for under the appropriate Contract items. Traffic changes shall not be made unless there is sufficient time, equipment, materials, and personnel available to complete the change properly before the end of the workday. This provision will not be required when traffic is rerouted for brief periods and the route can be clearly defined by channelizing devices, or flaggers, or both.

All vehicles used during the installation and removal of traffic control devices, including lane closures, shall be equipped with a vehicle-mounted lighted arrow board **or high intensity LED full width light bar** acceptable to the Resident. The arrow board **or full width light bar** shall be capable of displaying a left arrow, right arrow, double arrow, and light bar **patterns**.

652.4 Flaggers

The Contractor shall furnish flaggers as required by contract documents or as otherwise specified by the Resident. **Flaggers shall not stop traffic on Turnpike mainline or interchange ramps. Only State Police are allowed to stop traffic on mainline or interchange ramps.**

All flaggers must have successfully completed a flagger test approved by the Maine Department of Transportation and administered by a Maine Department of Transportation 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 3, along with a hat 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.

Flagger stations shall be located far enough in advance of the workspace so that approaching road users will have sufficient distance to stop at the intended stopping point. While flagging, the flagger should stand either on the shoulder adjacent to the traffic being controlled, or in the closed lane. At a spot obstruction with adequate sight distance, the flagger may stand on the shoulder opposite the closed sections to operate effectively. Under no circumstances shall the flagger stand in the lane being used by moving traffic or have their back to oncoming traffic. The flagger should be clearly visible to approaching traffic at all times and should have a clear escape route.

When conditions do not allow for proper approach sight distance of a flagger or storage space for waiting vehicles, additional flaggers shall be used at the rear of the backlogged traffic or at a point where approaching vehicles have adequate stopping sight distance to the rear of the backlogged traffic. All flagger stations shall be signed, even when in close proximity. The signs shall be removed or covered when flagger operations are not in place, even if it is for a very short duration.

Flaggers shall be provided as a minimum, a 10-minute break, every 2 hours and a 30 minute or longer lunch period away from the workstation. Flaggers may only receive 1 unpaid break per day; all other breaks must be paid. Sufficient certified flaggers shall be available onsite to provide for continuous flagging operations during break periods. If the flaggers are receiving the appropriate breaks, breaker flagger(s) shall be paid starting 2 hours after the work begins and ending 2 hours before the work ends. A maximum of 1 breaker per 6 flaggers will be paid. (1 breaker flagger for 2 to 6 flaggers, 2 breaker flaggers for 7 to 12 flaggers, etc.). If a flagger station is manned for 10 hours or more, then ½ hour for lunch will be deducted from billable breaker flagger hours.

652.41 Traffic Officers

Local road traffic officers, if required, shall be uniformed police officers. State Police officers and vehicles shall be used to warn and stop traffic on the Maine Turnpike. All State Police shall be scheduled through the Maine Turnpike Authority. The Authority will make payment for the State Police officers and vehicles directly to the State Police.

The Contractor will not be entitled to additional compensation if scheduled Work is not completed due to the unavailability of State Police.

652.5.1 Rumble Strip Crossing

When lane shifts or lane closures require traffic to cross a permanent longitudinal rumble strip for 7 calendar days or less, the Contractor shall install warning signs that read "RUMBLE STRIP CROSSING" with a supplemental Motorcycle Plaque, (W8-15P).

When lane shifts or lane closures require traffic to cross a permanent longitudinal rumble strip for more than 7 calendar days, the Contractor shall pave in the rumble strips in the area that traffic will cross, unless otherwise directed by the Resident. Rumble strips shall be replaced prior to the end of the project, when it is no longer necessary to cross them.

652.6.1 Daylight Work Times

Unless otherwise described in the Contract, the Contractor is allowed to commence work and end work daily according to the Sunrise/Sunset Table at: <http://www.sunrisesunset.com/usa/Maine.asp>. If the Project town is not listed, the closest town on the list will be used as agreed at the Preconstruction Meeting. Any work conducted before sunrise or after sunset will be considered Night Work.

652.6.2 Night work

When Night Work occurs (either scheduled or unscheduled), the Contractor shall provide and maintain lighting on all equipment, at all workstations, and all flagger stations.

The lighting facilities shall be capable of providing light of sufficient intensity to permit good workmanship, safety, and proper inspection at all times. The lighting shall be cut off and arranged on stanchions at a height that will provide perimeter lighting for each piece of equipment and will not interfere with traffic, including commercial vehicles, approaching the work site from either direction.

The Contractor shall have available portable floodlights for special areas.

The Contractor shall utilize padding, shielding or other insulation of mechanical and electrical equipment, if necessary, to minimize noise, and shall provide sufficient fuel, spare lamps, generators, etc. to maintain lighting of the work site.

The Contractor shall submit a lighting plan prior to any night work for review showing the type and location of lights to be used for night work. The Resident may require modifications be made to the lighting set up in actual field conditions.

Prior to beginning any Night Work, the Contractor shall furnish a light meter for the Residents use that is capable of measuring the range of light levels from 5 to 20 foot-candles.

Horizontal illumination, for activities on the ground, shall be measured with the photometer parallel to the road surface. For purposes of roadway lighting, the photometer is placed on the pavement. Vertical illumination, for overhead activities, shall be measured with the photometer perpendicular to the road surface. Measurements shall be taken at the height and location of the overhead activity.

Night Work lighting requirements:

Mobile Operations: For mobile-type operations, each piece of equipment (paver, roller, milling machine, etc.) will carry indirect (i.e. balloon type) lights capable of producing at least 10 foot-candles of lighting around the work area of the equipment.

Fixed Operations: For fixed-type operations (flaggers, curb, bridge, pipes, etc.), direct (i.e. tower) lighting will be utilized capable of illuminating the work area with at least 10 foot-candles of light.

Hybrid Operations: For hybrid-type operations (guardrail, sweeping, In-slope excavation, etc.), either direct or indirect lighting may be utilized. The chosen lights must be capable of producing at least 10 foot-candles of light around the work area of the equipment

Inspection Operations: Areas required to be inspected by the Authority will require a minimum of 5 foot-candles of lighting. This may be accomplished through direct or indirect means.

The Contractor shall apply 2- inch wide retro-reflective tape, with alternating red and white segments, to outline the front back and sides of construction vehicles and equipment, to define their shape and size to the extent practicable. Pickup trucks and personal vehicles are exempt from this requirement.

The Resident or any other representative of the Authority reserves the right to suspend the work at any time and request a meeting to discuss violations and remedies. The Authority shall not be held responsible for any delay in the work due to any suspension under this item.

Failure to follow the approved Lighting Plan will result in a Traffic Control violation.

Payment for lighting, vehicle mounted signs and other costs accrued because of night work will not be made directly but will be considered incidental to the related contract items.

652.6.3 Traffic Coordinator and Personnel

The Contractor shall submit to the Resident for approval a list of traffic control personnel assigned to the Project including qualifications, certifications and experience.

The Traffic Coordinator duties shall include, but are not necessarily limited to:

- a. Developing, in conjunction with the Resident and Project superintendent, a traffic control program for the days' work activities which will facilitate traffic in a safe and efficient manner.
- b. Ensure that all traffic control implements (signs, arrow boards, barrels, etc.) are on-site so the traffic program can be implemented effectively.
- c. Ensure a safe and effective setup or take-down of all signing implements to least impact the traveling motorist; and,
- d. Working knowledge of construction signing/traffic control requirements in conformance with the latest issued Manual on Uniform Traffic Control Devices.
- e. The Contractor shall supplement the traffic control plan with a daily plan, which includes schedules for utilizing traffic coordinators and flaggers. This plan shall be submitted daily and agreed upon cooperatively with the Resident.

652.7 Method of Measurement

Signs, signs supplied by the Authority, and panel markers will be measured by the square foot for all signs authorized and installed. Flashing arrow boards, portable-changeable message signs, and flashing and steady burn lights, will be measured by each unit authorized and installed on the project. Barricades and cones will be measured by each unit authorized. Drums will be measured by each or as a lump sum authorized and installed, as indicated on the plans and specifications. No additional payment will be made for devices that require replacement due to poor condition or inadequate retroreflectivity.

Flaggers or traffic officers used during the Contract, for the convenience of the Contractor, will not be measured separately for payment, but shall be incidental to the various pay items. **This includes use of Flaggers for the delivery of materials and equipment to the project or other Flagger use that is for the Contractor's convenience, as determined by the Resident Engineer. If flaggers are required to maintain traffic and there is not a pay item in the contractor for flaggers, then flaggers shall be incidental to the other Section 652 contract items and no separate payment shall be made.**

The accepted quantity of traffic officer and flagger time will be the number of hours the designated station is occupied. The number of hours authorized for payment, **if any**, will be measured to the nearest ¼ hour.

The Authority will make payment for the State Police officers and vehicles directly to the State Police when utilized for mainline traffic control activities. State Police escorts, if required to move oversize material or equipment loads to the jobsite, will not be paid separately, but shall be incidental to the various pay items.

Maintenance of traffic control devices will be measured by the calendar day or as one lump sum, as indicated in the plans and specifications, for all authorized and installed traffic control devices. Traffic control devices will only be measured for payment the first time used. Subsequent uses shall be incidental to Item 652.36 or 652.361.

The vehicle mounted arrow board, mounted on trucks used for installation and removal of lane closures, will not be measured separately for payment, but shall be incidental to Item 652.36 or 652.361.

The traffic coordinator(s) will not be measured separately for payment but shall be incidental to Item 652.36 or 652.361.

Portable light towers, lighting on equipment and lighting plan will not be measured separately for payment but shall be incidental to the related Contract items.

Truck mounted attenuator shall be measured for payment by the calendar day for each calendar day that the unit is used on a travel lane or shoulder on the project, as approved by the Resident.

Sequential Flashing Warning Lights shall be measured for payment by the maximum number of sequential flashing warning lights satisfactorily installed and properly functioning at

any one time during the life of the project. Payment shall include all materials and labor to install, maintain and remove all Sequential Flashing Warning Lights.

Automated Trailer Mounted Speed Limit Sign shall be measured for payment by the calendar day for each calendar day that the unit is used on a travel lane or shoulder on the project or per each for the continued use for the duration of the project. Payment shall include the Trailer, Radar Speed Limit Sign, flashing beacon amber lights, regulatory speed limit sign, fuel, necessary maintenance, and all checking of Radar Speed Limit Signs by manufacturer and all project moves including the transporting and delivery of the unit.

The accepted quantity of temporary portable rumble strips shall be measured by the unit complete in place, per lane closure application. A unit shall consist of 1 group of 3 full-lane width of rumble strips. As shown in the plans, a maximum of 3 units may be used at each lane closure. A unit shall be measured for each group of rumble strips, each time they are used for a lane closure.

652.8 Basis of Payment

The accepted quantity of signs, signs supplied by the Authority, and panel markers will be paid for at the contract unit price per square foot. Such payment will be full compensation for furnishing (or retrieving from the Authority) and installing all signs, sign supports, and all incidentals necessary to complete the installation of the signs.

The accepted quantity of flashing arrow boards, barricades, battery operated flashing and steady burn lights, and cones will be paid for at the contract unit price each for the actual number of devices authorized, furnished, and installed. Such payment shall be full compensation for all incidentals necessary to install and maintain the respective devices.

The Sequential Flashing Warning Lights will be paid for at the Contract unit price per each. This price shall include all costs associated with furnishing, installing, operating, maintaining, relocating, and removing the Sequential Flashing Warning Lights.

The Truck Mounted Attenuator(s) will be paid for at the Contract unit price per calendar day for each TMA used. This price shall include all costs associated with the use of the vehicle. Payment shall include operator, fuel, truck, maintenance, flashing lights, arrow board and all other incidentals necessary to operate the vehicle.

Failure by the contractor to reinstall cones, barrels, signs, covered/uncovered signs, and similar traffic control devices within an hour of them being displaced, moved, knocked over, un-covered and etc. will result in a \$150 fine per traffic control device if the issues is not resolved within 1 hour of notification by the resident. An additional \$150 will be assessed for each additional hour that the device has not been corrected. If the traffic control device is critical to the maintenance of traffic creating an actual or potential safety issue with traffic and is not corrected immediately then it will result in a violation letter as described below.

Failure by the contractor to follow the Contracts 652 Supplemental Specifications, Special Provisions and Standard Specification and/or the Manual on Uniform Traffic Control Devices (MUTCD) and/or the Contractors own Traffic Control Plan, or failure to correct a

violation, will result in a violation letter and result in a reduction in payment as shown in the schedule below. The Resident or any other representative of the Authority reserves the right to suspend the work at any time and request a meeting to discuss violations and remedies. The Authority shall not be held responsible for any delay in the work due to any suspension under this item. Any reduction in payment under this Special Provision will be in addition to forfeiting payment of maintenance of traffic control devices for that day.

<u>Amount of Penalty Damages per Violation</u>		
<u>1st</u>	<u>2nd</u>	<u>3rd & Subsequent</u>
\$500	\$1,000	\$2,500

652.8.1 Maintenance of Traffic Control Devices

Maintenance of Traffic Control Devices will be paid at the contract unit price per calendar day or lump sum price, as indicated in the plans and specifications. Such payment will be full compensation for all days that the Contractor maintains traffic as specified herein, and for moving devices as many times as necessary; for replacing devices damaged, lost, or stolen; and for cleaning, maintaining, and removing all devices used for traffic control, including replacing temporary pavement marking lines.

The contract price for Maintenance of Traffic Control Devices shall be full compensation for all days for such maintenance, encompassing all areas of the contract, regardless of whether or not the work areas or projects are geographically separated.

652.8.2 Other Items

The accepted quantities of flagger hours will be paid for at the contract unit price per hour for each flagging station occupied excluding lunch breaks, and for each approved breaker flagger. Overtime hours, as reported on the certified payrolls, will be paid an additional 30% of the bid price for 652.38. The computation and additional payment for overtime hours will occur during the project close-out process and will be paid as additional hours of 652.38 to the nearest ¼ hour. The contract unit price shall be full compensation for hiring, transporting, equipping, supervising, and the payment of flaggers and all overhead and incidentals necessary to complete the work.

There will be no payment made under any 652 pay items after the expiration of the adjusted total contract time.

The accepted quantities of traffic officer hours will be paid for at the contract unit price per ¼ hour for each station occupied, with no additional payment for overtime. This price shall be full compensation for supplying uniformed officers with police cruisers, and all incidentals necessary to complete the work, including transportation, equipment, and supervision.

Payment for temporary pavement marking lines and pavement marking removal will be made under the respective pay item in Section 627 - Pavement Markings.

Payment for temporary traffic signals will be made under Section 643 - Traffic Signals.

The accepted quantity of Portable Changeable Message Signs will be paid for at the Contract unit price each. This price shall be full compensation for furnishing, relocating, maintaining and removing the PCMS. The price also includes all costs associated with setting-up and paying for a data cellular account, technical support, training and any costs associated with the GPS location device.

Progress payment of each PCMS shall be pro-rated over the duration of the Contract. Contract duration shall be from the specified Contract start date to substantial completion or Contract completion, whichever is sooner.

For a PCMS that fails to operate when required, the Contractor will be given 24-hours to repair or replace the PCMS. For periods longer than 24-hours, payment will be reduced based on the pro-rated time that the PCMS is out of service.

Drums will be paid for at the contract unit price each, or at the Contract lump sum price, as designated in the Plans and specifications. Such payment shall be full compensation for all drums as shown on the Plans or required to complete the work.

The Truck Mounted Attenuator(s) will be paid for at the Contract unit price per calendar day. This price shall include all costs associated with the use of the vehicle. Payment shall include operator, fuel, truck, maintenance, flashing lights, arrow board and all other incidentals necessary to operate the vehicle.

The Automated Trailer Mounted Speed Limit Sign(s) will be paid for at the Contract unit price per calendar day or per each. This price shall include all costs associated with the use of the Automated Trailer Mounted Speed Limit Sign.

The accepted quantity of temporary portable rumble strips will be paid for at the contract unit price per unit which shall include the transport device. Payment is full compensation for providing, relocating, maintaining or replacing, and removing temporary portable rumble strips. If the pay item is not included in the contract quantities, then the Authority does not anticipate the use of this item on the contract. If contractor wishes to utilize temporary portable rumble strips and the item is not in the contract, then the contractor may propose use of them to the Authority for consideration.

Payment will be made under:

<u>Pay Item</u>	<u>Pay Unit</u>
652.30 Flashing Arrow	Each
652.31 Type I Barricade	Each
652.311 Type II Barricade	Each
652.312 Type III Barricades	Each
652.32 Battery Operated Light	Each
652.33 Drum	Each
652.331 Drum	Lump Sum
652.34 Cone	Each
652.35 Construction Signs	Square Foot
652.351 Construction Signs-Supplied by Authority	Square Foot

652.36	Maintenance of Traffic Control Devices	Calendar Day
652.361	Maintenance of Traffic Control Devices	Lump Sum
652.38	Flaggers	Hour
652.381	Traffic Officers	Hour
652.41	Portable-Changeable Message Sign	Each
652.45	Truck Mounted Attenuator	Calendar Day
652.4501	Truck Mounted Attenuator – 24,000 LB	Calendar Day
652.451	Automated Trailer Mounted Speed Limit Sign	Calendar Day
652.452	Automated Trailer Mounted Speed Limit Sign	Each
652.46	Temporary Portable Rumble Strips	Unit
652.47	Sequential Flashing Warning Lights	Each

SPECIAL PROVISIONSECTION 652MAINTENANCE OF TRAFFIC

(Specific Project Maintenance of Traffic Requirements)

This Specification describes the specific project maintenance of traffic requirements for this Project.

The following minimum traffic requirements shall be maintained. These requirements may be adjusted based on the traffic volume when authorized by the Authority.

All maintenance of traffic control devices shall meet current MUTCD guidelines and NCHRP 350 guidelines, and MASH guidelines if date of manufacture was after 2019.

Maine Turnpike Mainline Reconstruction

Traffic will be shifted towards the median during Phase 1B to pave the outside widening, creating narrower lanes and shoulders. The duration of this shift (and narrower lanes and shoulders) shall be kept to an absolute minimum dictated by paving operations. Once the final shift has been setup, the contractor shall have the appropriate staff and equipment and supplies available and ready to complete the paving without delay. Temporary concrete barrier shall be moved, at a minimum, back to Phase 1A to provide wider lanes and shoulders as soon as paving allows.

Traffic will be shifted away from the median during Phase 2 to construct the paved median and median concrete barrier. This shift may require narrower lanes and shoulders. Access to and from the median work zone will require traffic movements that are unanticipated by the traveling public. All contractor access shall be thoroughly detailed by the Contractor and submitted to the MTA for review and approval before being installed.

Interchange acceleration lanes, deceleration lanes, and ramps shall be maintained fully functional during the project or as approved by the MTA. Maintenance of traffic signage shall take into consideration the visibility of all permanent and temporary roadway guide signs. All roadway guide signs shall be maintained during construction including the temporary resetting of such signs to provide visibility to Turnpike patrons while also providing contractor access.

Maine Turnpike Drainage Operations

Lane closures in conjunction with traffic shifts within the times noted below will be required for construction of cross culverts. Culvert trenches not able to be completed per the plans in a single night must be closed (backfilled) and paved with temporary pavement prior to reopening lanes. Refer to the plans for additional guidance and layout in support of the mainline cross culvert installations. Construction of mainline cross culverts shall occur during Phase 1A.

Maine Turnpike Traffic Control Requirements

This Section outlines the minimum requirements that shall be maintained for work on, over, or adjacent to the Maine Turnpike roadway. Operations are allowed as outlined below:

Maintenance of traffic plans have been developed for the work on the mainline and ramps. Minimum main line width for a single travel lane shall be 14 ft and minimum ramp widths of 16 ft (12 ft lane and two 2 ft shoulders) must be maintained at all times, unless otherwise noted. Shoulder closures, lane closures, and lane shifts meeting the MUTCD guidelines, other than those shown in the plans, must be submitted for approval from the MTA prior to use in the construction operations. Requests for all closures shall be submitted to the MTA for approval before proceeding.

Where space is available pavement striping for all tapers shall create a minimum buffer of 250 feet to the point where the temporary concrete barrier taper ends and becomes parallel to the travelway. Temporary concrete barrier shall be tapered at a minimum 8:1 unless space is available and then it should be tapered at 15:1 or 100 feet whichever is longest.

Lane shifts and maintenance of traffic layouts merging with Adjacent Contracts, including the layouts contained in this Contract, shall be coordinated with the Adjacent Contractor and the Resident Engineer to ensure work zones are not impacted and that traffic is shifted smoothly from one work zone to the other. Contractor shall provide a 30-day notice to the Resident of all proposed changes to the maintenance of traffic layouts affecting Adjacent Work Zones. Precedence will be given to the Contract(s) executed before this contract, for all potential work zone overlaps.

Milling and paving of interchange ramps shall be done between 9:00 p.m. and 5:00 AM, unless otherwise shown on the Maintenance of Traffic Phasing Plans or as directed by the MTA. Only a single ramp at an interchange may be closed at once. Ramp closures will not be permitted the day before or after holidays, on holidays, or on Saturdays or Sundays. The Contractor shall request approval from the Resident/Authority two weeks prior for all closures. Portable changeable message signs shall be used to provide advance notice and warning of the ramp closure. PCMS's shall be operational a minimum of 1 week prior to ramp closure to notify Patrons. The contractor shall coordinate PCMS locations with the Resident and the MTA.

Construction vehicles will not be allowed to cross active ramps. Equipment moves across ramps will require a short-term ramp closure (i.e. 5-minute maximum timeframe) utilizing State Police and must be approved by the Authority in advance. Ramp closures for equipment moves will not be permitted between 6:00 a.m. and 10:00 a.m. and between 3:00 p.m. and 7:00 p.m. All State Police shall be coordinated through the Maine Turnpike Authority. The Authority will make payment for the State Police officers and vehicles directly to the State Police.

Lane and/or ramp closure setup may not begin until the beginning time specified. Closures that are setup early or that remain in place outside of the approved time period shall be subject to a lane rental fee of \$1,000 per five minutes for every five minutes outside of the approved time. The installation of the construction signs will be considered setting up the lane closure. Removal of the last construction sign will be considered removal of the closure. Construction signs shall be installed immediately prior to the start of the closure and shall be promptly removed when no longer required. The installation and removal of a closure, including signs, channelizing devices, and arrow boards shall be a continuous operation. The Authority reserves the right to order the removal of an approved closure.

Ramp closure setup, as described in the Maintenance of Traffic plans, shall begin and end in accordance with the times noted in the Lane and Shoulder Closure Tables below. The contractor shall submit a detailed ramp closure plan with a date/time schedule for approval a minimum of 45 days before the proposed closure. All ramp closures must be approved by the MTA before setup, including VMS and detour signage if required. Ramp closures setup early or that remain in place beyond the approved time period shall be subject to a lane rental fee detailed in this Special Provision. VMS and detour signage, set up and properly turned off or covered, will not be considered a violation of setup outside of the approved time period.

Multiple simultaneous or overlapping ramp closures, in a direction (northbound or southbound) will not be allowed; only one may be in place at a time. Contractor shall plan accordingly, including required review time.

Access to, and egress from, the construction area shall be with the direction of travel without crossing traffic. Construction vehicles are prohibited from merging with mainline traffic between 7:00 a.m. and 8:30 a.m. and between 4:00 p.m. and 5:30 p.m. unless approved in writing from the MTA. The contractor shall develop work zone access/egress with acceleration and deceleration areas and should utilize interchange ramp areas whenever feasible.

Loading/unloading trucks shall not be closer than six feet from an open travel lane.

The third lane shall be kept closed until the full length of widening is complete. At the completion of the contract and prior to opening the new third lane northbound, the Contractor shall set up all required traffic control devices and signage to advise Turnpike traffic that the third lane ENDS after the Exit 48 northbound on-ramp. Similarly, all required traffic control devices and signage in the southbound direction shall be fully installed prior to opening the southbound third lane. Barrels and signage left in place by the Contract 2020.03 to close the third lane within the Exit 46 interchange shall be maintained by this Contract until such time that the third lane of this contract is complete and ready to open. All drums and signs left in place by Contract 2020.03 shall become the property of the MTA.

Portable light towers will be required to illuminate the night construction work area(s) and shall be incidental to the Contract.

Work directly over traffic or within six feet of a travel lane as measured from the painted pavement marking line or traffic control device will require a lane closure. This work includes but is not limited to the following:

1. Unbolting structural steel
2. Removing structural steel
3. Erecting structural steel
4. Erecting or moving sign panels on bridges or sign structures
5. Bolting structural steel
6. Loading and unloading trucks
7. Light pole removal or installation

During the erection or removal of overhead structures or signs traffic shall be stopped and may be held for periods of up to 25 minutes during these operations. Before the roadway is

reopened, all materials shall be secured so they will not endanger traffic passing underneath. The Contractor will reimburse the Authority at the rate of \$2,500.00 per five-minute period for each roadway not reopened (northbound and southbound), in excess of the 25-minute limit. Total penalty shall be deducted from the next pay estimate.

Blasting of Ledge Stoppages for blasting will be allowed Monday through Thursday before 6:30 AM and after 6:30 PM, and on Fridays before 6:30 AM; except during Holiday periods where Blasting will not be allowed. The maximum time for which traffic may be stopped at any single time shall be six (6) minutes. This duration shall be measured as the time between the time that the last car passes the Resident, until the time the Resident determines that all travel lanes are cleared of blast debris. The Contractor shall reduce the size of the blast, change the design and method of the blast, use more mats, or otherwise alter the blasting so that the traffic is not stopped for more than six minutes. If, due to the throw of rock onto the highway or other blasting related activities, traffic is stopped for more than six minutes, the Contractor shall pay a penalty of \$1,000.00 per minute for every minute traffic is stopped in excess of the six-minute limit. The penalty shall be measured separately on the northbound and southbound roadway (or eastbound and westbound roadway). Total penalties will be deducted from the next pay estimate. Whenever the volume of traffic is excessive such that a six-minute interruption would cause objectionable congestion, in the opinion of the Authority, the hours during which blasting may occur may be further restricted. A detailed blasting plan shall be submitted as required in Special Provision 105.2.7 Use of Explosives and as may be required by Special Provision 104.4.6 Utility Coordination.

Lane and Shoulder Closure Details

		Mainline Northbound Exit 46 to Exit 49 May 16, 2021 to September 18, 2021 May 15, 2022 to September 17, 2022 May 14, 2023 to September 16, 2023		
		Equipment Moves	Temporary Lane Closures	Temporary Shoulder Closures
Days of Week:	Sunday night through Friday morning			
Time of Day:	9:00 p.m. to 6:00 a.m. following day	Allowed	Allowed	Allowed
Day of Week:	Friday night through Saturday morning			
Time of Day:	10:00 p.m. to 7:00 a.m. following day	Allowed	Allowed	Allowed

Mainline Northbound Exit 46 to Exit 49				
September 19, 2021 to May 14, 2022				
September 18, 2022 to May 13, 2023				
September 17, 2023 to Project Completion Date				
		Equipment Moves	Temporary Lane Closures	Temporary Shoulder Closures
Days of Week:	Sunday night through Friday morning			
Time of Day:	8:00 p.m. to 6:00 a.m. following day	Allowed	Allowed	Allowed
Day of Week:	Friday night through Saturday morning			
Time of Day:	9:00 p.m. to 8:00 a.m. following day	Allowed	Allowed	Allowed

Mainline Southbound Exit 46 to Exit 49 May 16, 2021 to September 18, 2021 May 15, 2022 to September 17, 2022 May 14, 2023 to September 16, 2023				
		Equipment Moves	Temporary Lane Closures	Temporary Shoulder Closures
Days of Week:	Sunday night through Friday morning			
Time of Day:	9:00 p.m. to 6:00 a.m. following day	Allowed	Allowed	Allowed
Day of Week:	Friday night through Saturday morning			
Time of Day:	10:00 p.m. to 7:00 a.m. following day	Allowed	Allowed	Allowed

Mainline Southbound Exit 46 to Exit 49 September 19, 2021 to May 14, 2022 September 18, 2022 to May 13, 2023 September 17, 2023 to Project Completion Date				
		Equipment Moves	Temporary Lane Closures	Temporary Shoulder Closures
Days of Week:	Sunday night through Friday morning			
Time of Day:	7:00* p.m. to 6:00 a.m. following day	Allowed	Allowed	Allowed
Day of Week:	Friday night through Saturday morning			
Time of Day:	9:00 p.m. to 8:00 a.m. following day	Allowed	Allowed	Allowed
* Sunday night temporary lane closures cannot start until 8:00 PM				

SPECIAL PROVISION

SECTION 719

SIGNING MATERIAL

Section 719.01 Reflective Sheeting

This Subsection is deleted in its entirety and replaced with the following:

Retroreflective sheeting for signs shall meet at a minimum the requirements for ASTM 4956 – Type XI (Prismatic) manufactured by 3M Company, for all signs.

Reflective sheeting, used in sign construction, shall have been manufactured within the six months immediately prior to the fabrication of each sign. Upon delivery at the job site of each shipment of signs, a letter of certification shall be provided that the reflective sheeting conforms to the requirements.

For Type 1 Guide Signs, all reflective sheeting shall be color matched on each sign unit.

All warning signs shall be fluorescent yellow except for Ramp Advisory Speed signs which shall be yellow.

All Construction Series signs that use orange backgrounds shall be fluorescent orange.

All Pedestrian Signs shall be fluorescent yellow-green.

EZ-PASS Purple shall conform to the FHWA Purple color box.

719.02 Demountable High Intensity Reflectorized Letters, Numerals, Symbols, and Borders

This Subsection, including the title, is deleted in its entirety and replaced with the following:

719.02 Letters, Numerals, Symbols, and Borders

All signs shall be manufactured utilizing Direct Applied letters, numerals, symbols and borders or be Digitally Printed meeting all sign sheeting manufacturer's (3M) requirements to ensure that the manufacturer's warranty will be in full effect.

All Type 1 overhead signs, Type 1 interchange signs and any other Type 1 signs over 100 square feet shall utilize Direct Applied letters, numerals, symbols and borders.

Direct Applied

Direct reflectorized applied letters, numerals, symbols and borders shall consist of cut out sheeting that shall meet at a minimum the requirements for ASTM 4956 – Type XI (Prismatic)

sheeting. The sheeting material used for the direct applied legend shall be the same type as used for the background.

Digitally Printed

Digital printing methods may be used to produce the sign copy and borders on retroreflective sheeting. Retroreflective sheeting complying with ASTM D 4956 Type XI and designated by the manufacturer as suitable for digital printing traffic signs along with associated ink and premium overlay film. Digitally Printed signs shall meet all sign sheeting manufacturer's (3M) requirements to ensure that the manufacturer's warranty will be in full effect

Transparent and opaque durable inks used in digital printed sign copy and borders shall be as recommended by the sheeting manufacturer (3M). Digital printed traffic colors shall be properly applied and shall have a warranty life of the base retroreflective sign sheeting. Digitally printed signs shall present a flat surface, free from foreign material, and all copy and borders shall be clear and sharp. Digital printed signs shall conform to 70% of the retroreflective minimum values established for its type and color (applicable to traffic colors only), as required by ASTM D 4956. Digital printed signs shall meet the daytime color and luminance, and nighttime color requirements of ASTM D 4956. Printed traffic colors shall meet the accelerated weathering and colorfastness requirements of ASTM D 4956. Digitally printed black shall remain sufficiently opaque for its intended use for the warranty period of the base sheeting. No variations in color or overlapping of colors will be permitted.

Digitally printed traffic signs shall have an integrated engineered match component clear UV- premium protective overlay recommended by the sheeting manufacturer applied to the entire face of the sign.

All digitally printed traffic signs shall utilize an integrated engineered match component system for materials and printing process and equipment. The integrated engineered match component system shall consist of retroreflective sheeting, durable ink(s), and clear protective overlay film, as specified by the sheeting manufacturer, applied to aluminum substrate.

The sign fabricator shall use an integrated engineered match component system digital printer approved by the sheeting manufacturer. Each approved digital printer shall only use the compatible retroreflective sign sheeting manufacturer's engineered match component system products. The sign fabricator shall maintain their digital printer's color calibration according to the sheeting manufacturer's requirements to help ensure digitally printed signs meet the manufacturer's specifications. The fabricator shall be trained by the sheeting manufacturer to produce digitally printed traffic signs that qualify for the sheeting manufacturer's warranty.

General

Type 1 Guide Signs shall have two-inch-tall, series C text that indicates the sign size, and the sign install date (MM/YY) located two inches above the bottom border of the sign.

SPECIAL PROVISION

SECTION 801

MISCELLANEOUS INCIDENTALS

(Test Pit)

801.01 Description

This work shall consist of excavating and back filling test holes to locate existing utilities at locations shown on the plans or as directed by the Resident.

801.02 Construction Requirements

The work shall be done in a manner that provides safe passage of the traveling public at all times. Coordination with the utilities is required prior and during the test pit activities. An authorized representative from the utility shall be present during the test pit activity. Test pits shall be completed in a manner that does not damage any utilities. Any damage to utilities or other roadway features by the test pit operations shall be repaired by the Contractor at no additional cost and shall be to the Resident’s satisfaction.

Once the location work is complete, the Contractor shall backfill the hole, with material consistent with the existing conditions and in accordance with the standard specifications for backfilling.

801.03 Method of Measurement

Test Pits will be measured for payment by each.

801.04 Basis of Payment

The accepted quantity of Test Pits will be paid for at the contract unit price per each excavation, which shall be full compensation for all labor, materials, tools, equipment, and incidentals necessary to the complete the work including excavation, backfilling, restoration, pavement replacement, disposal of materials and the protection of the utilities. Associated traffic control will not be paid for separately and is considered incidental to the test pit item.

Payment will be made under:

<u>Pay Item</u>	<u>Pay Unit</u>
801.03 Test Pit	Each

Appendix A
Maine Department of Environmental Protection (DEP)
Natural Resources Protection Act Permit and Water
Quality Certification



DEPARTMENT ORDER

IN THE MATTER OF

MAINE TURNPIKE AUTHORITY) NATURAL RESOURCES PROTECTION ACT
Scarborough, South Portland and Portland) FRESHWATER WETLAND ALTERATION
Cumberland County)
PORTLAND AREA WIDENING) WATER QUALITY CERTIFICATION
L-27726-TG-A-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, 335, and 502 of Department rules, the Department of Environmental Protection has considered the application of the MAINE TURNPIKE AUTHORITY 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 to widen Interstate I-95, the Maine Turnpike (Turnpike) to three travel lanes in both directions between mile marker 43.0 and mile marker 48.8. The proposed project lies within the municipal limits of the Town of Scarborough, the City of South Portland, and the City of Portland. The proposed project will consist of the following elements:

- Along the mainline: A 12-foot wide travel lane will be constructed along the outside of the existing highway. Non-guardrail shoulders will be 12 feet wide, and guardrail shoulders will be 17 feet wide and include a three-foot guardrail panel from the face of the rail to the slope break. Side slopes will be 6H:1V, 4H:1V, or 2H:1V, depending on site conditions, all with parabolic shaped ditches. Vegetation clearing lines will be ten feet beyond the bottom of the side slopes.
- Along entrance and exit ramps: One-lane ramps will be constructed with a 14-foot wide travel lane with four-foot wide left-shoulders and eight-foot wide right-shoulders. Two-lane ramps will have 12-foot wide travel lanes with four-foot wide left-shoulders and eight-foot wide right-shoulders. Side slopes without guardrails will be 4H:1V with parabolic ditches. Vegetation clearing lines will be ten feet beyond the bottom of the side slopes.
- Within the median: Existing grassed swales will be replaced with a paved surface and a concrete median barrier installed along the median centerline to replace the existing steel guardrail. The existing catch basin and subsurface drainage system used to convey stormwater off the road surface will be renovated to the new median and travel lane conditions.

The proposed project will extend from mile marker 43.0 to mile marker 48.8 within the existing highway right-of-way owned by the applicant and is expected to take three

construction seasons to complete. The proposed project excludes portions of the Maine Turnpike around the Stroudwater River Bridge, the Maine Central Railroad Bridge, and the Warren Avenue Bridge. Widening of the Turnpike at these locations received earlier Department approval as part of the bridge improvements.

The proposed project will alter approximately 170 linear feet of stream as a result of culvert extensions at Red Brook, Long Creek, Nason's Brook (identified in the application as the Fore River), and an unnamed stream that empties into Capisic Brook. Approximately five acres of freshwater wetlands at 38 locations will be altered as a result of the proposed project. Impacts to streams and wetlands are discussed in Finding 6.

The proposed project is shown a set of plans, the first of which is titled "Wetland Impacts, Index Plan", prepared by HNTB Corporation and dated February 2019 with a last revision date of June 2019.

B. Current Use of the Site: The highway will be located within the right-of-way of the Turnpike travel corridor in which a four-lane divided highway is currently located.

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 including an aerial photograph of the project site.

The proposed project is located in the portions of the Red Brook, Long Creek, the Stroudwater River, Nason's Brook, and Capisic Brook watersheds which are not scenic resources visited by the general public, in part, for the use, observation, enjoyment and appreciation of its natural and cultural visual qualities.

There are no navigational uses of any resources that would be unreasonably impacted by the proposed project.

The Department finds that the proposed activity will not unreasonably interfere with existing scenic, aesthetic, recreational or navigational uses of the freshwater wetlands that will be altered.

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.

In order to minimize sedimentation into protected natural resources, construction will be performed using a number of erosion and sedimentation control measures based on the latest version of the *Maine Department of Transportation Best Management Practices for Erosion and Sediment Control (BMPs)* and the applicant's standards and specifications (Supplemental Specification Section 656, Temporary Soil Erosion and Water Pollution Control). The applicant stated that each construction project implements a Construction Project Environmental Compliance Program, which assigns a Resident Engineer and Compliance Officer whose roles include inspection of all construction projects and bi-weekly inspection of erosion and sedimentation control devices, respectively. In addition, Supplemental Specification Section 656 requires each contractor to certify that its on-site responsible party has been trained and is knowledgeable in erosion and sediment control. Supplemental Specification Section 656 also establishes an overview of preparatory activities, excavation activities, construction activities (including spill prevention and control), a post-construction work plan, and a schedule of construction activity. Periodic inspections of the overall project, including the effectiveness and condition of erosion and sediment control devices are conducted by the applicant's Permitting Coordinator/Environmental Liaison.

In comments dated July 25, 2019, the Maine Department of Inland Fisheries and Wildlife (MDIFW) recommended that an independent third-party inspector be utilized to inspect the site. Given necessary requirements for limiting access to construction areas along the Turnpike and the on-site inspections that are routinely performed, the Department requested that, in lieu of utilizing a third-party inspector, the applicant provide the Department and MDIFW copies of weekly site inspections for those areas located within 100 feet of any streambank within the project site (riparian areas). The weekly reports must document site conditions, including photographs, and any necessary corrective actions that address erosion issues that may arise. Submission of these weekly inspections must continue until riparian areas are fully stabilized (vegetative cover over 90% of the area).

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, provided that copies of weekly inspections of riparian areas that document site conditions, including photographs, and any necessary corrective actions that address erosion issues are submitted to the Department and MDIFW until the disturbed riparian areas are fully stabilized.

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.

According to the Department's Geographic Information System database there are no mapped Essential or Significant Wildlife Habitats located at the site.

The MDIFW reviewed the proposed project, and in its comments, dated November 30, 2018, stated that no records of any Essential or Significant Wildlife Habitats were found within the project site. In its comments, MDIFW noted that the Maine Endangered Species Act lists several species of bats as endangered or threatened. Because bats are likely to be found on the project site during migration and/or breeding season, MDIFW recommended that tree clearing be limited to the period when bats are not present. The applicant agreed to limit tree clearing outside of the months of June and July, the recognized pupping season for tree-roosting bats.

MDIFW also noted that New England cottontail, a state endangered species, has been documented in the project site near Long Creek and recommended the applicant contact MDIFW's regional wildlife biologist to further assess the project site. On December 19, 2018, the regional wildlife biologist walked a portion of the project site within the area designated by MDIFW as potential cottontail habitat. Because of the proliferation of rabbit tracks noted during the site visit, DNA analyses of rabbit droppings were performed. Testing indicated that the droppings were from snowshoe hares, not New England cottontail. Based on this information, the regional biologist concluded that New England cottontail are not expected to be present on the project site.

Fisheries and stream protection issues are discussed in Finding 6.

Based on MDIFW's comments, the Department finds that the applicant has made adequate provision for the protection of wildlife, provided that no tree cutting is conducted during the period of June 1 and July 31.

5. WATER QUALITY CONSIDERATIONS:

The waters that are, or may be, affected by the proposed project are currently classified as Class C waters (38 M.R.S. §468(1)). Class C waters must be of such quality that they are suitable for the designated uses of drinking water supply after treatment, fishing, aquaculture, recreation in and on the water, industrial process and cooling water supply, hydroelectric power generation, navigation and as habitat for fish and other aquatic life (38 M.R.S. §465(4)(A)).

As discussed in Finding 3, the applicant proposes to use erosion and sediment control during construction to minimize impacts to water quality from siltation.

As discussed in Finding 6, MDIFW commented that Red Brook supports a population of wild brook trout. Prior to filing the application, the applicant and its consultants met with the Department to discuss treatment of stormwater from the proposed project. In accordance with the June 2017 Memorandum of Agreement for Stormwater Management Between the Maine Department of Transportation, Maine Turnpike Authority, and the Department of Environmental Protection (MOA), the applicant proposes to construct underdrained soil filters on both sides of the Turnpike adjacent to Red Brook. These stormwater BMPs are designed to be consistent with the treatment standards set forth in the Department's Chapter 500, *Stormwater Management* (06-096 C.M.R. ch.500, last amended August 12, 2015), and are expected to remove pollutants and provide some cooling of stormwater runoff, prior to discharge to Red Brook. As a result, treatment of stormwater runoff is anticipated to protect the water quality of the brook and the fish population in the brook. Underdrained soil filters are proposed adjacent to Long Creek and one stormwater meadow buffer is proposed in the vicinity of the Brighton Avenue overpass.

Based on the location of the proposed project, the construction methods proposed, and project's design and the Findings above, the Department finds that the proposed project will maintain and protect existing uses and the level of water quality necessary to protect those existing uses, will protect the existing water quality of affected waters, will not significantly impair the viability of the existing fish populations.

6. WETLANDS AND WATERBODIES PROTECTION RULES:

Wetlands:

The proposed project will also alter approximately 218,435 square feet (5.0 acres), and temporarily impact an additional 47,508 square feet (1.1 acres) of freshwater wetland at 38 locations. The impacted wetlands include approximately 25,639 square feet (0.59 acres) of forested wetlands and 192,794 square feet (4.4 acres) of wet meadow/emergent marsh vegetation, of which 134,580 square feet (3.1 acres) are currently routinely mowed to ensure highway safety. Thirteen wetland locations were identified as wetlands of special significance due to their proximity to streams, their location within designated flood plains, or that they contain greater than 20,000 square feet of emergent marsh vegetation. Most of the wetlands of special significance are designated as such because they contain greater than 20,000 square feet of emergent marsh vegetation and are already impaired because they are routinely managed (mowed or vegetation removed) to maintain highway clear zones.

Approximately 26,600 square feet of previously undisturbed of wet meadow/emergent marsh vegetation wetlands and approximately 7,000 square feet of forested wetland will be routinely managed to maintain highway clear zones following completion of the proposed project as the travel corridor extends further into adjacent wetland areas.

The applicant identified temporary wetland impacts as the area between the edge of project disturbance and the placement of silt fencing and stated that any wetlands disturbed in these areas will be restored to pre-disturbance conditions and revegetated with wetland vegetation.

Waterbodies:

The proposed project will require extending culverts on each side of the Turnpike from 20 to 68 feet, which will directly alter approximately 170 linear feet of stream at the four locations (Red Brook, Long Creek, Nason's Brook, and an unnamed stream that empties into Capisic Brook). Because of uncertainties in the construction schedule, the applicant is seeking approval for instream work windows outside of the normal window of July 15 to October 1, during periods of low flow.

Proposed measures to avoid or minimize impacts at each of the stream crossings include:

- All in-stream work will be completed within a contained work area created by the installation of temporary cofferdams that will be removed following construction.
- Culvert ends will be stabilized with riprap in the stream channel subsurface to minimize the formation of future scour holes and topped with 'special fill' materials selected to match the substrate of up or downstream areas and installed to match the elevation of the stream bed. The applicant's construction specifications include a materials and design specification for special fill – streambed materials, which was reviewed by MDIFW.
- The invert of culvert inlets and outlets will be set to facilitate fish and aquatic organism passage to avoid hanging conditions.
- MDIFW recommended, and the applicant agreed, that disturbed areas within riparian areas must be revegetated such that no exposed or unvegetated soil remain by October 1. In the event that ground disturbance activities are required following the October 1 limitation, the applicant has agreed to installing erosion and sediment control measures that include placement of six to 12 inches of erosion control mulch overlain with jute matting that will be pinned in place before freezing occurs. This material must be removed to allow the area to revegetate during the following growing season.

Red Brook

Red Brook crosses the Turnpike at mile marker 44.4 in a 192-foot long, 12-foot by 10-foot vertical ellipse plate arch culvert. The culvert is skewed approximately 30° from perpendicular to the travel lanes of the Turnpike. Designated as an urban impaired stream pursuant to the Department's Chapter 502, *Direct Watersheds of Lakes Most At Risk From New Development, And Urban Impaired Streams* (06-096 C.M.R. ch.502, last amended May 23, 2018), the stream supports a viable population of wild brook trout on both sides of the Turnpike, as documented by MDIFW. Within the project site, the stream runs south to north, parallel to the west side of the Turnpike, for approximately 400 feet before making an abrupt (approximately 90°) turn east toward the Turnpike

approximately 30 feet upstream from the inlet end of the culvert. Because of this turn, it was determined that extension of the inlet end of the culvert would require relocating the stream, an action that must be avoided.

The applicant examined several alternatives for extending the culvert ends of this crossing, including constructing a headwall and wingwall system to avoid extending the culvert altogether and minimize stream disturbance. The selected alternative is to slipline the existing culvert with an 11-foot by 9-foot aluminum plate or plastic (HDPE) pipe. At the inlet end, the slipline will be secured to a headwall and wingwall at the end of the existing culvert. At the outlet end, the culvert will be extended approximately 23 feet, for a total culvert length of approximately 215 feet. The applicant proposes to add natural bottom special fill matching the substrate of upstream or downstream areas, as best possible, within the sliplined pipe to improve habitat conditions and facilitate fish passage.

During initial project development, the applicant coordinated with MDIFW to establish instream work windows. For Red Brook, the proposed window of June 1 to September 30 was selected. In comments, dated July 24, 2019, MDIFW recommended that instream work be completed be reduced to the period July 1 to October 1. The applicant noted that for a project of this size, limiting the instream work window to periods of lowest flow may not always be available. The Department recognizes that stream flow in any given year is subject to multiple variables, and that these same variables affect the construction schedule. In the event that the Red Brook crossing can begin in the June 1 to July 1 period, and stream conditions would allow the work to begin without creating an unreasonable impact to the stream and fish habitat, the applicant may petition the Department and MDIFW to begin instream work prior to the July 1 date recommended by MDIFW. Both agencies must grant an approval for this early start.

Citing concerns with fish passage, the potential for hanging conditions, channel incision, and material in-culvert instability, MDIFW recommended that a five-year, post-construction monitoring plan be implemented and reports outlining stream conditions be filed with the Department and MDIFW. The applicant agreed to collaborate with the regulatory agencies in developing the post-construction monitoring plan, prior to initiation of the plan. MDIFW recommended that monitoring be performed during years 1, 3, and 5 following installation of culvert extension. Given the variability of stream conditions and that a single rain event may result in significant impacts to the stream, the Department determined that annual stream monitoring would be appropriate.

To ensure adequate fish passage and suitable stream flow conditions, the applicant must submit to the Department for review and approval a post-construction monitoring plan for the Red Brook crossing within three months of the date of this Order. Once approved, the applicant must file annual reports that document stream conditions for five years following the installation of the Red Brook culvert extension with reports due by December 31 of each calendar year.

Long Creek

Long Creek crosses the Turnpike at mile marker 45.9 in a 168-foot long, 78-inch diameter reinforced concrete pipe culvert. Pursuant to Chapter 502, Long Creek is designated by the Department as an urban impaired stream. Within the project site the stream runs northwest to southeast, crossing perpendicular to the travel lanes of the Turnpike. Approximately 30 feet downstream from the outlet end of the culvert, the stream makes an abrupt (approximately 90°) turn south and runs parallel to the east side of the Turnpike, for approximately 375 feet before turning east. Because of this turn, it was determined that extension of the outlet end of the culvert would not be practicable.

The applicant examined several alternatives for extending the culvert ends of this crossing, including constructing a headwall and wingwall system to avoid extending the culvert altogether and minimize stream disturbance. The selected alternative is to extend the inlet end on the west side of the Turnpike approximately 20 feet and the rebuild the headwall and wing walls at the outlet end, which will avoid realigning the stream. Using a 78-inch diameter reinforced concrete pipe to match the size of the existing culvert, the proposed work will result in a total culvert length of approximately 188 feet.

The applicant initially proposed instream work beyond the normal July 15 to October 1, except for the high flow period of March 15 to June 1. Given that MDIFW has expressed concern with working in riparian areas during frozen conditions, the applicant and MDIFW agreed to narrow the instream window to the period April 1 to November 1. MDIFW did not identify any fisheries issues with Long Creek.

Nason's Brook

Nason's Brook crosses the Turnpike at mile marker 47.8 in a triple, 194-foot long, 66-inch diameter reinforced concrete pipe culvert. Nason's Brook is designated by the Department as an urban impaired stream pursuant to Chapter 502. Within the project site the stream runs west to east and crosses perpendicular to the Turnpike.

The applicant examined several alternatives for extending the culvert ends of this crossing, including constructing a headwall and wingwall system to avoid extending the culvert altogether and minimize stream disturbance. The selected alternative is to extend both ends of the culvert approximately 28 feet using 66-inch diameter reinforced concrete pipes collared on to the existing culvert pipes. The proposed 56-foot extension will result in a total culvert length of approximately 250 feet.

The applicant initially proposed instream work beyond the normal July 15 to October 1, except for the high flow period of March 15 to June 1. Given that MDIFW has expressed concern with working in riparian areas during frozen conditions, the applicant and MDIFW agreed to narrow the instream window to the period April 1 to November 1. MDIFW did not identify any fisheries issues with Nason's Brook.

Unnamed Stream, Capisic Brook Watershed

Channelized man-made ditches from offsite converge and discharge to the western end of an existing 164-foot long, 60-inch diameter reinforced concrete pipe culvert at mile marker 48.9. At the outlet on the eastern side of the Turnpike, this waterbody exhibits the characteristics of a stream as defined in 38 M.R.S. §480-B(9) which ultimately drains into Capisic Brook an urban impaired stream designated by the Department as pursuant to Chapter 502.

The applicant examined several alternatives for extending the culvert ends of this crossing. The selected alternative is to extend both ends of the culvert approximately 32 feet at the inlet and 36 feet at the outlet using 60-inch reinforced concrete pipe collared on to the existing culvert pipes. The proposed 68-foot extension will result in a total culvert length of approximately 232 feet.

The applicant initially proposed instream work beyond the normal July 15 to October 1, except for the high flow period of March 15 to June 1. Given that MDIFW has expressed concern with working in riparian areas during frozen conditions, the applicant and MDIFW agreed to narrow the instream window to the period April 1 to November 1. MDIFW did not identify any fisheries issues with this stream.

Department Analysis

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 the applicant and dated February 28, 2019. The project purpose is to improve mobility and enhance safety for current and future traffic demand, and to meet the Maine Turnpike Authority's obligation of providing a safe and efficient highway for the mobility of both people and goods (freight).

The applicant examined 14 alternatives, including the no-action alternative, in its determination for the most practicable alternative that would meet the project purpose. Alternatives ranged from new/improved bus service, passenger and/or rail service, to construction of additional lanes on the Turnpike or I-295. Alternatives were grouped into

five categories (no action, demand management, system management, capacity, and combination of types), and then evaluated using the applicant's Portland Area Comprehensive Transportation System Regional Demand Model, a Benefit/Cost Analysis, and an Effects of Induced Demand review. The alternatives were also evaluated using 21 different measures of effectiveness, which were divided into five groups: transportation measures, environmental measures, cost/funding measures, implementation measures, and an overall summary. A final evaluation of the reasonableness of the alternatives was used to select the most practicable alternative that meets the project purpose.

Although several alternatives would result in impacts less damaging to the environment, these alternatives were dismissed because of costs or because the applicant would be the agency responsible for implementation of the alternative. The selected alternative was determined to fully meet the project purpose, would be cost effective, and readily implementable. Given the location of the protected natural resources on the project site, some impact to freshwater wetlands cannot be avoided.

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 noted that the American Association of State Highway and Transportation Organizations' roadside design guide recommends maintaining the widest possible "clear zone," an unencumbered roadside recovery area to enable vehicles that go off the road the ability to recover and return. The guide also recommended that, in the event that roadside obstructions could not be removed, then placement of guardrails would be acceptable, even as the guardrail itself would then be considered a roadside hazard. Where practicable, the applicant proposes to place side slopes at a 6H:1V grade as the clear zone for the project area but will place guardrails and 2H:1V side slopes adjacent to the stream crossings and in wetland areas, as needed.

Typical wetland impacts will result from the culvert extensions, as discussed above, and from shaping new road side slopes. The location and orientation of the freshwater wetlands along the project site allow the applicant to limit impacts to the wetland edges.

The Department finds that the road design and the angle of the side slopes in and adjacent to the wetland edges resulted in the minimum amount of wetland impacts necessary for the project.

C. Compensation. In accordance with Chapter 310 §5(C)(6)(d), compensation is not required to achieve the goal of no net loss of stream functions and values because the project will not result in over 300 linear feet of stream alteration, which is the threshold over which compensation is generally required. Further, the proposed project is not expected to have an adverse impact on fisheries or fish habitat provided that the applicant implements the stream protection measures discussed above. For these reasons, the Department determined that compensation is not required for stream alterations.

In accordance with Chapter 310, compensation is required for the proposed project to achieve the goal of no net loss of freshwater wetland functions and values.

The applicant submitted a functional assessment, dated December 2017, that described the wetlands to be altered by the proposed project. The functional assessment documented that the primary functions and values of these wetlands are sediment toxicant retention and wildlife habitat. The functional assessment noted that wetland functions, including wildlife habitat, for wetlands in the project area were generally low due to the periodic mowing and road safety maintenance programs performed by the applicant in the travel corridor. The functional assessment also noted that while these wetlands are effective at capturing sediment and pollutants that runoff the road surface and from adjacent commercial development, the elevated pollutant loading is contributing to degradation of the wetlands. High velocity flows from stormwater running off the road surface and surrounding developed area also reduce the retention time of pollutants in the wetland and lead to incised drainage channels.

Of the approximately 218,435 square feet wetland impacts associated with the proposed project, a loss of wetland functions or values was determined to occur for 191,832 square feet. Approximately 26,600 square feet of previously undisturbed wet meadow/emergent marsh vegetation wetlands will be altered as a result of management activities (mowed or vegetation removed) to maintain highway clear zones following completion of the proposed project as the travel corridor extends further into adjacent wetland areas. The Department has determined that these wetlands, although altered, will not result in a loss of wetland area or that wetland functions or values will be not be lost or degraded as a result of management activities, such that compensation will not be required for these wetland areas.

The application included a table that identified the wetland type, their functions and values, the type of impact, and a calculation of an In-Lieu Fee payment amount for the wetland impacts from the proposed project. Wetlands identified as wet meadow/emergent marsh vegetation wetlands were not subject to a resource multiplier because these areas are either located in artificial impoundments or are routinely altered (mowed) as part of the applicant's management program to maintain highway clear zones. The applicant proposes to make a contribution into the In-Lieu Fee program of the Maine Natural Resource Conservation Program in the amount of \$803,816.63. Prior to the start of construction, the applicant must submit a payment in the amount of \$803,816.63, payable to "Treasurer, State of Maine", and directed to the attention of the In-Lieu Fee Program Administrator at 17 State House Station, Augusta, Maine 04333.

The Department finds that the applicant has avoided and minimized stream and wetland impacts to the greatest extent practicable, and that the proposed project represents the least environmentally damaging alternative that meets the overall purpose of the project provided that the applicant files a post-construction monitoring plan for the Red Brook crossing to the Department for review and approval within three months of the date of this Order, and annual monitoring reports that document stream conditions are filed with

the Department for five years following approval of the post-construction monitoring plan and installation of the Red Brook culvert extension as outlined above; that instream work windows for each stream are limited to the specific period discussed above; and that prior to project construction, the applicant submits the In-Lieu Fee payment as described above.

The Department further finds that the activity will not unreasonably harm any 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.

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.

The proposed project is exempt from review under the Site Location of Development Act pursuant to 38 M.R.S. § 488(10).

The proposed project is also exempt from review under the Stormwater Management Law pursuant to 38 M.R.S. § 420-D(7)(G), as long as the project is constructed in accordance with the MOA referenced in Finding 5. The MOA requires that projects developed by the applicant located within watersheds of urban impaired streams must meet the General Standards contained in Chapter 500 *Stormwater Management Rules* (06-096 C.M.R. ch. 500, effective August 12, 2015) to the extent practicable. The applicant and the Department met several times to discuss stormwater treatment of the proposed project. The proposed project includes six underdrained soil filters located adjacent to Red Brook and Long Creek and one stormwater meadow buffer is proposed in the vicinity of the Brighton Avenue overpass. In addition, bridge improvement/roadway widening at the Stroudwater River Bridge, the Maine Central Railroad Bridge, and the Warren Avenue Bridge each include installation of underdrained soils that will capture stormwater runoff from the road surface created by the proposed project.

Given the linear nature of the project and the limitations for constructing stormwater treatment devices along the Turnpike, the Department is satisfied that the proposed project complies with the General Standards of Chapter 500 to the extent practicable.

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, provided that weekly site inspections that address erosion issues for those areas located within 100 feet of any streambank within the project site are submitted to the Department and MDIFW, as described in Finding 3 and instream work windows for each stream are limited to the specific period discussed in Finding 6.
- D. The proposed activity will not unreasonably harm any significant wildlife habitat, freshwater wetland plant habitat, threatened or endangered plant habitat, aquatic or adjacent upland habitat, travel corridor, freshwater, estuarine, or marine fisheries or other aquatic life provided that no tree cutting is conducted during the period of June 1 and July 31, as described in Finding 4; provided that the applicant files a post-construction monitoring plan for the Red Brook crossing to the Department for review and approval within three months of the date of this Order, and annual monitoring reports that document stream conditions are filed with the Department for five years following approval of the post-construction monitoring plan and installation of the Red Brook culvert extension, as described in Finding 6; provided that instream work windows for each stream are limited to the specific period discussed in Finding 6; and provided that prior to construction the applicant makes a contribution to the In-Lieu Fee program, as described in Finding 6.
- E. The proposed activity will not unreasonably interfere with the natural flow of any surface or subsurface waters.
- F. The proposed activity will not violate any state water quality law including those governing the classifications of the State's waters.
- G. The proposed activity will not unreasonably cause or increase the flooding of the alteration area or adjacent properties.
- H. The proposed activity is not on or adjacent to a sand dune.
- I. The proposed 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 the MAINE TURNPIKE AUTHORITY to widen the Maine Turnpike between mile marker 43.0 and mile marker 48.8, as described in Finding 1, SUBJECT TO THE ATTACHED CONDITIONS, and all applicable standards and regulations:

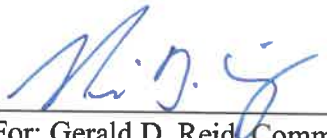
1. Standard Conditions of Approval, a copy attached.
2. The applicant shall take all necessary measures to ensure that its activities or those of its agents do not result in measurable erosion of soil on the site during the construction of the project covered by this approval.
3. Severability. The invalidity 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.
4. The applicant shall submit to the Department and MDIFW copies weekly site inspections that address erosion issues for those areas located within 100 feet of any streambank within the project site and any necessary corrective actions that address erosion issues. Submission of weekly inspections shall continue until riparian areas are fully stabilized (vegetative cover over 90% of the area).
5. The applicant shall submit to the Department for review and approval a post-construction monitoring plan for the Red Brook crossing within three months of the date of this Order.
6. The applicant shall file annual reports, in accordance with the approved post-construction monitoring plan, that document stream conditions for five years following the installation of the Red Brook culvert extension with reports due by December 31 of each calendar year.
7. The applicant shall limit instream work for Red Brook to period July 1 to October 1. In the event that the Red Brook crossing can begin in the June 1 to July 1 period, and stream conditions would allow the work to begin without creating an unreasonable impact to the stream and fish habitat, the applicant may petition the Department and MDIFW to begin instream work prior to the July 1. Both the Department and MDIFW must grant an approval for the instream work to begin prior to July 1. The applicant shall limit instream work for Long Creek, Nason's Brook, and the unnamed tributary to Capisic Brook to the period April 1 to November 1.

8. Prior to the start of construction, the applicant shall submit a payment in the amount of \$803,816.63, payable to "Treasurer, State of Maine", to the attention of the In-Lieu Fee Program Administrator at 17 State House Station, Augusta, Maine 04333.

THIS APPROVAL DOES NOT CONSTITUTE OR SUBSTITUTE FOR ANY OTHER REQUIRED STATE, FEDERAL OR LOCAL APPROVALS NOR DOES IT VERIFY COMPLIANCE WITH ANY APPLICABLE SHORELAND ZONING ORDINANCES.

DONE AND DATED IN AUGUSTA, MAINE, THIS 9th DAY OF August, 2019.

DEPARTMENT OF ENVIRONMENTAL PROTECTION

BY: 
For: Gerald D. Reid, Commissioner



PLEASE NOTE THE ATTACHED SHEET FOR GUIDANCE ON APPEAL PROCEDURES.

RLG/L27726AN/ATS#84203



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.



DEP INFORMATION SHEET

Appealing a Department Licensing Decision

Dated: November 2018

Contact: (207) 287-2452

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) an administrative process before the Board of Environmental Protection (Board); or (2) 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. § 3451(4)) or a general permit for an offshore wind energy demonstration project (38 M.R.S. § 480-HH(1)) or a general permit for a tidal energy demonstration project (38 M.R.S. § 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. §§ 341-D(4) & 346; the *Maine Administrative Procedure Act*, 5 M.R.S. § 11001; and the DEP's *Rules Concerning the Processing of Applications and Other Administrative Matters* ("Chapter 2"), 06-096 C.M.R. ch. 2.

DEADLINE 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 more than 30 calendar days after the date on which the Commissioner's decision was filed with the Board will be dismissed unless notice of the Commissioner's license decision was required to be given to the person filing an appeal (appellant) and the notice was not given as required.

HOW TO SUBMIT AN APPEAL TO THE BOARD

Signed original appeal documents must be sent to: Chair, Board of Environmental Protection, 17 State House Station, Augusta, ME 04333-0017. An appeal may be submitted by fax or e-mail if it contains a scanned original signature. It is recommended that a faxed or e-mailed appeal be followed by the submittal of mailed original paper documents. The complete appeal, including any attachments, must be received at DEP's offices in Augusta on or before 5:00 PM on the due date; materials received after 5:00 pm are not considered received until the following day. The risk of material not being received in a timely manner is on the sender, regardless of the method used. The appellant must also send a copy of the appeal documents to the Commissioner of the DEP; the applicant (if the appellant is not the applicant in the license proceeding at issue); and if a hearing was held on the application, any intervenor in that hearing process. All of the information listed in the next section of this information sheet must be submitted at the time the appeal is filed.

INFORMATION APPEAL PAPERWORK MUST CONTAIN

Appeal materials must contain the following information at the time the appeal is submitted:

1. *Aggrieved Status.* The appeal must explain how the appellant has standing to maintain an appeal. This requires an explanation of how the appellant 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.* The appeal must identify the specific findings of fact, conclusions regarding compliance with the law, license conditions, or other aspects of the written license decision or of the license review process that the appellant objects to or believes to be in error.
3. *The basis of the objections or challenge.* For the objections identified in Item #2, the appeal must state why the appellant believes that the license decision is incorrect and should be modified or reversed. If possible, the appeal should cite specific evidence in the record or specific licensing requirements that the appellant believes were not properly considered or fully addressed.
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 matters specifically raised in the written notice of appeal.
6. *Request for hearing.* If the appellant wishes the Board to hold a public hearing on the appeal, a request for public hearing must be filed as part of the notice of appeal, and must include an offer of proof in accordance with Chapter 2. The Board will hear the arguments in favor of and in opposition to a hearing on the appeal and the presentations on the merits of an appeal at a regularly scheduled meeting. If the Board decides to hold a public hearing on an appeal, that hearing will then be scheduled for a later date.
7. *New or additional evidence to be offered.* If an appellant wants to provide evidence not previously provided to DEP staff during the DEP's review of the application, the request and the proposed evidence must be submitted with the appeal. The Board may allow new or additional evidence, referred to as supplemental evidence, to be considered in an appeal only under very limited circumstances. The proposed evidence must be relevant and material, and (a) the person seeking to add information to the record must show due diligence in bringing the evidence to the DEP's attention at the earliest possible time in the licensing process; or (b) the evidence itself must be newly discovered and therefore unable to have been presented earlier in the process. Specific requirements for supplemental evidence are found in Chapter 2 § 24.

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, and is made easily accessible by the DEP. Upon request, the DEP will make application materials available during normal working hours, provide space to review the file, and provide an 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 general questions regarding the appeal process.
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. Unless a stay of the decision is requested and granted, 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, and will provide 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, any materials submitted in response to the appeal, and relevant excerpts from the DEP's application review file will be sent to Board members with a recommended decision from DEP staff. The appellant, the license holder if different from the appellant, and any interested persons are notified in advance of the date set for Board consideration of an appeal or request for public hearing. The appellant and the license holder will have an opportunity to address the Board at the Board meeting. 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, the 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. § 346(1); 06-096 C.M.R. ch. 2; 5 M.R.S. § 11001; and 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. 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. § 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.

Appendix B
US Army Corps of Engineers Individual Permit



DEPARTMENT OF THE ARMY
US ARMY CORPS OF ENGINEERS
NEW ENGLAND DISTRICT
696 VIRGINIA ROAD
CONCORD MA 01742-2751

Regulatory Division
File No. NAE-2019-00701

August 21, 2019

Maine Turnpike Authority
c/o Sean Donohue
2360 Congress Street
Portland, Maine 04102

Dear Mr. Donohue:

Enclosed are two copies of a Department of the Army permit authorizing you to place temporary and permanent fill below the ordinary high water mark of waters of the U.S. including adjacent freshwater wetlands. **Please sign both copies of the permit and return one signed copy to this office at the address above.** No fee is required. The authorized work cannot start until we receive a complete, signed copy of the permit.

You are required to complete and return the enclosed forms to this office:

1. Preliminary Jurisdictional Determination Form to be submitted along with your signed copy of the permit
2. Work Start Notification Form at least two weeks before the anticipated work start date.
3. Compliance Certification Form within one month following the completion of the authorized work.

This permit is a limited authorization containing a specific set of conditions. Please read the permit thoroughly to familiarize yourself with those conditions, **including any conditions contained on the enclosed state water quality certification.** If a contractor does the work for you, both you and the contractor are responsible for ensuring that the work is done in compliance with the permit's terms and conditions, as any violations could result in civil or criminal penalties.

Our verification of this project's wetland delineation under the Corps of Engineers Wetlands Delineation Manual, and its applicable supplement, is valid for a period of five years from the date of this letter unless new information warrants revision of the determination before the expiration date.

A combined Notification of Administrative Appeal Options and Process (NAP) and Request for Appeal (RFA) form, and flow chart explaining the appeals process and your options, are enclosed. If you desire to appeal this proffered permit, you must submit a completed RFA form along with any supporting or clarifying information to James W. Haggerty; Administrative Appeals Review Officer; North Atlantic Division, Corps of Engineers; North Atlantic Fort Hamilton Military Community, Bldg. 301; General Lee Avenue; Brooklyn, NY 11252-6700.

Contact info: (347) 370-4650 or james.w.haggerty@usace.army.mil.


In order for an RFA to be accepted by the Corps, the Corps must determine that it is complete, that it meets the criteria for appeal under 33 CFR 331.5, and that it has been received by the Division Office within 60 days of the date of the NAP.

You may not appeal conditions contained in the State water quality certification or the CZM consistency determination under this program as they are automatically included in the Federal permit. This authorization does not obviate the need to obtain other Federal, state, or local authorizations required by law.

We continually strive to improve our customer service. 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=regulatory_survey.

If you have any questions regarding this correspondence, please contact Colin Greenan at 978-318-8676 at our Augusta, Maine Project Office.

Sincerely,


Frank J. Del Giudice
Chief, Permits and Enforcement Branch
Regulatory Division

Enclosures

cc:

Laura Teracino, U.S. Environmental Protection Agency Region 1, Teracino.Laura@epa.gov

DEPARTMENT OF THE ARMY PERMIT

Permittee Maine Turnpike Authority c/o Sean Donohue, 2360 Congress Street, Portland, Maine 04102

Permit No. NAE-2019-00701

Issuing Office New England District

NOTE: The term "you" and its derivatives, as used in this permit, means the permittee or any future transferee. The term "this office" refers to the appropriate district or division office of the Corps of Engineers having jurisdiction over the permitted activity or the appropriate official of that office acting under the authority of the commanding officer.

You are authorized to perform work in accordance with the terms and conditions specified below.

Project Description:

Place temporary and permanent fill below the ordinary high water marks of Red Brook, Long Creek, an unnamed tributary to the Fore River, and an unnamed tributary to Capisic Brook and in adjacent freshwater wetlands along the Maine Turnpike (Interstate 95) from Holmes Road at Scarborough, north 5.7 mi. to approximately 0.2 mile north of Exit 48 at Portland, Maine all in order to upgrade the Turnpike to current safety and capacity standards and to accommodate projected traffic volumes.

Project Description Continued on Page 4

This work is shown on the attached plans entitled, "USGS Topographic Map" in one sheet dated "January 2019", "Sections" in 12 sheets dated "06/19" and "10/18" respectively and "WETLAND IMPACTS" in 32 sheets dated "FEBRUARY, 2019".

Project Location:

Along the Maine Turnpike in numerous waterways and adjacent freshwater wetlands between Scarborough, Maine and Portland, Maine.

Permit Conditions:

General Conditions:

1. The time limit for completing the work authorized ends on December 31, 2024. If you find that you need more time to complete the authorized activity, submit your request for a time extension to this office for consideration at least one month before the above date is reached.
2. You must maintain the activity authorized by this permit in good condition and in conformance with the terms and conditions of this permit. You are not relieved of this requirement if you abandon the permitted activity, although you may make a good faith transfer to a third party in compliance with General Condition 4 below. Should you wish to cease to maintain the authorized activity or should you desire to abandon it without a good faith transfer, you must obtain a modification of this permit from this office, which may require restoration of the area.
3. If you discover any previously unknown historic or archeological remains while accomplishing the activity authorized by this permit, you must immediately notify this office of what you have found. We will initiate the Federal and state coordination required to determine if the remains warrant a recovery effort or if the site is eligible for listing in the National Register of Historic Places.

4. If you sell the property associated with this permit, you must obtain the signature of the new owner in the space provided and forward a copy of the permit to this office to validate the transfer of this authorization.

5. If a conditioned water quality certification has been issued for your project, you must comply with the conditions specified in the certification as special conditions to this permit. For your convenience, a copy of the certification is attached if it contains such conditions.

6. You must allow representatives from this office to inspect the authorized activity at any time deemed necessary to ensure that it is being or has been accomplished in accordance with the terms and conditions of your permit.

Special Conditions:

1. The permittee shall ensure 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 work.

Special Conditions continued on Page 4

Further Information:

1. Congressional Authorities: You have been authorized to undertake the activity described above pursuant to:

() Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 403).

(X) Section 404 of the Clean Water Act (33 U.S.C. 1344).

() Section 103 of the Marine Protection, Research and Sanctuaries Act of 1972 (33 U.S.C. 1413).

2. Limits of this authorization.

a. This permit does not obviate the need to obtain other Federal, state, or local authorizations required by law.

b. This permit does not grant any property rights or exclusive privileges.

c. This permit does not authorize any injury to the property or rights of others.

d. This permit does not authorize interference with any existing or proposed Federal project.

3. Limits of Federal Liability. In issuing this permit, the Federal Government does not assume any liability for the following:

a. Damages to the permitted project or uses thereof as a result of other permitted or unpermitted activities or from natural causes.

b. Damages to the permitted project or uses thereof as a result of current or future activities undertaken by or on behalf of the United States in the public interest.

c. Damages to persons, property, or to other permitted or unpermitted activities or structures caused by the activity authorized by this permit.

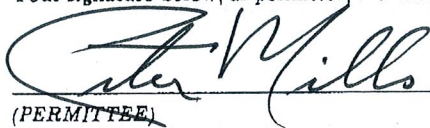
d. Design or construction deficiencies associated with the permitted work.

- e. Damage claims associated with any future modification, suspension, or revocation of this permit.
4. Reliance on Applicant's Data: The determination of this office that issuance of this permit is not contrary to the public interest was made in reliance on the information you provided.
5. Reevaluation of Permit Decision. This office may reevaluate its decision on this permit at any time the circumstances warrant. Circumstances that could require a reevaluation include, but are not limited to, the following:
- a. You fail to comply with the terms and conditions of this permit.
 - b. The information provided by you in support of your permit application proves to have been false, incomplete, or inaccurate (See 4 above).
 - c. Significant new information surfaces which this office did not consider in reaching the original public interest decision.

Such a reevaluation may result in a determination that it is appropriate to use the suspension, modification, and revocation procedures contained in 33 CFR 325.7 or enforcement procedures such as those contained in 33 CFR 326.4 and 326.5. The referenced enforcement procedures provide for the issuance of an administrative order requiring you to comply with the terms and conditions of your permit and for the initiation of legal action where appropriate. You will be required to pay for any corrective measures ordered by this office, and if you fail to comply with such directive, this office may in certain situations (such as those specified in 33 CFR 209.170) accomplish the corrective measures by contract or otherwise and bill you for the cost.

6. Extensions. General condition 1 establishes a time limit for the completion of the activity authorized by this permit. Unless there are circumstances requiring either a prompt completion of the authorized activity or a reevaluation of the public interest decision, the Corps will normally give favorable consideration to a request for an extension of this time limit.

Your signature below, as permittee, indicates that you accept and agree to comply with the terms and conditions of this permit.

 _____ 8.22.2019 _____
 (PERMITTEE) (DATE)

This permit becomes effective when the Federal official, designated to act for the Secretary of the Army, has signed below.

 _____ 21 August 2019 _____
 Frank J. Del Giudice (DATE)
 Chief, Permits & Enforcement Branch
 For District Engineer

When the structures or work authorized by this permit are still in existence at the time the property is transferred, the terms and conditions of this permit will continue to be binding on the new owner(s) of the property. To validate the transfer of this permit and the associated liabilities associated with compliance with its terms and conditions, have the transferee sign and date below.

 (TRANSFeree) (DATE)

Project Description Continued from Page 1

This work includes the addition of a third travel lane in each direction, shoulder widening, sideslope improvements, and drainage improvements. This work will result in approximately 4,873 s.f. of permanent and 3,351 s.f. temporary streambed impact and 4.24 ac. of permanent and 1.17 ac. of temporary freshwater wetland impact.

Special Conditions continued from Page 2

If the permit is issued after the construction specifications but before receipt of bids or quotes, the entire permit shall be included as an addendum to the specifications. If the permit is issued after receipt of bids or quotes, the entire permit shall be included in the contract or sub-contract as a change order. 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 jurisdiction.

2. 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 to this office at least two weeks before the anticipated starting date. The permittee shall complete and return the enclosed Compliance Certification Form within one month following the completion of the authorized work. **These forms are attached after the plans.**

3. Except where stated otherwise, reports, drawings, correspondence and any other submittals required by this permit shall be marked with the words "Permit No. NAE-2019-00701" and shall be addressed to "Inspection Section, CENAE-R, U.S. Army Corps of Engineers, 696 Virginia Road, Concord, MA 01742-2751." Documents which are not marked and addressed in this manner may not reach their intended destination and do not comply with the requirements of this permit.

4. Compensatory mitigation shall consist of payment of \$803,816.63 to the Maine Natural Resource Conservation Program. The attached completed In-Lieu-Fee (ILF) Project Data Worksheet shall be mailed with a cashier's check or bank draft made out to "Treasurer, State of Maine", with the permit number clearly noted on the check. The check and worksheet shall be mailed to Maine Department of Environmental Protection, Attention: ILF Program Administrator, 17 State House Station, Augusta, Maine 04333. **This authorization is not valid until the permittee provides the Corps with a copy of the check with the permit number noted on the check.** The ILF amount is only valid for a period of one year from the date of the authorization. After that time, the project shall be reevaluated and a new amount determined.

5. Adequate sedimentation and erosion control devices, such as geo-textile 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.

6. No temporary fill (e.g., access roads, cofferdams) may be placed in waters or wetlands unless specifically authorized by this permit. If temporary fill is used, it shall be disposed of at an upland site and suitably contained to prevent its subsequent erosion into a water of the U.S., and the area shall be restored to its original contours (but not higher) and character upon completion of the project. During use, such temporary fill must be stabilized to prevent erosion or, in the case fill placed in flowing water (rivers or streams), clean washed stone should be used.

7. In-stream construction work at the Red Brook crossing shall be conducted between July 1st and October 1st in any year in order to minimize potential impacts to aquatic resources and local water quality. In-stream construction work at the Long Creek, unnamed tributary to the Fore River and unnamed tributary to Capisic Brook crossings shall be conducted between April 1st and November 1st in any year also in order to minimize potential impacts to aquatic resources and local water quality. All in-stream construction work shall also be conducted "in the dry" using cofferdams, temporary flume pipes, culverts, etc. and downstream flows shall be maintained during in-stream construction.

8. No tree cutting shall occur between June 1st and July 31st of any year, and to the maximum extent practicable, tree cutting shall occur between October 16th and April 9th of any year in order to minimize potential impacts to federally threatened northern long-eared bats.

MAINE IN-LIEU-FEE (ILF) PROJECT IMPACT WORKSHEET

DEP Invoice # _____ *Filled in by ILF Administrator in Augusta*

Project name: Maine Turnpike Portland Area Widening

Permittee(s): Maine Turnpike Authority c/o Sean Donohue

DEP/Corps permit #: L-27726-TG-A-N/NAE-2019-00701 *Attach a copy of the permit*

DEP/Corps Project Manager: Robert Green/Colin Greenan

ILF Fee Amount: \$803,816.63 (184,835 s.f. x (\$3.61 + \$0.69) + (6,997 s.f. x (3.61+\$0.69) x 0.30)

Check Date: _____ *Filled in by ILF Administrator in Augusta*

Project address: from Holmes Rd. to 0.2 mi. north of Exit 48 *Attach a locus map*

Biophysical region - Section: South Coastal

Biophysical region - Subsection: Gulf of Maine Coastal Lowland

Total impact area subject to compensation: 191,832 s.f.

Resource(s) impacted:

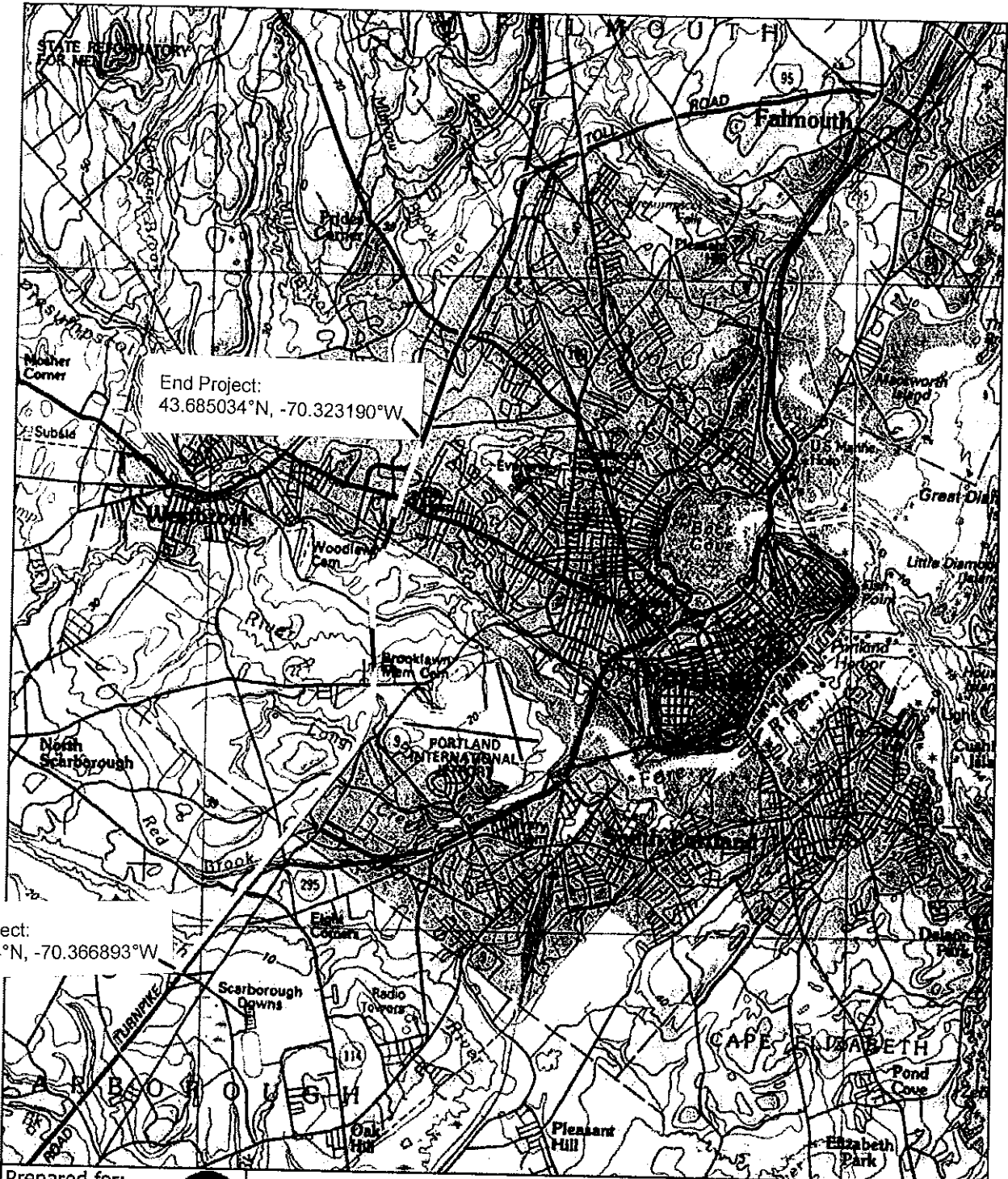
Resource Types (list all that apply)	Functions & Values (for wetland impacts) (list all that apply, by resource type)	Types of Impacts (list all that apply, by resource type)	SF Impacted (by resource type)	Linear FT of Streams Impacted (for Corps use)
PEM	FF,FSH,STR,NR,VQ,WH	Fill	166,193 s.f.	
PFO	FF,FSH,STR,NR,VQ,WH	Fill	18,642 s.f.	
PFO	FF,FSH,STR,NR,VQ,WH	Conversion from PFO to PEM	6,997 s.f.	
Total impacts:			191,832 s.f.	

Resource Types: Wetlands by NWI Type (PEM, PFO, PSS, PUB, M1, M2, E1, E2, etc), significant vernal pool depression (SVP), significant vernal pool critical terrestrial habitat (VPCTH), shorebird feeding & staging habitat (shorebird), inland waterfowl & wading bird habitat (IWWH), Tidal waterfowl & wading bird habitat (TWWH), lake or pond (L1, L2), river/stream/brook (RSB)


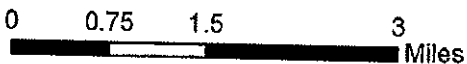

Wetland Functions & Values: Groundwater recharge/discharge (GWR); floodflow alteration (FF); fish & shellfish habitat (FSH); sediment toxicant retention (STR); nutrient removal (NR); production export (PE); sediment/shoreline stabilization (SS); recreation (R); education/scientific value (ESV); uniqueness/heritage (UH); and visual quality/aesthetics (VQ); wildlife habitat (WH)

Types of Impacts: May include: filling, dredging, vegetation conversion (e.g. forested to shrub/scrub), excavation with associated discharge, etc.

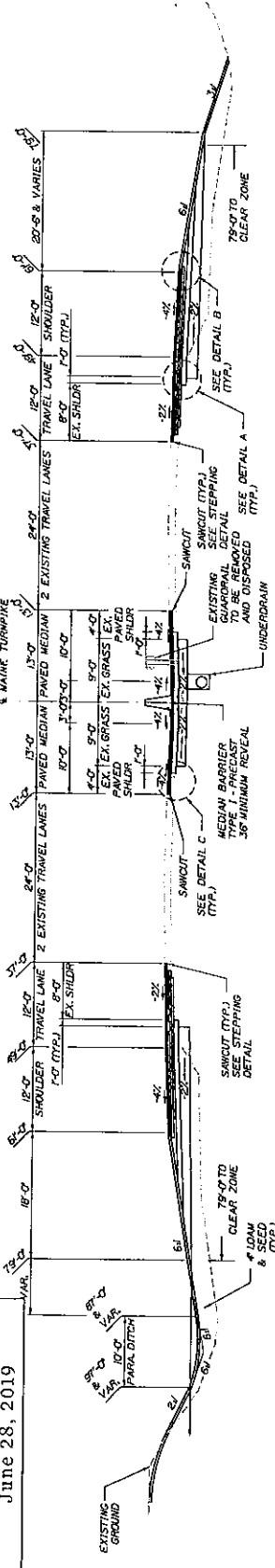
APPENDIX A: U.S.G.S. TOPOGRAPHICAL MAP AND AERIAL SITE PLAN



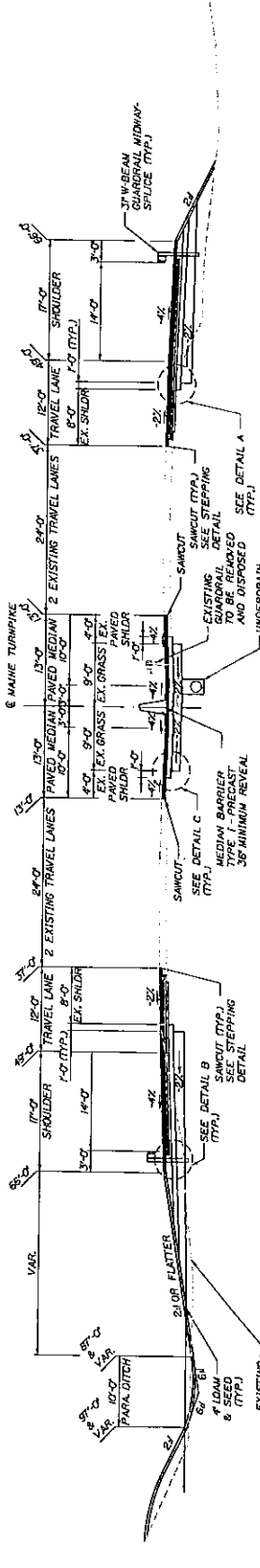
Begin Project:
43.610374°N, -70.366893°W

Prepared for: The Maine Turnpike Authority 	Portland Area Widening Project Area	USGS Topographic Map
Prepared by: HNTB		 January 2019

60% Submission
June 28, 2019

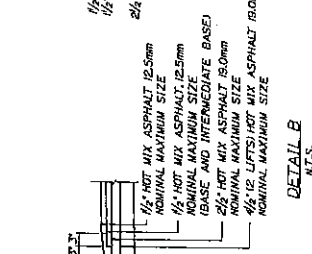
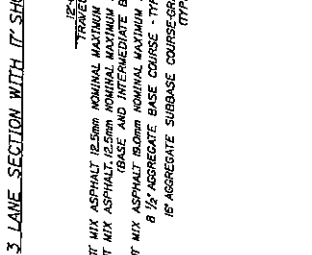
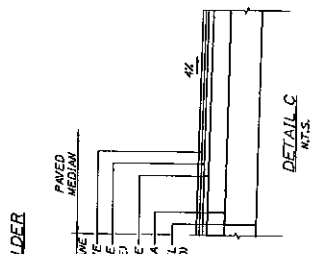


3 LANE SECTION WITH 12' SHOULDER



3 LANE SECTION WITH 17' SHOULDER

- NOTES:
1. THE PAVEMENT BASE DEPTHS AND CROSS SLOPES AS SHOWN ON THE PLANS ARE INTENDED TO BE NOMINAL.
 2. WHEN SUPERELEVATION OF THE TRAVEL LANES EXCEEDS 4% LOW SIDE SHOULDER SHALL HAVE THE SAME SLOPE AS THE TRAVEL LANE.
 3. CONCRETE WEARWASH DIFFERENCE IN RATES OF CROSS SLOPE SHALL NOT EXCEED 6%.
 4. CURBS FOR BOTH SUPERELEVATED AND NORMAL SECTIONS FOR ALL COURSES OF SUBBASE AND PAVEMENT SHALL BE STRAIGHT.
 5. A LAYER OF HOT RUBBERIZED ASPHALT SHALL BE APPLIED TO SURFACE LAYER OF ALL SAWCUT AND PAVEMENT JOINTS PRIOR TO PAVING. REMAINDER TO BE BITUMINOUS TACK COAT. PAVEMENT SHALL BE INCIDENTAL TO THE PAVEMENT THEMSELVES.
 6. BITUMINOUS TACK COAT IS REQUIRED BETWEEN ALL LIFTS OF PAVEMENT OR BETWEEN PAVEMENT AND SUBBASE OR WELDED SURFACES PRIOR TO FINISHING PROPOSED PAVEMENT.
 7. CONTRACTOR TO VERIFY FOR ADEQUATE COURSE DEPTHS FROM RAMP ADJACENT TO TURNPIKE TO RAMP PROPER.



Scale: NOT TO SCALE.

No.	Revision	By	Date

Designed by: _____

HNTB

CONSULTANT PROJECT MANAGER: DALE A. MITCHELL, P.E.

By	Date

Checked: PJS 05/19
In Charge: RAL 06/19



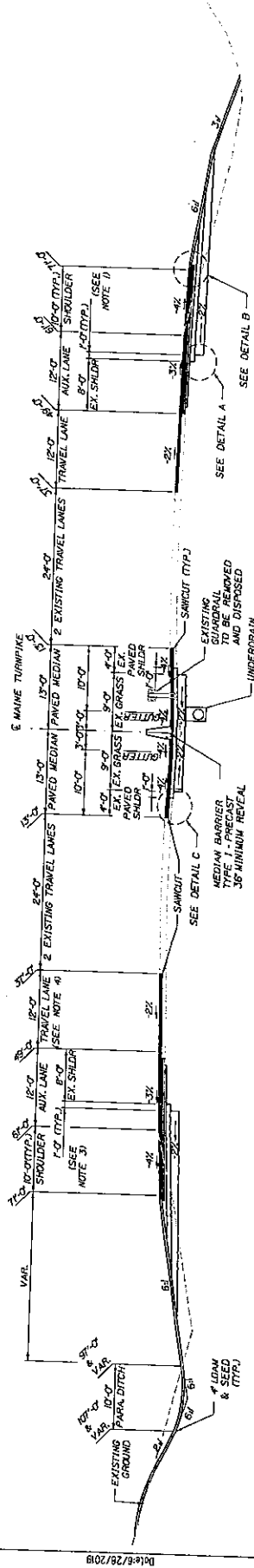
THE GOLD STAR
MEMORIAL HIGHWAY

PORTLAND AREA WIDENING &
SAFETY IMPROVEMENTS
MM 43.0 TO MM 49.3
TYPICAL SECTIONS (1 OF 3)

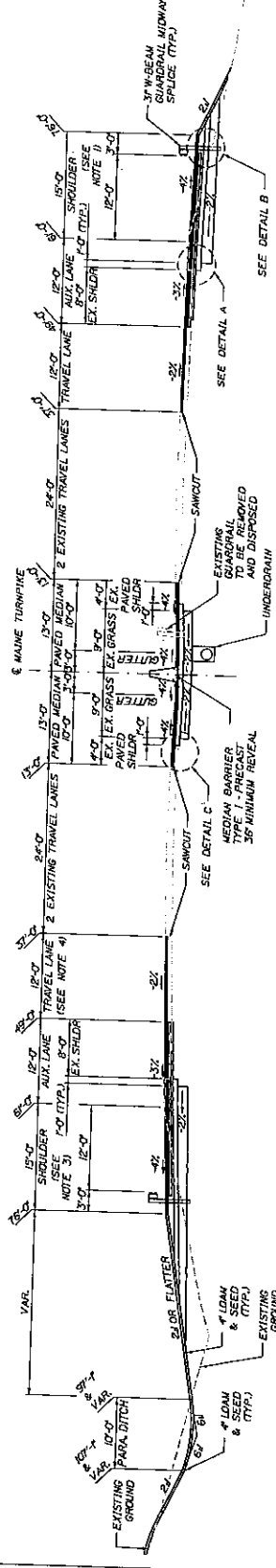
CONTRACTS
NTA PROJECT MANAGER: RALPH NORWOOD IV, P.E., P.D.E.

Sections
Maine Turnpike Authority- Portland Area
Widening
NAE-2019-00701
Sheet 1 of 12
Date: 06/19/19

60% Submission
June 28, 2019



ACCELERATION/ DECELERATION LANE SECTION
WITH 10' SHOULDER



ACCELERATION/ DECELERATION LANE SECTION
WITH 15' SHOULDER

Scale: NOT TO SCALE

No.	Revision	By	Date

Designed by:

Consultant	Project Manager	Date	By	Date
HNTB	DALE A. MITCHELL, P.E.	06/19	DA	06/19

HNTB CORPORATION
340 County Road, Suite 6-C
Waterville, ME 05682
TEL (207) 774-5152
FAX (207) 428-0809



THE GOLD STAR
MEMORIAL HIGHWAY

PORTLAND AREA WIDENING &
SAFETY IMPROVEMENTS
MM 43.0 TO MM 49.3
TYPICAL SECTIONS (2 OF 3)

CONTRACTS:
MTA PROJECT MANAGER: RALPH NORWOOD IV, P.E., PTOE

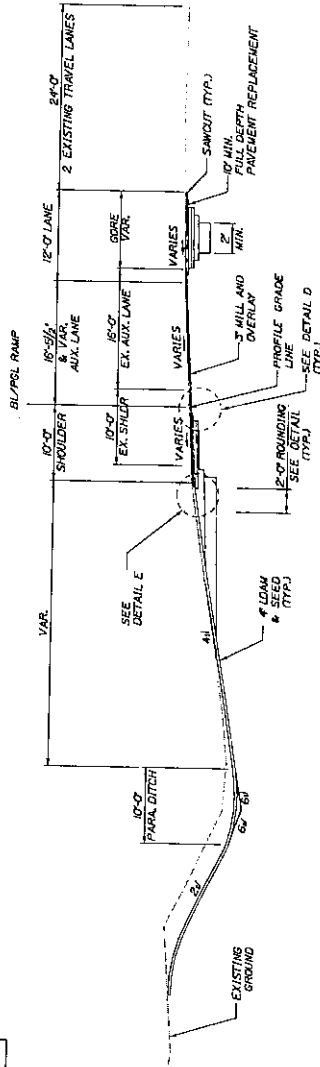
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Sections
Maine Turnpike Authority- Portland Area
Widening
NAE-2019-00701
Sheet 2 of 12

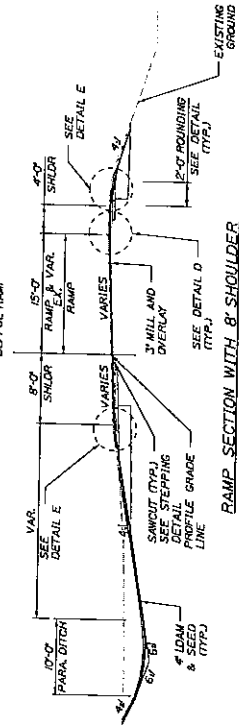
Dale E. 26/2019

Form: 001 TP-02-09

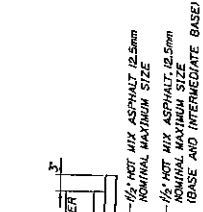
60% Submission
June 28, 2019



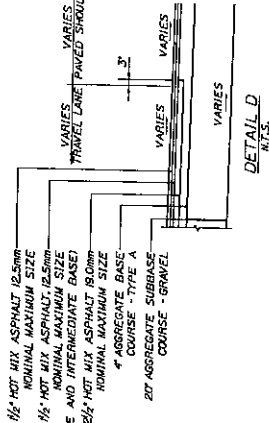
ACCELERATION, DECELERATION LANE SECTION
WITH 10' SHOULDER AND GORE



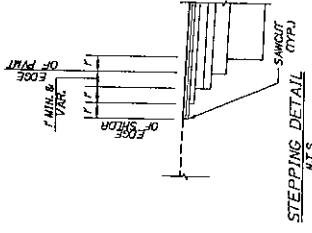
RAMP SECTION WITH 8' SHOULDER



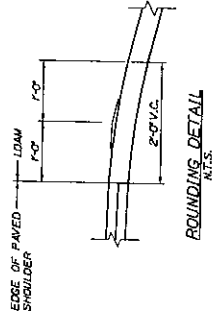
DETAIL E
N.T.S.



DETAIL D
N.T.S.



STEPPING DETAIL
N.T.S.



ROUNDING DETAIL
N.T.S.

Scale: NOT TO SCALE

No.	Revision	By	Date

Designed by:



HNTB CORPORATION
340 County Road, Suite 6-C
Westbrook, ME 04092
TEL (207) 774-5155
FAX (207) 228-0809

CONSULTANT PROJECT MANAGER:	DALE A. MITCHELL, P.E.
Checked	DAJ 06/19
Designed	GW 06/19
Drawn	in Charge of DAL 06/19

THE GOLD STAR
MEMORIAL HIGHWAY



PORTLAND AREA
MAINLINE IMPROVEMENTS
MM 43.7 TO MM 49.3
TYPICAL SECTION (3 OF 3)

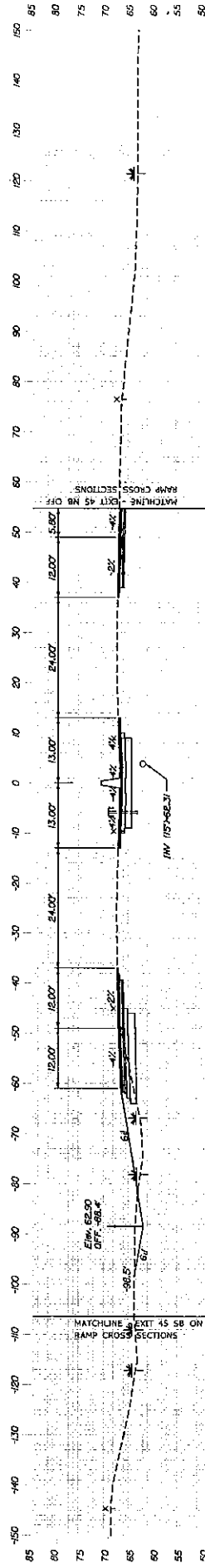
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MTA PROJECT MANAGER: RALPH HORNWOOD IV, P.E., PTOE

SHEET NUMBER: TYP-03

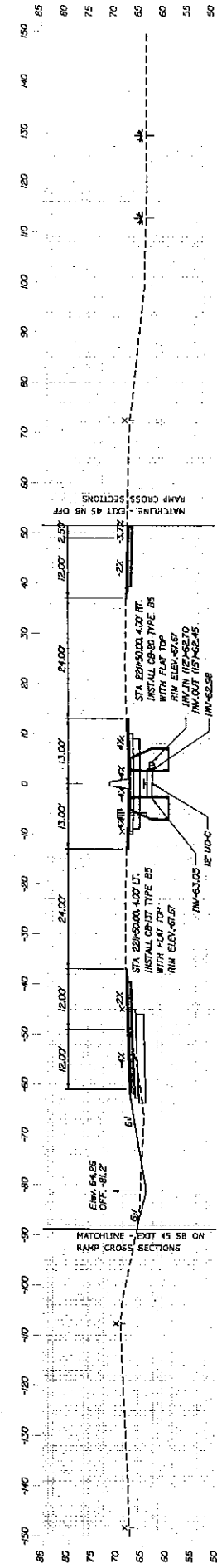
Sections
Maine Turnpike Authority- Portland Area
Widening
NAE-2019-00701
Sheet 3 of 12

60% SUBMISSION
June 28, 2019

Date: 6/28/2019



b 2212+00.00



b 2211+50.00

Scale: 1" = 20'

By Date

Designed TA 06/19 Checked TRS 06/19
Drawn GW 06/19 In Charge of RAL 06/19

Designed by:



CONSULTANT PROJECT MANAGER: DALE A. MITCHELL, P.E.

HNTB CORPORATION
340 County Road, Suite 6-C
Westbrook, ME 04092
TEL (207) 774-5155
FAX (207) 774-5909



THE GOLD STAR
MEMORIAL HIGHWAY

M.T.A. PROJECT MANAGER: RALPH NORWOOD, W.P.E., P.T.O.E.

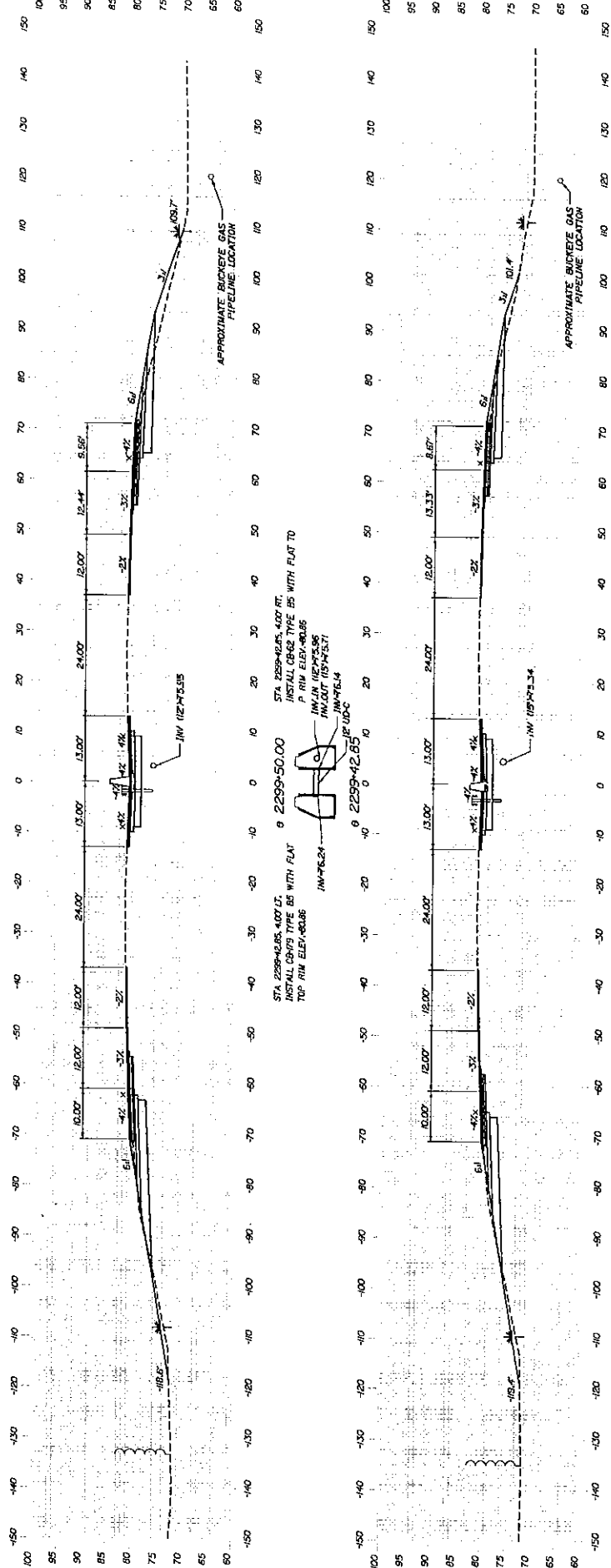
CONTRACT:

PORTLAND AREA WIDENING &
SAFETY IMPROVEMENTS
MM 43.0 TO MM 49.3
MAINE TURNPIKE CROSS SECTIONS
STA. b 2211+50 TO STA. b 2212+00

Sections
Maine Turnpike Authority - Portland Area
Widening
NAE-2019-00701
Sheet 4 of 12
Date: "06/19"

Filename: 000_Cross-Section_50.dgn

60% SUBMISSION
June 28, 2019



Scale: 1" = 20'
Scale of Feet

No.	Revision	By	Date

Designed by: HNTB
 CONSULTANT PROJECT MANAGER: DALE A. MITCHELL, P.E.
 Checked: TRS 06/19
 In Charge of: JAL 06/19
 Drawn: GW 06/19

HNTB CORPORATION
 340 County Road, Suite 6-C
 Westbrook, ME 04092
 TEL (207) 774-5955
 FAX (207) 728-0809

MAINE TURNPIKE
 THE GOLD STAR
 MEMORIAL HIGHWAY

PORTLAND AREA WIDENING &
 SAFETY IMPROVEMENTS
 MM 43.0 TO MM 49.3
 MAINE TURNPIKE CROSS SECTIONS
 STA. e 2299+00 TO STA. e 2299+50

CONTRACT: MTA PROJECT MANAGER: RALPH NORWOOD IV, P.E., PTOE

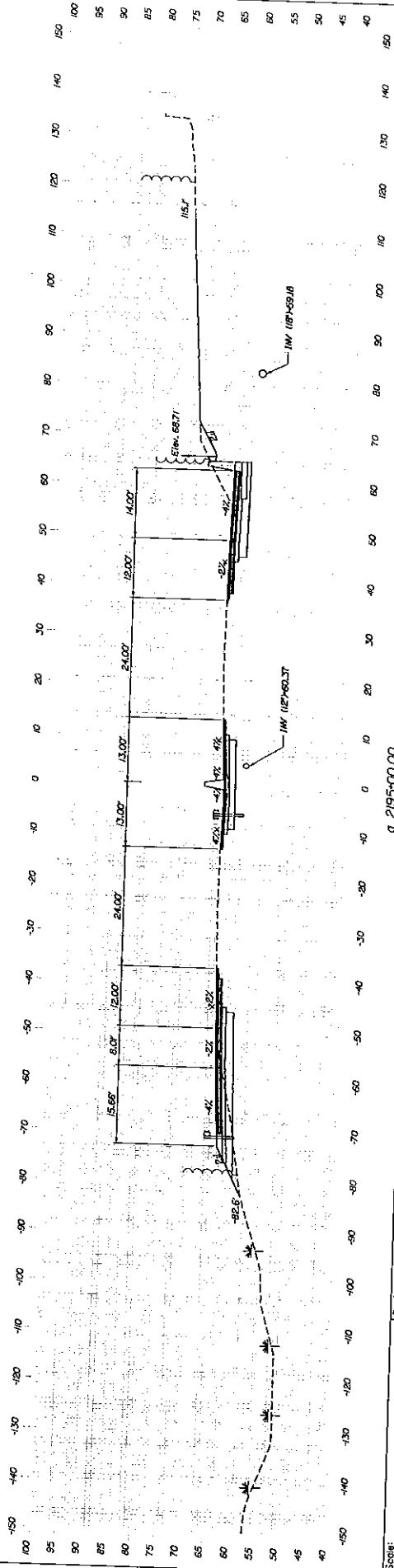
Sections
 Maine Turnpike Authority- Portland Area
 Widening
 NAE-2019-00701
 Sheet 5 of 12
 Date: "06/19"

Date: 6/28/2019

From: 000_Cross_Section_145.dwg

60% SUBMISSION
June 28, 2019

Date: 6/28/2019



Scale: 1" = 20'
 Scale of Paper: 1" = 20'
 Revision: _____
 No. _____
 By: _____
 Date: _____
 Checked: _____
 In Charge of: _____
 Drawn: _____
 Date: 06/19
 By: T.A.
 Checked: T.B.S.
 In Charge of: R.A.L.
 Date: 06/19

HNTB

HNTB CORPORATION
 340 County Road, Suite 6-C
 Westbrook, ME 04092
 TEL (207) 774-5852
 FAX (207) 228-5909

MAINE TURNPIKE

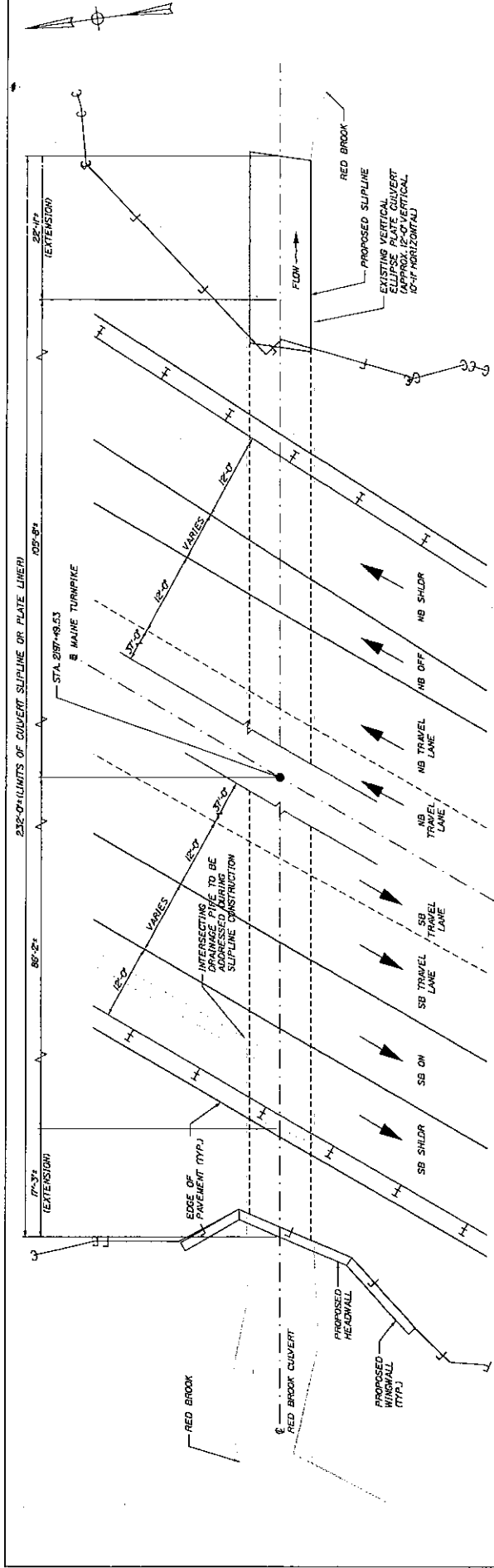
THE GOLD STAR MEMORIAL HIGHWAY

PORTLAND AREA WIDENING & SAFETY IMPROVEMENTS
 MM 43.0 TO MM 49.3
 MAINE TURNPIKE CROSS SECTIONS
 STA. 0 2195+00 TO STA. 0 2195+00

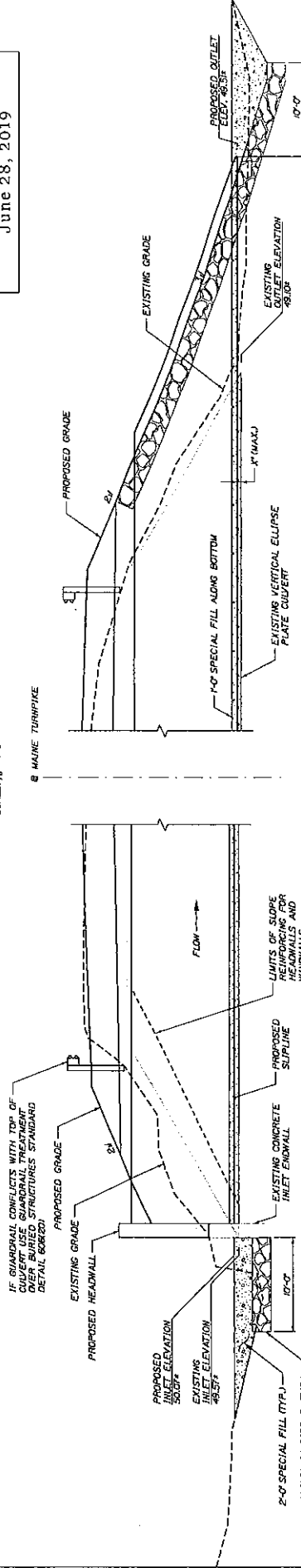
CONTRACT: _____
 SHEET NUMBER: _____

M.A. PROJECT MANAGER: RALPH INGHAM IV, P.E., P.T.C.E.

Sections
 Maine Turnpike Authority- Portland Area
 Widening
 NAE-2019-00701
 Sheet 6 of 12



PLAN VIEW - RED BROOK CULVERT
SCALE: 1/8" = 1'-0"



LONGITUDINAL SECTION - RED BROOK CULVERT
SCALE: 1/4" = 1'-0"

60% Submission
June 28, 2019

Scale:

No.	Revised	By	Date

Designed by: _____

Checked by: _____

In Charge of: _____

HNTB

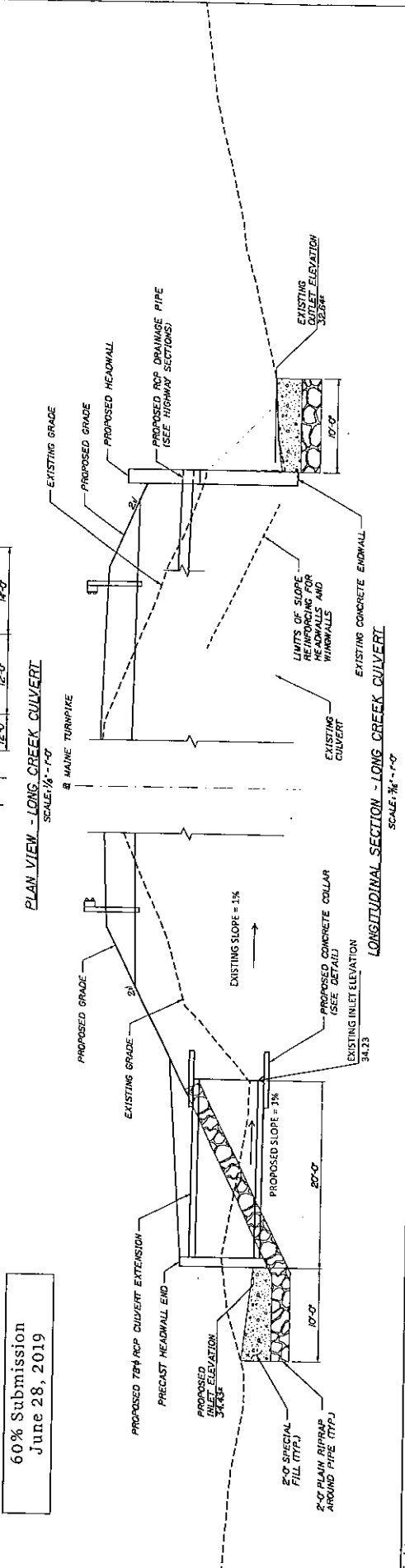
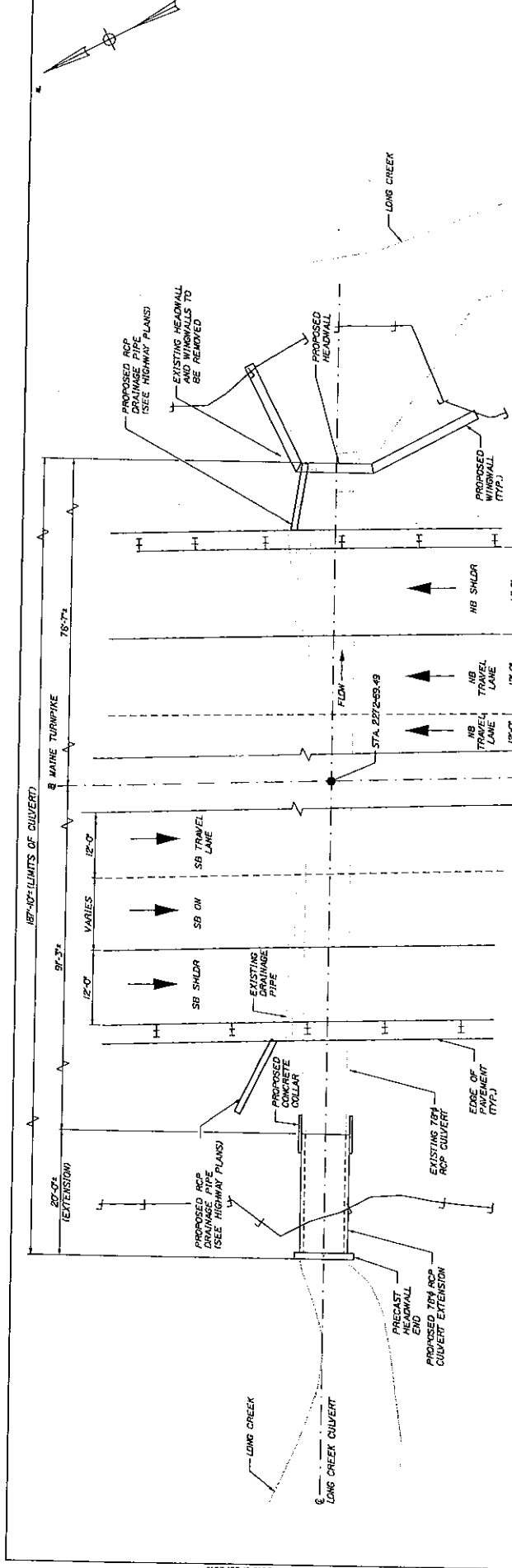
HNTB CORPORATION
340 County Road, Suite 6-C
Westbrook, ME, 04092
TEL (207) 728-5355
FAX (207) 728-0303

MAINE TURNPIKE

THE GOLD STAR
MEMORIAL HIGHWAY

PORTLAND AREA WIDENING &
SAFETY IMPROVEMENTS
RED BROOK CULVERT MODIFICATIONS
GENERAL PLAN AND SECTION
SHEET NUMBER: S-02

Sections
Maine Turnpike Authority- Portland Area
Widening
NAE-2019-00701
Sheet 7 of 12



60% Submission
June 28, 2019

PORTLAND AREA WIDENING &
SAFETY IMPROVEMENTS
LONG CREEK CULVERT MODIFICATIONS
GENERAL PLAN AND SECTION
SHEET NUMBER: S-04

THE GOLD STAR
MEMORIAL HIGHWAY

CONTRACT:
MTA PROJECT MANAGER: RALPH NORWOOD IV, P.E., PTOC

HNTB CORPORATION
340 County Road, Suite 6-C
Westbrook, ME 04092
TEL (207) 774-5155
FAX (207) 728-0908

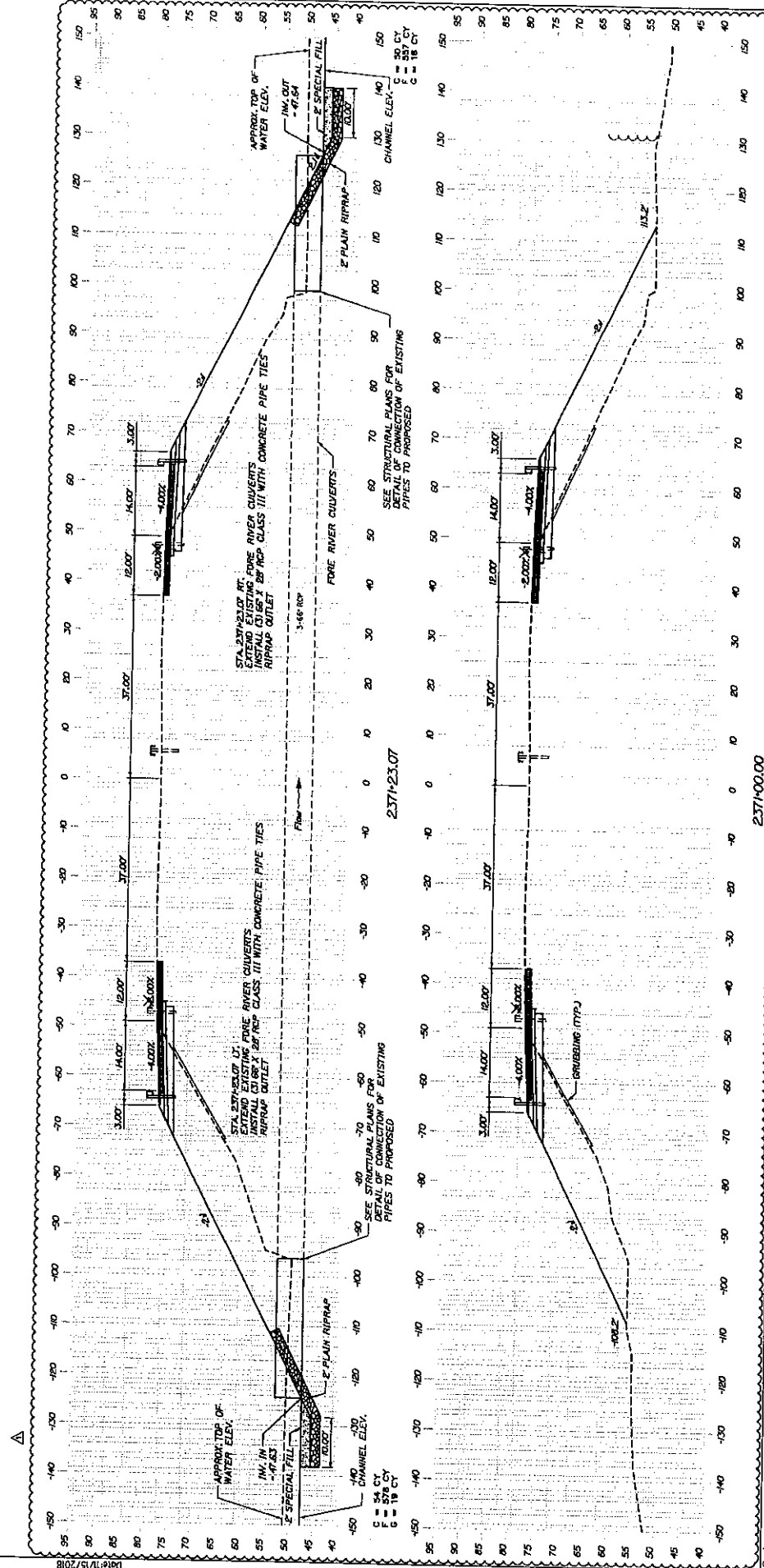
HNTB		DESIGNED BY:	
No.	Revision	By	Date

CONSULTANT PROJECT MANAGER: DALE A. MITCHELL, P.E.
 BY: DAK 05/18
 CHECKED: JAY 05/18
 DESIGNED: ERE 05/18
 DRAWN: IN CHARGE OF: RAL 05/18

Sections
Maine Turnpike Authority - Portland Area
Widening
NAE-2019-00701
Sheet 8 of 12

Date: 6/28/2019

Frame: 004 - Long Creek Culvert Mods - General Plan and Elevation



THE GOLD STAR MEMORIAL HIGHWAY
 BRIDGE IMPROVEMENTS
 MAINE CENTRAL RAILROAD OVERPASS
 STA. 2371+00 TO STA. 2371+23

MTA PROJECT MANAGER: Kristin Goyen, P.E.
 CONTRACT: 2

HNTB CORPORATION
 340 County Road, Suite 6-C
 Westbrook, ME 04092
 TEL (207) 774-5155
 FAX (207) 728-0909

HNTB CONSULTANT PROJECT MANAGER: Timothy Coils, PE	
By: [Signature]	Checked: [Signature]
Designated: [Signature]	In Charge of: [Signature]

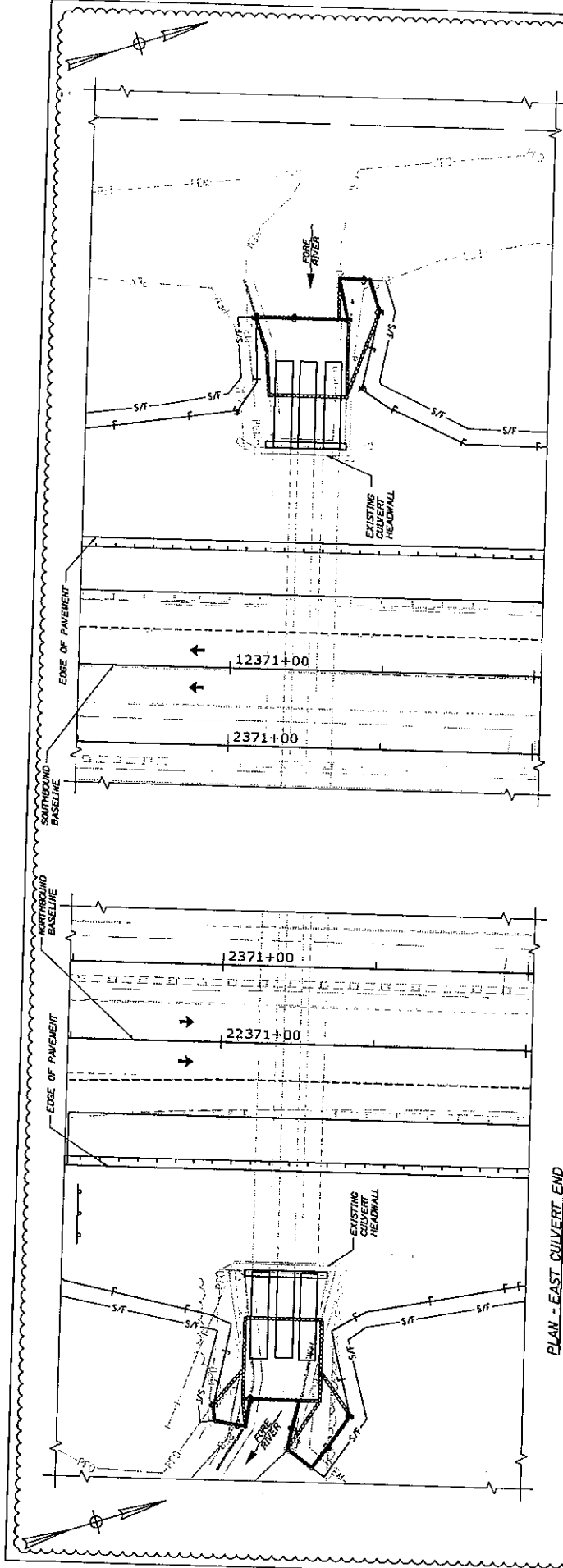
No. 1	Revision	By: [Signature]	Date: [Date]
1	FORE RIVER CULVERTS	JRH	10/7/18

Sections
 Maine Turnpike Authority - Portland Area
 Widening
 NAE-2019-00701
 Sheet 9 of 12

Scale: 1" = 20'
 Scale of Feet

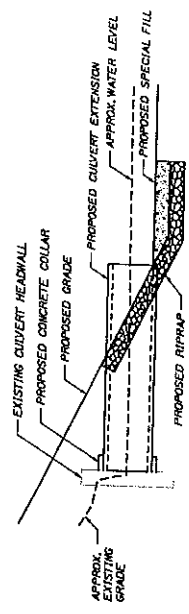
Designed by:

Date: 11/15/2018



PLAN - WEST CULVERT END
1/8" = 1'-0"

PLAN - EAST CULVERT END
1/8" = 1'-0"



ELEVATION AT CULVERT END
1/8" = 1'-0"
(EASTWARD SHOWING WESTWARD SLOPE)

- NOTES:**
1. SEE SPECIAL PROVISION SECTION 603 FOR FORE RIVER CONCRETE COLLAR FOR ADDITIONAL INFORMATION.
 2. CONCRETE SHALL BE CLASS A AND REINFORCING SHALL BE EPOXY COATED GRADE 60.
 3. REFER TO GENERAL PLAN AND CROSS SECTIONS FOR ADDITIONAL INFORMATION ON GRADING AND RIPRAP LIMITS.
 4. CONSTRUCTION JOINTS HAVE BEEN PROVIDED TO ALLOW PHASED CONSTRUCTION. COFFERDAMS MAY BE USED AND ARE TO BE PAID FOR UNDER ITEM SIGTS AND SLOPE.
 5. ALL WORK ASSOCIATED WITH THE CONCRETE COLLAR SHALL BE PAID FOR UNDER ITEM 603.02B.
 6. CONTRACTOR SHALL NOTE THAT PRESERVE LIMITS HAVE BEEN PLACED ON THE WORK THAT IMPACTS FORE RIVER AND WETLANDS SURROUNDING THE PROJECT. NO WORK IMPACTING FORE RIVER AND THE SURROUNDING WETLANDS SHALL OCCUR BEFORE JULY 15, 2018 OR UNTIL A FINAL AUTHORIZED ENVIRONMENTAL PERMIT HAS BEEN RECEIVED AS APPROVED BY THE RESIDENT.
 7. REINFORCING STEEL SHALL HAVE A CLEAR COVER OF 3".
 8. FOR CULVERT EXTENSION DETAILS SEE SHEET S-4.

Scale: AS NOTED

No.	Revision	By	Date
1	CULVERT EXTENSION	JSM	10/18

Designed by:

Checked	By	Date
EMC	10/18	10/18
PEB	10/18	10/18

In Charge of:

Checked	By	Date
EMC	10/18	10/18
PEB	10/18	10/18



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340 County Road, Suite 6-C
Westbrook, ME 04092
TEL (207) 774-5855
FAX (207) 228-0809



THE GOLD STAR
MEMORIAL HIGHWAY

BRIDGE IMPROVEMENTS
MAINE CENTRAL RAILROAD OVERPASS
FORE RIVER CULVERT I

CONTRACT

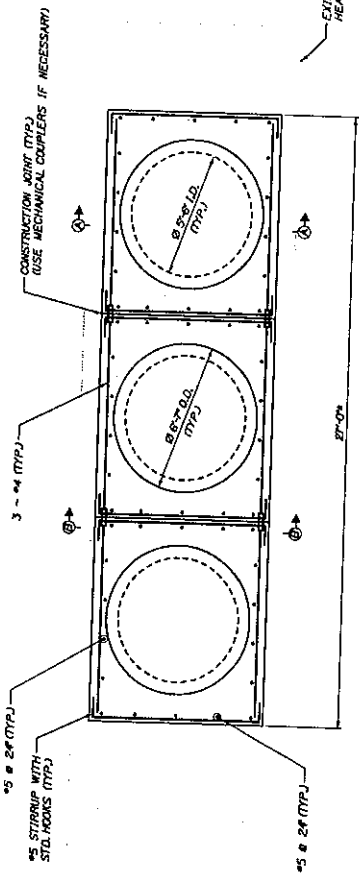
MTA PROJECT MANAGER: Kristi Van Ooyen, P.E.

SHEET NUMBER: S-40

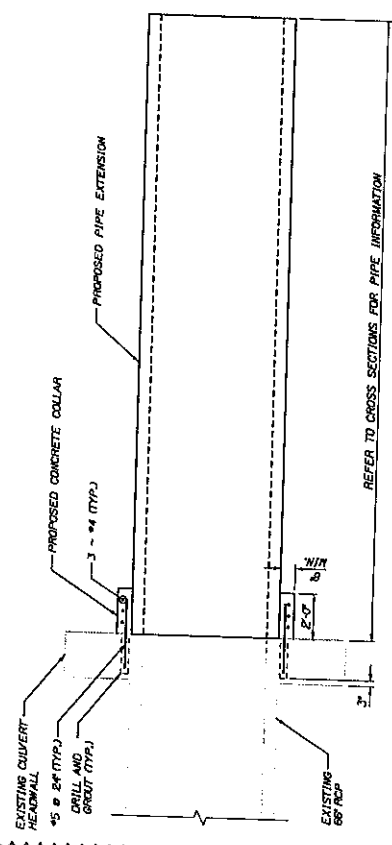
Sections
Maine Turnpike Authority- Portland Area
Widening
NAE-2019-00701
Sheet 10 of 12

Date: 11/15/2018

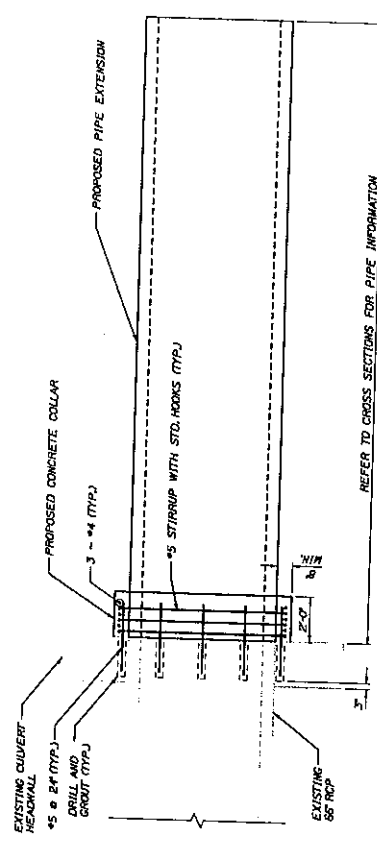
13100000-091 For Fore River Culvert 1.dgn



ELEVATION VIEW
3/4" = 1'-0"



SECTION A-A
3/4" = 1'-0"



SECTION B-B
3/4" = 1'-0"

NOTES:
1. CONTRACTOR TO VERIFY EXISTING PIPE AND HEADWALL DIMENSIONS PRIOR TO CONSTRUCTION.

Scale: AS NOTED

No.	Description	By	Date
1	CUVERT EXTENSION	JSW	10/18

Designed by	Checked	By	Date



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Westbrook, ME 04092
TEL (207) 774-5155
FAX (207) 228-0809



THE GOLD STAR
MEMORIAL HIGHWAY

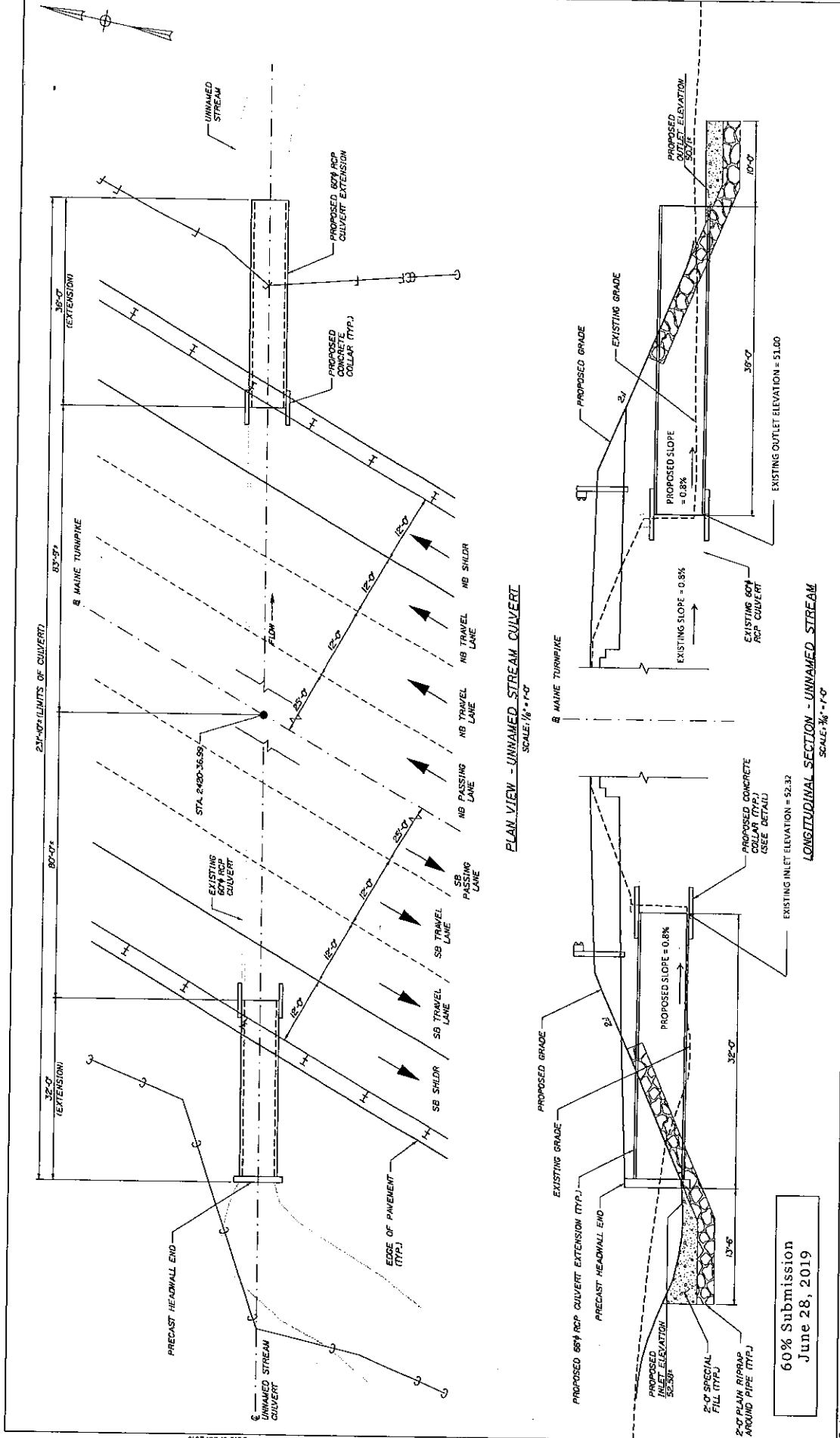
BRIDGE IMPROVEMENTS
MAINE CENTRAL RAILROAD OVERPASS
FORE RIVER CULVERT II

CONTRACT

MTA PROJECT MANAGER: Kristi Van Dyke, P.E.

SHEET NUMBER: S-41

Sections
Maine Turnpike Authority- Portland Area
Widening
NAE-2019-00701
Sheet 11 of 12



60% Submission
June 28, 2019

Scale: _____

No.	Revision	By	Date

Designed by: _____
Checked by: _____
In Charge of: _____



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Westbrook, ME 04092
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FAX (207) 228-0908



THE GOLD STAR
MEMORIAL HIGHWAY

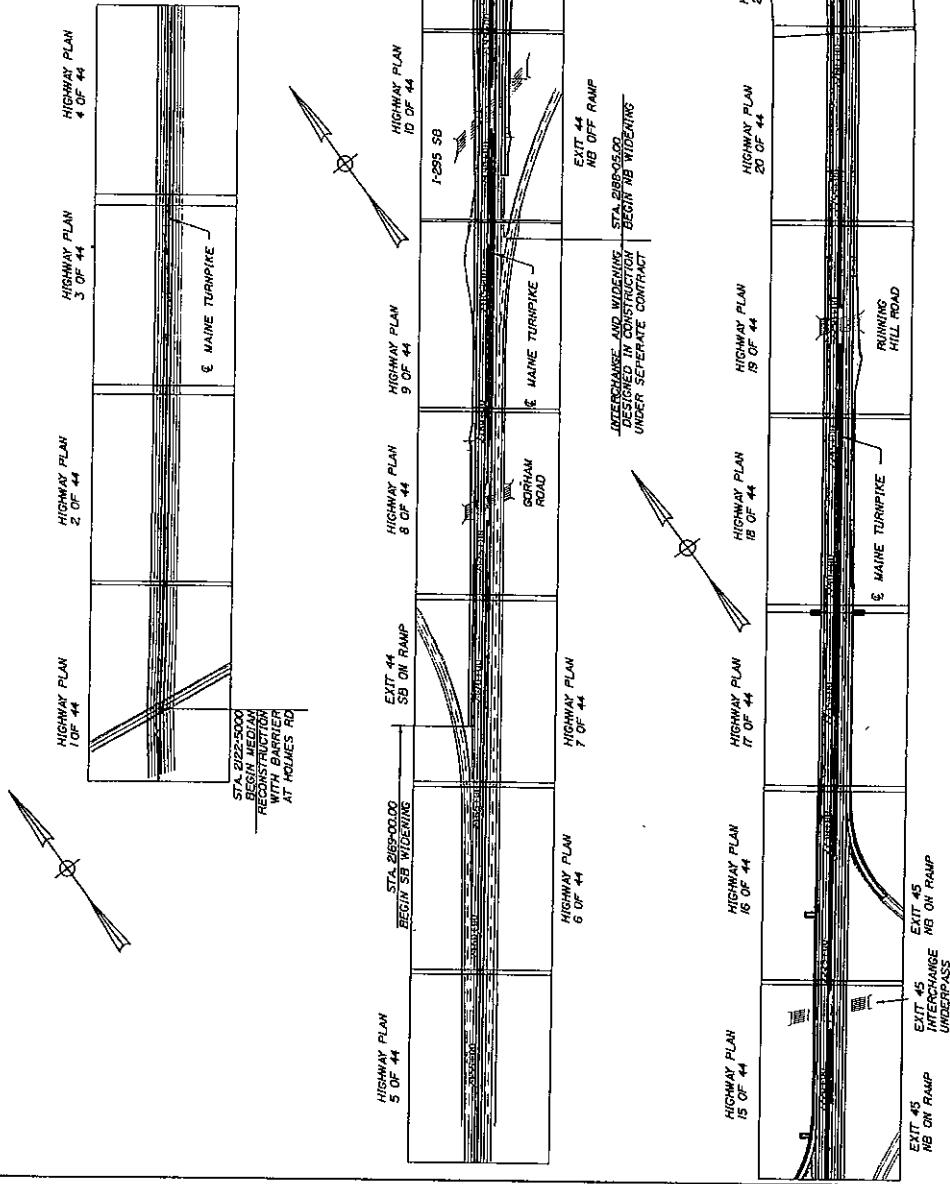
M.T.A. PROJECT MANAGER: BALEH, NORWOOD IV, P.E., P.T.O.E.

CONTRACT: _____

PORTLAND AREA WIDENING &
SAFETY IMPROVEMENTS
UNNAMED STREAM CULVERT MODIFICATIONS
GENERAL PLAN AND SECTION

SHEET NUMBER: S-07

Sections
Maine Turnpike Authority- Portland Area
Widening
NAE-2019-00701
Sheet 12 of 12



Plan Legend

- Temporary stone check dam
- Wetland
- Temporary wetland impact
- Permanent wetland impact
- Stream impact
- Limit of field delineated wetland (wetland continuous)
- Limit of field delineated wetland of special significance (WSS)
- ROW line
- Silt fence
- Clearing limit

Symbols Key

- Groundwater Recharge/ Discharge
- Floodflow Alteration (Storage & Desynchronization)
- Fish and Shellfish Habitat
- Sediment/Toxicant Retention
- Nutrient
- Removal/Retention/Transformation
- Production Export

Principal Value or Function

Wetland I.D.	Total Acres	Impacted Acres
	-	-
	-	-
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ARCHITECTS ENGINEERS PLANNERS

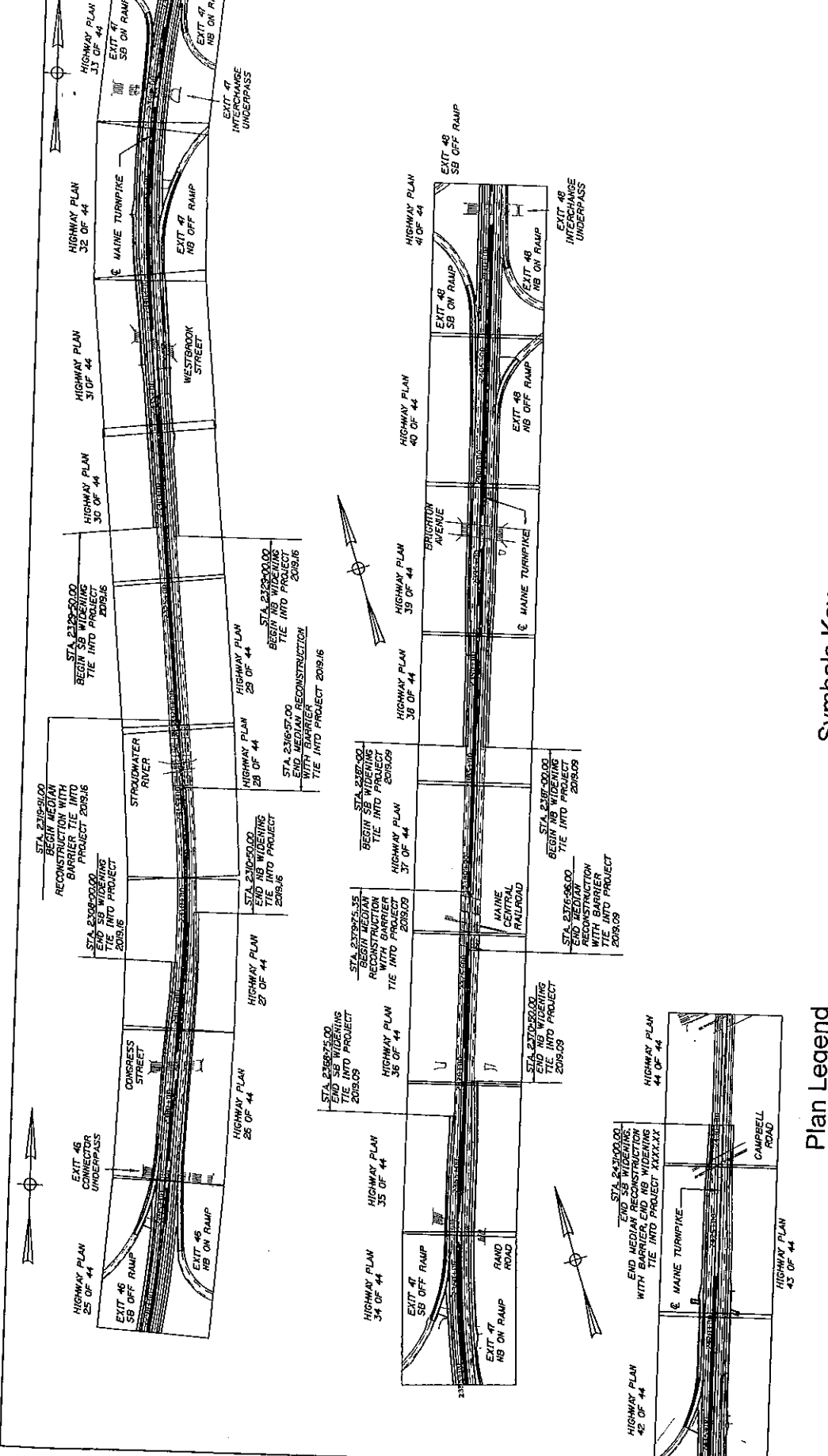
THE GOLD STAR MEMORIAL HIGHWAY

**PORTLAND AREA
WIDENING & SAFETY
IMPROVEMENTS**

**WETLAND IMPACTS
INDEX PLAN**

DATE: FEBRUARY, 2019

SHEET 1 OF 46



Wetland I.D.	Total Acres	Impacted Acres

Symbols Key

	Groundwater Recharge/Discharge
	Floodflow Alteration (Storage & Desynchronization)
	Fish and Shellfish Habitat
	Sediment/Toxicant Retention
	Nutrient Removal/Retention/Transformation
	Production Export
	Principal Value or Function
	Sediment/Shoreline Stabilization
	Wildlife Habitat
	Recreation Consumptive & Non-consumptive
	Educational Scientific Value
	Uniqueness/Heritage
	Visual Quality/Aesthetics
	Endangered Species

Symbols Key

Plan Legend

	Temporary stone check dam
	Wetland
	Temporary wetland impact
	Permanent wetland impact
	Stream impact
	Limit of field delineated wetland (wetland confines)
	Limit of field delineated wetland of special significance (WSS)
	ROW line
	Silt fence
	Clearing limit

Plan Legend

Scale and Bar

SCALE: 1"=750'

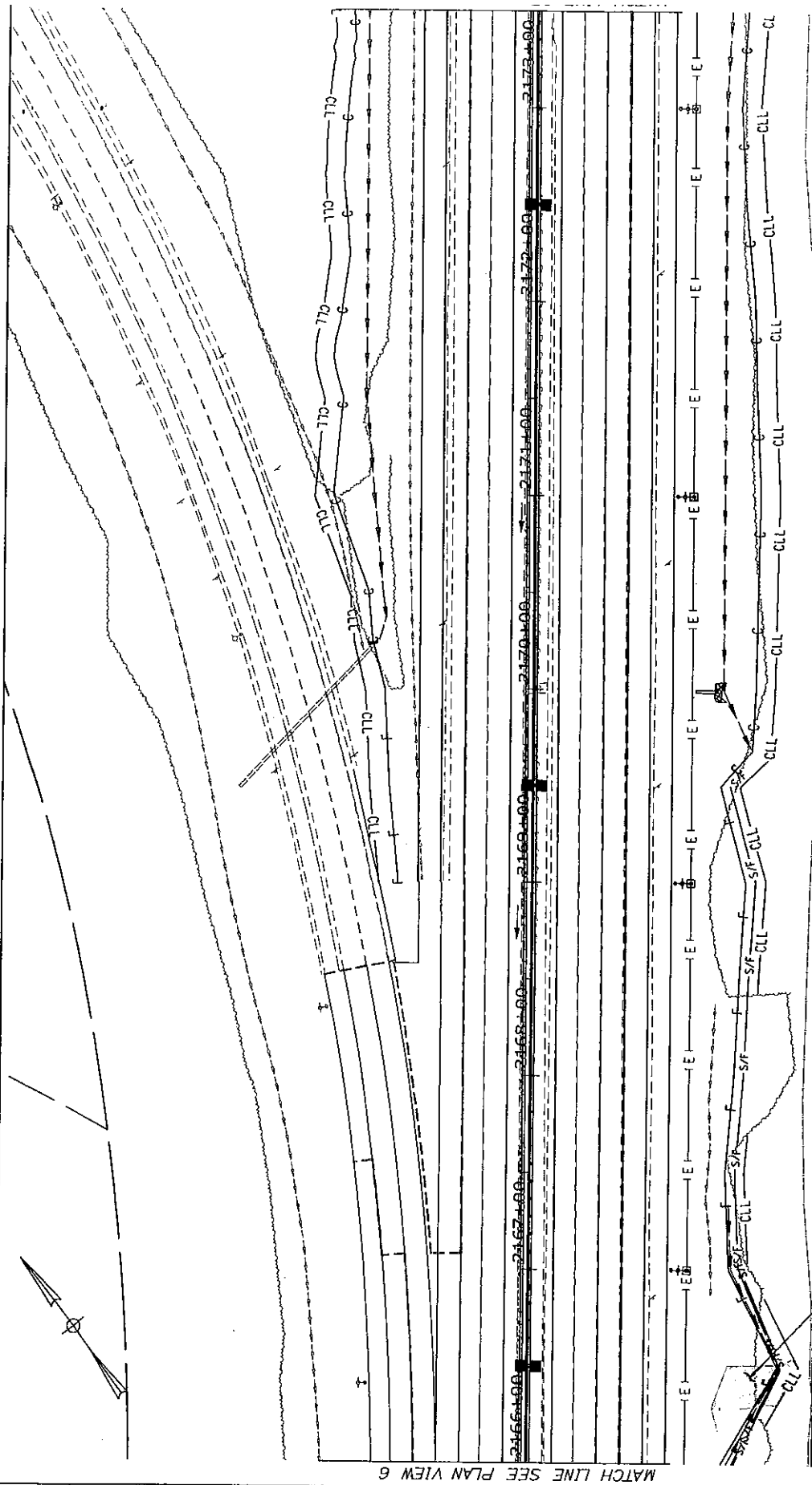
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HNTB
ARCHITECTS ENGINEERS PLANNERS

THE GOLD STAR MEMORIAL HIGHWAY

WETLAND IMPACTS INDEX PLAN 2

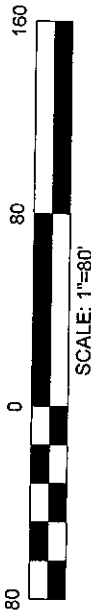
PORTLAND AREA WIDENING & SAFETY IMPROVEMENTS



MATCH LINE SEE PLAN VIEW 6

Delineated by Stantec Consulting Services

Wetland I.D.	Total Acres	Impacted Acres
A	0.03 AC	0.02 AC



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ARCHITECTS ENGINEERS PLANNERS

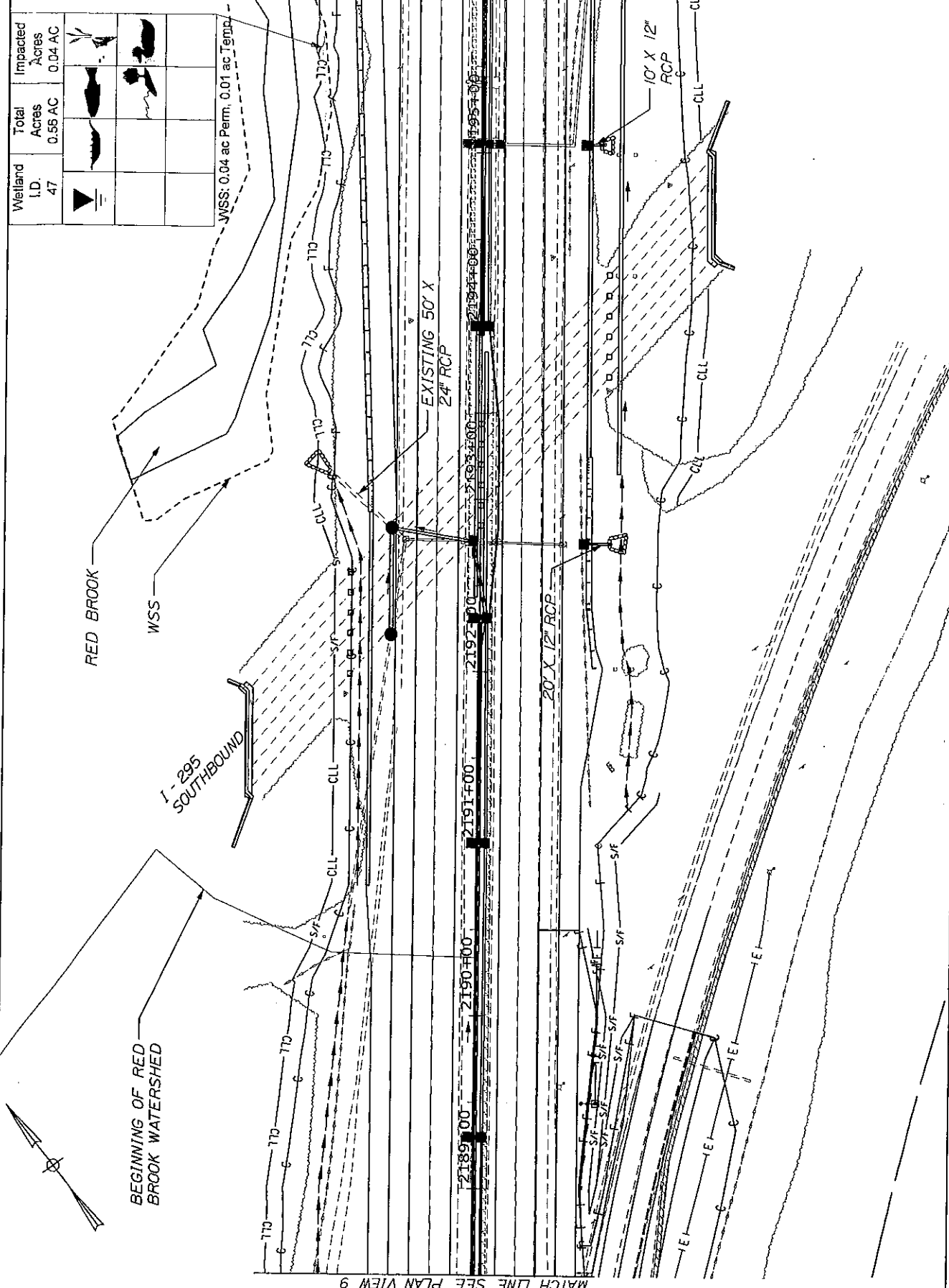
THE GOLD STAR MEMORIAL HIGHWAY

**PORTLAND AREA
WIDENING & SAFETY
IMPROVEMENTS**

**WETLAND IMPACTS
PLAN VIEW 7**

DATE: FEBRUARY, 2019

SHEET 9 OF 46



Wetland I.D.	Total Acres	Impacted Acres
47	0.55 AC	0.04 AC

WSS: 0.04 ac Perm, 0.01 ac Temp.



SCALE: 1"=80'



THE GOLD STAR
MEMORIAL HIGHWAY

HNTB
ARCHITECTS ENGINEERS PLANNERS

WETLAND IMPACTS
PLAN VIEW 10

PORTLAND AREA
WIDENING & SAFETY
IMPROVEMENTS

DATE: FEBRUARY, 2019

SHEET 12 OF 46

MATCH LINE SEE PLAN VIEW 10

Wetland I.D.	Total Acres	Impacted Acres
47	0.56 AC	0.04 AC

WSS: 0.04 ac Perm, 0.01 ac Temp

USF #1

USF #2

EXISTING 12' X 10' CORRUGATED STEEL PIPE

33' X 24" RCP

10' X 12" RCP

SEE CROSS-SECTIONS FOR MORE DETAIL

RED BROOK



SCALE: 1"=80'



THE GOLD STAR MEMORIAL HIGHWAY

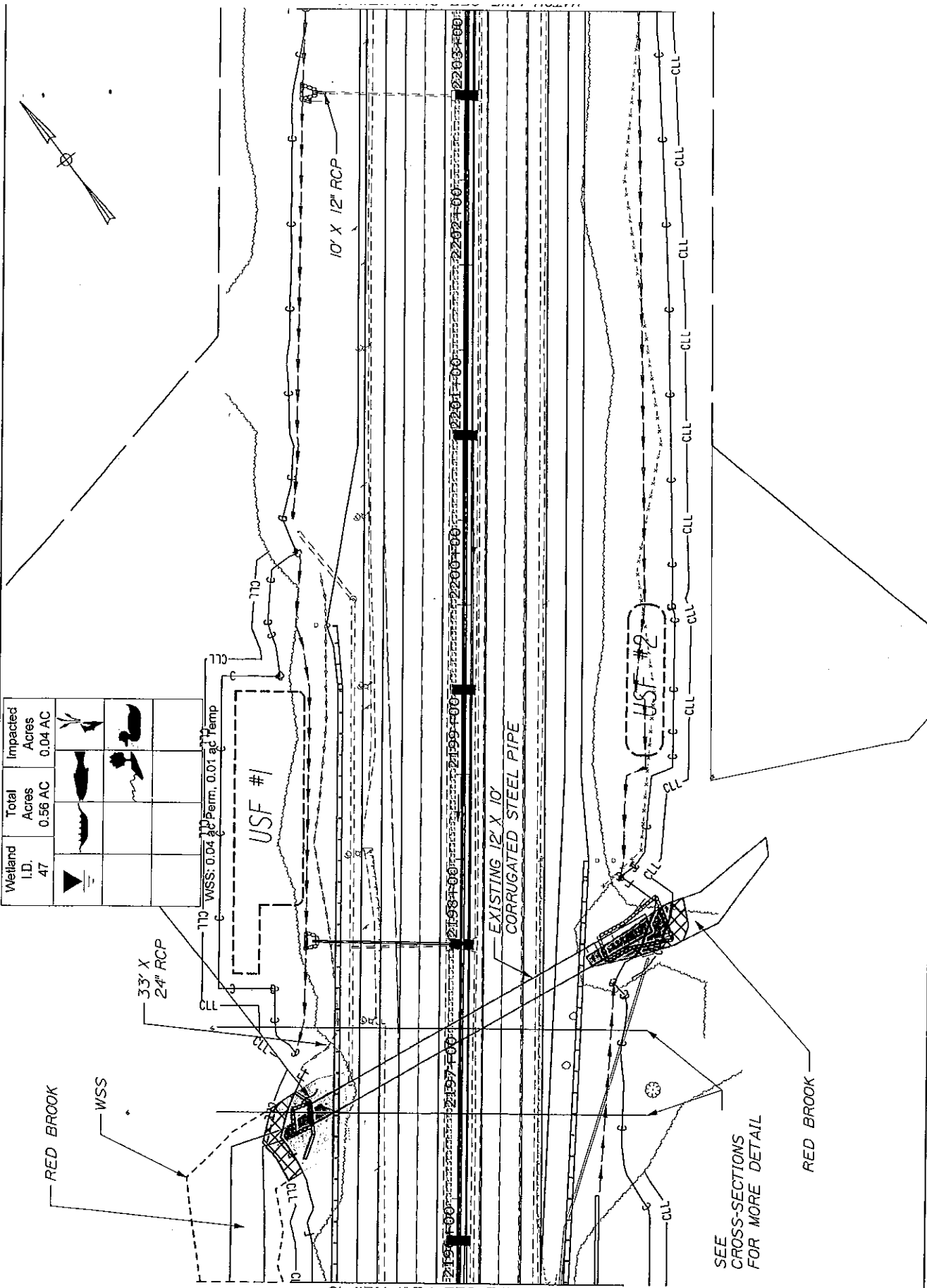
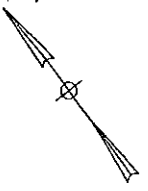
HNTB
ARCHITECTS ENGINEERS PLANNERS

PORTLAND AREA
WIDENING & SAFETY
IMPROVEMENTS

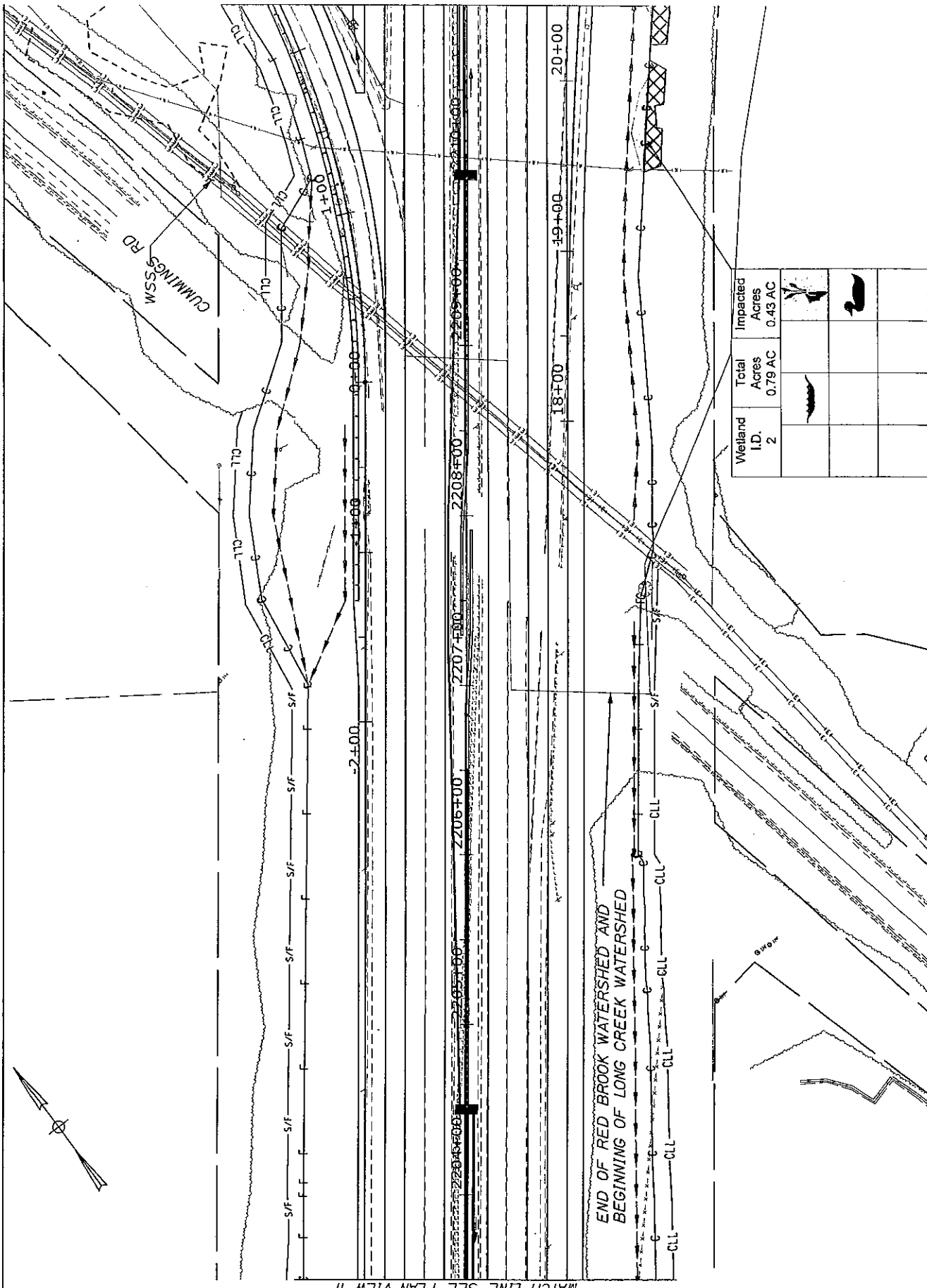
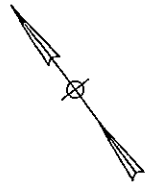
WETLAND IMPACTS
PLAN VIEW 11

DATE: FEBRUARY, 2019

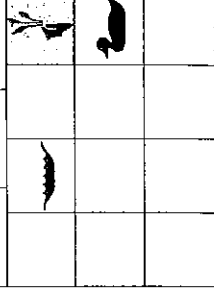
SHEET 13 OF 46



MATCH LINE SEE PLAN VIEW II



Wetland I.D.	Total Acres	Impacted Acres
2	0.79 AC	0.43 AC



THE GOLD STAR
MEMORIAL HIGHWAY

HNTB
ARCHITECTS ENGINEERS PLANNERS

PORTLAND AREA
WIDENING & SAFETY
IMPROVEMENTS

WETLAND IMPACTS
PLAN VIEW 12

DATE: FEBRUARY, 2019

SHEET 14 OF 4

MATCH LINE SEE PLAN VIEW 12

MATCH LINE SEE PLAN VIEW 14

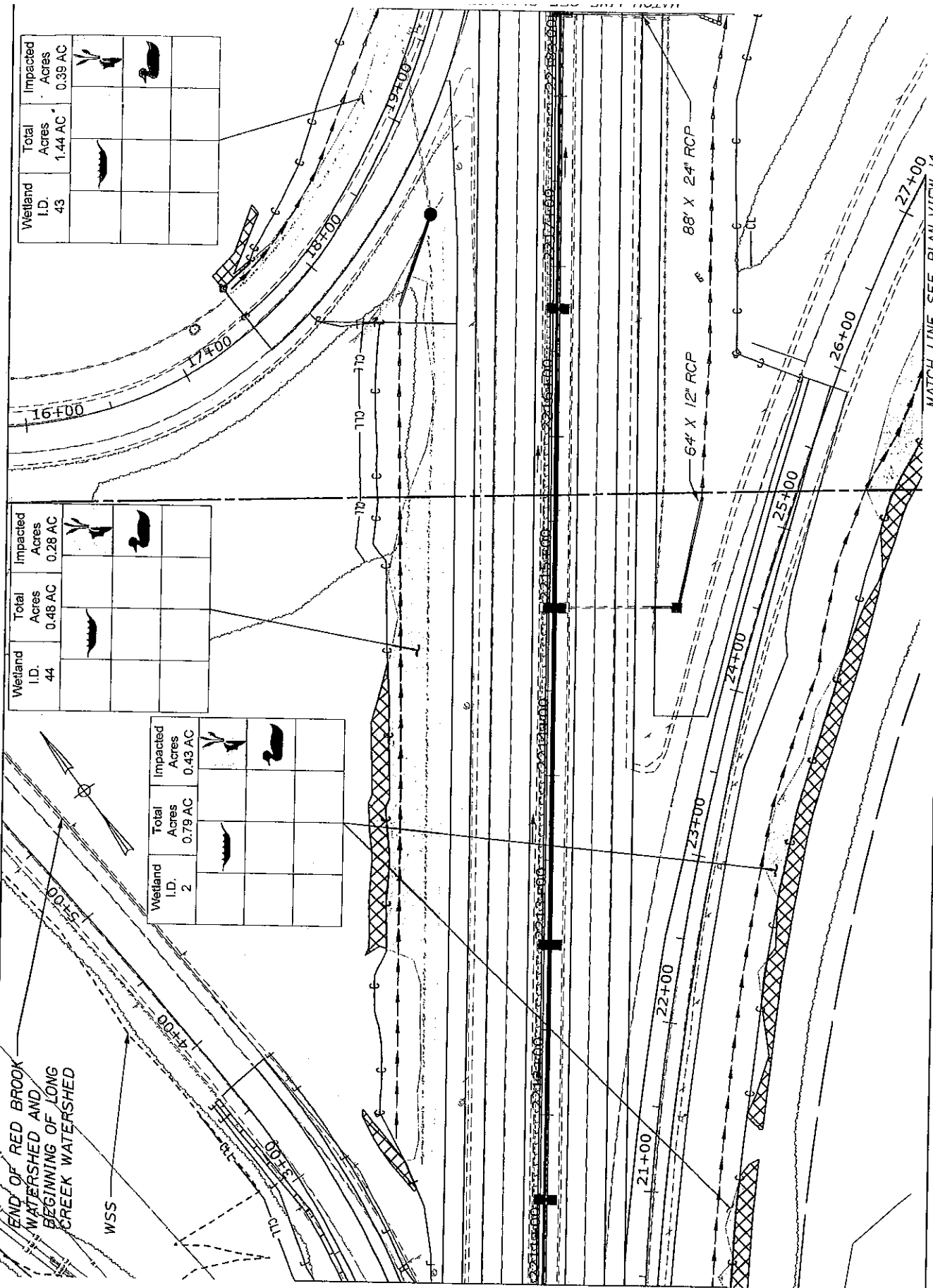
END OF RED BROOK WATERSHED AND BEGINNING OF LONG CREEK WATERSHED

WSS

Wetland I.D.	43	Total Acres	1.44 AC	Impacted Acres	0.39 AC

Wetland I.D.	44	Total Acres	0.48 AC	Impacted Acres	0.28 AC

Wetland I.D.	2	Total Acres	0.79 AC	Impacted Acres	0.43 AC



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ARCHITECTS ENGINEERS PLANNERS

THE GOLD STAR
MEMORIAL HIGHWAY

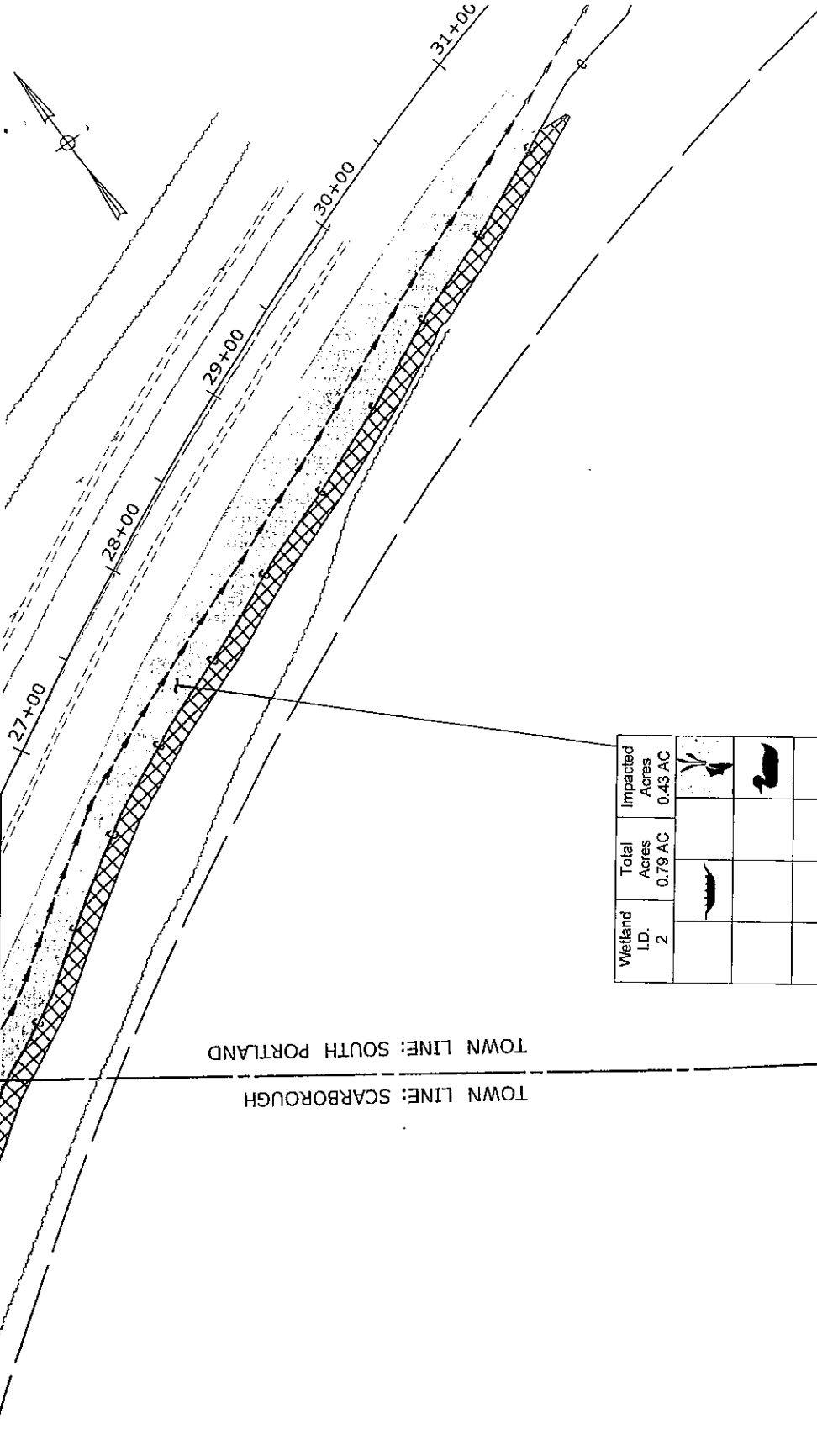
PORTLAND AREA
WIDENING & SAFETY
IMPROVEMENTS

WETLAND IMPACTS
PLAN VIEW 13

DATE: FEBRUARY, 2019

SHEET 15 OF 46

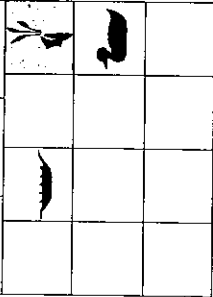
MATCH LINE SEE PLAN VIEW 13



TOWN LINE: SCARBOROUGH

TOWN LINE: SOUTH PORTLAND

Wetland I.D.	Total Acres	Impacted Acres
2	0.79 AC	0.43 AC



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ARCHITECTS ENGINEERS PLANNERS

THE GOLD STAR MEMORIAL HIGHWAY

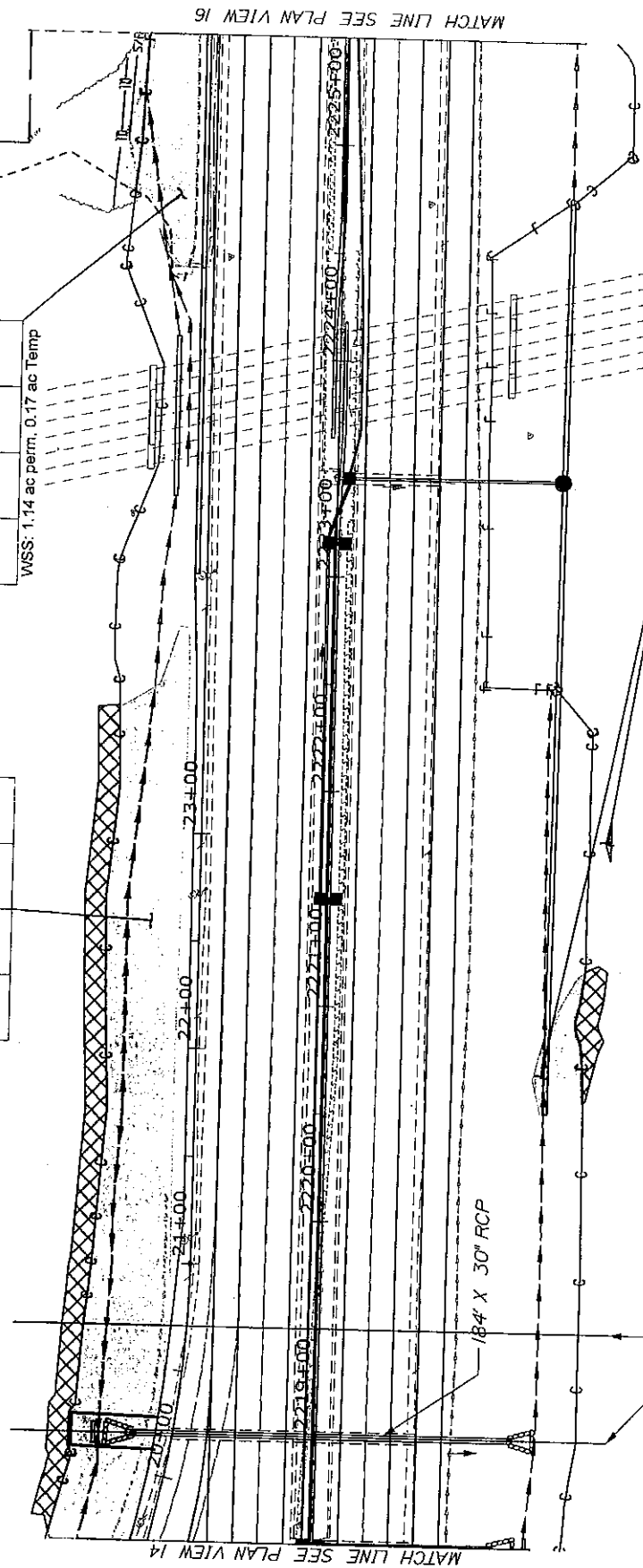
WETLAND IMPACTS
PLAN VIEW 14

PORTLAND AREA
WIDENING & SAFETY
IMPROVEMENTS

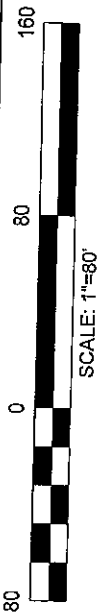
Wetland I.D.	Total Acres	Impacted Acres
43	1.44 AC	0.39 AC

Wetland I.D.	Total Acres	Impacted Acres
42	2.48 AC	1.14 AC

WSS: 1.14 ac perm, 0.17 ac Temp



Wetland I.D.	Total Acres	Impacted Acres
4	0.22 AC	0.02 AC



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ARCHITECTS ENGINEERS PLANNERS

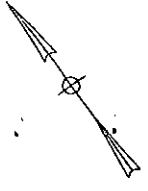
THE GOLD STAR MEMORIAL HIGHWAY

**PORTLAND AREA
WIDENING & SAFETY
IMPROVEMENTS**

**WETLAND IMPACTS
PLAN VIEW 15**

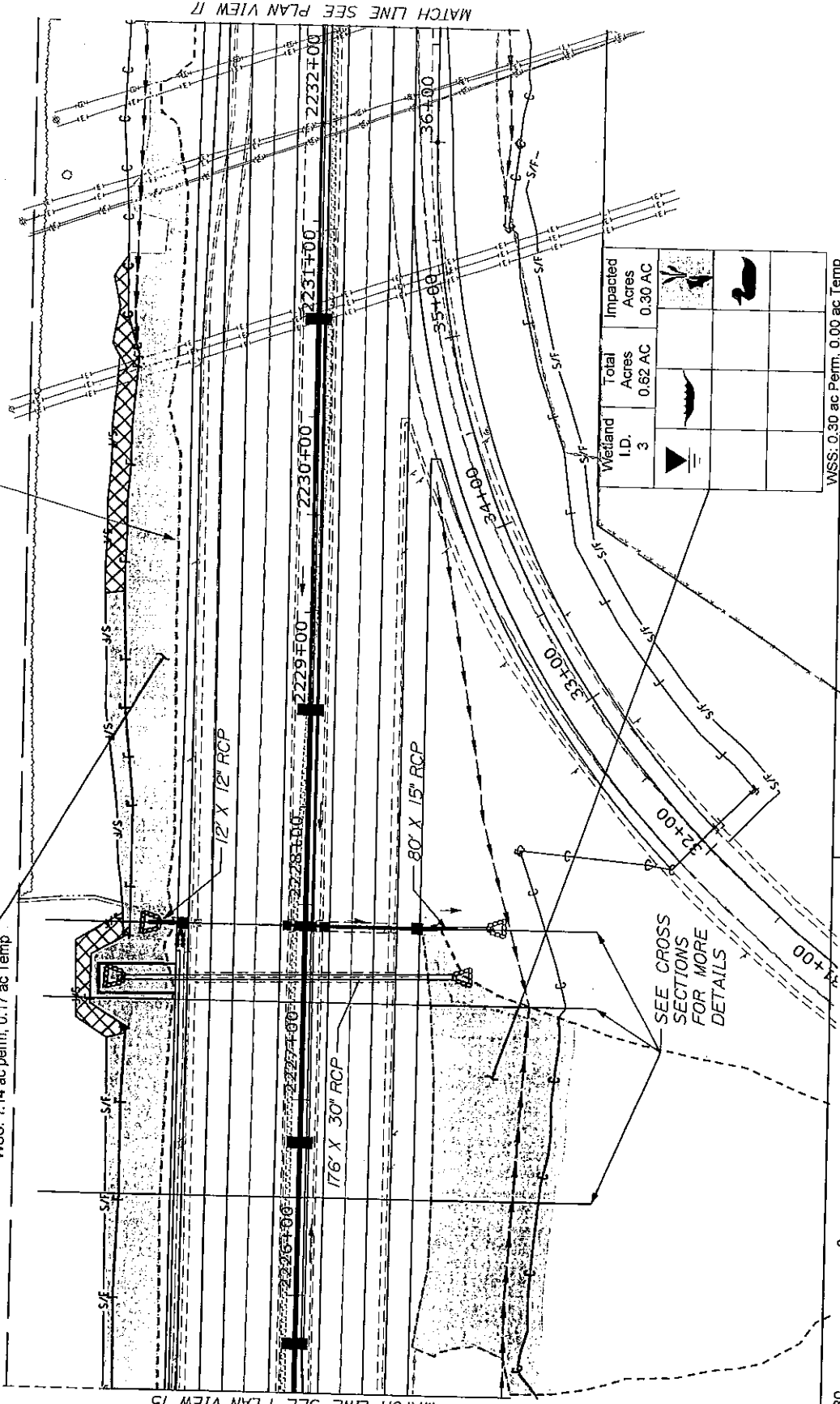
DATE: FEBRUARY, 2019

SHEET 17 OF 46



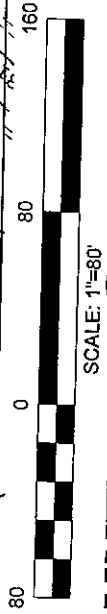
Wetland I.D.	Total Acres	Impacted Acres
42	2.48 AC	1.14 AC

WSS: 1.14 ac perm, 0.17 ac Temp



Wetland I.D.	Total Acres	Impacted Acres
3	0.62 AC	0.30 AC

WSS: 0.30 ac Perm, 0.00 ac Temp

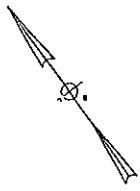


HNTB
ARCHITECTS ENGINEERS PLANNERS

THE GOLD STAR MEMORIAL HIGHWAY

**PORTLAND AREA
WIDENING & SAFETY
IMPROVEMENTS**

**WETLAND IMPACTS
PLAN VIEW 16**



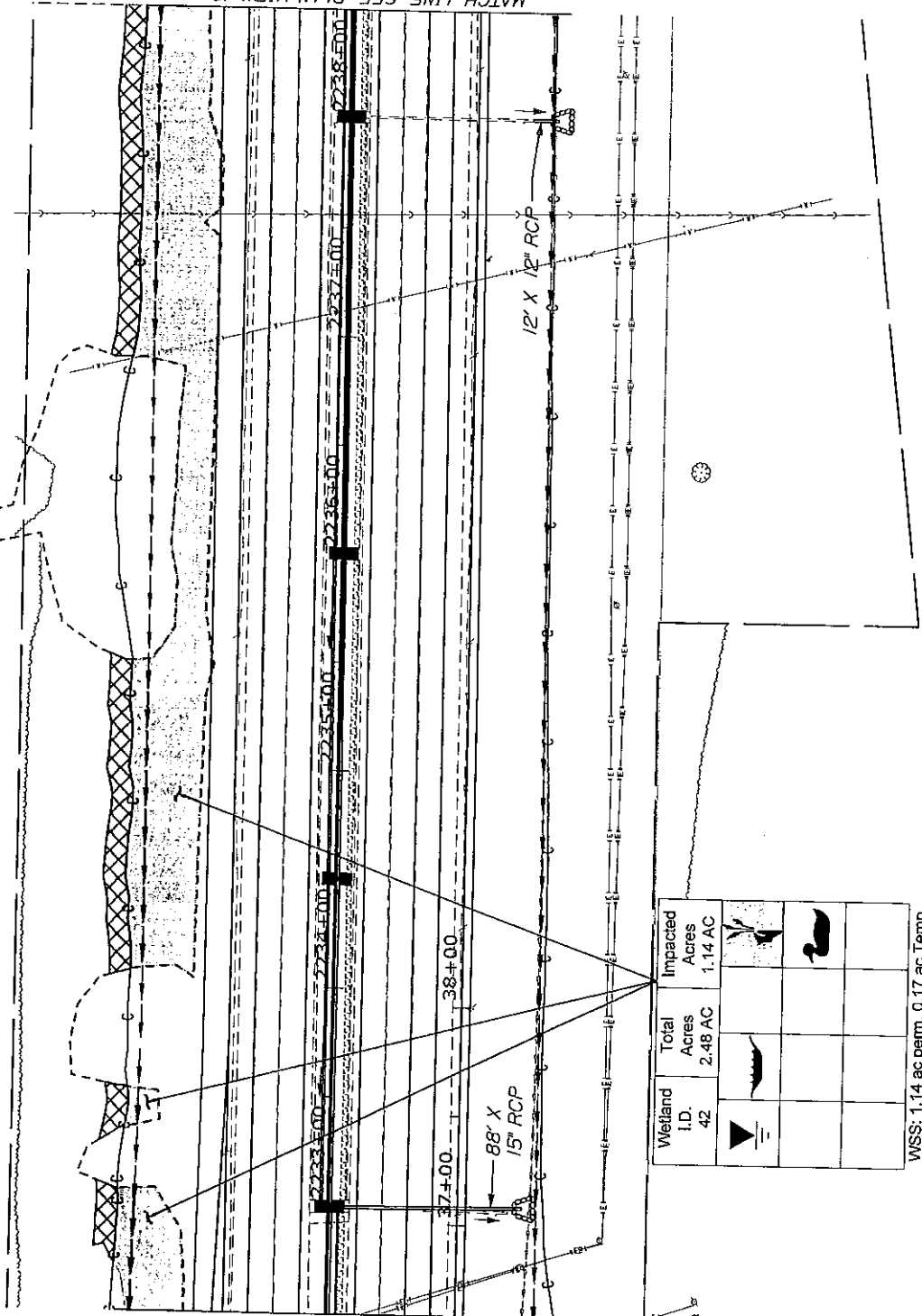
MATCH LINE SEE PLAN VIEW 18

MATCH LINE SEE PLAN VIEW 16

WSS

12" X 12" RCP

88" X 15" RCP



Wetland I.D.	Total Acres	Impacted Acres
42	2.48 AC	1.14 AC

WSS: 1.14 ac perm. 0.17 ac Temp

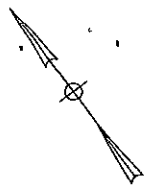


HNTB
ARCHITECTS ENGINEERS PLANNERS

THE GOLD STAR MEMORIAL HIGHWAY

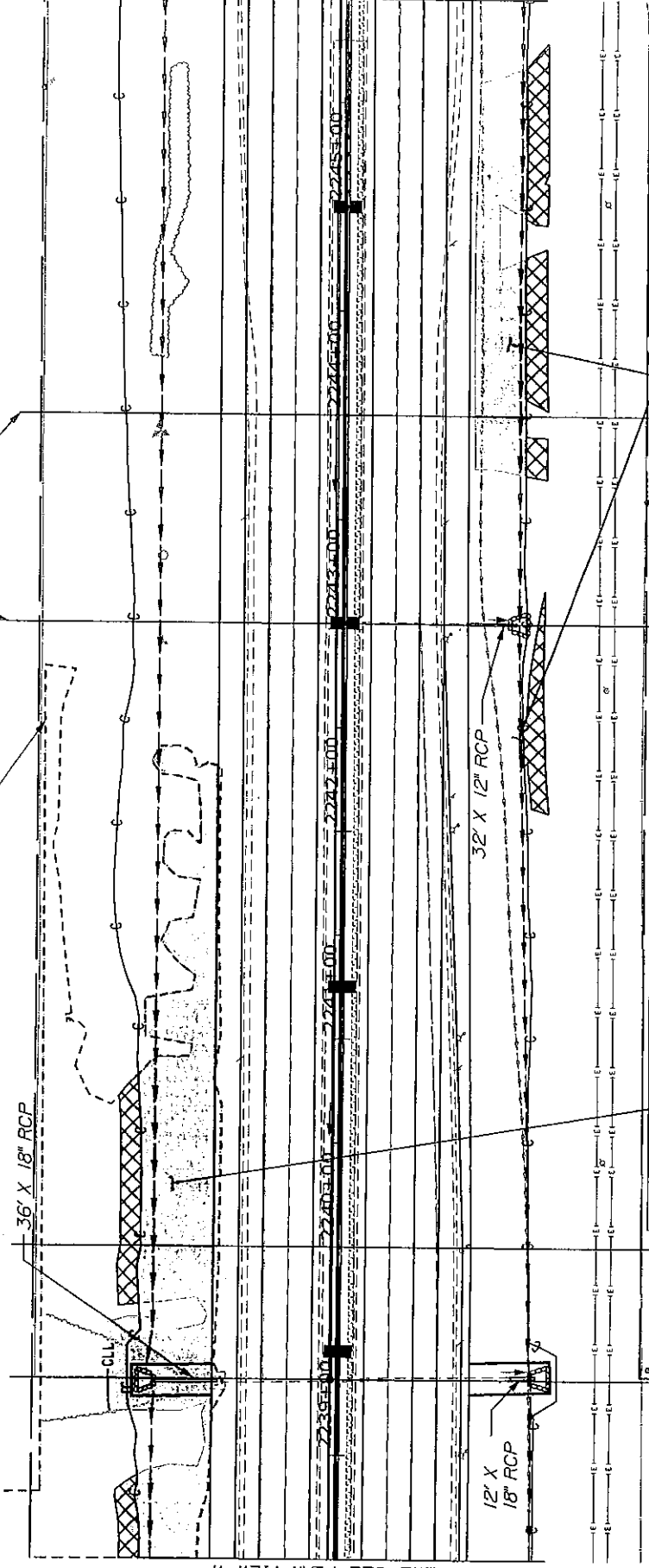
**PORTLAND AREA
WIDENING & SAFETY
IMPROVEMENTS**

**WETLAND IMPACTS
PLAN VIEW 17**



SEE CROSS SECTIONS FOR MORE DETAILS

WSS



SEE CROSS SECTIONS FOR MORE DETAILS

Wetland I.D.	Total Acres	Impacted Acres
42	2.48 AC	1.14 AC

WSS: 1.14 ac perm, 0.17 ac Temp

Wetland I.D.	Total Acres	Impacted Acres
6	0.51 AC	0.10 AC



HNTB
ARCHITECTS ENGINEERS PLANNERS

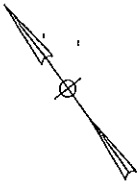
THE GOLD STAR MEMORIAL HIGHWAY

PORTLAND AREA WIDENING & SAFETY IMPROVEMENTS

WETLAND IMPACTS PLAN VIEW 18

DATE: FEBRUARY, 2019

SHEET 20 OF 46

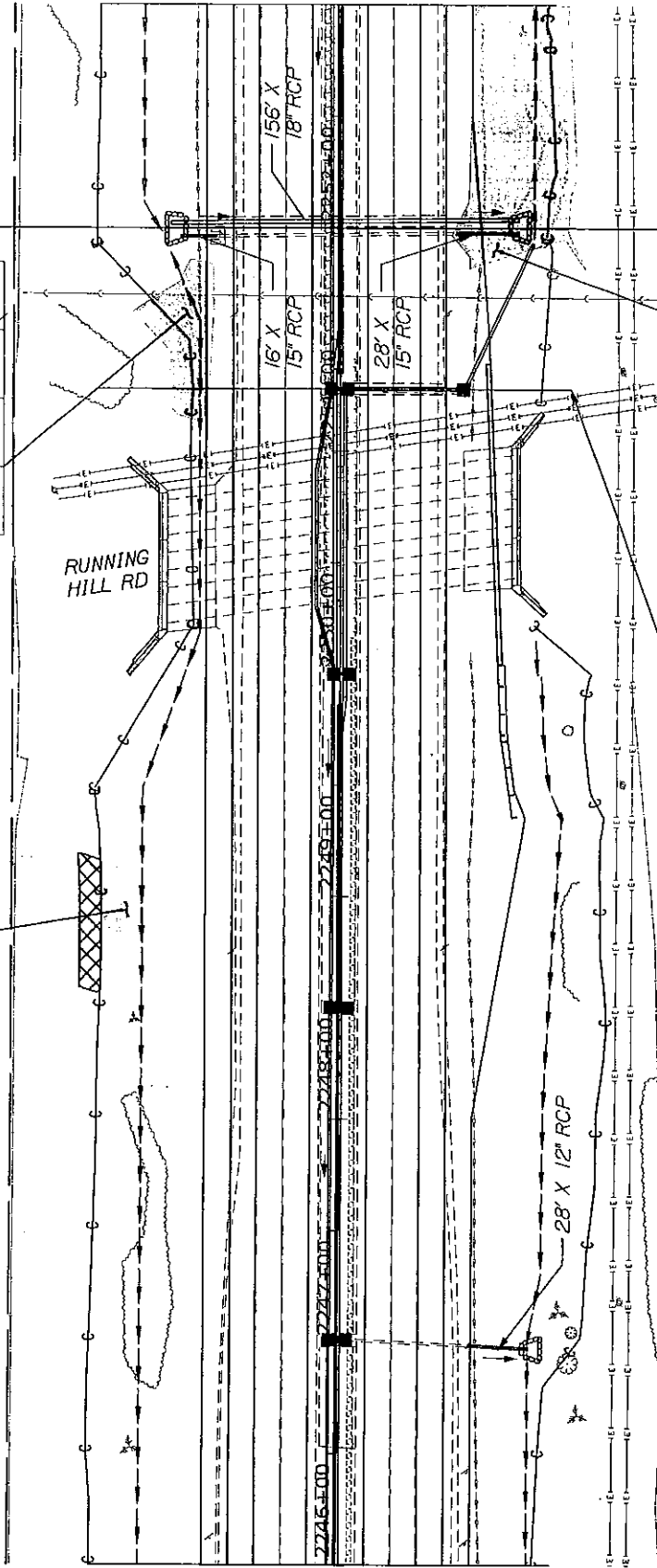


MATCH LINE SEE PLAN VIEW 20

MATCH LINE SEE PLAN VIEW 18

Wetland I.D.	41	Total Acres	0.07 AC	Impacted Acres	0.04 AC

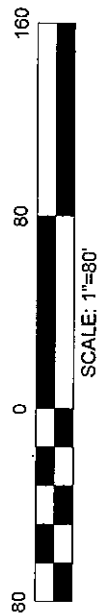
Wetland I.D.	60	Total Acres	0.07 AC	Impacted Acres	0.02 AC



Wetland I.D.	61	Total Acres	0.89 AC	Impacted Acres	0.33 AC

SEE CROSS SECTIONS FOR MORE DETAILS

SEE CROSS SECTIONS FOR MORE DETAILS



THE GOLD STAR
MEMORIAL HIGHWAY



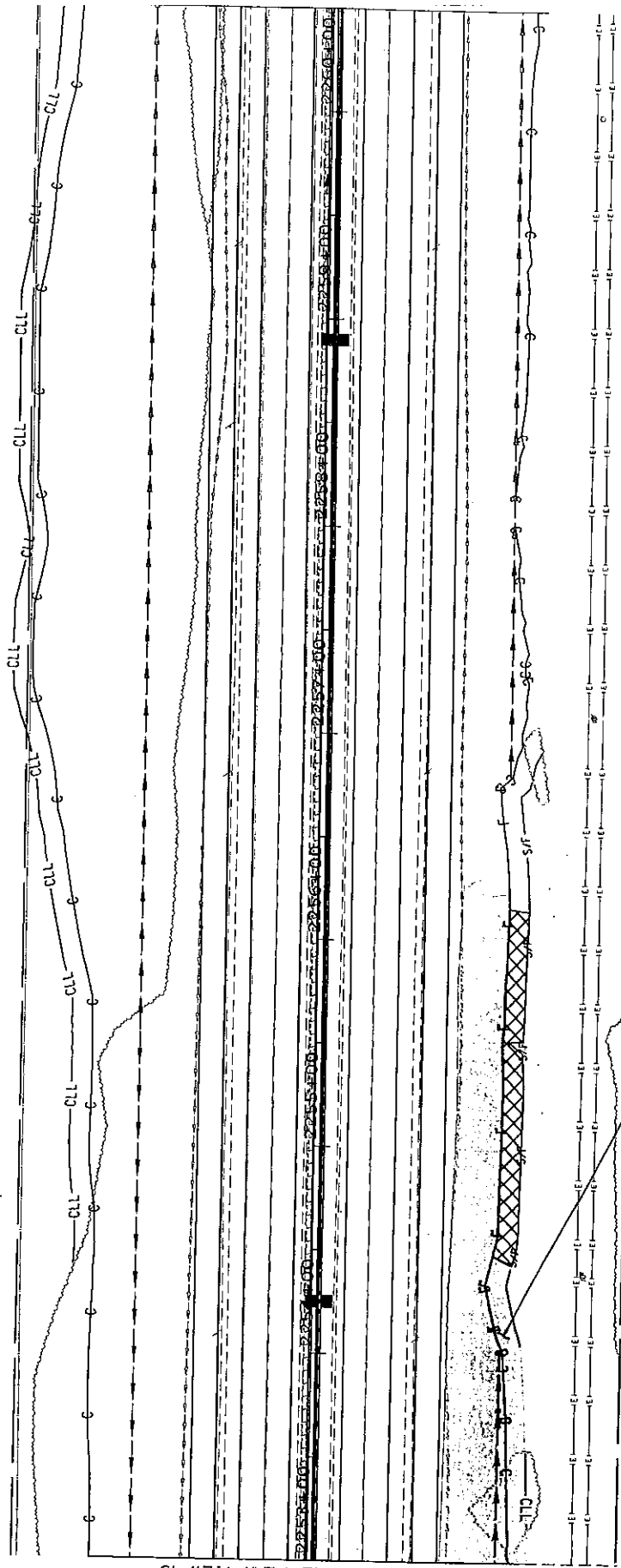
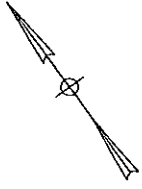
ARCHITECTS ENGINEERS PLANNERS

WETLAND IMPACTS
PLAN VIEW 19

PORTLAND AREA
WIDENING & SAFETY
IMPROVEMENTS

DATE: FEBRUARY, 2019

SHEET 21 OF 46



MATCH LINE SEE PLAN VIEW 19

Wetland I.D.	Total Acres	Impacted Acres
61	0.89 AC	0.33 AC



HNTB
ARCHITECTS ENGINEERS PLANNERS

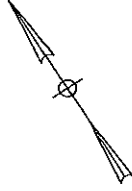
THE GOLD STAR MEMORIAL HIGHWAY

**PORTLAND AREA
WIDENING & SAFETY
IMPROVEMENTS**

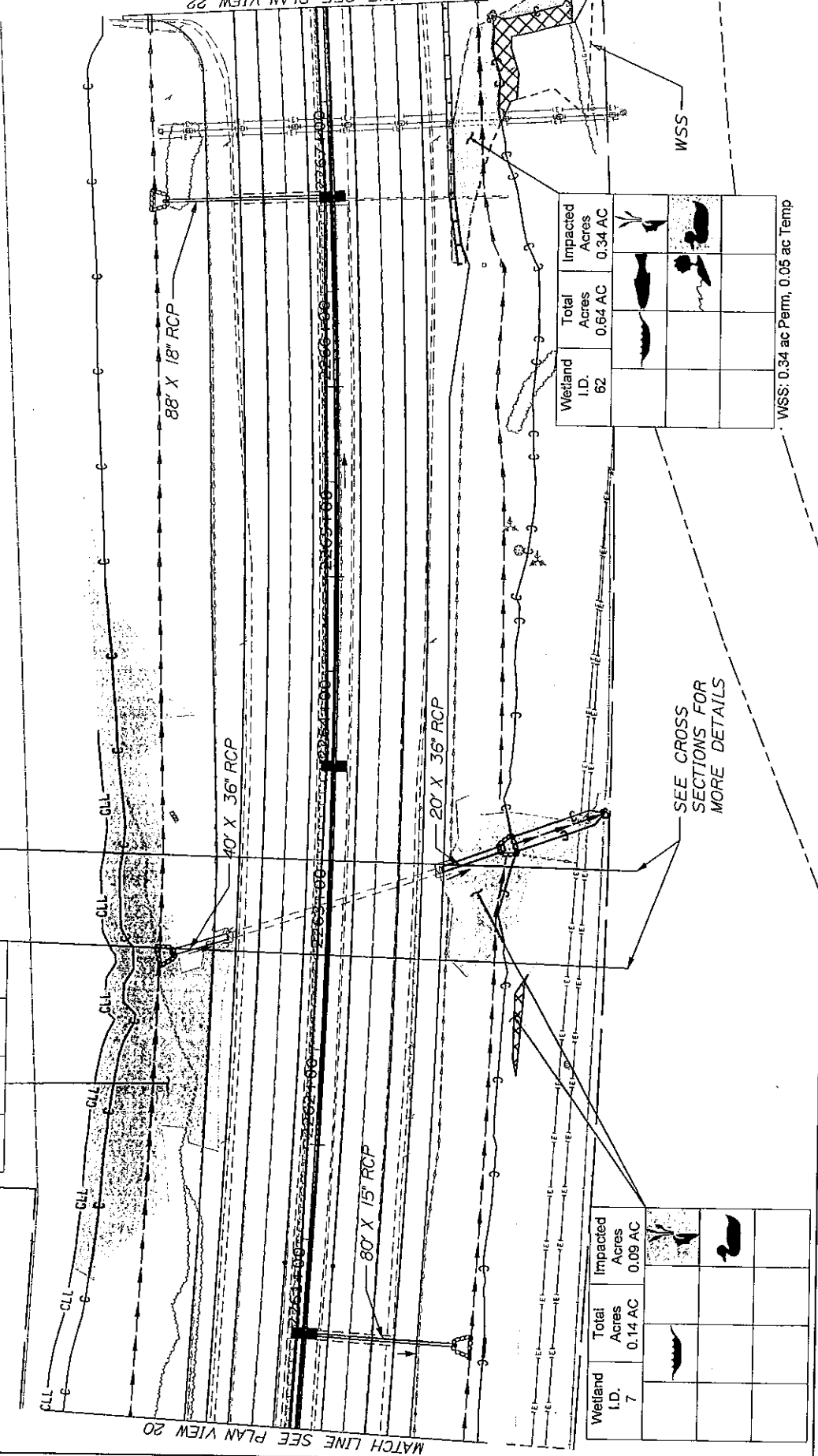
**WETLAND IMPACTS
PLAN VIEW 20**

DATE: FEBRUARY, 2019

SHEET 22 OF 46



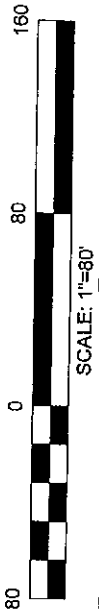
Wetland I.D.	40	Total Acres	0.89 AC	Impacted Acres	0.36 AC



Wetland I.D.	62	Total Acres	0.64 AC	Impacted Acres	0.34 AC

WSS: 0.34 ac Perm, 0.05 ac Temp

SEE CROSS SECTIONS FOR MORE DETAILS



HNTB
ARCHITECTS ENGINEERS PLANNERS

THE GOLD STAR MEMORIAL HIGHWAY

**WETLAND IMPACTS
PLAN VIEW 21**

**PORTLAND AREA
WIDENING & SAFETY
IMPROVEMENTS**

DATE: FEBRUARY, 2019

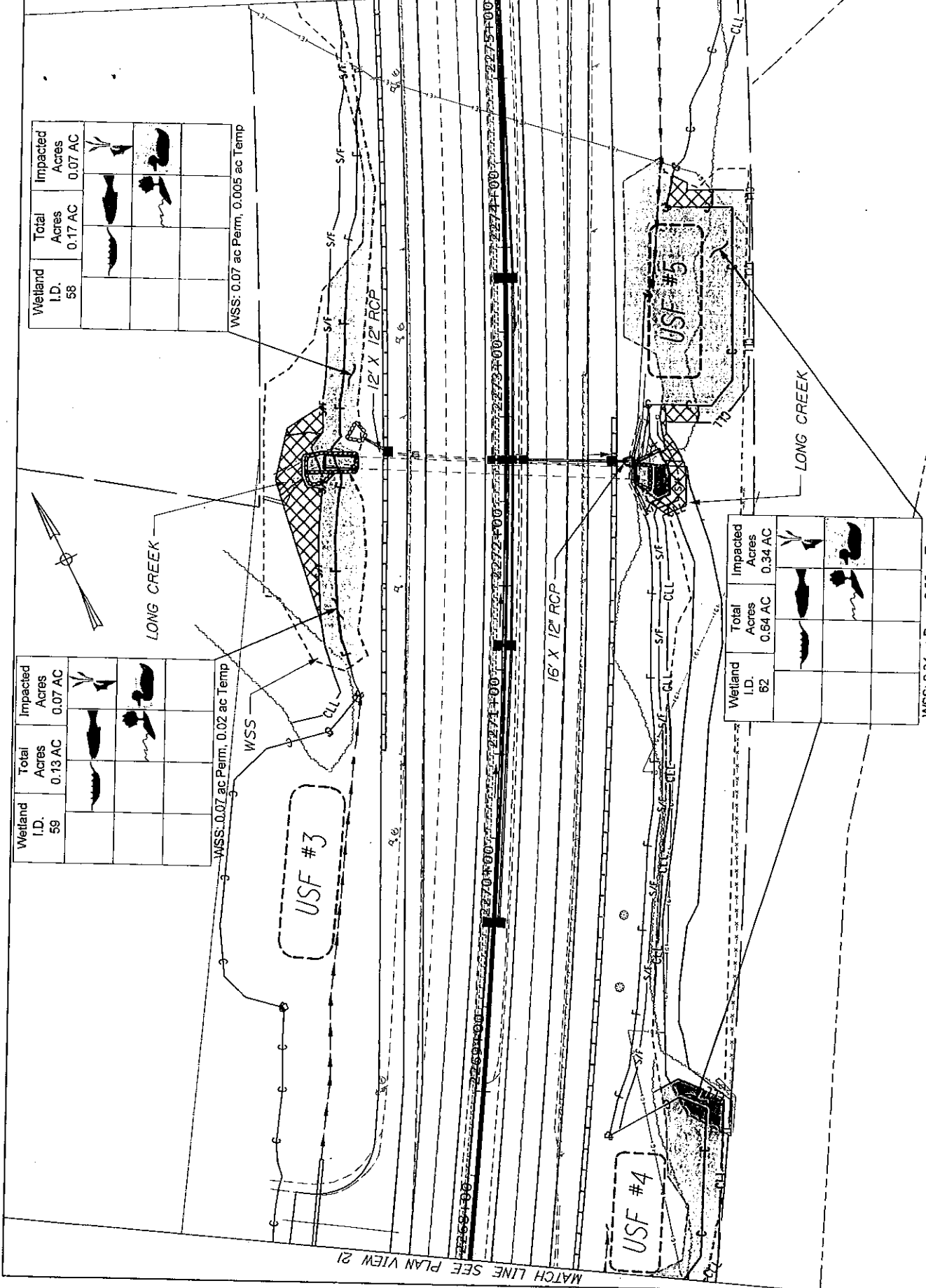
SHEET 23 OF 46

MATCH LINE SEE PLAN VIEW 20

MATCH LINE SEE PLAN VIEW 22

MATCH LINE SEE PLAN VIEW 23

MATCH LINE SEE PLAN VIEW 21



Wetland I.D.	Total Acres	Impacted Acres
59	0.13 AC	0.07 AC

Wetland I.D.	Total Acres	Impacted Acres
58	0.17 AC	0.07 AC

Wetland I.D.	Total Acres	Impacted Acres
62	0.64 AC	0.34 AC

WSS: 0.07 ac Perm, 0.005 ac Temp

WSS: 0.07 ac Perm, 0.02 ac Temp

WSS: 0.34 ac Perm, 0.05 ac Temp



HNTB
ARCHITECTS ENGINEERS PLANNERS

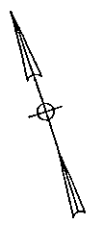
THE GOLD STAR MEMORIAL HIGHWAY

**PORTLAND AREA
WIDENING & SAFETY
IMPROVEMENTS**

**WETLAND IMPACTS
PLAN VIEW 22**

MATCH LINE SEE PLAN VIEW 22

MATCH LINE SEE PLAN VIEW 24



Wetland I.D.	Total Acres	Impacted Acres
58	0.17 AC	0.07 AC

WSS: 0.07 ac Perm, 0.005 ac Temp

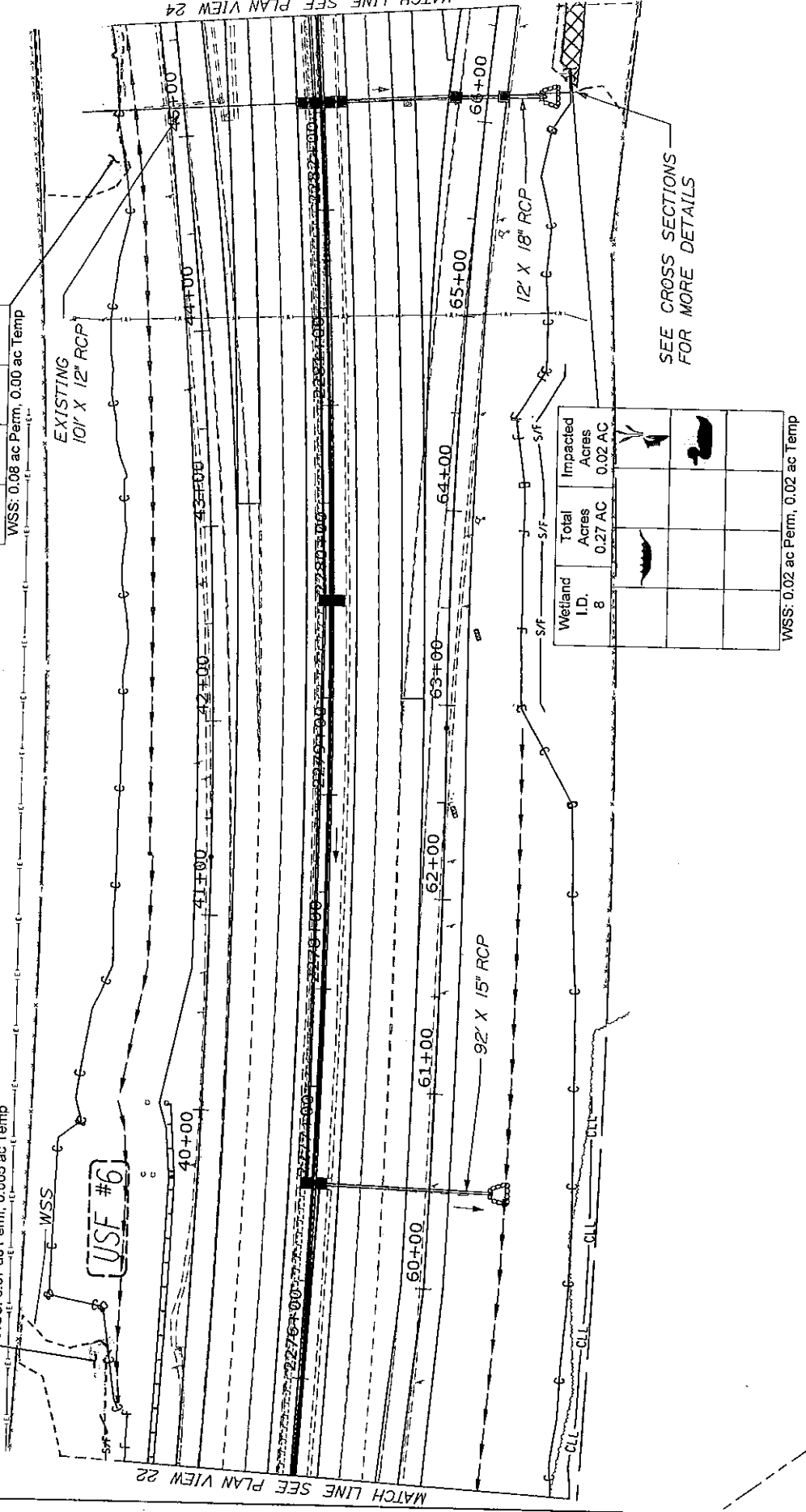
USF #6

WSS

Wetland I.D.	Total Acres	Impacted Acres
39	0.25 AC	0.08 AC

WSS: 0.08 ac Perm, 0.00 ac Temp

EXISTING 10' X 12" RCP



Wetland I.D.	Total Acres	Impacted Acres
8	0.27 AC	0.02 AC

WSS: 0.02 ac Perm, 0.02 ac Temp

SEE CROSS SECTIONS FOR MORE DETAILS



SCALE: 1"=80'



THE GOLD STAR MEMORIAL HIGHWAY

PORTLAND AREA WIDENING & SAFETY IMPROVEMENTS

WETLAND IMPACTS PLAN VIEW 23

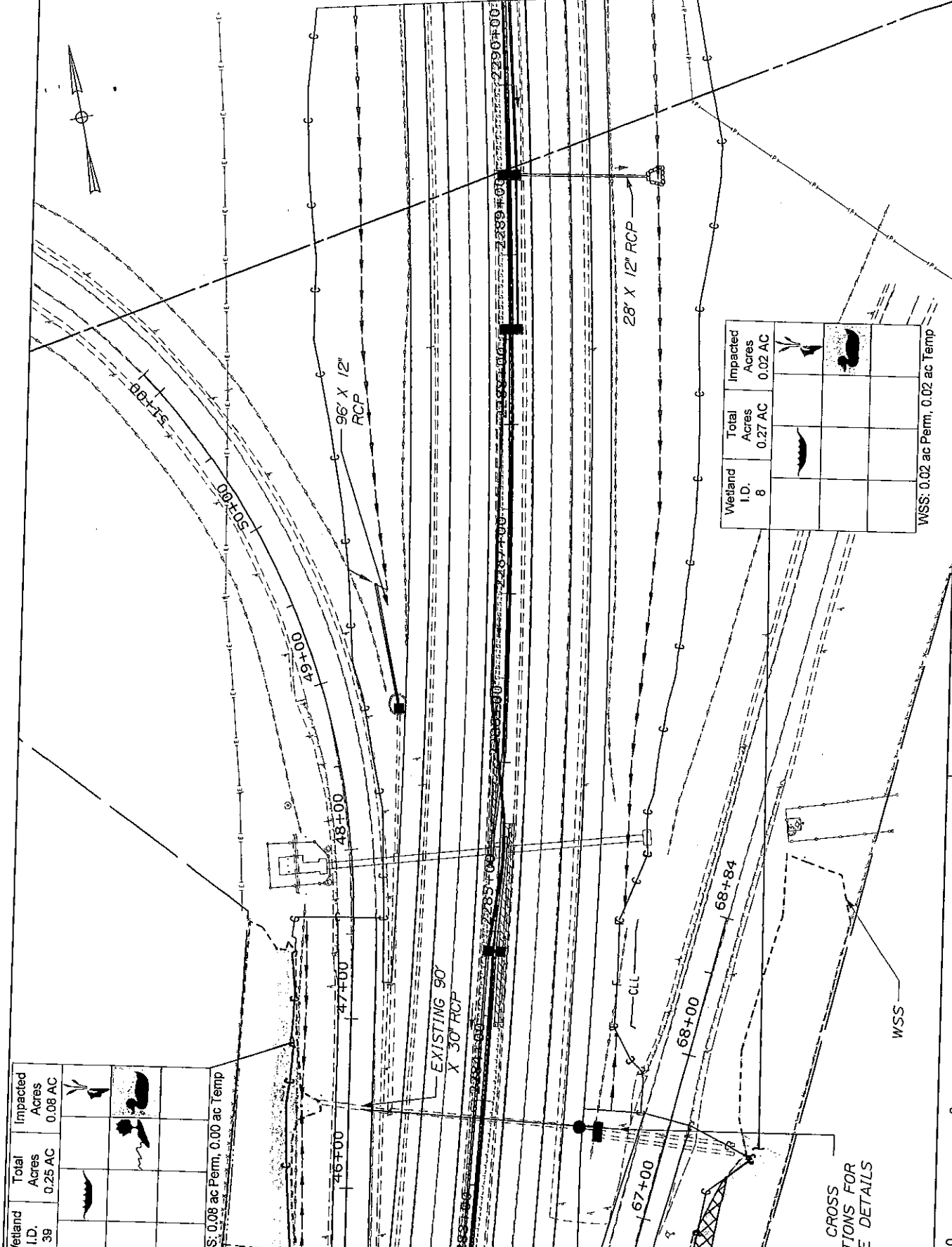
DATE: FEBRUARY, 2019

SHEET 25 OF 46

Wetland I.D.	Total Acres	Impacted Acres
39	0.25 AC	0.08 AC

WSS: 0.08 ac Perm, 0.00 ac Temp

MATCH LINE SEE PLAN VIEW 23



Wetland I.D.	Total Acres	Impacted Acres
8	0.27 AC	0.02 AC

WSS: 0.02 ac Perm, 0.02 ac Temp



HNTB
ARCHITECTS ENGINEERS PLANNERS

THE GOLD STAR
MEMORIAL HIGHWAY

PORTLAND AREA
WIDENING & SAFETY
IMPROVEMENTS

WETLAND IMPACTS
PLAN VIEW 24

SKYWAY DRIVE

Wetland I.D.	37	Total Acres	1.38 AC	Impacted Acres	0.006 AC

WSS: 0.006 ac perm, 0.00 ac Temp

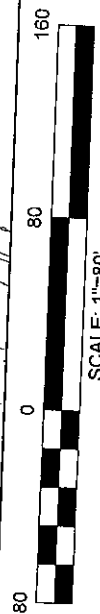
Wetland I.D.	10	Total Acres	1.40 AC	Impacted Acres	0.04 AC

WSS: 0.04 ac Perm, 0.08 ac Temp

MATCH LINE SEE PLAN VIEW 24

SEE CROSS SECTIONS FOR MORE DETAILS

96' X 15' RCP



PORTLAND AREA
WIDENING & SAFETY
IMPROVEMENTS

WETLAND IMPACTS
PLAN VIEW 25

DATE: FEBRUARY, 2019

SHEET 27 OF 46

MATCH LINE SEE PLAN VIEW 25

Wetland I.D.	Total Acres	Impacted Acres
36	0.63 AC	0.13 AC

Wetland I.D.	Total Acres	Impacted Acres
10	1.40 AC	0.04 AC

WSS: 0.04 ac Perm, 0.08 ac Temp



SCALE: 1"=80'



THE GOLD STAR MEMORIAL HIGHWAY

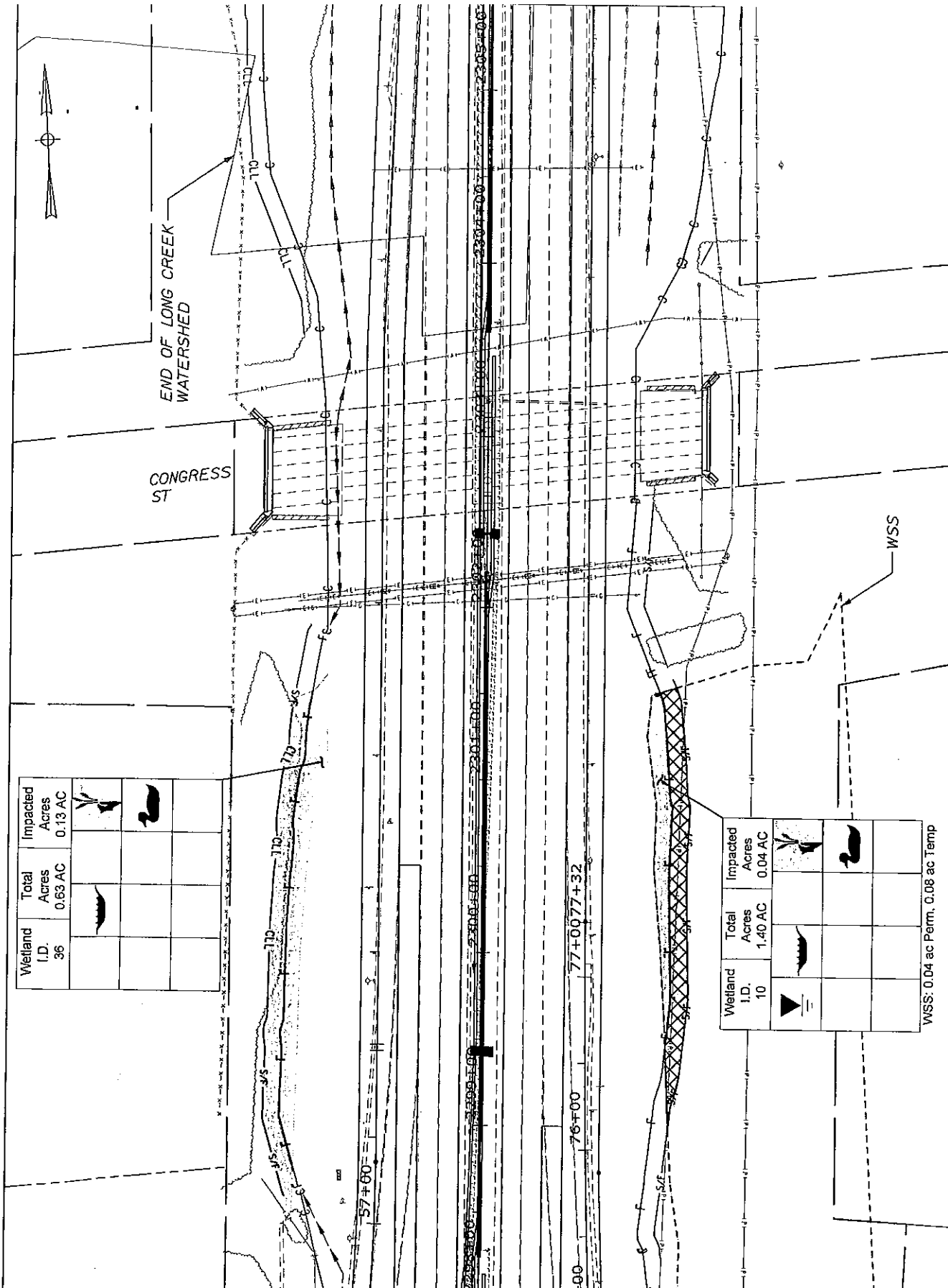
HNTB
ARCHITECTS ENGINEERS PLANNERS

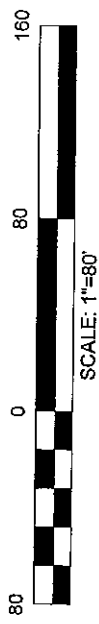
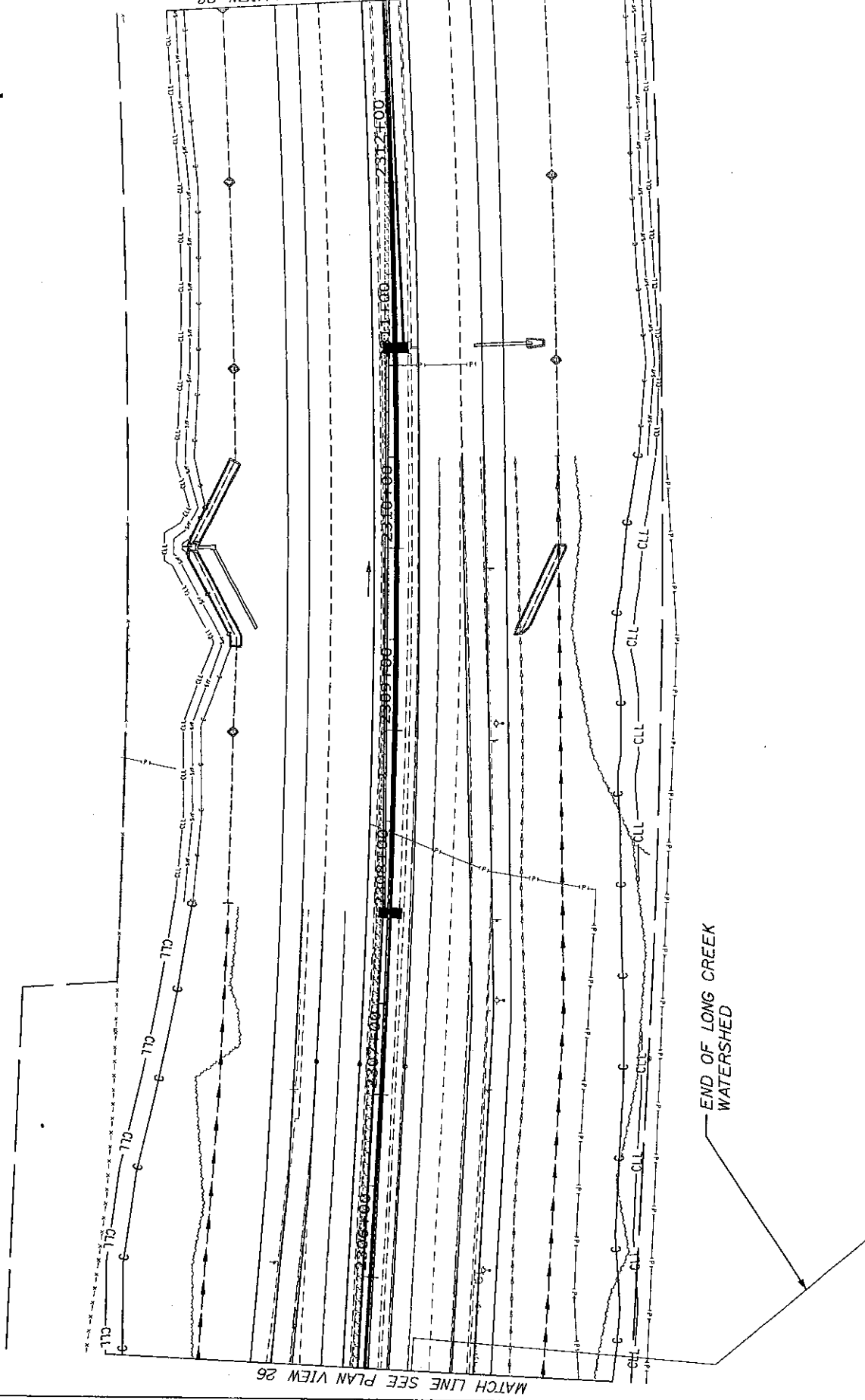
PORTLAND AREA
WIDENING & SAFETY
IMPROVEMENTS

WETLAND IMPACTS
PLAN VIEW 26

DATE: FEBRUARY, 2019

SHEET 28 OF 40





HNTB
ARCHITECTS ENGINEERS PLANNERS

**THE GOLD STAR
MEMORIAL HIGHWAY**

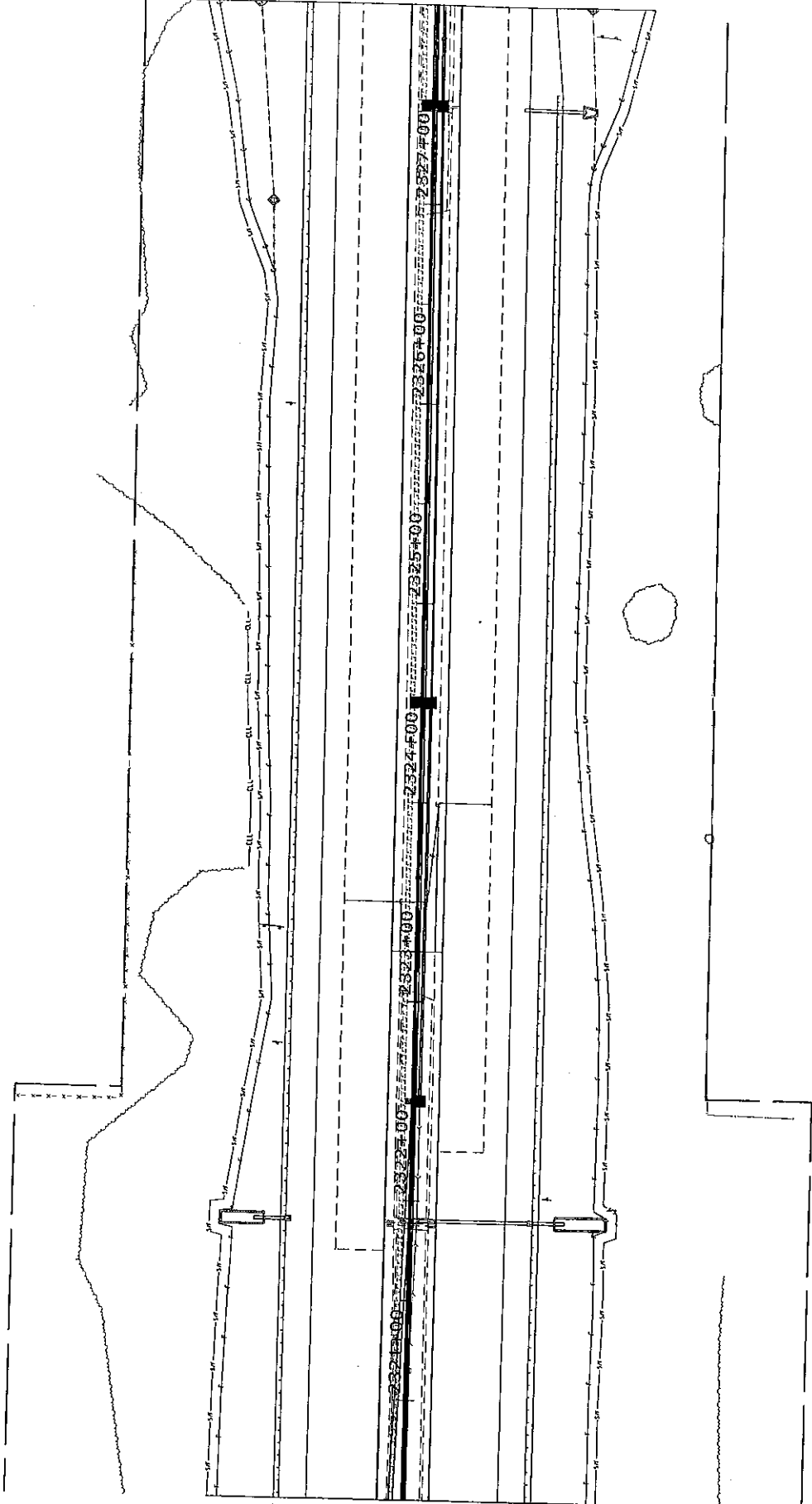
**PORTLAND AREA
WIDENING & SAFETY
IMPROVEMENTS**

**WETLAND IMPACTS
PLAN VIEW 27**

DATE: FEBRUARY, 2019

SHEET 29 OF 46

MATCH LINE SEE PLAN VIEW 28



THE GOLD STAR
MEMORIAL HIGHWAY

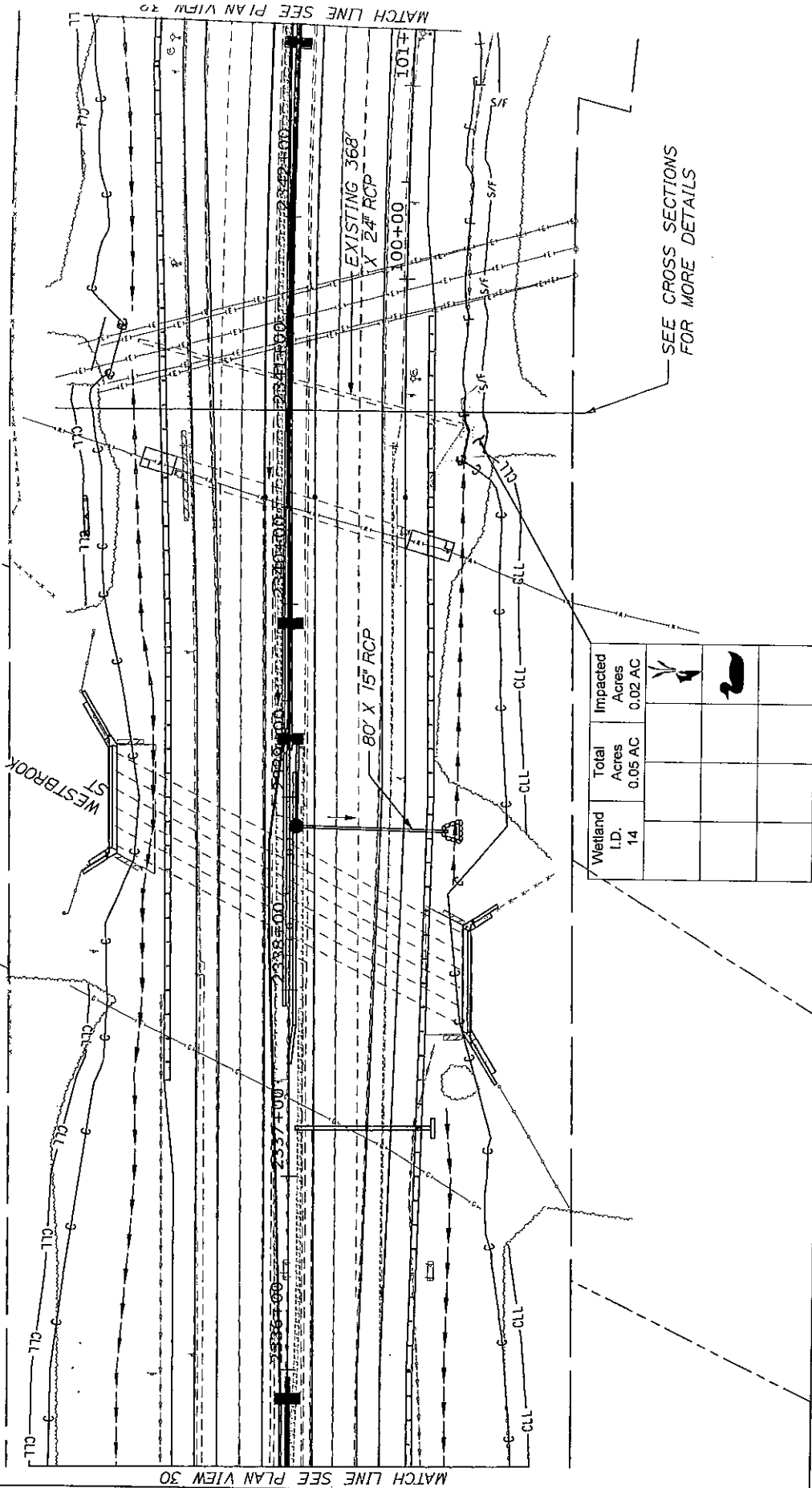
HNTB
ARCHITECTS ENGINEERS PLANNERS

PORTLAND AREA
WIDENING & SAFETY
IMPROVEMENTS

WETLAND IMPACTS
PLAN VIEW 29

DATE: FEBRUARY, 2019

SHEET 31 OF 46



SEE CROSS SECTIONS
FOR MORE DETAILS

Wetland I.D.	Total Acres	Impacted Acres
14	0.05 AC	0.02 AC



THE GOLD STAR
MEMORIAL HIGHWAY



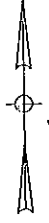
HNTB
ARCHITECTS ENGINEERS PLANNERS

WETLAND IMPACTS
PLAN VIEW 31

PORTLAND AREA
WIDENING & SAFETY
IMPROVEMENTS

DATE: FEBRUARY, 2019

SHEET 33 OF 46

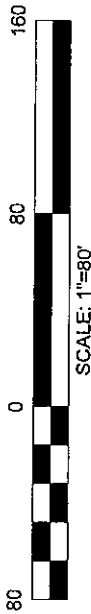


Wetland I.D.	Total Acres	Impacted Acres
31	0.11 AC	0.03 AC

BEGINNING OF MASON'S BROOK WATERSHED



MATCH LINE SEE PLAN VIEW 31



THE GOLD STAR MEMORIAL HIGHWAY



HNTB
ARCHITECTS ENGINEERS PLANNERS

WETLAND IMPACTS
PLAN VIEW 32

PORTLAND AREA
WIDENING & SAFETY
IMPROVEMENTS

DATE: FEBRUARY, 2019

SHEET 34 OF 40

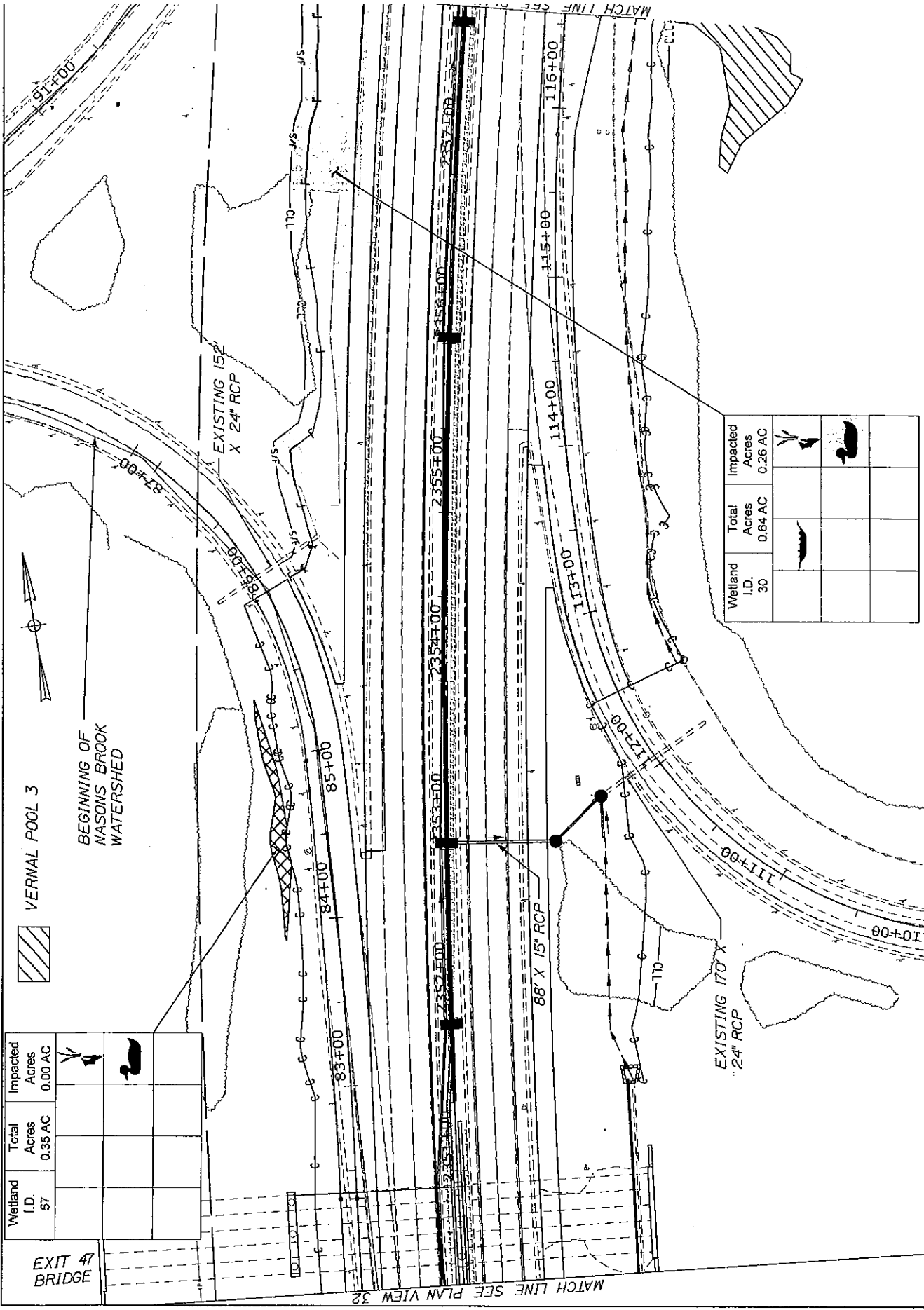
Wetland I.D.	Total Acres	Impacted Acres
57	0.35 AC	0.00 AC

EXIT 47 BRIDGE

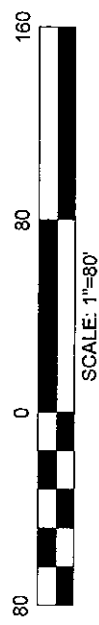


VERNAL POOL 3

BEGINNING OF
MASON'S BROOK
WATERSHED



Wetland I.D.	Total Acres	Impacted Acres
30	0.64 AC	0.26 AC



THE GOLD STAR
MEMORIAL HIGHWAY

HNTB
ARCHITECTS ENGINEERS PLANNERS

WETLAND IMPACTS
PLAN VIEW 33

PORTLAND AREA
WIDENING & SAFETY
IMPROVEMENTS

DATE: FEBRUARY, 2019

SHEET 35 OF 46

VERNAL POOL 3



EXISTING 90' x 24" CMP

EXISTING 48' x 24" RCP

8' x 18" RCP

8' x 12" RCP

SEE CROSS SECTIONS FOR MORE DETAILS

WESTBROOK ARTERIAL

BEGINNING OF NASON'S BROOK WATERSHED

MATCH LINE SEE PLAN VIEW 33

Wetland I.D.	30	Total Acres	0.84 AC	Impacted Acres	0.26 AC

Wetland I.D.	50	Total Acres	0.11 AC	Impacted Acres	0.00 AC

Wetland I.D.	17	Total Acres	0.12 AC	Impacted Acres	0.03 AC
					ES

Wetland I.D.	18	Total Acres	0.33 AC	Impacted Acres	0.05 AC



SCALE: 1"=80'



THE GOLD STAR MEMORIAL HIGHWAY

HNTB
ARCHITECTS ENGINEERS PLANNERS

PORTLAND AREA
WIDENING & SAFETY
IMPROVEMENTS

WETLAND IMPACTS
PLAN VIEW 34

DATE: FEBRUARY, 2019

SHEET 36 OF 46

Wetland I.D.	27	Total Acres	0.28 AC	Impacted Acres	0.01 AC

WSS: 0.01 ac Perm, 0.03 ac Temp

SEE CROSS SECTIONS FOR MORE DETAILS

MATCH LINE SEE PLAN VIEW 34

MATCH LINE SEE PLAN VIEW 36

Wetland I.D.	18	Total Acres	0.33 AC	Impacted Acres	0.05 AC

Wetland I.D.	19	Total Acres	0.12 AC	Impacted Acres	0.01 AC

WSS: 0.01 ac Perm, 0.01 ac Temp

SEE CROSS SECTIONS FOR MORE DETAILS



SCALE: 1"=80'



HNTB
ARCHITECTS ENGINEERS PLANNERS

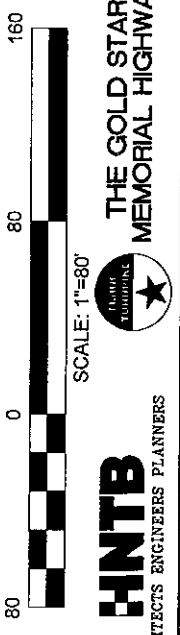
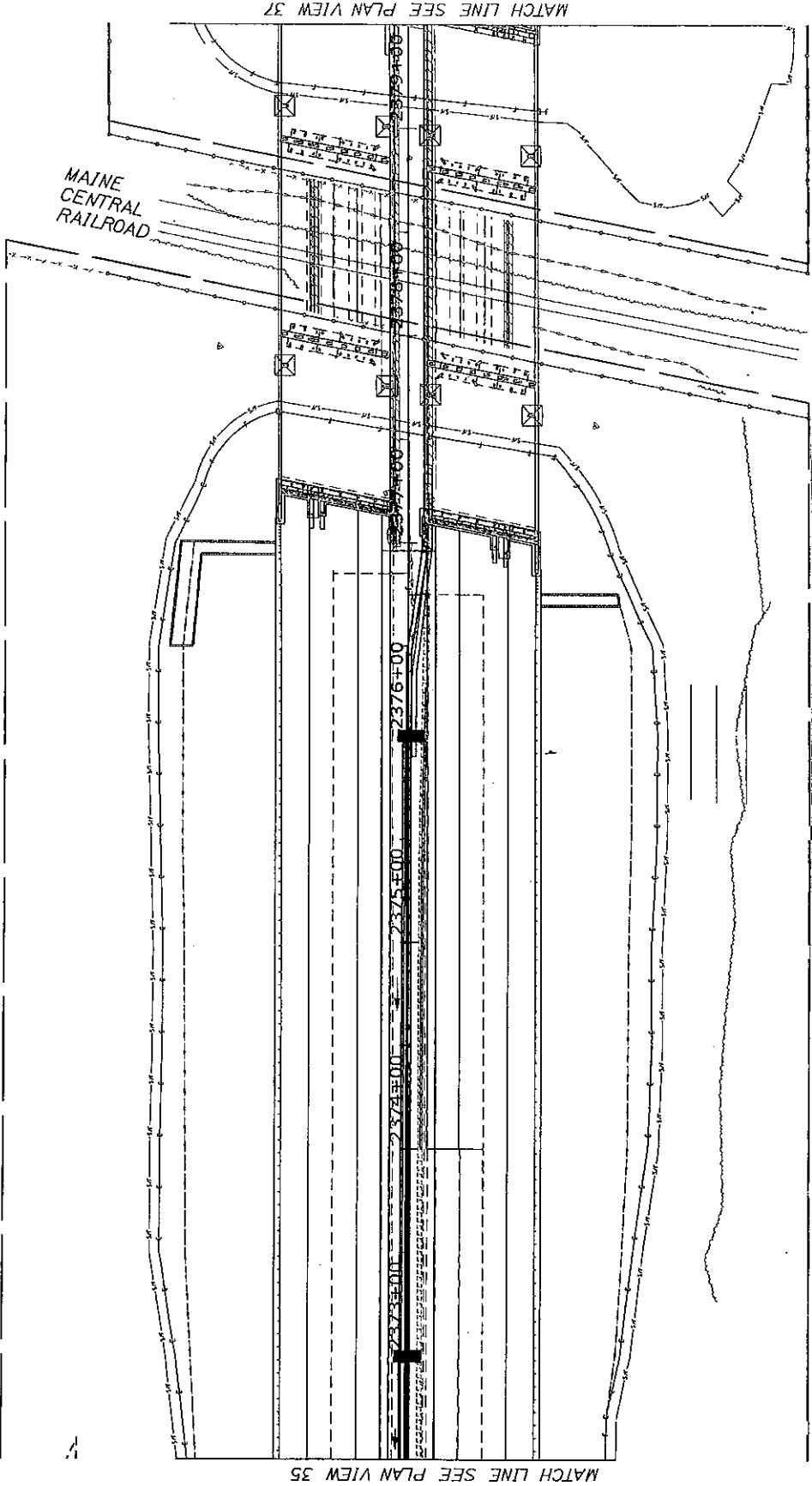
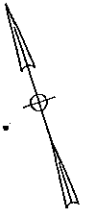
THE GOLD STAR
MEMORIAL HIGHWAY

WETLAND IMPACTS
PLAN VIEW 35

PORTLAND AREA
WIDENING & SAFETY
IMPROVEMENTS

DATE: FEBRUARY, 2019

SHEET 37 OF 46



THE GOLD STAR
MEMORIAL HIGHWAY

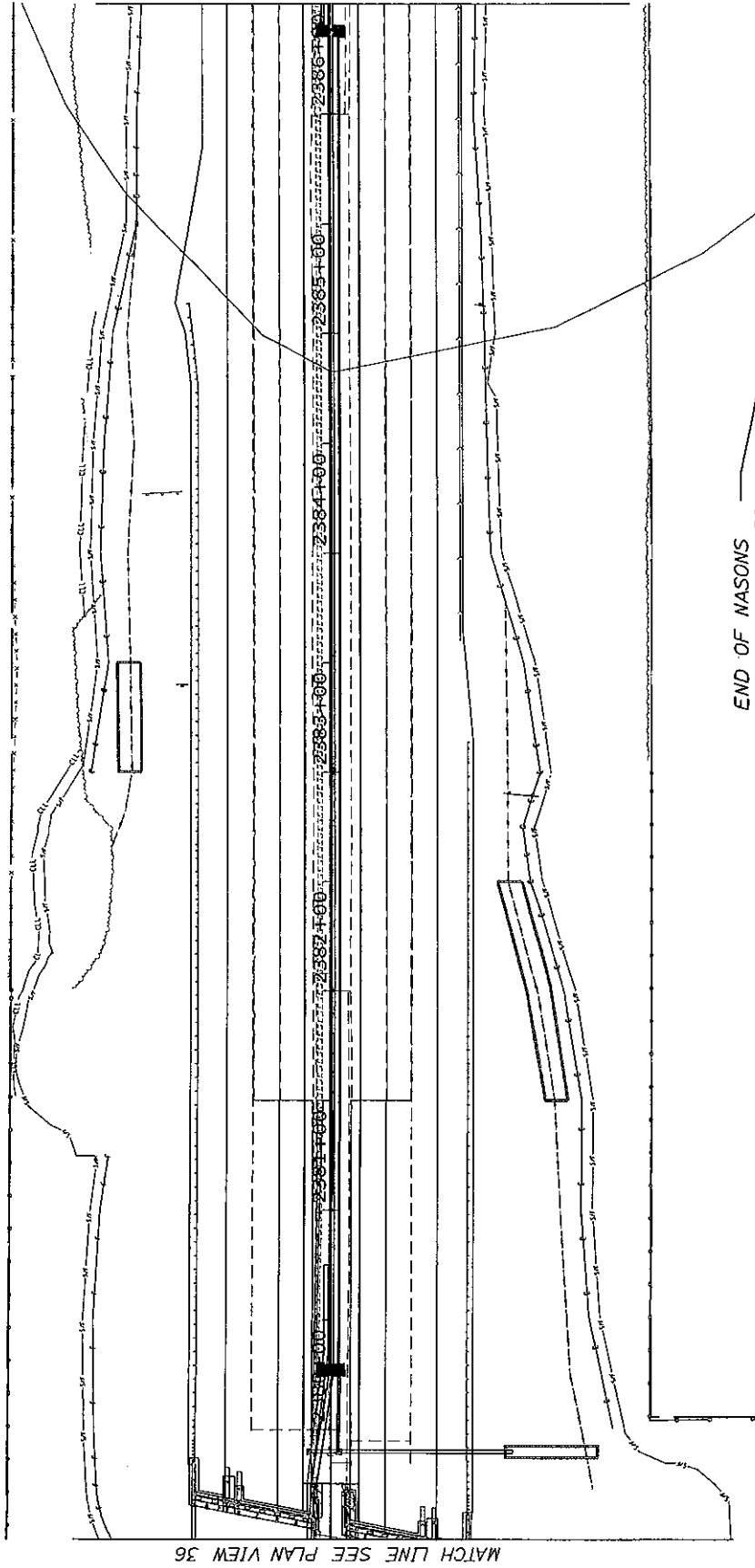
HNTB
ARCHITECTS ENGINEERS PLANNERS

WETLAND IMPACTS
PLAN VIEW 36

PORTLAND AREA
WIDENING & SAFETY
IMPROVEMENTS

DATE: FEBRUARY, 2019

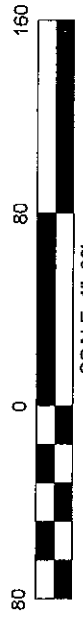
SHEET 38 OF 46



MATCH LINE SEE PLAN VIEW 36

MATCH LINE SEE PLAN VIEW 38

END OF NASONS
BROOK WATERSHED
AND BEGINNING OF
CAPISIC BROOK
WATERSHED



THE GOLD STAR
MEMORIAL HIGHWAY

HNTB

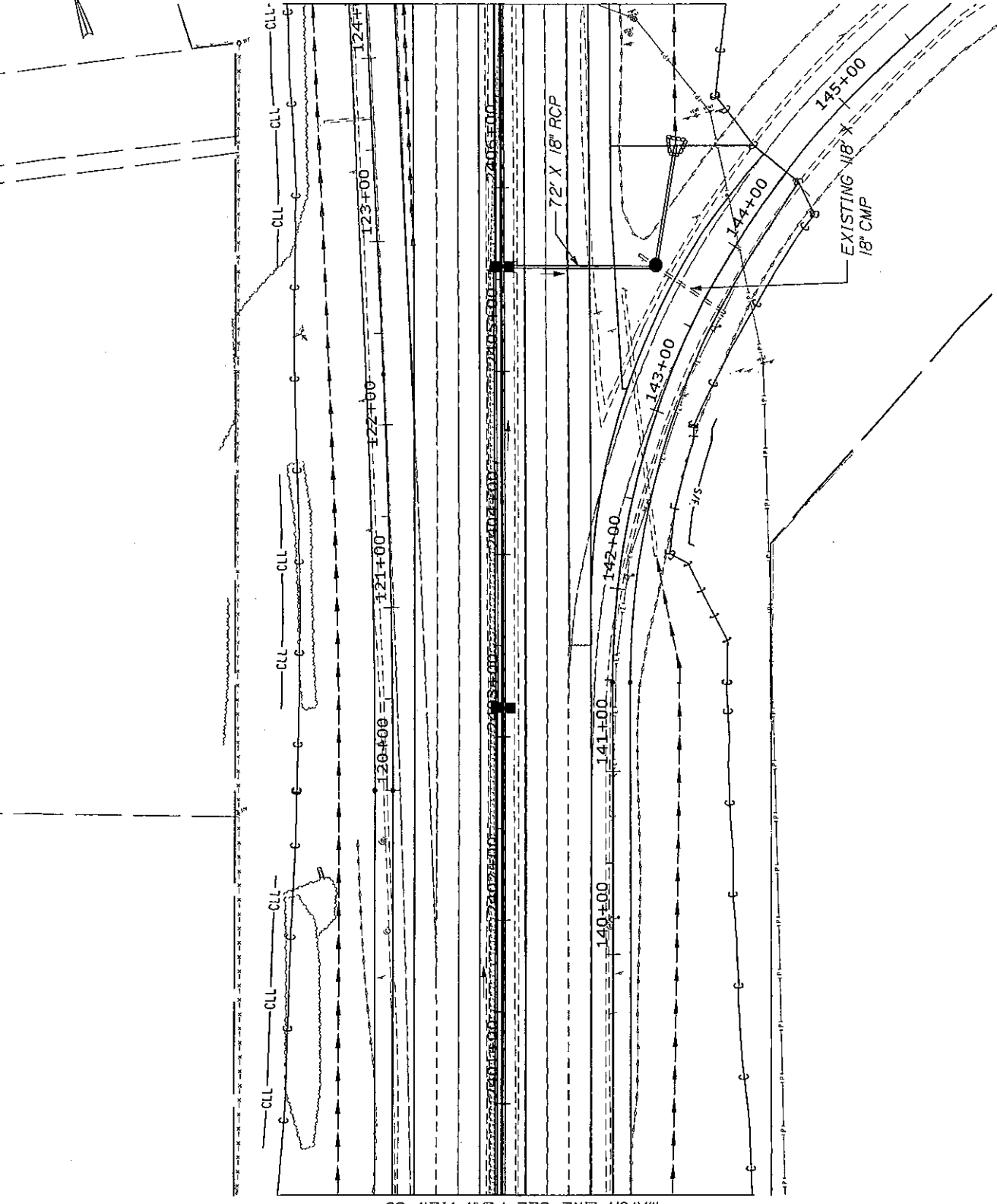
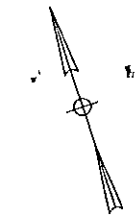
ARCHITECTS ENGINEERS PLANNERS

WETLAND IMPACTS
PLAN VIEW 37

PORTLAND AREA
WIDENING & SAFETY
IMPROVEMENTS

DATE: FEBRUARY, 2019

SHEET 39 OF 46

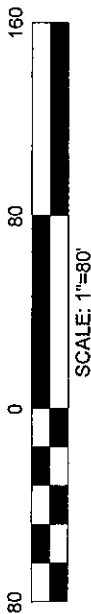


MATCH LINE SEE PLAN VIEW 41

MATCH LINE SEE PLAN VIEW 39

WETLAND IMPACTS
PLAN VIEW 40

PORTLAND AREA
WIDENING & SAFETY
IMPROVEMENTS



THE GOLD STAR
MEMORIAL HIGHWAY



HNTB

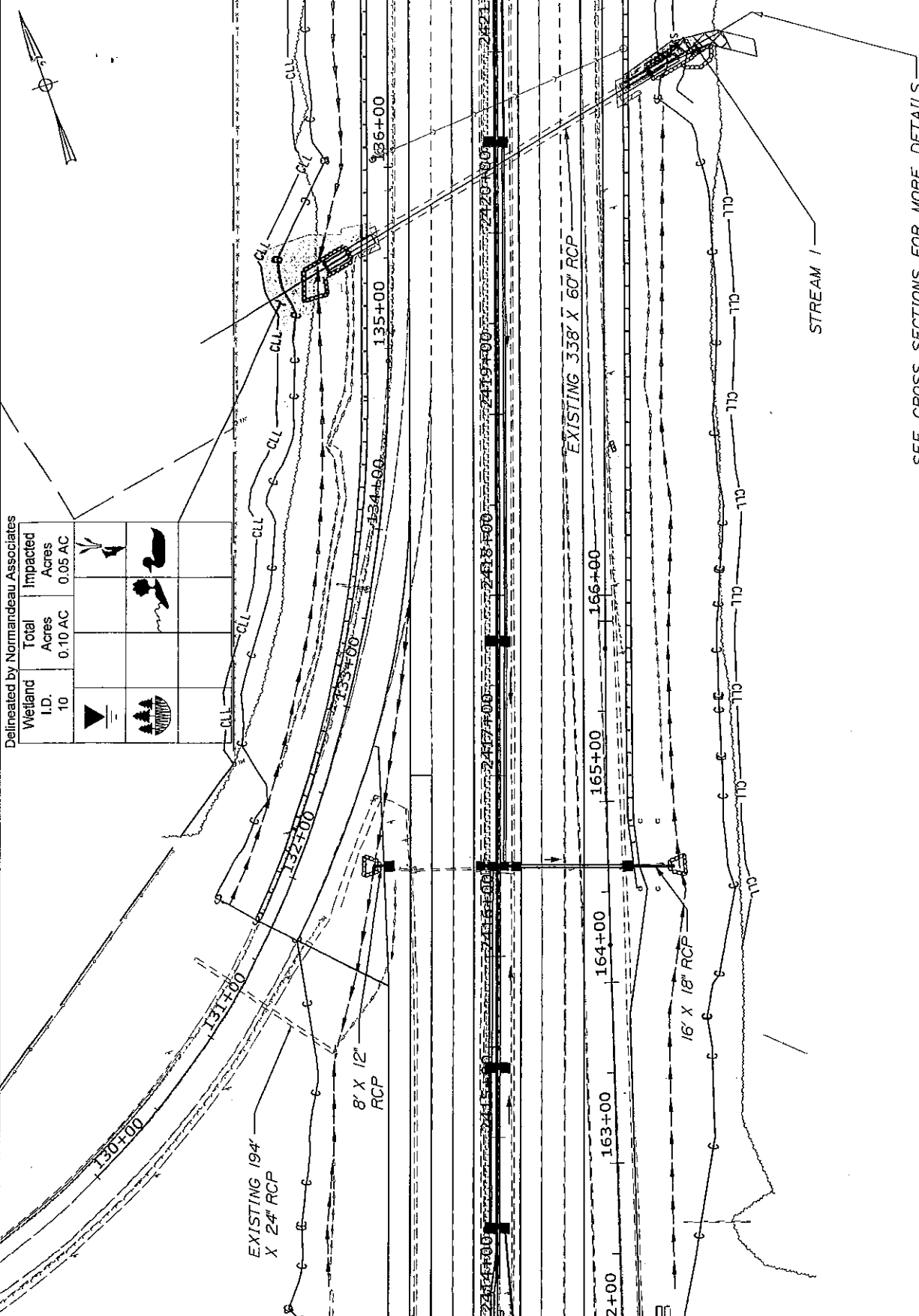
ARCHITECTS ENGINEERS PLANNERS

DATE: FEBRUARY, 2019

SHEET 42 OF 46

MATCH LINE SEE PLAN VIEW 41

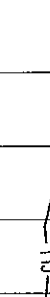
MATCH LINE SEE PLAN VIEW 42



SEE CROSS SECTIONS FOR MORE DETAILS

Delineated by Normandeau Associates

Wetland I.D.	Total Acres	Impacted Acres
10	0.10 AC	0.05 AC



SCALE: 1"=80'



THE GOLD STAR MEMORIAL HIGHWAY

HNTB
ARCHITECTS ENGINEERS PLANNERS

WETLAND IMPACTS
PLAN VIEW 42

PORTLAND AREA
WIDENING & SAFETY
IMPROVEMENTS

DATE: FEBRUARY, 2019

SHEET 44 OF 46

MATCH LINE SEE PLAN VIEW 42

SEE CROSS SECTIONS FOR MORE DETAILS

Delineated by Normandeau Associates

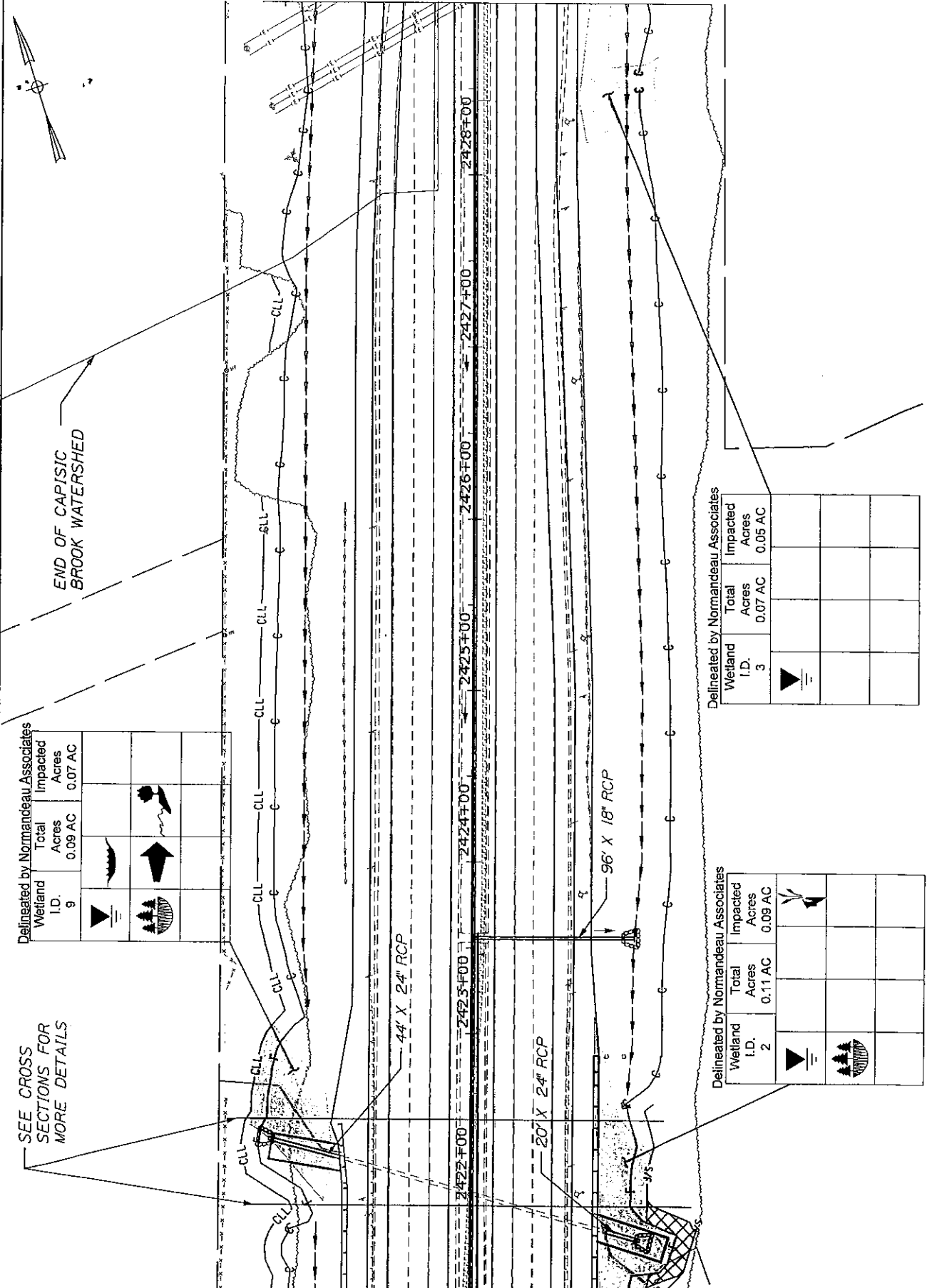
Wetland I.D.	Total Acres	Impacted Acres
9	0.09 AC	0.07 AC

Delineated by Normandeau Associates

Wetland I.D.	Total Acres	Impacted Acres
2	0.11 AC	0.09 AC

Delineated by Normandeau Associates

Wetland I.D.	Total Acres	Impacted Acres
3	0.07 AC	0.05 AC



HNTB
ARCHITECTS ENGINEERS PLANNERS

THE GOLD STAR MEMORIAL HIGHWAY

**WETLAND IMPACTS
PLAN VIEW 43**

**PORTLAND AREA
WIDENING & SAFETY
IMPROVEMENTS**

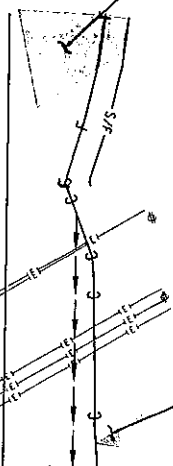
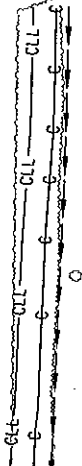
DATE: FEBRUARY, 2019

SHEET 45 OF 46

WARREN
• AVE



MATCH LINE SEE PLAN VIEW 43



2429+00 2430+00 2431+00 2432+00 2433+00 2434+00 2435+00

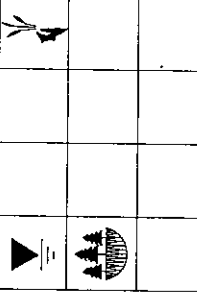
END OF CARISIC
BROOK WATERSHED

Delineated by Normandeau Associates

Wetland I.D.	Total Acres	Impacted Acres
4	0.007 AC	0.001 AC

Delineated by Normandeau Associates

Wetland I.D.	Total Acres	Impacted Acres
5	0.23 AC	0.03 AC



SCALE: 1"=80'



THE GOLD STAR
MEMORIAL HIGHWAY



HNTB
ARCHITECTS ENGINEERS PLANNERS

PORTLAND AREA
WIDENING & SAFETY
IMPROVEMENTS

WETLAND IMPACTS
PLAN VIEW 44

DATE: FEBRUARY, 2019

SHEET 46 OF 46



**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

USACE Project Number: NAE-2019-00701

Name of Permittee: Maine Turnpike Authority c/o Sean Donohue

Permit Issuance Date: August 21, 2019

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 *
* Policy Analysis/Technical Support Branch, ATTN: Marie Farese *
* 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

WORK-START NOTIFICATION FORM
(Minimum Notice: Two weeks before work begins)

EMAIL TO: colin.m.greenan@usace.army.mil and cenae-r@usace.army.mil

or

MAIL TO:

Colin M. Greenan
Maine Project Office
U.S. Army Corps of Engineers, New England District
442 Civic Center Drive, Suite 350
Augusta, Maine 04330

A Corps of Engineers Permit (number NAE-2019-00701) was issued to the Maine Turnpike Authority c/o Sean Donohue on August 21, 2019. The permit authorized the permittee to place temporary and permanent fill below the ordinary high water marks of Red Brook, Long Creek, Nason's Brook, and an unnamed tributary to Capisic Brook and in adjacent freshwater wetlands along the Maine Turnpike (Interstate 95) from Holmes Road at Scarborough, north 5.7 mi. to approximately 0.2 mile north of Exit 48 at Portland, Maine all in order to upgrade the Turnpike to current safety and capacity standards and to accommodate projected traffic volumes.

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: _____

Phone & email: () _____ () _____

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: Colin M. Greenan

Submittals Required: Payment of \$803,816.63 to the Maine Natural Resource Conservation Program

Inspection Recommendation: Random Individual Permit Compliance



**NOTIFICATION OF ADMINISTRATIVE APPEAL OPTIONS AND PROCESS AND
REQUEST FOR APPEAL**

Applicant: Maine Turnpike Authority c/o Sean Donohue		File Number: NAE-2019-00701	Date: August 21, 2019
Attached is:			See Section below
	INITIAL PROFFERED PERMIT (Standard Permit or Letter of permission)		A
X	PROFFERED PERMIT (Standard Permit or Letter of permission)		B
	PERMIT DENIAL		C
	APPROVED JURISDICTIONAL DETERMINATION		D
X	PRELIMINARY JURISDICTIONAL DETERMINATION		E

SECTION I - The following identifies your rights and options regarding an administrative appeal of the above decision. Additional information may be found at <http://www.usace.army.mil/Missions/CivilWorks/RegulatoryProgramandPermits/appeals.aspx> or Corps regulations at 33 CFR Part 331.

A: INITIAL PROFFERED PERMIT: You may accept or object to the permit.

- **ACCEPT:** If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- **OBJECT:** If you object to the permit (Standard or LOP) because of certain terms and conditions therein, you may request that the permit be modified accordingly. You must complete Section II of this form and return the form to the district engineer. Your objections must be received by the district engineer within 60 days of the date of this notice, or you will forfeit your right to appeal the permit in the future. Upon receipt of your letter, the district engineer will evaluate your objections and may: (a) modify the permit to address all of your concerns, (b) modify the permit to address some of your objections, or (c) not modify the permit having determined that the permit should be issued as previously written. After evaluating your objections, the district engineer will send you a proffered permit for your reconsideration, as indicated in Section B below.

B: PROFFERED PERMIT: You may accept or appeal the permit

- **ACCEPT:** If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- **APPEAL:** If you choose to decline the proffered permit (Standard or LOP) because of certain terms and conditions therein, you may appeal the declined permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

C: PERMIT DENIAL: You may appeal the denial of a permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

D: APPROVED JURISDICTIONAL DETERMINATION: You may accept or appeal the approved JD or provide new information.

- **ACCEPT:** You do not need to notify the Corps to accept an approved JD. Failure to notify the Corps within 60 days of the date of this notice, means that you accept the approved JD in its entirety, and waive all rights to appeal the approved JD.
- **APPEAL:** If you disagree with the approved JD, you may appeal the approved JD under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

E: PRELIMINARY JURISDICTIONAL DETERMINATION: You do not need to respond to the Corps regarding the preliminary JD. The Preliminary JD is not appealable. If you wish, you may request an approved JD (which may be appealed), by contacting the Corps district for further instruction. Also you may provide new information for further consideration by the Corps to reevaluate the JD.

SECTION II - REQUEST FOR APPEAL or OBJECTIONS TO AN INITIAL PROFFERED PERMIT

REASONS FOR APPEAL OR OBJECTIONS: (Describe your reasons for appealing the decision or your objections to an initial proffered permit in clear concise statements. You may attach additional information to this form to clarify where your reasons or objections are addressed in the administrative record.)

ADDITIONAL INFORMATION: The appeal is limited to a review of the administrative record, the Corps memorandum for the record of the appeal conference or meeting, and any supplemental information that the review officer has determined is needed to clarify the administrative record. Neither the appellant nor the Corps may add new information or analyses to the record. However, you may provide additional information to clarify the location of information that is already in the administrative record.

POINT OF CONTACT FOR QUESTIONS OR INFORMATION:

If you have questions regarding this decision and/or the appeal process you may contact:

If you only have questions regarding the appeal process you may also contact:

Mr. James W. Haggerty
Regulatory Program Manager (CENAD-PD-OR)
U.S. Army Corps of Engineers
Fort Hamilton Military Community
301 General Lee Avenue
Brooklyn, New York 11252-6700
Telephone number: 347-370-4650

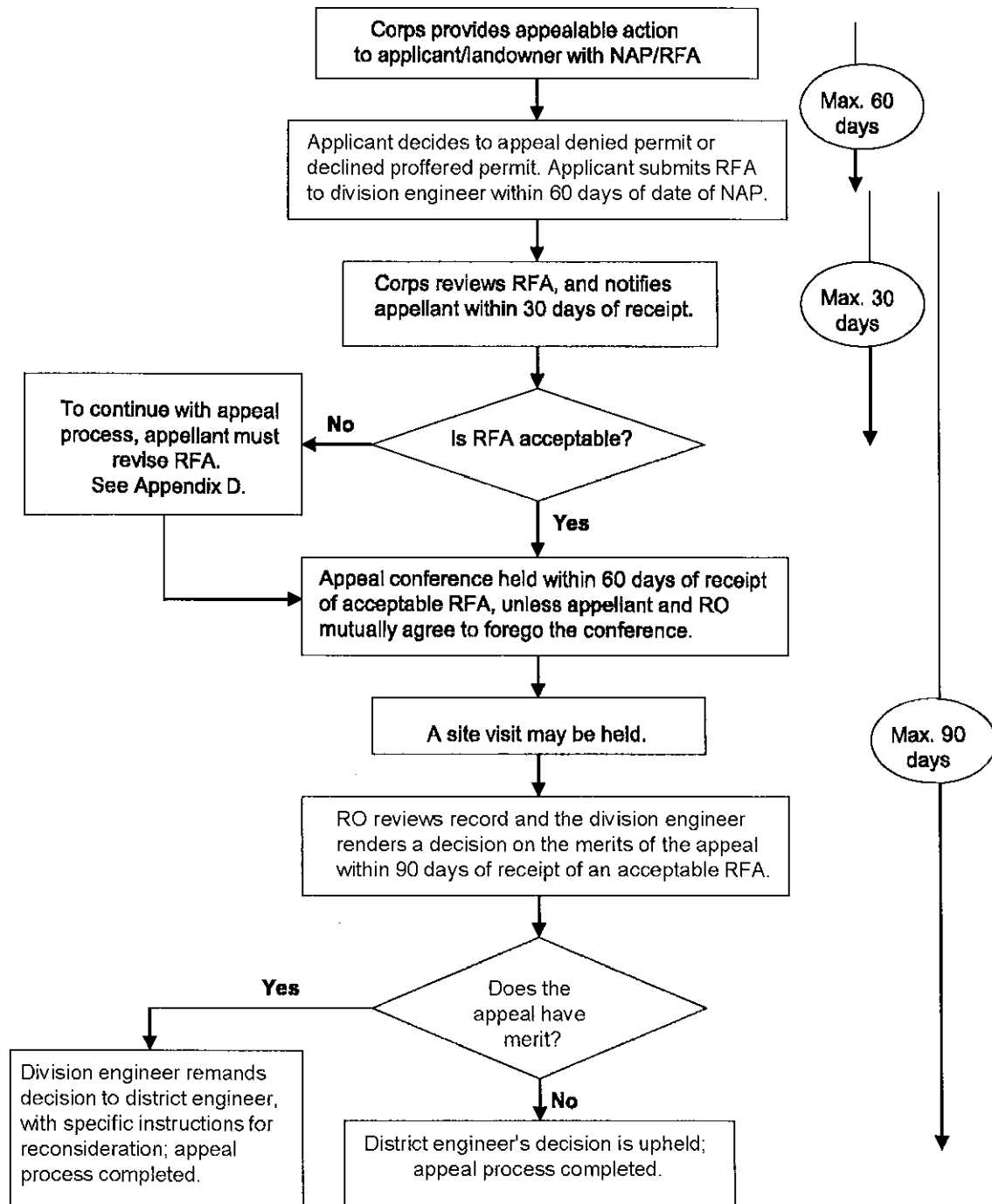
RIGHT OF ENTRY: Your signature below grants the right of entry to Corps of Engineers personnel, and any government consultants, to conduct investigations of the project site during the course of the appeal process. You will be provided a 15 day notice of any site investigation, and will have the opportunity to participate in all site investigations.

Signature of appellant or agent.

Date:

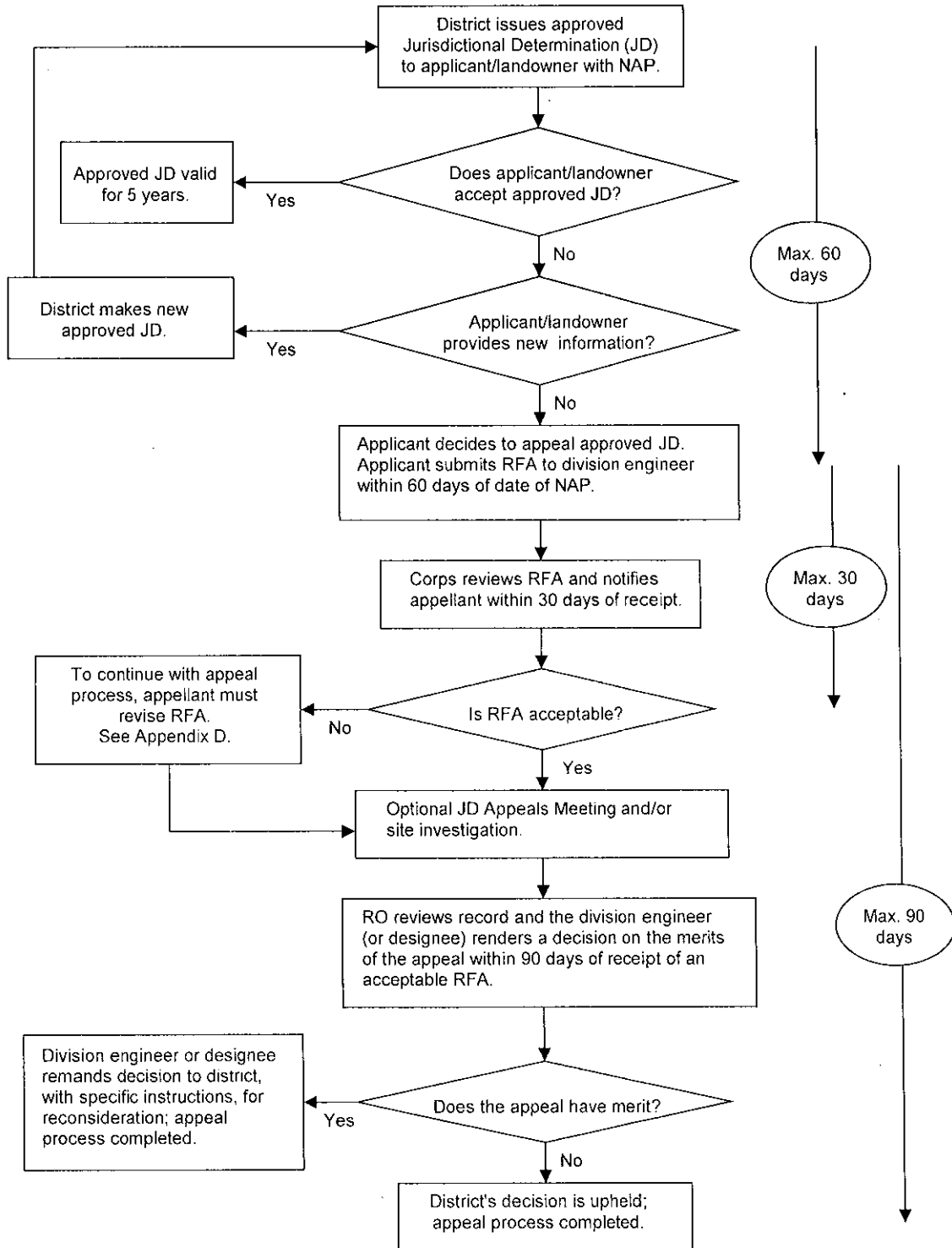
Telephone number:

Administrative Appeal Process for Permit Denials and Proffered Permits



NOTE: If new information is provided to the Corps, the applicant will be asked if the applicant wishes to revise the project or record. If so, the appeal will be withdrawn and the case returned to the District for appropriate action. If not, then the Division Engineer will rule on the merits of the appeal based on the administrative record without consideration of the new information. However, the new information may cause the District Engineer to take action under 33 CFR 325.7, independent of the appeal process.

Administrative Appeal Process for Approved Jurisdictional Determination



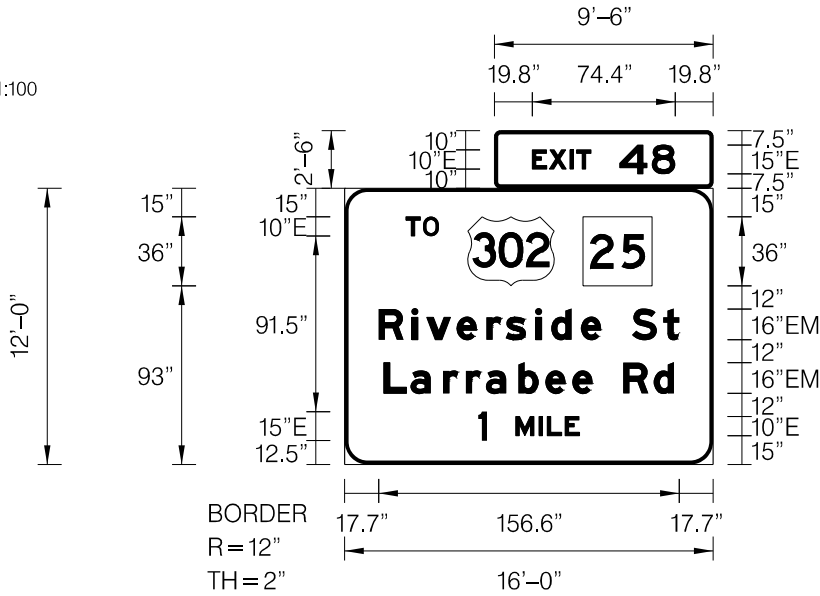
Appendix C

Appendix C Sign Details

SIGN DETAIL

1:40

1:100



**Maine
Turnpike
Authority**

SIGN NUMBER	GS-2
WIDTH x HGHT.	16'-0" x 12'-0"
BORDER WIDTH	2"
CORNER RADIUS	12"
MOUNTING	Overhead
BACKGROUND	TYPE: Reflective COLOR: Green
LEGEND/BORDER	TYPE: Reflective COLOR: White/White

SYMBOL	X	Y	WID	HT
M1-4(302)	0	64.2	45	36
M1-5(25)	0	124.2	36	36

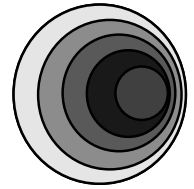
LETTER POSITIONS (X)

LENGTH SERIES/SIZE

Letter	X	Y	WID	HT	Series/Size
E	19.8	39.4	19.8	10.15	E 2000
X	28.7	39.4	19.8	10.15	E 2000
I	39.4	39.4	19.8	10.15	E 2000
T	42.9	39.4	19.8	10.15	E 2000
4	65.4	39.4	19.8	10.15	E 2000
8	82.1	39.4	19.8	10.15	E 2000
T	31.9	40.8	17.3	10	E 2000
O	40.8	40.8	17.3	10	E 2000
R	17.7	58.3	156.6	16.12	EM 2000
i	35	58.3	156.6	16.12	EM 2000
v	42.8	58.3	156.6	16.12	EM 2000
e	58.3	58.3	156.6	16.12	EM 2000
r	73.8	58.3	156.6	16.12	EM 2000
s	83.9	58.3	156.6	16.12	EM 2000
i	99.4	58.3	156.6	16.12	EM 2000
d	107.6	58.3	156.6	16.12	EM 2000
e	123.1	58.3	156.6	16.12	EM 2000
S	133.7	58.3	156.6	16.12	EM 2000
t	149.7	58.3	156.6	16.12	EM 2000
L	20.4	63.1	151.2	16.12	EM 2000
a	34.3	63.1	151.2	16.12	EM 2000
r	51.3	63.1	151.2	16.12	EM 2000
r	63.1	63.1	151.2	16.12	EM 2000
a	73.5	63.1	151.2	16.12	EM 2000
b	90.5	63.1	151.2	16.12	EM 2000
e	104.6	63.1	151.2	16.12	EM 2000
e	118.6	63.1	151.2	16.12	EM 2000
R	129.2	63.1	151.2	16.12	EM 2000
d	145.2	63.1	151.2	16.12	EM 2000
1	69.7	105.6	52.6	15.10	E 2000
M	89.2	105.6	52.6	15.10	E 2000
I	101.2	105.6	52.6	15.10	E 2000
L	105.6	105.6	52.6	15.10	E 2000
E	114.8	105.6	52.6	15.10	E 2000

Appendix D
Buckeye Partners - Right-of-way Restrictions

BUCKEYE PARTNERS, L.P. AND AFFILIATES
Five TEK Park, 9999 Hamilton Boulevard
Breinigsville, PA 18031

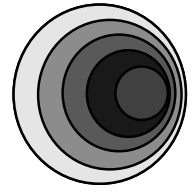


Right-of-Way Use Restrictions Specification
Revision 6

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**Buckeye Partners, L.P. and Affiliates
Right-of-Way Use Restrictions Specification
Revision 6**



Purpose and Scope

This Right-of-Way Use Restrictions Specification (hereinafter called “Specification”) has been developed by Buckeye Partners, L.P. and Affiliates (hereinafter called “Buckeye”) and is intended for landowners, utility owners, general contractors and their sub-contractors, pipeline/utility contractors, real estate developers, brokers and agents, lending officers and title underwriters, engineers, architects, surveyors, and local / governmental elected staffs (hereinafter called “Crossing Party”) as a guideline for the design and construction of proposed land development.

Buckeye appreciates this opportunity to work with you in the planning stages of your development (or construction activity), and we look forward to working with you proactively. Buckeye’s primary concern when activities are taking place near our pipeline is public safety and environmental protection. The intent of this Specification is to provide a clear and consistent set of requirements that will: (1) reduce the risk of damage to our pipeline and related facilities; (2) ensure unencumbered access to our right-of-way and pipeline facilities and the availability of adequate workspace for routine maintenance, future inspection, and/or repair work on our pipeline; and (3) enable the effective corrosion protection of our pipeline.

All such activities and projects that are performed near Buckeye’s pipeline facilities are subject to formal review by Buckeye prior to issuance of final written approval. Depending on the scope of the project and its impact on Buckeye’s pipeline facilities, additional engineering requirements and protective measures may apply. Furthermore, any damage caused by the encroaching party to Buckeye’s pipeline(s), the pipeline cathodic protection system, or other Buckeye assets is the sole responsibility of the encroaching party. Buckeye will pursue reimbursement for all costs associated with the event including, but not limited to, excavation services, inspection services, pipeline repairs, and loss of operations.

The following requirements are not only the policy of Buckeye, but comply with regulations set forth by the United States Department of Transportation, Safety Regulations, 49 CFR, Parts 192 and 195.

We want to be a good neighbor, but to do so requires us to act responsibly in protecting our right-of-way and preventing damage to the pipeline system. While we want to make every effort to accommodate your desired use of your property, our responsibility for public safety is paramount. Through proper planning and communications, we can ensure the safety and integrity of our pipeline system and the welfare of our neighbors.

The transmittal of this Specification does not constitute Buckeye’s approval or permission for the Crossing Party to begin construction or work within or across the pipeline right-of-way. Work may not commence until written authorization approving such work has been issued by Buckeye.

1.0 General Guidelines

1.1 The safety of the pipeline must be considered at all times. No attempt to probe for or engage in any construction activities which might damage the pipeline is permitted.

- 1.2 Before any preliminary field work or construction begins in the vicinity of Buckeye's pipeline, a determination of the exact location and elevation of the pipeline must be made. To coordinate this procedure, please contact our local Field Operations Manager at the Buckeye facility nearest to your proposed project (see Attachment 1 for a listing of Buckeye's facilities and telephone numbers). Buckeye makes no assurance that its permanent pipeline markers are positioned directly over its pipeline(s). Line markers should be placed at intervals determined by "line of sight". The relocation, removal, or destruction of Buckeye's pipeline markers are prohibited by federal law. Pipeline markers damaged or made unusable shall be repaired or replaced at the Encroaching Party's expense.
- 1.3 All proposed drawings/plans must be submitted to Buckeye's Right of Way Department for review to determine to what extent, if any, the pipeline or right-of-way will be affected by the proposed construction and/or development. These drawings/plans must be prepared in strict compliance to Attachment 4, "Requirements for Submission of Design Plans".
- 1.4 Buckeye may require the property owner to provide proof of current ownership of the land where the proposed encroachment is to occur. Such proof may be in the form of a Title Commitment, Title Policy, or a certified copy of a recorded Conveyance Deed.
- 1.5 When any construction activity is conducted in or around our pipeline right-of-way, Buckeye's On-Site Inspector must be present at all times. **NO WORK SHALL TAKE PLACE WITHOUT A BUCKEYE ON-SITE INSPECTOR PRESENT.** For this free-of-charge service, contact our local Field Operations Manager at the Buckeye facility nearest to your proposed project.
- 1.6 The Crossing Party shall contact Buckeye for re-marking of a pipeline if the existing markers are inadequate for any reason, including disturbance due to construction activities.

Note: Federal law prohibits the removal of pipeline markers.
- 1.7 The Crossing Party shall not burn trash, brush, or other items or substances within 50 feet of the pipeline.
- 1.8 The Crossing Party shall not store any equipment or materials on the right-of-way. Full access must be maintained to the pipeline(s) at all times. The stockpiling of items including soil, or topsoil over the pipeline(s) is not permitted.
- 1.9 During routine or emergency maintenance on the pipeline, the cost to restore approved surface improvements (e.g., pavement, landscaping, sidewalks, etc.) shall be the responsibility of the Crossing Party.
- 1.10 Depending on the type and nature of the encroachment, Buckeye may require the pipeline(s) within the proposed encroachment to be exposed, visually inspected, and backfilled by a Buckeye representative at the full expense of the Crossing Party. Buckeye will evaluate the pipeline(s) cathodic protection system, including the coating type and condition, for suitability of service in relation to the proposed encroachment. Should Buckeye deem that the cathodic protection system and/or coating system is insufficient for any reason, Buckeye will repair or upgrade the system at the Crossing Party's expense to accommodate the proposed encroachment. Potential cathodic protection modifications can include, but are not limited to equipment such as rectifiers, anode systems, test stations, casing pipe, and coating.

2.0 Excavation and Construction Restrictions

- 2.1 Excavation operations shall be performed in accordance with appropriate State “One-Call” utility locating system requirements. As a matter of State law, anyone undertaking excavation work is required to call three (3) working days before excavating in MA, ME, MI, MO, NJ, PA, RI, SC, TN, and WI; two (2) working days in all other states (see Attachment 3 for State “One-Call” numbers).



- 2.2 The Crossing Party will conduct “white-lining” of any proposed excavation areas. Buckeye will erect temporary pipeline markers/flags (yellow) identifying the location of the pipeline within the work area, and will provide information on how to respond should the pipeline be damaged or a commodity release occur. All personnel operating equipment over or around the pipeline must be made aware of its location and what to do if they make contact with the pipeline.

Note: The Encroaching Party must utilize a qualified contractor of Buckeye’s choice to locate and mark the existing Buckeye operated pipeline(s) using current industry practices and agrees to mark the location of the pipeline with buoys or by electronic location methods as approved by Buckeye for the duration of the construction activity in the vicinity of Buckeye’s operated pipeline(s). If proposing dredging activities within 150-feet of Buckeye’s pipeline(s), a dredging plan must be submitted to Buckeye for review and approval.

- 2.3 When a Crossing Party excavates near Buckeye’s pipeline, a Buckeye representative must locate the pipeline and determine the depth of cover before the Crossing Party begins excavation. The Buckeye representative and the excavator must review and complete an Excavation Safety Checklist (Attachment 9). The Crossing Party shall not perform any excavation, crossing, backfilling, or construction operations until Buckeye’s On-Site Inspector has reviewed the proposed work on site and given approval for work to proceed. Buckeye’s On-Site Inspector shall have full authority to stop the work if it is determined that the work is being performed in an unsafe manner.
- 2.4 No equipment shall work directly over the pipeline. The Crossing Party shall install temporary fencing along Buckeye’s right-of-way boundaries so that equipment will not inadvertently pass over the pipeline at locations other than those established for crossing (see Section 3.6).
- 2.5 When excavating within the right-of-way, the Crossing Party’s backhoe shall have a plate welded over the teeth of the backhoe bucket, and the side cutters must be removed prior to excavation. However, if within 24 inches of the outer edge of the pipe (this “tolerance zone” extends on all sides of the pipe), only hand excavation, air cutting, and vacuum excavation are permitted.
- 2.6 No excavations shall be made on land adjacent to the pipeline that will in any way impair, withdraw lateral support, cause subsidence, create the accumulation of water, or cause damage to the pipeline or right-of-way.
- 2.7 The Crossing Party shall ensure all excavation work complies with OSHA’s excavation standards outlined in 29 CFR 1926 and correct any noncompliant excavation site before Buckeye’s On-Site Inspector or the Crossing Party enters the site to perform work.

- 2.8 If conditions require, the Crossing Party shall be directed by Buckeye to install sand or cement bags or other suitable insulating materials to maintain proper vertical clearance from the pipeline.
- 2.9 At any location where the pipeline is exposed, the Crossing Party shall provide Buckeye the opportunity to inspect the pipeline condition, install cathodic protection test leads, and/or install underground warning mesh.
- 2.10 The maximum unsupported exposed length of pipe shall be 20 feet for 4-inch-diameter pipe, 25 feet for 6-inch- to 10-inch-diameter pipe, and 35 feet for 12-inch- to 24-inch-diameter pipe. When required, the pipeline shall be supported with grout and sand bags or padded skids. At no time shall the pipeline be used as a brace to support equipment or sheeting/shoring materials.

Note: The Crossing Party shall submit a support plan for Buckeye's review and approval.

- 2.11 No buried pipeline may be left exposed for any duration of time without concurrence of Buckeye's On-Site Inspector.
- 2.12 Backfill and compaction shall be performed to the satisfaction and in the presence of Buckeye's On-Site Inspector. Within 5 feet of the pipeline crossing location, the Crossing Party shall place at least 12 inches of sand with no sharp gravel, rock, hard clods, vegetation, or other debris on all sides of any pipeline, and remaining backfill shall be placed so as not to disturb this padding material or damage the pipeline (see Attachment 7 for Foreign Utility Crossing Detail). Backfill over the pipe shall be compacted by hand until 18 inches of cover is achieved. The disturbed ground shall be compacted to the same degree of compaction of surrounding areas. The Crossing Party shall restore the site to its original condition except for items that are part of the Buckeye approved change.

3.0 Specific Guidelines

3.1 Cover, Grading, and Drainage

3.1.1 Cover and Grading:

- a. The existing cover over the pipeline shall not be modified without Buckeye's written approval.
- b. The final grading shall net a minimum cover of 36 inches over the pipeline.
- c. In areas where buildings are proposed within 50 feet of the pipeline or due to other surface improvements and/or in areas determined by Buckeye, final grading shall net a minimum cover of 48 inches over the pipeline.
- d. The maximum allowable constructed cross-slope within the ROW shall be 5H:1V and shall never be greater than the existing cross-slope.
- e. The maximum allowable cover/soil shall not exceed six (6) feet without Buckeye's written approval.
- f. Use of vibratory equipment larger than walk-behind units are not permitted within 25 feet of the pipeline.

3.1.2 Drainage:

- a. Detention ponds, lakes, structures or any type of impoundment of water, temporary or permanent, are prohibited within the right-of-way.
- b. Culverts are not permitted within the right-of-way.

- c. Any modifications to an existing drainage pattern shall be designed such that the erosion of the pipeline cover is controlled.
- d. For streams, drainage channels, and ditches, a minimum of cover of 60 inches is required between the pipeline and the bottom of the drainage canal or ditch (see Section 3.3.1.f for road drainage ditches).

3.2 Aboveground and Underground Structures

3.2.1 **General Requirements:**

- a. Buildings or other structures, including, but without limitation, overhanging balconies, patios, decks, swimming pools, wells, walls, septic systems, propane tanks, transformer pads, manholes, valve boxes, storm drain inlets, utility poles, the storage of materials, or any other item which will create an obstruction or prevent the inspection of the right-of-way by air or foot, shall not be erected within the right-of-way.
- b. The Crossing Party shall not develop or build retaining walls, drive piling or sheeting, or install an engineered structure that develops or controls overburden loads that will impact the pipeline (see Section 3.9).
- c. Deep foundations which include piers, caissons, drilled shafts, bored piles, and cast-in-situ piles located within 500 feet of the pipeline shall be installed/drilled using an auger.
- d. Occupied structures shall not be located within 50 feet of the pipeline unless a minimum cover of 48 inches is provided above the top of the pipeline.
- e. Any deviation for aboveground and underground structures will be reviewed by Buckeye on a **case-by-case basis**.

3.2.2 **Gardening and Landscaping:**

- a. Trees, shrubs and bushes are not permitted within the right-of-way. Trees planted outside of the right-of-way should be placed so branches and limbs will not overhang the pipeline right-of-way as the tree matures. Buckeye may trim/remove overhanging branches and limbs that encroach into the right-of-way.
- b. Flowerbeds, vegetable gardens and lawns, are permitted within the right-of-way. Buckeye is not responsible for replacing any plantings located within the right-of-way.

3.2.3 **Fences and Walls:**

- a. Privacy fences or fences that prevent access to the right-of-way are not permitted.
- b. All other fence installations within the right-of-way will be reviewed for approval by Buckeye on a **case-by-case basis**. Upon Buckeye's written approval, fences shall be constructed with a 14-foot gate or removable sections across the right-of-way.
- c. Fence posts shall not be installed within 5 feet of the pipeline and must be equidistant if crossing the pipeline.
- d. No fence shall cross the right-of-way at less than a 60-degree angle.
- e. Fences that run parallel to the pipeline shall be installed outside the right-of-way.
- f. Masonry, brick, or stone walls are not permitted on the right-of-way.

3.3 Roads, Driveways, Sidewalks, and Parking Areas

3.3.1 **General Requirements:**

- a. Roads, driveways, sidewalks, or parking areas are strictly prohibited. When extenuating circumstances arise, these items may be reviewed by Buckeye on a

- case-by-case basis. Upon Buckeye's written approval, roads, driveways, and sidewalks shall cross perpendicular to the pipeline.
- b. The maximum allowable cover shall not exceed six (6) feet without Buckeye's written approval.
 - c. Use of vibratory equipment larger than walk-behind units is not permitted within 25 feet of the pipeline.
 - d. Roads or driveways shall not be installed longitudinally within the right-of-way.
 - e. For roads and driveways, a minimum cover of 48 inches with a net cover of 36 inches of undisturbed soil is required above the pipeline.
 - f. A minimum cover of 36 inches over the pipeline is required at road drainage ditches. Upon Buckeye's approval, this cover can be reduced to 24 inches if ditch is rock/rip-rap lined and 12 inches if ditch is concrete lined.
 - g. For asphalt parking lots and sidewalks, a minimum cover of 36 inches with a net cover of 24 inches of undisturbed soil is required above the pipeline. Additional cover may be required by Buckeye based upon specific site conditions.
 - h. Stockpiling of materials on the right-of-way is not permitted. These materials include, but are not limited to soil, snow, stone, boulders, trees, brush, grass clippings, leaves, etc.

3.4 Foreign Utility Crossings

3.4.1 **General Requirements:**

- a. Utilities shall cross perpendicular to the pipeline.
- b. Utilities are required to cross beneath the pipeline with a minimum clearance of 24 inches. Exceptions to Buckeye's clearance requirements for underground service entrances to single family dwellings will be reviewed on a **case-by-case basis**.
- c. Sand or select fill shall be placed between the pipeline and utility (see Section 2.8).
- d. Utilities installed parallel to the pipeline shall be reviewed by Buckeye on a **case-by-case basis**. If approved, the utility shall be no closer than 15 feet from the pipeline.
- e. Warning tape, in accordance with A.P.W.A. Uniform Color Code, shall be placed above utility, 12 inches below ground, for a distance of 25 feet on either side of crossing.
- f. Signage shall be placed at crossing as determined appropriate by Buckeye.
- g. Splice boxes, service risers, energized equipment, etc., are not permitted within the right-of-way.

h. Trenchless Excavations:

- [1] Utilities installed by a trenchless excavation method (directional drilling, jacking, slick boring, etc.) shall be reviewed by Buckeye on a **case-by-case basis**.
- [2] Buckeye reserves the right to select the method of crossing for the proposed utility.
- [3] A minimum clearance of 60 inches (5 feet) below the pipeline is required.
- [4] For directional drilling operations, a tracking system is required to verify the exact location of the drill head.
- [5] For perpendicular crossings, a 4 feet by 4 feet excavation window, 24 inches below the pipeline is required for visual inspection of the pipeline to ensure the drill (or bore) does not impact the pipeline.
- [6] Blind boring is not permitted within Buckeye's right-of-way.
- [7] When trenchless excavations are authorized by Buckeye parallel to and within 10 feet of an existing pipeline, observation holes shall be excavated at 25-foot intervals to monitor the progress and horizontal/vertical location of the drill head.

[8] Buckeye must be provided with an advance copy of the horizontal directional drill (HDD) plan for the trenchless excavation which specifies how the HDD will be tracked, monitored and controlled at least two weeks before work is to commence. The plan must detail preventative measures to prevent conflicts with Buckeye's existing facility. The plan must state the planned HDD bore diameters, rod lengths, ream diameters, method of guidance, method of drill head tracking, etc. Additionally, the plan needs to include procedures for continuous monitoring and reporting of the drill head location, and state the appropriate vertical and horizontal deviation tolerances for the HDD operations in accordance with API RP 1172 – "6 Final Design". The procedure must include reporting requirements and procedures to correct or shut down the HDD trajectory should the operation exceeds the established tolerances. Buckeye Operations must be notified immediately if tolerances are compromised and should be involved in the recommencement of operations after tolerances are exceeded.

3.4.2 Metallic Utilities:

- a. Bonds and test leads shall be installed at the expense of and by the Crossing Party where Buckeye deems necessary.
- b. Utilities shall be coated with a non-conductive coating for a distance of 50 feet on either side of the pipeline crossing.
- c. Ductile water pipe shall include nitrile gaskets within 50 feet of the pipeline crossing or anywhere within 25 feet of horizontal offset locations.

3.4.3 Non-Metallic Utilities:

- a. Utilities shall be wrapped with tracer wire within the width of the right-of-way.
- b. Natural gas (or other industrial gases) lines shall be encased in a 6-inch envelope of yellow 3,000 psi concrete across the right-of-way for a minimum distance of 10 feet to each side of each BUCKEYE Pipeline(s) across the right-of-way.
- c. PVC water pipe shall include nitrile gaskets within 50 feet of the pipeline crossing or anywhere within 25 feet of horizontal offset locations.

3.4.4 Underwater Line Crossings:

- a. For underwater line location procedures, refer to section 2.2.
- b. The Encroaching Party must provide qualified diving inspectors to Buckeye for use during the crossing activity at no cost to Buckeye.
- c. The Encroaching Party must place sacks filled with sand and cement between Buckeye's pipeline(s) and the encroaching utility to provide and maintain the required minimum vertical clearance between the two utilities.

3.4.5 Electrical, Fiber-Optic, and Communications Cables

a. Buried Cables:

- [1] Electrical conductors/cable installations shall meet minimum requirements of National Electric Code for buried conductors and be adequately shielded and be impervious to hydrocarbon liquids.
- [2] Cables are required to cross beneath the pipeline with a minimum clearance of 24 inches. Exceptions to Buckeye's clearance requirements for underground service entrances to single family dwellings will be reviewed on a **case-by-case basis**.
- [3] Sand or select fill shall be placed between the pipeline and cable (see Section 2.8).

- [4] All cables shall be installed in Schedule 80 PVC pipe and encased in a 6-inch envelope of color coded (i.e. red for electrical cable, orange for communication cable) 3,000 psi concrete for a minimum distance of 10 feet to each side of each BUCKEYE Pipeline(s) across the right-of-way.
- [5] Warning tape, in accordance with A.P.W.A. Uniform Color Code, shall be placed above the utility, 12 inches below ground, for a distance of 25 feet on either side of the crossing.
- [6] Signage for the crossing shall be placed as determined appropriate by Buckeye.

b. Aboveground Cables:

- [1] A minimum of 20 feet of above-grade clearance for a distance of 25 feet on each side of the pipeline is required.
- [2] Mechanical supports and service drops including poles, towers, guy wires, ground rods, anchors, etc., are not permitted within 25 feet of the pipeline.

3.5 Temporary Access Roads and Heavy/Construction Vehicle Crossings

3.5.1 General Requirements:

- a. The Encroaching Party shall provide Buckeye information as to the type, model, size, and axle weight of construction equipment that will be used over or in the vicinity of the pipeline(s).
- b. Trucks carrying a maximum axle load up to 15,000 pounds may cross the right-of-way after Buckeye has confirmed a minimum cover of 48 inches over the pipeline.
- c. For all other cases, earthen ramps (see Attachment 6), swamp mats, air bridges, reinforced-concrete slabs (see Attachment 5), or steel plates may be required. Loading conditions and protection measures will be evaluated and dictated by Buckeye's Right of Way Department.
- d. When temporary fill must be added, colored sheets of plastic shall be placed under the temporary fill at original grade so that the original grade will not be disturbed when the temporary fill is removed.
- e. At all crossing locations, the Crossing Party will provide 12" of clean AASHTO 1 stone over the pipeline right-of-way.
- f. During the use of an approved temporary construction road, Buckeye may require that the Crossing Party provide additional protective measures deemed necessary to prevent damage to the pipeline.
- g. Buckeye will limit the number of temporary construction roads constructed by the Crossing Party.

3.6 Railroad Crossings

3.6.1 General Requirements:

- a. A minimum clearance of 72 inches is required between railroad tracks and the pipeline.
- b. A minimum cover of 36 inches is required between the bottom of drainage ditches on either side of a railroad and the pipeline.
- c. For railroad main lines, the pipeline crossing must comply with local railroad guidelines that delineate the requirements for carrier pipe, casing pipe, and clearances. Buckeye shall be consulted for the review of any State submittals.
- d. For private spur crossings, Buckeye will determine the railroad entity having jurisdictional authority to dictate crossing requirements.

3.7 Farming and Field Tile

3.7.1 **General Requirements:**

- a. Field tile running parallel to the pipeline shall be spaced 10 feet from the centerline of the pipeline.
- b. Field tile shall cross the pipeline perpendicularly with a clearance of 12 inches above or below the pipeline.
- c. Buckeye will approve the total number of crossings of the pipeline on a **case-by-case basis**.
- d. Deep plowing or “ripping” operations shall be approved by and coordinated with Buckeye.

3.8 Construction-Induced Vibrations

3.8.1 **General Requirements:**

- a. Construction activities that generate ground vibrations, including, but without limitation, pile driving, sheet driving, soil compaction work, jackhammering, or ramming, shall be reviewed by Buckeye on a **case-by-case basis**.
- b. If the Crossing Party anticipates such an activity within 10 feet of the pipeline, then continuous testing monitored by a seismograph located directly over the pipeline at its closest point to the activity must be conducted. The Crossing Party shall provide, at their expense, the monitoring service which must be approved by Buckeye.
- c. The particle velocity of any one component of a three-component seismograph must not exceed 2.0 inches per second as recorded on the seismograph placed directly over the pipeline.

3.9 Blasting Operations

3.9.1 **Blasting within 500 feet of the pipeline right-of-way:**

- a. The Crossing Party must submit a blast plan to Buckeye for review and approval. Verbal and written notice will be given 14 and 21 days respectively.
- b. Blasting plans must include the following information:
 - Dates blasting to occur
 - Explosives type
 - Maximum shot hole depth and diameter
 - Number of holes and spacing
 - Delay pattern
 - Delay types and intervals
 - Depth of overburden
 - Depth of blast area
 - Maximum charge per hole, per delay
 - Show drilling/blasting pattern plan and profile in relation to Buckeye facilities
 - Calculated radiant peak particle velocity (PPV) at varying distances from the pipeline and at the pipeline itself
 - State permit (copy)
 - Blasting contractor qualifications and insurance certificate (copy)
 - Blasting Safety Plan (copy)

The Crossing Party shall complete Attachment 8, “Blasting Plan Submission Form”, and include this form with their submission to Buckeye.

- c. The Crossing Party shall make arrangements for a Buckeye On-site Inspector to be present to witness the blasting operation.

3.9.2 Blasting within 300 feet of the pipeline right-of-way:

(Adds to or replaces items in Section 3.10.1)

- a. Blasting shall be monitored by a seismograph located directly over the pipeline at its closest point to the blast hole(s). The Crossing Party shall provide, at their expense, the monitoring service which must be approved by Buckeye.
- b. The particle velocity of any one component of a three-component seismograph must not exceed 2.0 inches per second as recorded on the seismograph placed on the ground directly over the pipeline.
- c. For blast testing, an initial test blast using a maximum charge of one pound shall be performed. The Crossing party shall detonate the first test blast with all necessary monitoring equipment in place to observe the results of the proposed blast design. Each subsequent test blast may be set and detonated only after the seismograph reading from the previous test blast indicates that further blasting can be safely conducted.
- d. Routine production blasting may be initiated after completion of a successful test blast, with allowable charge based on the seismographic vibration recordings of test blasts. However, all blasting must be continuously monitored by a seismograph. The velocity recorded must not exceed the 2.0 inches per second limit noted above.

3.9.3 Blasting within 50 feet of the pipeline right-of-way:

(Adds to or replaces items in Section 3.10.2)

- a. The Crossing Party shall hire a consulting firm that specializes in underground blasting to conduct the seismograph survey and certify the results.
- b. Buckeye will approve the Crossing Party's selection of consulting firms that will conduct the seismographic surveys before starting any blasting operation.

3.9.4 Special Requirements:

- a. For multiple-delay blasting, the Crossing Party shall begin the blasting sequence at the charge closest to the pipeline and progress away from the pipeline.
- b. If seismographic readings above the limit stated in item 3.10.2.d of this section are recorded, the pipeline must be exposed and inspected for possible damage and/or product release. The Crossing Party conducting blasting operations is responsible for all expenses related to the exposure and any subsequent repairs necessitated by the operation.
- c. At Buckeye's request, the Crossing Party shall install sheet piling, open trench channels, and/or matting to protect the pipeline during blasting operations.

3.10 Seismic Vibrating Operations

3.10.1 Seismic vibrating within 500 feet of the pipeline right-of-way:

- a. The Crossing Party must submit a seismic vibrating plan to Buckeye for review and approval. Verbal and written notice will be given 14 and 21 days respectively.
- b. Seismic vibrating plans, when using Vibroseis System Vibrators to radiate ground vibrations, must include information on soil conditions and depth of exploration, the anticipated number and type of vibrations, type and weight of vehicle, and peak force of equipment.
- c. The peak force by vehicle weight shall not exceed 45,000 pounds.
- d. The Crossing Party shall also make arrangements for a Buckeye On-Site Inspector to be present to witness the seismic vibrating operation.

3.10.2 Seismic vibrating within 100 feet of the pipeline right-of-way:

- a. Vibration shall be monitored by a seismograph located directly over the pipeline at its closest point to the vibrator(s). The Crossing Party shall provide, at their expense, the monitoring service which must be approved by Buckeye.
- b. The Crossing party shall determine and limit the maximum peak force allowed under continuous seismographic vibration monitoring such that the peak particle velocity will not exceed 2.0 inches per second.
- c. Seismic vibration surveys shall not be conducted closer than 100 feet to the pipeline.

3.10.3 **Special Requirements:**

- a. If seismographic readings above the limit stated in item 3.11.2.b of this section are recorded, the pipeline must be exposed and inspected for possible damage and/or product release. The Crossing Party conducting seismic vibrating operations is responsible for all expenses related to the exposure and any subsequent repairs necessitated by the operation.
- b. At Buckeye's request, the Crossing Party shall install sheet piling and/or open trench channels to protect the pipeline during seismic vibrating operations.

3.11 Wind Turbines

3.11.1 **Setback Distance from Pipelines**

- a. Wind turbine structures shall be set back from any Buckeye pipeline at least a distance equal to 110% of the structure height, which is defined as the height of the entire wind turbine system as measured from the bottom of the base to the highest vertical point of the system including the base and tower and the highest reach of the turbines or blades.
- b. No facilities associated with a wind turbine installation project shall be permitted to be installed within the pipeline easement.
- c. Warning lights shall be installed on all wind turbines that are located within 1,200 feet of any Buckeye pipeline.

3.11.2 **Construction Equipment and Crane Crossings**

- a. All temporary access roads and heavy/construction vehicle crossings shall comply with Section 3.6 above.
- b. Where cranes and other maintenance vehicles will need to cross Buckeye pipelines on a routine permanent basis for maintenance of the turbine(s), permanent crossing locations must be established, an encroachment agreement must be signed by the landowner and facility owner, and permanent crossing protections must be installed to the satisfaction of Buckeye.
- c. Construction materials or equipment shall not be transported longitudinally over Buckeye's pipelines.

3.11.3 **Underground Utilities**

- a. Cables and electrical conduit shall crossings shall comply with Section 3.5 above.
- b. BUCKEYE may require at the expense of the CROSSING PARTY an AC Arc Fault Study, specific to the CROSSING PARTY'S project encroachments. The study will determine if there is adequate AC Arc Fault protection of and separation from BUCKEYE'S facilities. BUCKEYE will arrange for the engineering, design and installation of AC mitigation and Lightning suppression systems, as deemed necessary by the AC Arc Fault Study. The reasonable cost of such AC remediation

and Lightning suppression systems shall be submitted to CROSSING PARTY for review and approval, which approval shall not be unreasonably delayed, conditioned or withheld, and, upon approval such reasonable cost will be prepaid by CROSSING PARTY to BUCKEYE.

4.0 Deviations and Exceptions

- 4.1 When and where special circumstances dictate, deviation from these requirements must be formally approved by Buckeye in writing prior to commencement of any excavation or other construction activity that may impact the pipeline. Any such deviations must be explained and documented and provided to Buckeye for review and approval.

5.0 Additional Information and Buckeye Contacts

- 5.1 Should you have any questions regarding pipeline rights-of-way or your specific easement, contact Buckeye's Right of Way Department at the applicable phone number listed in [Attachment 2](#).
- 5.2 Should you have any questions regarding Buckeye's engineering requirements, contact Buckeye's Encroachment Design Reviewer at encroachmentreviews@buckeye.com .

Attachment 1: Buckeye Facility Locations and Phone Numbers

Alabama	Birmingham	(205) 369-0179
	Montgomery	(334) 309-4710
California	San Diego	(714) 269-9028
Connecticut & Massachusetts	Wethersfield	(860) 529-7781
	New Haven	(203) 469-3479
Florida	Port Everglades	(954) 522-8464
Georgia	Birmingham (AL)	(205) 369-0179
Illinois	Argo	(708) 259-1352
	Lemont (West Shore)	(708) 227-0962
	Kankakee	(815) 932-3029
	Hartford	(618) 255-1100
Indiana	Hammond	(219) 781-3383
	Hammond (West Shore)	(708) 227-0962
	Huntington	(260) 356-5802
Iowa	Cedar Rapids	(708) 259-1352
	Council Bluffs	(712) 366-9461
	Des Moines	(515) 226-4017
	Ottumwa	(641) 684-6789
Louisiana	Liberty (TX)	(936) 336-5773
Maine	South Portland	(207) 808-4533
Michigan	Wayne	(734) 721-8834
Missouri	North St. Louis	(314) 231-2000
	Sugar Creek	(816) 836-6000
	Burlington Junction	(660) 725-3386
Nevada	Reno	(760) 802-1535
New Jersey	Linden	(908) 374-5301
New York	Auburn	(315) 253-5395
	New York City	(718) 656-5746
North Carolina	Goldsboro	(919) 778-2712
Ohio	Lima	(419) 993-8025
	Mantua	(330) 274-2234
	Toledo	(419) 698-8190
Pennsylvania	Boothwyn	(610) 459-3441
	Coraopolis	(412) 264-7432
	Duncansville	(814) 695-4852
	Malvern	(610) 249-9430
	Mechanicsburg	(717) 766-7633
	Macungie	(484) 232-4218
Tennessee	Memphis	(901) 395-0122
Texas	Liberty	(936) 336-5773
Wisconsin	Milwaukee (West Shore)	(708) 227-0962
	Madison (West Shore)	(815) 964-3727

Attachment 2: Right of Way & Engineering Contacts

Name	Responsibility	Phone / Address / Email
David Boone	Sr. Manager, Right of Way, Real Estate, and Damage Prevention	(610) 904-44015 TEK Park, 9999 Hamilton Blvd. Breinigsville, PA 18031 dboone@buckeye.com
Chris McPike	Sr. Specialist, Right of Way <i>Central District:</i> Eastern Ohio, Pennsylvania (Central & Western)	(216) 271-8103 4800 East 49 th Street Cleveland, OH 44125 CMcPike@buckeye.com
Brandon Allen	Specialist, Right of Way II <i>Central District:</i> Michigan, Ohio (except for Eastern Ohio)	(216) 318-2124 4800 East 49 th Street Cleveland, OH 44125 BAllen@buckeye.com
Jana Olthoff	Specialist, Right of Way II <i>West District:</i> Northern & Central Illinois, Indiana, Wisconsin	(219) 741-0201 5521 West Lincoln Highway Crown Point, IN JOlthoff@buckeye.com
Wesley Pekarek	Sr. Specialist, Right of Way <i>West District:</i> Iowa, Missouri, Southern Illinois, California, Nevada	(816) 836-6096 1315 N. Sterling Ave. Sugar Creek, MO 64054 WPekarek@buckeye.com
Chris Scheid	Specialist, Right of Way II <i>East District:</i> Northeast Pennsylvania, Southeast Pennsylvania, Central Pennsylvania, New York (Upstate), Maryland, Virginia	(484) 232-4454 5002 Buckeye Road Emmaus, PA 18049 CScheid@buckeye.com
Emily Litwa	Specialist, Right of Way II <i>Northeast District:</i> New Jersey, Connecticut, Maine, Massachusetts, New York	(732)-692-5243 750 Cliff Rd Port Reading, NJ 07064 ELitwa@buckeye.com
Dave Jones	Sr. Specialist, Right of Way <i>Encroachment Design Review:</i> East, Northeast, Central, West Districts	(610)-904-4409 5 TEK Park, 9999 Hamilton Blvd. Breinigsville, PA 18031 DAJones@buckeye.com
Daniel Mangum	Sr. Specialist, Right of Way & Development <i>South District:</i> Texas, Louisiana, Tennessee, Alabama, Georgia, South Carolina, Nevada, Florida,	(832) 325-1626 One Greenway Plaza, Suite 600 Houston, Texas 77046 DMangum@buckeye.com

	North Carolina	
Teriann Williams	Right of Way Coordinators <i>Easements and Records:</i> Supporting East, Northeast, Central, and West Districts	(610) 904-4418 5 TEK Park, 9999 Hamilton Blvd. Breinigsville, PA 18031 TEWilliams@buckeye.com

Attachment 3: State One Call Systems (National One Call System - Dial 811)

State	One Call Program	Phone No.	Website
Alabama	Alabama 811	(800) 292-8525	www.al811.com
California - North	USA North of Central / Northern California & Nevada	(800) 227-2600	www.usanorth.org
- South	Dig Alert & Underground Service Alert South	(800) 422-4133	www.digalert.org
Connecticut	Call Before You Dig	(800) 922-4455	www.cbyd.com
Florida	Sunshine State One Call	(800) 432-4770	www.callsunshine.com
Georgia	Georgia 811	(800) 282-7411	www.georgia811.com
Illinois - Non-Chicago	Julie, Inc.	(800) 892-0123	www.illinois1call.com
- Chicago	DIGGER - Chicago Utility Alert Network	(312) 744-7000	www.cityofchicago.org/transportation
Indiana	Indiana 811	(800) 382-5544	www.indiana811.org
Iowa	Iowa One Call	(800) 292-8989	www.iowaonecall.com
Louisiana	Louisiana One Call System, Inc.	(800) 272-3020	www.laonecall.com
Maine	Dig Safe System Inc.	(888) 344-7233	www.digsafe.com
Massachusetts	Dig Safe System Inc.	(888) 344-7233	www.digsafe.com
Michigan	MISS Dig System, Inc.	(800) 482-7171	www.missdig.net
Missouri	Missouri One Call System, Inc.	(800) 344-7483	www.mo1call.com
Nevada	USA North of Central / Northern California & Nevada	(800) 227-2600	www.usanorth.org
New Jersey	New Jersey One Call	(800) 272-1000	www.nj1-call.org
New York	Dig Safely New York	(800) 962-7962	www.digsafelynewyork.com
New York City & Long Island	New York 811, Inc.	(800) 272-4480	www.newyork-811.com
North Carolina	North Carolina 811	(800) 632-4949	www.nc811.org
Ohio	Ohio Utilities Protection Service	(800) 362-2764	www.oups.org
Pennsylvania	Pennsylvania One Call System, Inc.	(800) 242-1776	www.pa1call.org
Rhode Island	Dig Safe System Inc.	(800) 344-7233	www.digsafe.com
South Carolina	South Carolina 811 / PUPS	(888) 721-7877	www.sc811.com
Tennessee	Tennessee 811	(800) 351-1111	www.tnonecall.com OR www.tennessee811.com
Texas	Texas 811 OR Lone Star Notification Center	(800) 344-8377 (800) 669-8344	www.texas811.org www.lsnconeall.com
Wisconsin	Wisconsin Diggers Hotline	(800) 242-8511	www.diggershotline.com

Attachment 4: Application for Design Plan Submission and Encroachment Review

INSTRUCTIONS

Prior to completing the following Application for Design Plan Submission and Encroachment Review (application), please review these instructions to determine if an application is required and to ensure that all necessary information has been obtained. Failure to follow these instructions and/or failure to provide the required information will delay the review process.

One Call Notification – To prevent damages to pipeline facilities from subsurface excavation or any activity that disturbs or impacts the depth of cover over underground facilities, Buckeye participates in "One-Call" organizations in all the states in which Buckeye has operating facilities. A list of the One-Call organizations Buckeye participates in is listed in Attachment 3 of the Right of Way Use Restrictions Specification. Placing a one call notification will put you in contact with the appropriate Buckeye Field Representative

Buckeye Field Representative Coordination – Discuss with the Buckeye Field Representative a summary of the project and potential encroachments. The Buckeye Field Representative will determine if any additional information such as pipeline depth of cover is necessary and if an application is required.

Application and Plan Submission –

SUBMIT APPLICATION AND PLANS TO:

Buckeye Partners, L.P.
ROW Department
Attn: Encroachment Review
5 Tek Park, 9999 Hamilton Blvd.
Breinigsville, PA 18031

OR

encroachmentreviews@buckeye.com
With subject line reading
"Encroachment Review Application"

Buckeye requires a minimum of 60 days for technical review upon receipt of complete application with all relevant fees and complete and accurate design plans. Submission of plans electronically to the above email address is encouraged and acceptable, but signed application and fees must follow by mail.

Relocation or Modification – Should the initial encroachment review result in a determination that Buckeye facilities must be relocated or modified because of the request, additional review time may be required. A Feasibility Study will be performed to prepare a scope of work, cost estimate, schedule and project plan; the cost of which will be borne by a party or parties other than Buckeye and must be paid before the relocation or modification will commence. A Technical Services Agreement between Buckeye and the responsible entity will be prepared to specify the duties of each party. A Letter of No Objection or Encroachment Agreement will be issued which will authorize the construction of the proposed encroachment under certain terms and conditions.

Permission / Notification - A fully-executed Approval Letter, Encroachment Agreement, Reimbursement Agreement, and/or Technical Services Agreement is needed prior to construction. Buckeye must be notified 10-days prior to construction to allow for the scheduling of a Buckeye representative to be present. It is also the encroaching entity's responsibility to notify the owners of any other pipelines, communication lines, other third party property or facility owners located within the proposed project area and to secure any additional needed rights from these parties where Buckeye's rights are limited.

If construction of the aforementioned project does not commence within three calendar years of the issued approval letter date, the Crossing Party shall submit a new application and resubmission fee. The Company shall have the right to reconsider the conditions and privileges granted, and have full right to consider current policies and procedures at the time of resubmission.

APPLICATION FEES: A non-refundable Encroachment Application Fee must accompany all encroachment review requests for private development within Buckeye's right-of-way. Any request submitted without the required application fee, or that does not contain the specified information in the format requested on the application, may not be considered. Remit payment by check payable to: *Buckeye Partners, L.P.* Buckeye may require a developer to enter an agreement to pay any outside consultant costs that Buckeye deems necessary for a complete review of the proposed encroachment(s).

Initial Encroachment Application Fee is \$3,000. Following initial review, all necessary plan resubmissions until plan approval shall be accompanied by a **Resubmission Fee of \$750.**

Small Project Application Fee is \$500. This reduced fee is reserved solely for single utility line service crossings or requests for installation of a fence or other residential-related improvement within Buckeye's pipeline easement.

Application for Design Plan Submission and Encroachment Review

PROJECT INFORMATION & LOCATION

BUCKEYE PARTNERS, L.P.

Project Title

Project Address

City

State

Zip Code

Latitude

Longitude

Municipality

County

APPLICANT INFORMATION:

Name and Title of Applicant

Company

Email Address

Phone Number

Address

City

State

Zip Code

LEGAL NAME OF INDIVIDUAL, COMPANY, OR ENTITY TO WHICH PERMISSION WILL BE GRANTED:

Name

Name and Title of authorized signatory for company or entity

Address

City

State

Zip Code

Email Address

Fax Number

PROJECT INVOLVES THE FOLLOWING IMPACTS TO BUCKEYE'S FACILITIES (CHECK ALL THAT APPLY):

- Cover, grading, and drainage pattern changes
- Aboveground and/or underground structures
- Road, driveway, sidewalks, and parking areas
- Utility crossings including gas, water (steam), sewer (storm/sanitary) – include trench backfill detail
- Electrical, fiber-optic, and communications cables
- Temporary access roads for the crossing of heavy/construction equipment
- Railroad crossings
- Farming and field tile
- Construction-induced vibrations
- Blasting operations (attach BLASTING PLAN)
- Seismic vibrating operations (attach SEISMIC VIBRATING PLAN)
- Exposure of the pipeline (attach SUPPORT PLAN)
- Boring, drilling, or tunneling near the pipeline (attach DRILL PLAN)
- Other: _____

APPLICATION MUST CONTAIN THE FOLLOWING:

- Completed and Signed "Application for Design Plan Submission and Encroachment Review" Form
- Encroachment Application Fee** (see guidelines on page 1 of the application)
- Design Plans (1 paper copy, 1 electronic copy), depicting the following:
 - Field-verified location of Buckeye pipeline(s) location and width of Buckeye's easement tract

_____/_____/_____
Name of Buckeye Employee Date of Pipeline Locating Activity Design One Call No.

- Field-verified depth of Buckeye pipeline(s) along all proposed road or utility crossings, drainage channels, and all other areas of proposed grade change within the pipeline right-of-way (attach a copy of any field data provided by Buckeye Representative)

_____/_____/_____
Name of Buckeye Employee Date of Pipeline Depth Investigation

- Buckeye pipeline(s) labeled " _-inch High Pressure Petroleum Products Pipeline" (line type "-HPPPP-")
- Buckeye included on Utilities List, and Local Contact and phone number on plans
- Buckeye Pipeline(s) highlighted in yellow. List all plan sheets on which Buckeye facilities are located:

-
- Location of ground disturbances (blasting, seismic testing, pile driving, jackhammering, etc. within 1,500 feet of Buckeye pipeline(s))

- Proposed location(s) where construction equipment will cross the pipeline right-of-way
- Structure setback distances from the pipeline right-of-way and from the nearest pipeline
- Proposed landscaping within 25 feet of either side of the pipeline(s)

- Any permanent fencing that will limit/encumber Buckeye's access to the pipeline right-of-way

- If the drainage pattern will be altered in any way over the Buckeye pipeline(s), a drainage plan that identifies new flow paths and all inlet/outfall/collection points

- Right-of-Way Use Restrictions specification pages 1-13 included as part of final design plan (can be done by adding a drawing sheet to plans and appending (cut and paste) the specification onto this sheet.

For property improvements that involve grade/pavement alterations, road work (new construction or improvements of existing), utility crossings (buried and overhead), or other subsurface or on-surface structure installations within Buckeye's right-of-way:

- Separate plan and profile drawing of Buckeye pipeline(s) for existing and proposed conditions.
- Subgrade details that show materials and thickness of each paving layer/course.
- Amount of existing cover that will be removed or new cover added over the pipeline(s), and proposed final grade amount of cover over the pipeline(s).
- Clearances between Buckeye's pipeline(s) and any existing and new (buried or overhead) utilities that cross the pipeline right-of-way.
- Show the clearances between Buckeye's pipeline(s) and each proposed substructure at the two closest reference points.
- For any utility to be installed via boring, drilling, or tunneling, include a detailed procedure of this work with your design plans. Note: "Blind" boring is not permitted. Buckeye's pipeline(s) must be exposed during the bore operation to ensure that the bore head crosses safely underneath the pipeline(s).

Indicate any areas of disturbance or other work that will require Buckeye's pipeline(s) to be exposed in order to perform your work.

Supplemental Plan Information (as applicable)

Blasting Vibrating Plan

Seismic Vibrating Plan

Support Plan

Drill Plan

I hereby authorize Buckeye to contact the Engineer/Survey firm which prepared the drawings, survey and attachments.

I certify that the information provided is accurate and I realize that incomplete information may delay processing or invalidate this application.

Signature of Applicant

By: _____

Name: _____ Date: _____

Title: _____

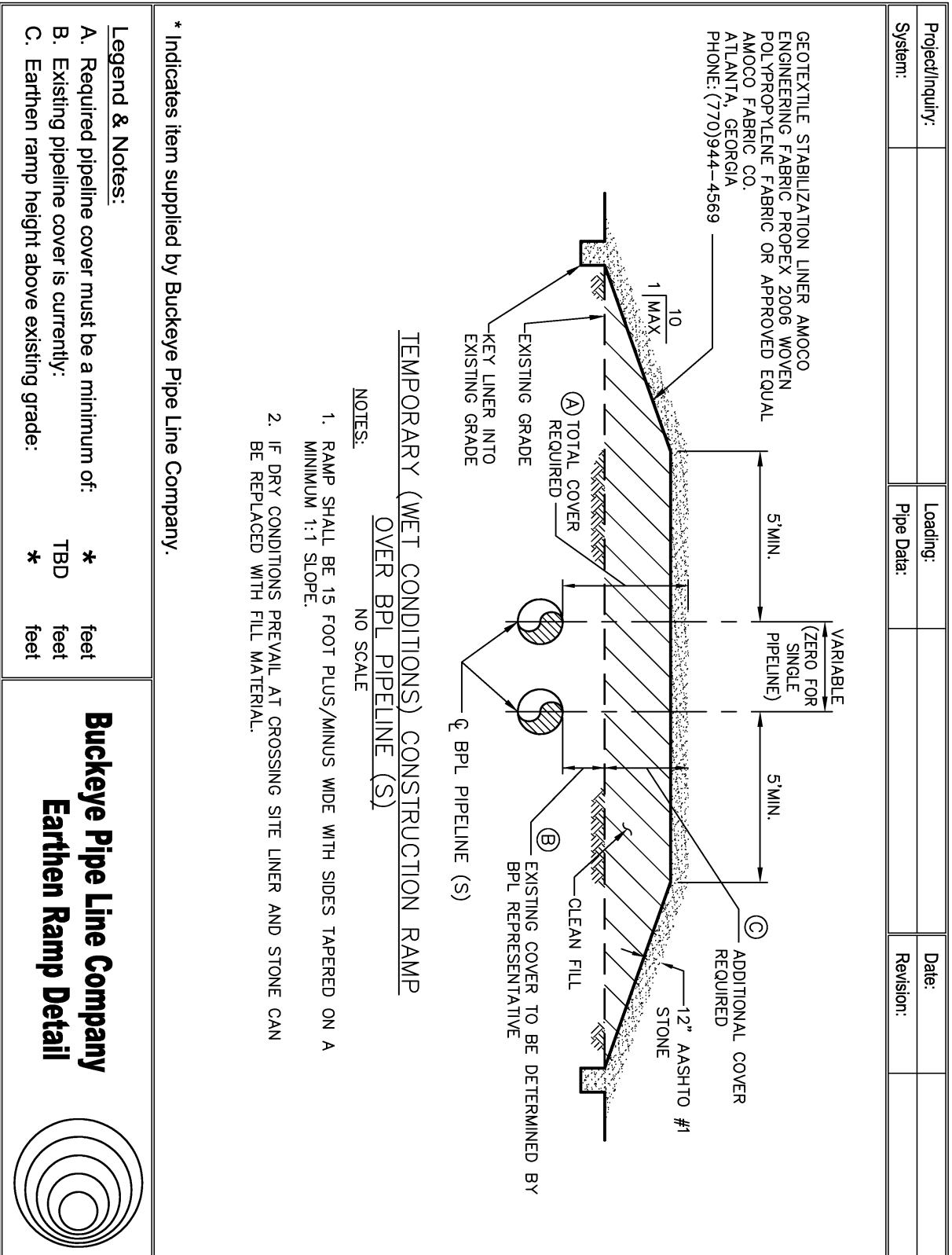
**PAYMENT INFORMATION
(APPLICANT TO COMPLETE)**

Check Number: _____

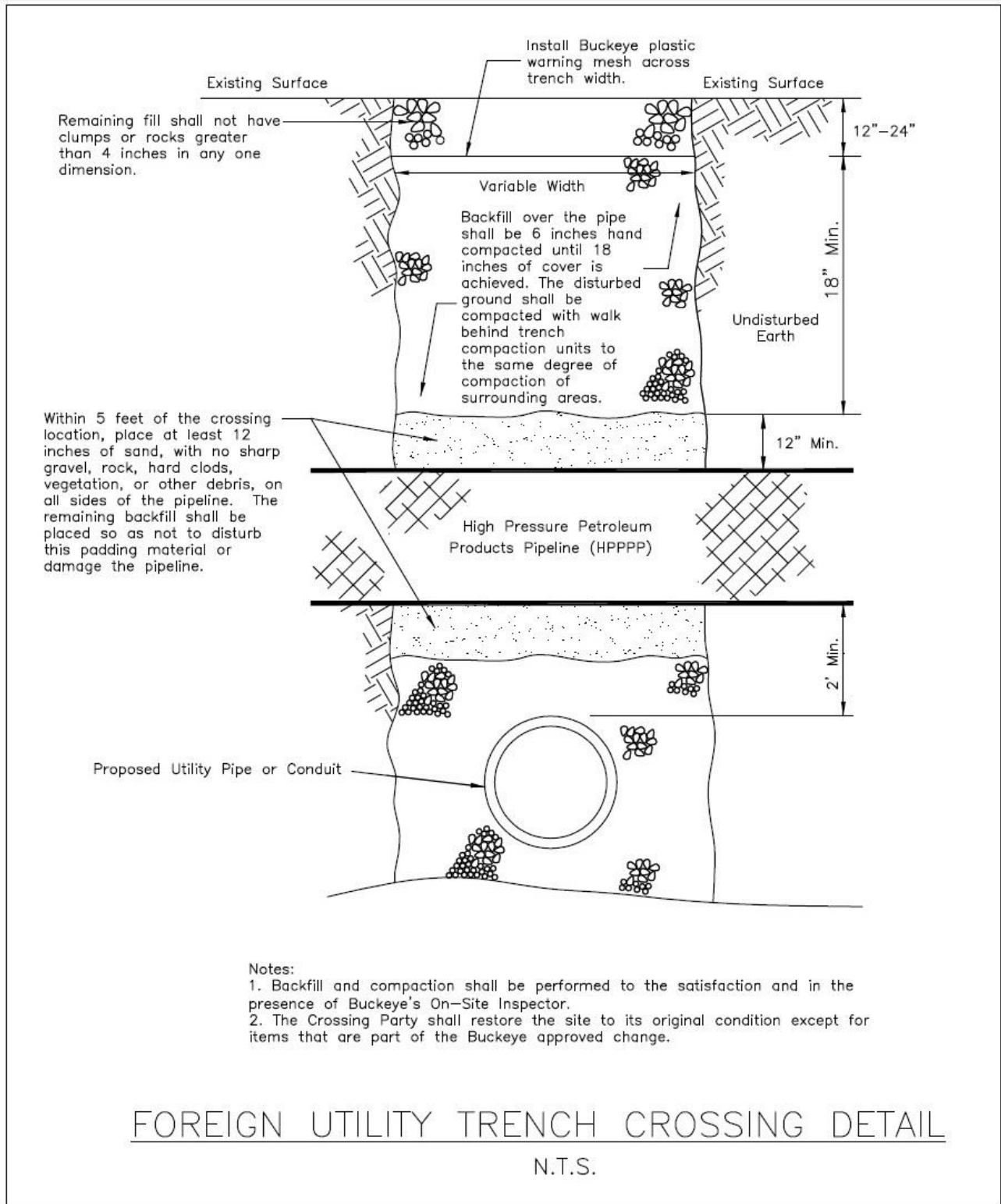
Payment Amount: \$_____



Attachment 6: Earthen Ramp Detail



Attachment 7: Foreign Utility Trench Crossing Detail



Attachment 8: Blasting Plan Submission Form

INFORMATION SECTION	
Blasting Contractor -	Contracted by -
Company Name: _____	Company Name: _____
Phone: _____	Address: _____
Email Address: _____	_____
Contact Person: _____	Contact Person: _____
Project Name: _____	
Address: _____	
*Latitude: _____	
*Longitude: _____	
Location and Distance (in feet) to Nearest Buckeye Pipeline: _____	

Date of Blasting: _____	

EXPLOSIVES SECTION	
Type of Explosives: _____	
Max. Charge / Hole (lbs): _____	
Charge Delay (ms): _____	
No. of Holes: _____	
Max. Depth of Charge (ft): _____	
Max. Diameter of Charge (in): _____	
Calculated Particle Velocity at a point -	
Depth of Blast Area (ft): _____	300 feet from blasting event (in/sec): _____
Depth of Overburden (ft): _____	200 feet from blasting event (in/sec): _____
Type of Rock to be Blasted: _____	100 feet from blasting event (in/sec): _____
Density of Rock (lbs/cu-ft): _____	Directly above pipeline (in/sec): _____ @ _____ ft. _____

ATTACHMENT CHECKLIST
<input type="checkbox"/> Drilling/Blasting Pattern Sketch - include all depths, measurements, and delay patterns relative to Buckeye facility involved and each charge.
<input type="checkbox"/> State Approval Letter
<input type="checkbox"/> Blasting Contractor's Qualifications
<input type="checkbox"/> Blasting Contractor's Insurance Certificate
<input type="checkbox"/> Blasting Contractor's Safety Plan
OMMISSION OF ANY INFORMATION REQUESTED ABOVE WILL DELAY YOUR BLASTING PLAN REVIEW
Buckeye requires a minimum of 14 days for technical review upon receipt of complete and accurate blasting plans

Attachment 9: Excavation Safety Checklist

195 F-09, FORM A – EXCAVATION SAFETY CHECKLIST

The information noted on this form is intended to communicate general information about our pipeline(s) and is not intended to be solely relied upon by any party for the purpose of excavation or any similar purpose.

By law, to enable all participating utilities time to mark their facilities, the **One Call Center** in your state requires notification by calling 811 prior to any excavation. Buckeye Partners, L.P. is a member of this One Call enterprise and will automatically be notified through this system. In addition, a Buckeye inspector will perform and/or review with the excavator representative the applicable checklist items below.

Pipeline Locate Activity:

- If plans are available, requested a copy of the written project plans and drawings for review with the excavator and/or engineer. Had the excavator and/or engineer explain the extent of the work area, location and depth of the excavation, type of proposed utilities, location of proposed utilities, number of utility crossings, etc.
- Established the pipeline(s) location and marked the line(s) per state One Call requirements throughout the entire work area.
- Photographed all established pipeline markings throughout the work area.

Communication with the Excavator and/or Engineer:

- The excavator and/or engineer was advised that a Buckeye inspector must:**
 - **Monitor the excavation site daily when work is performed within 25 feet of a Buckeye pipeline.**
 - **Observe continuously all excavation and backfill activity performed within 10 feet of a Buckeye pipeline or during the installation of any utility across a Buckeye pipeline facility.**
 - **In addition, the excavator was instructed to call 800-331-4115 if they were ready to excavate within either above distance of a Buckeye pipeline and a Buckeye inspector was not present. When called a Buckeye inspector will be sent to perform the inspection, which is free of charge.**
- The excavator was advised that only backhoes or trackhoes with a steel plate welded across the teeth of the bucket are permitted to be used during excavation work around a Buckeye pipeline.
- The excavator was advised that the Buckeye inspector is required by law to perform an external inspection of any Buckeye pipeline exposed during excavation activity. The excavator understands that he/she is responsible to provide an OSHA compliant excavation, allowing the Buckeye inspector safe ingress and egress to examine our exposed pipeline.
- Walked through the work area with the excavator and communicated the locations of all Buckeye pipelines in the planned work area.
- Discussed the number of pipelines, pipe size(s), approximate pressures, approximate depths, excavation tolerance zones, hand digging requirements, and the hazards and characteristics of product(s) in the pipeline system(s) located in the planned work area.
- The excavator was advised to call the One Call Center 811 or contact Buckeye, if the Buckeye markings are destroyed or need to be refreshed in the planned work area. This service is provided free of charge.
- The excavator was advised that before any exposed Buckeye pipeline can be backfilled, the Buckeye inspector will direct the placement of an orange warning mesh over the pipeline.
- The excavator was advised that **any contact** with the pipeline, pipeline coating, test station wiring, or anode beds **must be reported to Buckeye prior to backfilling the excavation** to permit further inspection of the damage to assure continued safe pipeline operations.
- The excavator was advised that failure to comply with the conditions outlined above would result in Buckeye requiring the excavator to expose the pipeline again to allow an examination of the pipeline at the excavator's expense. If damage to the pipeline is discovered, Buckeye may seek monetary compensation for all repair costs. Buckeye may also report this activity to all concerned parties (State One Call Center, Regulatory Agencies, Principal Contractor, Excavator's Insurance Company, etc.).

If you are unable to reach the representative designated below, or **in case of an emergency**, request assistance by calling **1-800-331-4115**.

One Call Ticket:		Line Segments:		
Work Order:		Mile Posts:		
Nearest Street				

Buckeye Information		Property Owner / Excavator /Engineer	
Date:		Name:	
Name:		Phone:	
Cell Phone:		Signature:	

Appendix E
Portland Pipe Line Corporation – Construction Practices

Figure 7-1



PORTLAND PIPE LINE CORPORATION
Safety, Environment, Customer, Community



Dig Safe System, Inc.
It's Smart. It's Free. It's the Law.



Know what's below.
Call before you dig.

CONSTRUCTION PRACTICES

TO BE OBSERVED BY OTHERS WHEN ON OR NEAR PORTLAND PIPE LINE CORPORATION RIGHTS-OF-WAY

The guidelines and construction practices listed below shall be followed by other pipeline, utility, construction organizations, and others performing work in the Portland Pipe Line Corporation right-of-way:

1. A minimum distance of 50 feet should be maintained between new structures and nearest pipeline (49 CFR 195.210).
2. Crossings of the pipelines should ideally be 90°, but in no case less than 45°.
3. A minimum vertical distance between lines crossing beneath the pipelines shall be 18 inches. Compaction near the pipelines shall be equal to original soil compaction. Certain soil conditions may dictate additional vertical clearance.
4. Lines crossing over the pipelines shall have an 18-inch minimum vertical clearance with 90% or greater Proctor compaction density or pipeline-approved supports on both sides of the pipeline crossed.
5. Excavation in questionable soils conditions, where shear failure or trench collapse might occur, must be investigated by a soils engineering consultant; and where conditions warrant it, suitable plans for soils stabilization shall be designed and carried out by a qualified engineer.
6. No excavation in the vicinity of pipelines is to be made without a pipeline representative being present. Excavation within five (5) feet of a pipeline shall be done with extreme caution and only by hand digging under a Pipe Line representative's direction. The pipelines and the required separation distance must be exposed for observation during trenchless crossings, for example by directional drilling, to ensure safety and clearance.
7. Where heavy construction vehicles must cross a pipeline, suitable compacted cover and padding shall be placed over the pipeline to provide generally not less than four (4) feet of suitable protective material over the pipeline. Pipe Line representative will locate pipelines for landowner or contractor upon request.
8. In no case shall cover be less than that required by the Department of Transportation, Code of Federal Regulation for transportation of hazardous liquids by pipeline (49 CFR 195.248).
9. All blasting is to be kept to an absolute minimum and shall be done according to good construction practices, using experienced, qualified blasting personnel and only then with Pipe Line approval.

Figure 7-1

10. Be aware of potential interference between Portland Pipe Line's DC electric rectifier systems and AC power line or power cable networks. If a pole line anchor is placed near a ground bed, contact a corrosion department representative for assistance.
11. Portland Pipe Line is to be notified at least 48 hours before work is performed in the vicinity of its pipelines. In extreme emergencies, when this is not possible, notification should be given at the earliest possible time.
12. No spoil, either of a permanent or temporary nature, is to be deposited on the pipelines.
13. Portland Pipe Line should be notified during initial planning stages for future installations located near pipelines so that the best mutually acceptable design practices are adopted.
14. Projects involving grading or access or utility crossings of Portland Pipe Line Corporation pipelines or rights of way must be submitted to PPLC for review and written approval prior to construction, with supporting documentation to demonstrate that the work will comply with the above requirements.
15. Portland Pipe Line Corporation supports the use of the Best Practices for project planning, design, and construction developed by the Common Ground Alliance and available at www.commongroundalliance.com.

Contact Information:

Director of Operations
(207) 767-0440

Maintenance Supervisor – Maine
(207) 767-0437

Maintenance Supervisor – New Hampshire/Vermont
(207) 232-7084

This document is provided for general technical guidance. All site and project specifics should be coordinated with a Portland Pipe Line Corporation representative.



CONSTRUCTION PRACTICES

TO BE OBSERVED BY OTHERS WHEN ON OR NEAR MONTREAL PIPE LINE LIMITED RIGHTS-OF-WAY

The guidelines and construction practices listed below shall be followed by other pipeline, utility, construction organizations, and others performing work in the Montreal Pipe Line Limited (MPLL) right-of-way:

1. A minimum distance of 15 meters (50 feet) should be maintained between new structures and nearest pipeline.
2. Crossings of the pipelines should ideally be 90°, but in no case less than 45°.
3. A minimum vertical distance between lines crossing beneath the pipelines shall be 45 centimeters (18 inches). Compaction near the pipelines shall be equal to original soil compaction. Certain soil conditions may dictate additional vertical clearance.
4. Lines crossing over the pipelines shall have 45 centimeters (18 inches) minimum vertical clearance with 90% or greater Proctor compaction density or MPLL-approved supports on both sides of the pipeline crossed.
5. Excavation in questionable soils conditions, where shear failure or trench collapse might occur, must be investigated by a soils engineering consultant; and where conditions warrant it, suitable plans for soils stabilization shall be designed and carried out by a qualified engineer.
6. No excavation in the vicinity of pipelines is to be made without a pipeline representative being present. Excavation within 3 meters (10 feet) of a pipeline shall be done with extreme caution and only by hand digging under an MPLL representative's direction. The pipelines and the required separation distance must be exposed for observation during trenchless crossings, for example by directional drilling, to ensure safety and clearance.
7. Where heavy construction vehicles must cross a pipeline, suitable compacted cover and padding shall be placed over the pipeline to provide generally not less than 3 meters (10 feet) of suitable protective material over the pipeline. An MPLL representative will locate pipelines for landowner or contractor upon request.
8. In no case shall cover be less than that required by the National Energy Board.
9. All blasting is to be kept to an absolute minimum and shall be done according to good construction practices, using experienced, qualified blasting personnel and only then with MPLL approval.

Figure 7-3

10. Be aware of potential interference between MPLL's DC electric rectifier systems and AC power line or power cable networks. If a pole line anchor is placed near a ground bed, contact a corrosion department representative for assistance.
11. MPLL is to be notified at least 72 hours before work is performed in the vicinity of its pipelines. In extreme emergencies, when this is not possible, notification should be given at the earliest possible time.
12. No spoil, either of a permanent or temporary nature, is to be deposited on the pipelines.
13. MPLL should be notified during initial planning stages for future installations located near pipelines so that the best mutually acceptable design practices are adopted.
14. Projects involving grading or access or utility crossings of Montreal Pipe Line Limited pipelines or rights of way must be submitted to MPLL for review and written approval prior to construction, with supporting documentation to demonstrate that the work will comply with the above requirements.
15. Montreal Pipe Line Limited supports the use of the Best Practices for project planning, design, and construction developed by the Quebec Common Ground Alliance, and available at www.apisq-qcga.ca.

Contact Information:

Québec Operations Manager
(514) 645-7268

Emergencies 24/7
1-888-977-4589

Fax
(514) 645-7663

This document is provided for general technical guidance. All site and project specifics should be coordinated with a Montreal Pipe Line Limited representative.

Appendix F
FAA Construction Restrictions



Mail Processing Center
 Federal Aviation Administration
 Southwest Regional Office
 Obstruction Evaluation Group
 10101 Hillwood Parkway
 Fort Worth, TX 76177

Aeronautical Study No.
 2021-ANE-16-OE

Issued Date: 03/03/2021

Ralph C. Norwood IV, P.E., PTOE
 Maine Turnpike Authority
 2360 Congress Street
 Portland, ME 04102

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure: Utility Pole Brighton Ave Utility Pole
 Location: Portland, ME
 Latitude: 43-40-35.00N NAD 83
 Longitude: 70-19-39.55W
 Heights: 100 feet site elevation (SE)
 35 feet above ground level (AGL)
 135 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

- At least 10 days prior to start of construction (7460-2, Part 1)
- Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

Based on this evaluation, marking and lighting are not necessary for aviation safety. However, if marking/lighting are accomplished on a voluntary basis, we recommend it be installed in accordance with FAA Advisory circular 70/7460-1 M.

This determination expires on 09/03/2022 unless:

- (a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
- (b) extended, revised, or terminated by the issuing office.
- (c) the construction is subject to the licensing authority of the Federal Communications Commission (FCC) and an application for a construction permit has been filed, as required by the FCC, within 6 months of the date of this determination. In such case, the determination expires on the date prescribed by the FCC for completion of construction, or the date the FCC denies the application.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is based, in part, on the foregoing description which includes specific coordinates, heights, frequency(ies) and power. Any changes in coordinates, heights, and frequencies or use of greater power, except those frequencies specified in the Colo Void Clause Coalition; Antenna System Co-Location; Voluntary Best Practices, effective 21 Nov 2007, will void this determination. Any future construction or alteration, including increase to heights, power, or the addition of other transmitters, requires separate notice to the FAA. This determination includes all previously filed frequencies and power for this structure.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

If we can be of further assistance, please contact our office at (202) 267-0105, or j.garver@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2021-ANE-16-OE.

Signature Control No: 462455217-472367575

(DNE)

Jay Garver
Specialist

Attachment(s)
Map(s)





Mail Processing Center
 Federal Aviation Administration
 Southwest Regional Office
 Obstruction Evaluation Group
 10101 Hillwood Parkway
 Fort Worth, TX 76177

Aeronautical Study No.
 2021-ANE-17-OE

Issued Date: 03/03/2021

Ralph C. Norwood IV, P.E., PTOE
 Maine Turnpike Authority
 2360 Congress Street
 Portland, ME 04102

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure: Sign Overhead Variable Message Sign
 Location: Portland, ME
 Latitude: 43-40-21.34N NAD 83
 Longitude: 70-19-44.29W
 Heights: 109 feet site elevation (SE)
 27 feet above ground level (AGL)
 136 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

- At least 10 days prior to start of construction (7460-2, Part 1)
- Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

Based on this evaluation, marking and lighting are not necessary for aviation safety. However, if marking/lighting are accomplished on a voluntary basis, we recommend it be installed in accordance with FAA Advisory circular 70/7460-1 M.

This determination expires on 09/03/2022 unless:

- (a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
- (b) extended, revised, or terminated by the issuing office.
- (c) the construction is subject to the licensing authority of the Federal Communications Commission (FCC) and an application for a construction permit has been filed, as required by the FCC, within 6 months of the date of this determination. In such case, the determination expires on the date prescribed by the FCC for completion of construction, or the date the FCC denies the application.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is based, in part, on the foregoing description which includes specific coordinates, heights, frequency(ies) and power. Any changes in coordinates, heights, and frequencies or use of greater power, except those frequencies specified in the Colo Void Clause Coalition; Antenna System Co-Location; Voluntary Best Practices, effective 21 Nov 2007, will void this determination. Any future construction or alteration, including increase to heights, power, or the addition of other transmitters, requires separate notice to the FAA. This determination includes all previously filed frequencies and power for this structure.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

If we can be of further assistance, please contact our office at (202) 267-0105, or j.garver@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2021-ANE-17-OE.

Signature Control No: 462455218-472376459

(DNE)

Jay Garver
Specialist

Attachment(s)
Map(s)





Mail Processing Center
 Federal Aviation Administration
 Southwest Regional Office
 Obstruction Evaluation Group
 10101 Hillwood Parkway
 Fort Worth, TX 76177

Aeronautical Study No.
 2021-ANE-20-OE

Issued Date: 03/03/2021

Ralph C. Norwood IV, P.E., PTOE
 Maine Turnpike Authority
 2360 Congress Street
 Portland, ME 04102

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure: Interstate Highway Turnpike Widening - Sta. 2288+50 13' RT
 Location: Portland, ME
 Latitude: 43-38-49.41N NAD 83
 Longitude: 70-19-53.82W
 Heights: 70 feet site elevation (SE)
 0 feet above ground level (AGL)
 70 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

- At least 10 days prior to start of construction (7460-2, Part 1)
- Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

Based on this evaluation, marking and lighting are not necessary for aviation safety. However, if marking/lighting are accomplished on a voluntary basis, we recommend it be installed in accordance with FAA Advisory circular 70/7460-1 M.

This aeronautical study included evaluation of a structure with an above ground level height that would at times be increased by the presence of mobile objects. For the purpose of this aeronautical study, the above ground level height was adjusted upward in accordance with 14 CFR 77.9(c) and the proposal was studied as a traverseway.

This determination expires on 09/03/2022 unless:

- (a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
- (b) extended, revised, or terminated by the issuing office.

- (c) the construction is subject to the licensing authority of the Federal Communications Commission (FCC) and an application for a construction permit has been filed, as required by the FCC, within 6 months of the date of this determination. In such case, the determination expires on the date prescribed by the FCC for completion of construction, or the date the FCC denies the application.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is based, in part, on the foregoing description which includes specific coordinates, heights, frequency(ies) and power. Any changes in coordinates, heights, and frequencies or use of greater power, except those frequencies specified in the Colo Void Clause Coalition; Antenna System Co-Location; Voluntary Best Practices, effective 21 Nov 2007, will void this determination. Any future construction or alteration, including increase to heights, power, or the addition of other transmitters, requires separate notice to the FAA. This determination includes all previously filed frequencies and power for this structure.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

If we can be of further assistance, please contact our office at (202) 267-0105, or j.garver@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2021-ANE-20-OE.

Signature Control No: 462455221-472385760

(DNE)

Jay Garver
Specialist

Attachment(s)
Map(s)





Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2021-ANE-25-OE

Issued Date: 03/03/2021

Ralph C. Norwood IV, P.E., PTOE
Maine Turnpike Authority
2360 Congress Street
Portland, ME 04102

****DETERMINATION OF NO HAZARD TO AIR NAVIGATION FOR TEMPORARY STRUCTURE****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Crane Proposed Variable Message Sign - Crane
Location:	Portland, ME
Latitude:	43-40-20.62N NAD 83
Longitude:	70-19-44.53W
Heights:	108 feet site elevation (SE) 100 feet above ground level (AGL) 208 feet above mean sea level (AMSL)

This aeronautical study revealed that the temporary structure does not exceed obstruction standards and would not be a hazard to air navigation provided the condition(s), if any, in this letter is (are) met:

****SEE ATTACHMENT FOR ADDITIONAL CONDITION(S) OR INFORMATION****

This determination is based, in part, on the foregoing description which includes specific coordinates, heights, frequency(ies) and power. Any changes in coordinates, heights and frequencies or use of greater power, except those frequencies specified in the Colo Void Clause Coalition; Antenna System Co-Location; Voluntary Best Practices, effective 21 Nov 2007, will void this determination. Any future construction or alteration, including increase to heights, power or the addition of other transmitters, requires separate notice to the FAA. This determination includes all previously filed frequencies and power for this structure.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of a structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this temporary structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

A copy of this determination will be forwarded to the Federal Aviation Administration Flight Procedures Office if the structure is subject to the issuance of a Notice To Airman (NOTAM).

If you have any questions, please contact our office at (202) 267-0105, or j.garver@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2021-ANE-25-OE

Signature Control No: 462455226-472439035

(TMP)

Jay Garver

Specialist

Additional Condition(s) or Information for ASN 2021-ANE-25-OE

Proposal: To construct and/or operate a(n) Crane to a height of 100 feet above ground level, 208 feet above mean sea level.

Location: The structure will be located 1.83 nautical miles northwest of PWM Airport reference point.

Part 77 Obstruction Standard(s) Exceeded and Aeronautical Impacts, if any:

Based on this aeronautical study, the structure would not constitute a substantial adverse effect on aeronautical operations or procedures because it will be temporary. The temporary structure would not be considered a hazard to air navigation provided all of the conditions specified in this determination are strictly met.

As a condition to this Determination, the structure is to be marked/lighted in accordance with FAA Advisory circular 70/7460-1 M, Obstruction Marking and Lighting, marked-Chapters 3(Marked),14(Temporary),&15.

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

As a condition to this determination, the temporary structure must be lowered to the ground when not in use and during the hours between sunset and sunrise.

It is required that the manager of PORTLAND INTL JETPORT, (207) 756-8310 be notified at least 3 business days prior to the temporary structure being erected and again when the structure is removed from the site.

It is required that the manager of PORTLAND INTL JETPORT Air Traffic Control Tower @ (207) 552-1415 be notified at least 3 business days prior to the temporary structure being erected and again when the structure is removed from the site. Additionally, please provide contact information for the onsite operator in the event that Air Traffic Control requires the temporary structure to be lowered immediately.

This determination expires on 09/03/2022 unless extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.







Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2021-ANE-27-OE

Issued Date: 05/10/2021

Ralph C. Norwood IV, P.E., PTOE
Maine Turnpike Authority
2360 Congress Street
Portland, ME 04102

****DETERMINATION OF NO HAZARD TO AIR NAVIGATION FOR TEMPORARY STRUCTURE****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Construction Equipment Construction Equipment - Sta. 2288+50 13' RT.
Location:	Portland, ME
Latitude:	43-38-49.41N NAD 83
Longitude:	70-19-53.82W
Heights:	70 feet site elevation (SE) 31 feet above ground level (AGL) 101 feet above mean sea level (AMSL)

This aeronautical study revealed that the temporary structure does not exceed obstruction standards and would not be a hazard to air navigation provided the condition(s), if any, in this letter is (are) met:

****SEE ATTACHMENT FOR ADDITIONAL CONDITION(S) OR INFORMATION****

This determination is based, in part, on the foregoing description which includes specific coordinates, heights, frequency(ies) and power. Any changes in coordinates, heights and frequencies or use of greater power, except those frequencies specified in the Colo Void Clause Coalition; Antenna System Co-Location; Voluntary Best Practices, effective 21 Nov 2007, will void this determination. Any future construction or alteration, including increase to heights, power or the addition of other transmitters, requires separate notice to the FAA. This determination includes all previously filed frequencies and power for this structure.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of a structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this temporary structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

A copy of this determination will be forwarded to the Federal Aviation Administration Flight Procedures Office if the structure is subject to the issuance of a Notice To Airman (NOTAM).

If you have any questions, please contact our office at (202) 267-0105, or j.garver@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2021-ANE-27-OE

Signature Control No: 462455228-480222327

(TMP)

Jay Garver

Specialist

Additional Condition(s) or Information for ASN 2021-ANE-27-OE

Proposal: To construct and/or operate a(n) Construction Equipment to a height of 31 feet above ground level, 101 feet above mean sea level.

Location: The structure will be located 1.01 nautical miles west of PWM Airport reference point.

Part 77 Obstruction Standard(s) Exceeded and Aeronautical Impacts, if any:

Based on this aeronautical study, the structure would not constitute a substantial adverse effect on aeronautical operations or procedures because it will be temporary. The temporary structure would not be considered a hazard to air navigation provided all of the conditions specified in this determination are strictly met.

Based on this evaluation, marking and lighting are not necessary for aviation safety. However, if marking/lighting are accomplished on a voluntary basis, we recommend it be installed in accordance with FAA Advisory circular 70/7460-1 M.

As a condition to this determination, the temporary structure must be lowered to the ground when not in use and during the hours between sunset and sunrise.

It is required that the manager of PORTLAND INTL JETPORT, (207) 756-8310 be notified at least 3 business days prior to the temporary structure being erected and again when the structure is removed from the site.

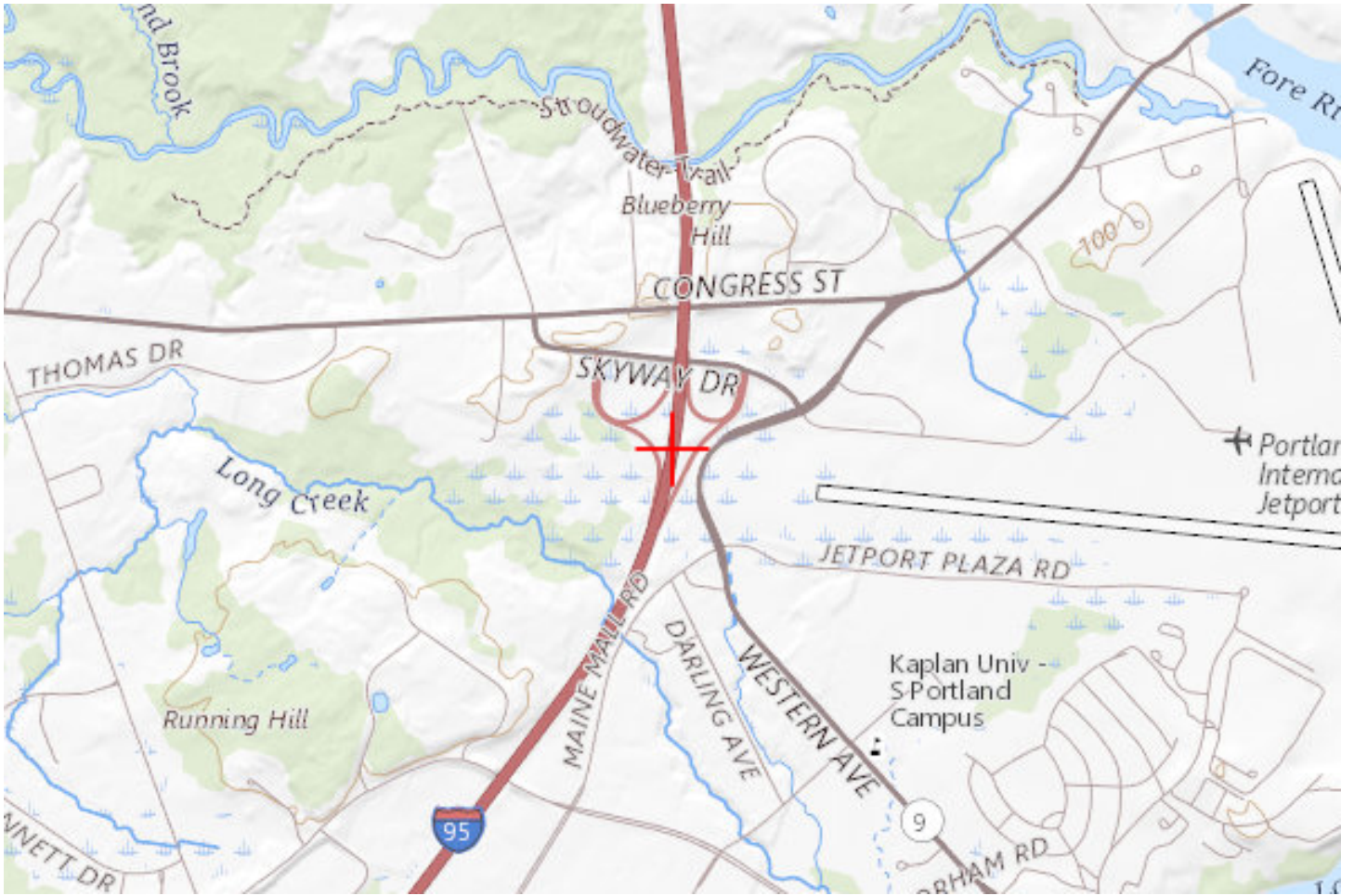
It is required that the manager of PORTLAND INTL JETPORT Air Traffic Control Tower @ (207) 780-3396 be notified at least 3 business days prior to the temporary structure being erected and again when the structure is removed from the site. Additionally, please provide contact information for the onsite operator in the event that Air Traffic Control requires the temporary structure to be lowered immediately.

Any height exceeding 31 feet above ground level (101 feet above mean sea level), will result in a substantial adverse effect and would warrant a Determination of Hazard to Air Navigation.

This determination expires on 11/10/2022 unless extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

TOPO Map for ASN 2021-ANE-27-OE







Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2021-ANE-25-OE

Issued Date: 03/03/2021

Ralph C. Norwood IV, P.E., PTOE
Maine Turnpike Authority
2360 Congress Street
Portland, ME 04102

****DETERMINATION OF NO HAZARD TO AIR NAVIGATION FOR TEMPORARY STRUCTURE****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Crane Proposed Variable Message Sign - Crane
Location:	Portland, ME
Latitude:	43-40-20.62N NAD 83
Longitude:	70-19-44.53W
Heights:	108 feet site elevation (SE) 100 feet above ground level (AGL) 208 feet above mean sea level (AMSL)

This aeronautical study revealed that the temporary structure does not exceed obstruction standards and would not be a hazard to air navigation provided the condition(s), if any, in this letter is (are) met:

****SEE ATTACHMENT FOR ADDITIONAL CONDITION(S) OR INFORMATION****

This determination is based, in part, on the foregoing description which includes specific coordinates, heights, frequency(ies) and power. Any changes in coordinates, heights and frequencies or use of greater power, except those frequencies specified in the Colo Void Clause Coalition; Antenna System Co-Location; Voluntary Best Practices, effective 21 Nov 2007, will void this determination. Any future construction or alteration, including increase to heights, power or the addition of other transmitters, requires separate notice to the FAA. This determination includes all previously filed frequencies and power for this structure.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of a structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this temporary structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

A copy of this determination will be forwarded to the Federal Aviation Administration Flight Procedures Office if the structure is subject to the issuance of a Notice To Airman (NOTAM).

If you have any questions, please contact our office at (202) 267-0105, or j.garver@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2021-ANE-25-OE

Signature Control No: 462455226-472439035

(TMP)

Jay Garver

Specialist

Additional Condition(s) or Information for ASN 2021-ANE-25-OE

Proposal: To construct and/or operate a(n) Crane to a height of 100 feet above ground level, 208 feet above mean sea level.

Location: The structure will be located 1.83 nautical miles northwest of PWM Airport reference point.

Part 77 Obstruction Standard(s) Exceeded and Aeronautical Impacts, if any:

Based on this aeronautical study, the structure would not constitute a substantial adverse effect on aeronautical operations or procedures because it will be temporary. The temporary structure would not be considered a hazard to air navigation provided all of the conditions specified in this determination are strictly met.

As a condition to this Determination, the structure is to be marked/lighted in accordance with FAA Advisory circular 70/7460-1 M, Obstruction Marking and Lighting, marked-Chapters 3(Marked),14(Temporary),&15.

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

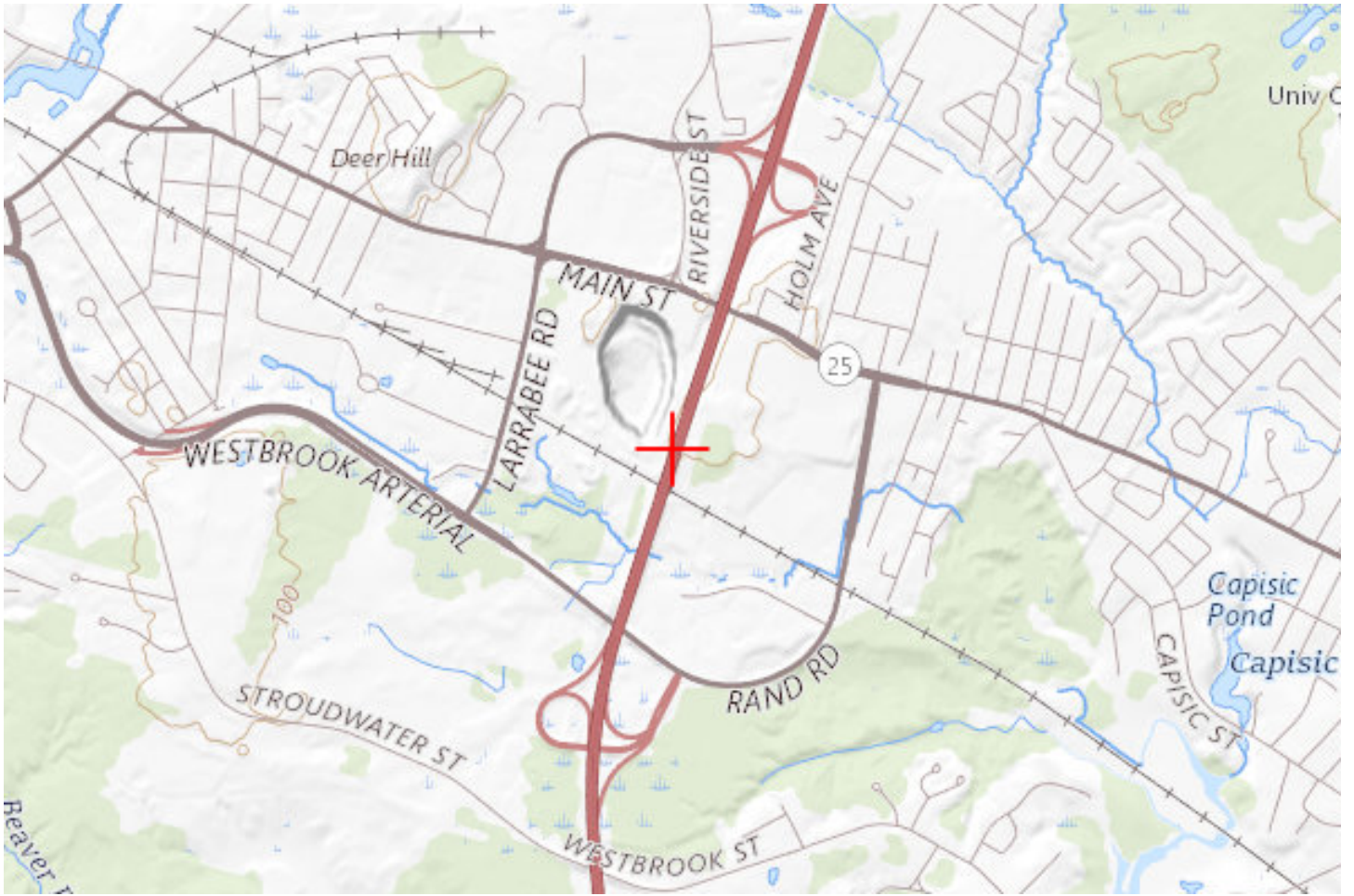
As a condition to this determination, the temporary structure must be lowered to the ground when not in use and during the hours between sunset and sunrise.

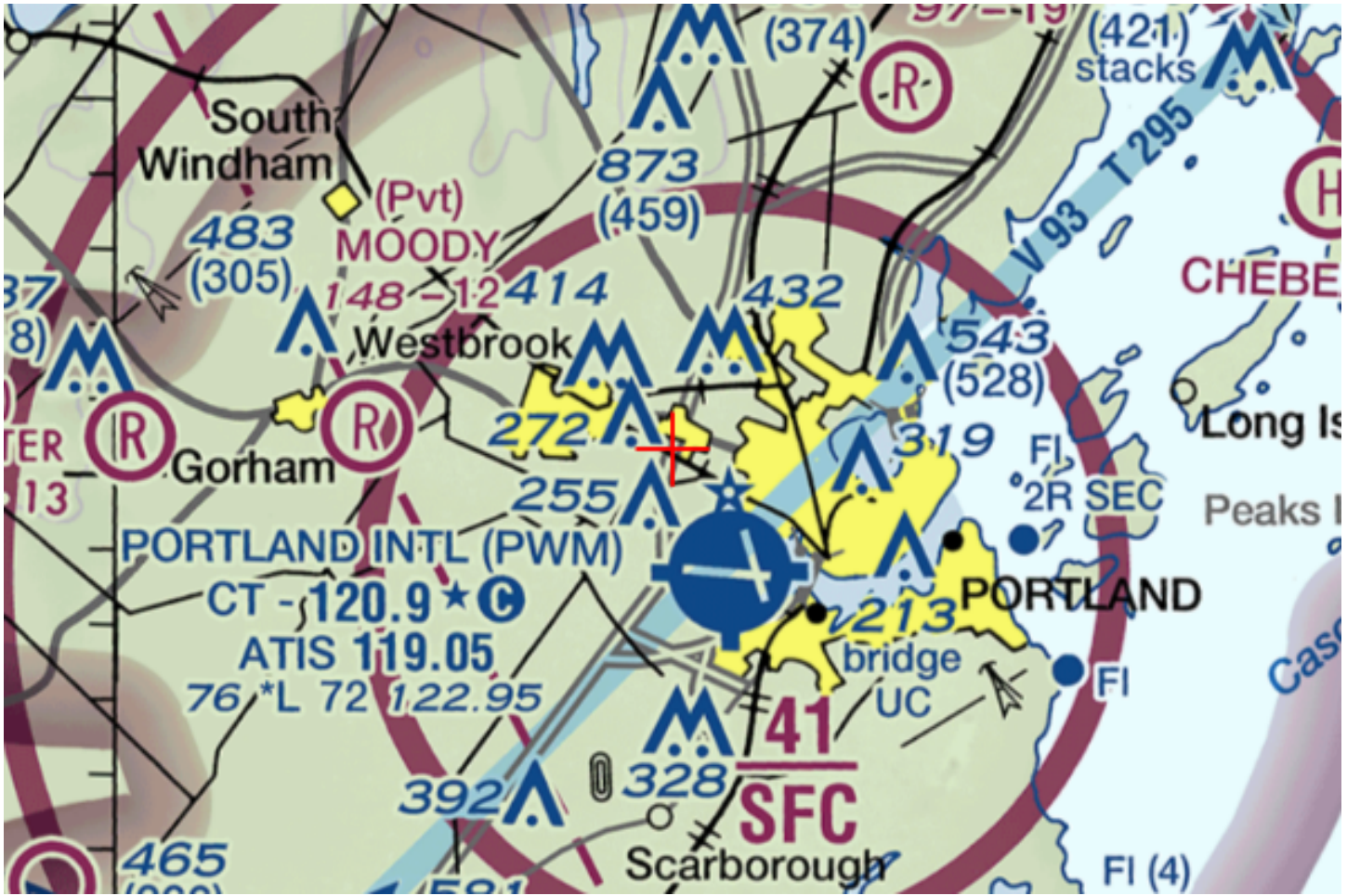
It is required that the manager of PORTLAND INTL JETPORT, (207) 756-8310 be notified at least 3 business days prior to the temporary structure being erected and again when the structure is removed from the site.

It is required that the manager of PORTLAND INTL JETPORT Air Traffic Control Tower @ (207) 552-1415 be notified at least 3 business days prior to the temporary structure being erected and again when the structure is removed from the site. Additionally, please provide contact information for the onsite operator in the event that Air Traffic Control requires the temporary structure to be lowered immediately.

This determination expires on 09/03/2022 unless extended, revised, or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.







Mail Processing Center
 Federal Aviation Administration
 Southwest Regional Office
 Obstruction Evaluation Group
 10101 Hillwood Parkway
 Fort Worth, TX 76177

Aeronautical Study No.
 2021-ANE-36-OE

Issued Date: 03/03/2021

Ralph C. Norwood IV, P.E., PTOE
 Maine Turnpike Authority
 2360 Congress Street
 Portland, ME 04102

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure: Light Pole Station 56+25 LT
 Location: Portland, ME
 Latitude: 43-38-58.79N NAD 83
 Longitude: 70-19-53.64W
 Heights: 77 feet site elevation (SE)
 35 feet above ground level (AGL)
 112 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

- At least 10 days prior to start of construction (7460-2, Part 1)
- Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

Based on this evaluation, marking and lighting are not necessary for aviation safety. However, if marking/lighting are accomplished on a voluntary basis, we recommend it be installed in accordance with FAA Advisory circular 70/7460-1 M.

This determination expires on 09/03/2022 unless:

- (a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
- (b) extended, revised, or terminated by the issuing office.
- (c) the construction is subject to the licensing authority of the Federal Communications Commission (FCC) and an application for a construction permit has been filed, as required by the FCC, within 6 months of the date of this determination. In such case, the determination expires on the date prescribed by the FCC for completion of construction, or the date the FCC denies the application.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is based, in part, on the foregoing description which includes specific coordinates, heights, frequency(ies) and power. Any changes in coordinates, heights, and frequencies or use of greater power, except those frequencies specified in the Colo Void Clause Coalition; Antenna System Co-Location; Voluntary Best Practices, effective 21 Nov 2007, will void this determination. Any future construction or alteration, including increase to heights, power, or the addition of other transmitters, requires separate notice to the FAA. This determination includes all previously filed frequencies and power for this structure.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

If we can be of further assistance, please contact our office at (202) 267-0105, or j.garver@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2021-ANE-36-OE.

Signature Control No: 462455245-472398593

(DNE)

Jay Garver
Specialist

Attachment(s)
Map(s)





Mail Processing Center
 Federal Aviation Administration
 Southwest Regional Office
 Obstruction Evaluation Group
 10101 Hillwood Parkway
 Fort Worth, TX 76177

Aeronautical Study No.
 2021-ANE-74-OE

Issued Date: 03/03/2021

Ralph C. Norwood IV, P.E., PTOE
 Maine Turnpike Authority
 2360 Congress Street
 Portland, ME 04102

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure: Light Pole Station 2301+04 LT
 Location: Portland, ME
 Latitude: 43-39-01.74N NAD 83
 Longitude: 70-19-53.44W
 Heights: 81 feet site elevation (SE)
 35 feet above ground level (AGL)
 116 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

- At least 10 days prior to start of construction (7460-2, Part 1)
- Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

Based on this evaluation, marking and lighting are not necessary for aviation safety. However, if marking/lighting are accomplished on a voluntary basis, we recommend it be installed in accordance with FAA Advisory circular 70/7460-1 M.

This determination expires on 09/03/2022 unless:

- (a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
- (b) extended, revised, or terminated by the issuing office.
- (c) the construction is subject to the licensing authority of the Federal Communications Commission (FCC) and an application for a construction permit has been filed, as required by the FCC, within 6 months of the date of this determination. In such case, the determination expires on the date prescribed by the FCC for completion of construction, or the date the FCC denies the application.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is based, in part, on the foregoing description which includes specific coordinates, heights, frequency(ies) and power. Any changes in coordinates, heights, and frequencies or use of greater power, except those frequencies specified in the Colo Void Clause Coalition; Antenna System Co-Location; Voluntary Best Practices, effective 21 Nov 2007, will void this determination. Any future construction or alteration, including increase to heights, power, or the addition of other transmitters, requires separate notice to the FAA. This determination includes all previously filed frequencies and power for this structure.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

If we can be of further assistance, please contact our office at (202) 267-0105, or j.garver@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2021-ANE-74-OE.

Signature Control No: 462455286-472407183

(DNE)

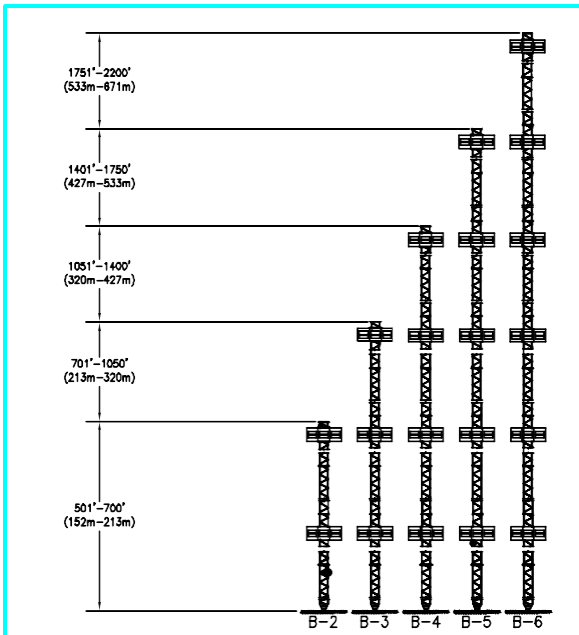
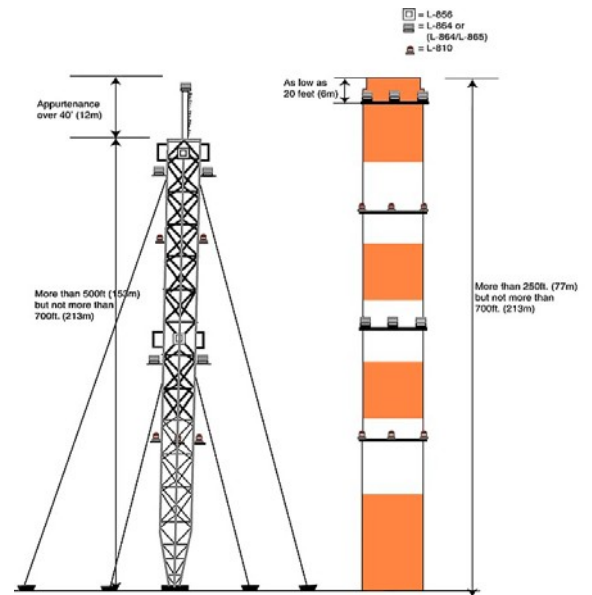
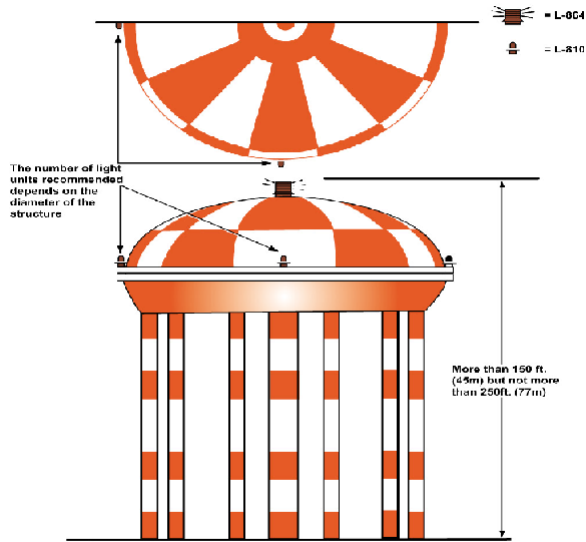
Jay Garver
Specialist

Attachment(s)
Map(s)





Obstruction Marking and Lighting





Advisory Circular

Subject: Obstruction Marking and Lighting

Date: 11/16/2020 **AC No.** 70/7460-1M
Initiated By: AJV-P13

Purpose.

This Advisory Circular (AC) describes the Federal Aviation Administration's standards for marking and lighting structures to promote aviation safety.

Cancellation. AC 70/7460-1L, change 2, Obstruction Marking and Lighting, dated August 2018 is cancelled by this version.

1. **Effective Date.** This AC is effective November 16, 2020.
2. **Related Documents.**
 - a. Title 14 of the Code of Federal Regulations Part 77 describes the standards used relative to objects in the navigable airspace and specifies the requirements for notice to the Administrator of certain proposed construction or alteration.
 - b. Federal Communications Commission (FCC) specifications are contained in Part 17 of the FCC Rules and Regulations

Principal Changes.

This circular contains numerous editorial changes. Major changes are listed below.

- a. Page 2, Addition of Note. The FAA has changed specifications for light emitting diode (LED)-based red obstruction lights to make them visible to pilots using certain night vision goggle systems. Effective with the implementation of this change in FAA AC 150/5345-43, *Specification for Obstruction Lighting Equipment*, manufacturers will be required to meet the new specification for certified red LED-based obstruction lights.
- b. Page 6, Removed paragraph 2.8, Obstruction Height Definition. Structures lower than 499 feet AGL can be considered obstructions. As written, the paragraph caused confusion and was deleted.
- c. Informational paragraphs are added regarding the change to manufacturing standards for LED-based red obstruction lights compatibility with night vision goggle systems and maintaining conspicuity to avoid misinterpretation when replacing lights.
- d. Reorganized information in Chapter 11, Marking and Lighting of Catenary and Catenary Support Structures and chapter 13, Marking and Lighting Wind Turbines.
- e. Reorganized chapters by subject matter and figures in , Pages A-1 to A- 29, as well as minor grammatical changes

- f. Added Chapter 14, Marking and Lighting Temporary Structures and associated figures in the Appendix, Figures A-31 through A-33.
- g. Added Figure 22, Catenary Markers - Line Spacing (Adjacent Lines Within 200 feet (60.96 m) or Less
- h. Added , Figure 30 Wind Turbine Lighting During Construction.

Comments or Suggestions.

Direct comments or suggestions regarding this AC to:

Federal Aviation Administration
Manager, Policy Assurance
Attention: AJV-P13
600 Independence Avenue, S.W.
Washington, DC 20591

Karen Chiodini, Director (A)
Policy, AJV-P
Mission Support Services
Federal Aviation Administration

CHAPTER 1. ADMINISTRATIVE AND GENERAL PROCEDURES

1.1 Reporting Requirements.

A Sponsor proposing any type of construction or alteration of a structure that may affect the National Airspace System (NAS) as required under the provisions of Code of Federal Regulations (CFR), Title 14, Aeronautics and Space, Part 77, Safe, Efficient Use, and Preservation of the Navigable Airspace (14 CFR, Part 77), is to notify the Federal Aviation Administration (FAA) by completing the FAA Form 7460-1, Notice of Proposed Construction or Alteration.

This form should be filed electronically at <https://oeaaa.faa.gov>. The website includes the FAA Notice Criteria Tool for Sponsors use to determine if the structure exceeds criteria threshold and requires a notice to be filed.

1.2 Preconstruction Notice.

The notice must be submitted:

1. At least 45 days prior to the date of proposed construction or alteration is to begin.
2. On or before the date an application for a construction permit is filed with the Federal Communications Commission (FCC). The FCC advises its applicants to file with the FAA well in advance of the 45-day period to expedite FCC processing.

1.3 FAA Acknowledgement.

The FAA will acknowledge, electronically, each FAA Form 7460-1 notice received.

1.4 Supplemental Notice Requirement.

1. If required, the FAA will include a statement requiring the filing of FAA Form 7460-2, Notice of Actual Construction or Alteration, on the determination. All FAA Forms 7460-2 should be filed electronically at <https://oeaaa.faa.gov>.
2. FAA Form 7460-2, Part 1, must be submitted to the FAA at least ten days prior to starting the actual construction or alteration of a structure. The FAA Form 7460-2, Part 2, completed within five days after the structure has reached its greatest height.
3. In addition, notification of dismantlement or abandonment of construction must be submitted to the FAA using the supplemental notice FAA Form 7460-2.

Note: Notification as required in the determination is critical to aviation safety.

1.5 Modifications and Deviations.

Requests for modification or deviation from the standards outlined in this AC must be submitted to the FAA Obstruction Evaluation Group (OEG). The Sponsor is responsible for adhering to approved marking and/or lighting limitations, and recommendations given, and should notify the FAA and FCC (for those structures regulated by the FCC) prior to making any changes, such as removal of marking and/or lighting. Requests received for any changes after a determination has been issued will require a new aeronautical study and may result in a modified determination, including updated marking and/or lighting recommendations.

1. Modification examples. Modifications will be based on whether they impact aviation safety. Examples of modifications are as follows:
 - a. Marking and/or lighting only a portion of an object. The object may be located with respect to other objects or terrain that only a portion of it needs to be marked and/or lighted.
 - b. No marking and/or lighting. The object may be located with respect to other objects or terrain, removed from the general flow of air traffic, or may be so conspicuous by its shape, size, or color that marking or lighting would serve no useful purpose.
 - c. Voluntary marking and/or lighting. The object may be located with respect to other objects or terrain that the Sponsor feels increased conspicuity would better serve aviation safety. Sponsors who desire to voluntarily mark and/or light their structure should do so in accordance with this AC.
 - d. Marking or lighting an object in accordance with the standards for an object of greater height or size. The object may present such an extraordinary hazard potential that higher standards may be recommended for increased conspicuity to ensure aviation safety.
2. Deviations. The assigned Obstruction Evaluation Specialist will conduct an aeronautical study of the proposed deviation(s) and forward their recommendation to their FAA Team Manager for final approval. Examples of deviations that may be considered:
 - a. Colors of objects.
 - b. Dimensions of color bands or rectangles.
 - c. Colors/types of lights.
 - d. Basic signals and intensity of lighting.
 - e. Night/day lighting combinations.
 - f. Flash rate.

The FAA strongly recommends that owners become familiar with the different types of lighting systems and to specifically request the type of lighting system desired when submitting FAA Form 7460-1. Information regarding types of lighting systems is provided in Chapters 5 - 10, and specifications regarding lighting equipment classifications in Table A-1, in this AC. While the FAA will make every effort to accommodate the structure Sponsor's request, Sponsors should also request information from system manufacturers to determine which system best meets their needs based on purpose, installation, and maintenance costs.

1.6 Additional Notification.

Proper authorization and annotations of obstruction marking and lighting may require notice to the FCC prior to making any change to the submitted information which the FAA based its determination. This includes modification, deviation, or optional upgrade to white lighting on structure, which may be subject to inspection and enforcement of marking and lighting requirements by the FCC. FCC Forms and Bulletins can be obtained from the FCC's National Call Center at 1-888-CALL-FCC (1-888-225-5322) or online at: <https://www.fcc.gov/wireless-telecommunications>. Additionally, upon completion of the actual change, complete the "Add Supplemental Notice (FAA Form 7460-2)" at the <https://oeaaa.faa.gov> website.

CHAPTER 2. GENERAL

2.1 Structures to be Marked and Lighted.

Any temporary or permanent structure, including all appurtenances, that exceeds any obstruction standard contained in 14 CFR Part 77 or an overall height of 200 feet (60.96m) above ground level (AGL) should be marked and/or lighted. However, an FAA aeronautical study may reveal that the absence of marking and/or lighting will not impair aviation safety. Conversely, the object may present such an extraordinary hazard potential that higher standards may be recommended for increased conspicuity to ensure aviation safety. Recommendations for marking and/or lighting structures can vary, depending on terrain features, weather patterns, geographic location, number of structures, and overall design layout. The FAA may also recommend marking and/or lighting a structure that does not exceed 200 feet (60.96 m) AGL or 14 CFR Part 77 standards because of its particular location. The marking and lighting configurations are illustrated in Appendix A.

2.2 Guyed Structures.

The guys of a 2,000-foot (609.60 m) skeletal tower are anchored between 1,600 feet (487.68 m) and 2,000 feet (609.60 m) from the base of the structure. This places a portion of the guys 1,500 feet (457.20 m) from the tower at a height of between 125 feet (38.10 m) and 500 feet (152.40 m) AGL. Title 14 CFR Part 91, Section 119, requires pilots, when operating over other than congested areas, to remain at least 500 feet (152.40 m) from man-made structures. Therefore, the tower must be cleared by 2,000 feet (609.60 m) horizontally to avoid all guy wires. Properly maintained marking and lighting are important for increased conspicuity because the guys of a structure are difficult to see until the aircraft is dangerously close.

2.3 Marking and Lighting Equipment.

Considerable effort and research was expended to determine the minimum marking and lighting systems and quality of materials that will produce an acceptable level of aviation safety. The FAA will recommend only those marking and lighting systems that meet established technical standards and commercial outside lighting should not be used in lieu of FAA recommended marking and/or lighting. While additional lights may be desirable to identify an obstruction to air navigation, and may on occasion be recommended, the FAA will recommend minimum standards in the interest of safety, economy, and related concerns. Therefore, to provide an adequate level of safety, obstruction lighting systems should be installed, operated, and maintained in accordance with the recommended standards herein. Chapter 15 contains descriptions of FAA- approved obstruction marking and lighting equipment and information referred to in this AC.

2.4 Light Failure Notification.

Sponsors should consider that conspicuity is achieved only when all recommended lights are working. Partial equipment outages decrease the margin of safety. Any outage should be corrected as soon as possible. Failure of steady-burning side or intermediate lights should be corrected as soon as possible, but notification is not required.

Note: On September 11, 2020, the FAA changed specifications for LED-based red obstruction lights to make them visible to pilots using certain night vision goggle systems. Effective with implementation of this change in FAA AC 150/5345-43, *Specification for Obstruction Lighting Equipment*, manufacturers will be required to meet the new specification for certified red LED-based obstruction lights.

Because the new specification ensures the light is visible to pilots operating with night vision goggles, there is risk of a pilot misinterpreting the tower height if a legacy intermediate-level light is replaced with one that meets the new specification unless the top light meets the new specification as well. Therefore, if a legacy specification intermediate-level LED-based light is replaced with a light that meets the new specifications, then the top-level light(s) on the obstruction must also meet the new specification to ensure the entire obstruction is visible during the use of night vision goggles.

- 2.4.1. Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light, flashing obstruction light regardless of its position, wind turbine lighting fixture, or wind turbine synchronization should be reported immediately by calling Outage Reporting and Notice to Airmen (NOTAM) at 877-487-6867, or in Alaska 800-478- 3576, so a NOTAM can be issued. For structures that are regulated by the FCC, the FCC advises that noncompliance with notification procedures could subject the Sponsor to penalties or monetary forfeitures. Voluntarily installed lights (not required by an FAA determination) do not require a NOTAM.
- 2.4.2. The following information should be specified for outage reporting:
1. Name of persons or organizations reporting the light failures, including any title, address, and telephone number.
 2. The type of structure.
 3. Location of structure (including latitude and longitude, prominent structures, landmarks, etc.).
 4. Height of structure AGL/above mean sea level (AMSL) if known.
 5. Return to service date.
 6. FCC Antenna Structure Registration Number (for structures that are regulated by the FCC).

Note: When the primary lamp in a double obstruction light fails and the secondary lamp comes on, no report is required.

2.5 Notification of Restoration.

As soon as normal operation is restored, notify Outage Reporting and NOTAM Offices (see Paragraph 2.4.1).

Note: For structures regulated by the FCC, the FCC advises that noncompliance with notification procedures could subject the Sponsor to penalties or monetary forfeitures.

2.6 Federal Communications Commission (FCC) Requirement.

The use of a high-intensity flashing white lighting system on structures located in residential neighborhoods (as defined by applicable zoning laws) trigger requirements for FCC licenses and an environmental assessment.

2.7 Voluntary Marking of Meteorological Evaluation Towers (MET) Less Than 200 Feet (60.96 m) AGL.

The FAA recommends voluntary marking of MET less than 200 feet (60.96 m) AGL in accordance with marking guidance contained in this AC. Historically this guidance has not been applied, however the FAA recognizes the need to address safety impacts to low-level agricultural flight operations and believes that voluntarily marking MET less than 200 feet (60.96 m) AGL in remote and rural areas enhance the conspicuity of these structures.

1. Painting. The MET should be painted in accordance with the standards and criteria contained in Chapters 3 and 15, with alternating bands of aviation orange and white paint. In addition, paragraph 3.3.1 states that all markings should be replaced when faded or otherwise deteriorated.
2. High-visibility sleeves. It is recommended that several high-visibility sleeves be installed on the MET outer guy wires (see Figure A-2). One high-visibility sleeve should be installed on each guy wire, as close to the anchor point as possible, but at a height well above the crop or vegetation canopy. A second sleeve should be installed on the same outer guy wires midway between the location of the lower sleeve and the upper attachment point of the guy wire to the MET.

Spherical markers. It is also recommended that high-visibility aviation orange spherical marker (or cable) balls be attached to the guy wires. Spherical markers should be installed and displayed in accordance to Chapter 11. The FAA, however, recognizes various weather conditions and manufacturing placement standards may affect the placement and use of high-visibility sleeves and/or spherical markers. Thus, some flexibility is allowed when determining sleeve length and marker placement on the MET.

CHAPTER 3. MARKING GUIDELINES

3.1 Purpose.

This chapter provides recommended guidelines to make certain structures conspicuous to pilots during daylight hours. One way to achieve this conspicuity is to paint and/or mark these structures. Recommendations on marking structures can vary, depending on terrain features, weather patterns, geographic location, and the number of structures.

3.2 Paint Colors.

Alternate sections of aviation orange and white paint should be used as the contrast in colors provides maximum visibility of an obstruction. Specific paint standards are contained in Chapter 15.

3.3 Paint Standards.

To be effective, the paint used should meet specific color requirements when freshly applied to a structure. Because all outdoor paints deteriorate with time, and it is not practical to give a maintenance schedule for all climates, surfaces should be repainted when the color changes noticeably or its effectiveness is reduced by scaling, oxidation, chipping, or layers of contamination. The subsequent standards should be followed.

3.3.1 Materials and Application.

The FAA recommends that quality paint and materials be selected to maximize years of service. The paint should be appropriate for the surfaces to be painted, including any previous coatings, and suitable for the environmental conditions. Surface preparation and paint application should follow the manufacturer's recommendations.

Note: In-Service Aviation Orange Color Tolerance Charts are available from private suppliers for determining when repainting is required. The color should be sampled on the upper half of the structure, since weathering is greater there.

3.3.2 Surfaces not Requiring Paint.

Ladders, decks, and walkways of steel towers and similar structures do not need to be painted if a smooth surface presents a potential hazard to maintenance personnel. Painting may also be omitted from precision or critical surfaces if the paint would have an adverse effect on the transmission or radiation characteristics of a signal. However, the structure's overall marking effect should not be reduced.

3.3.3 Skeletal Structures.

Complete all marking/painting prior to or immediately upon completion of construction. This

applies to catenary support structures, radio and television towers, and similar skeletal structures. To be effective, paint should be applied to all inner and outer surfaces of the framework.

3.4 Paint Patterns.

Various types of paint patterns are used to mark structures. The pattern is determined by the size and shape of the structure. The following patterns are recommended:

3.4.1 Solid Pattern.

Obstacles should be painted aviation orange if the structure's horizontal and vertical dimensions do not exceed 10.5 feet (3.20 m).

3.4.2 Checkerboard Pattern.

Alternating rectangles of aviation orange and white are normally displayed on the following structures:

1. Water, gas, and grain storage tanks (see Figures A-3, A-4, and A-5).
2. Buildings, as required.
3. Large structures exceeding 10.5 feet (3.20 m) across, having a horizontal dimension that is equal to or greater than the vertical dimension.

3.4.3 Size of Patterns.

The sides of the checkerboard pattern should measure not less than five feet (1.52 m) or more than 20 feet (6.10 m) and should be as nearly square as possible. However, if it is impractical because of the size or shape of a structure, the sides of the patterns may be less than five feet (1.52 m). The pattern should be arranged so that each outer corner of the structure will be painted aviation orange.

3.4.4 Alternate Bands.

Alternate bands of aviation orange and white are normally displayed on the following structures:

1. Communication towers and catenary support structures.
2. Poles.
3. Smokestacks.
4. Skeletal framework of storage tanks and similar structures.

5. Structures that appear narrow from a side view that are 10.5 feet (3.20 m) or less across, and the horizontal dimension is less than the vertical dimension
6. Coaxial cable, conduits, and other cables attached to the face of a tower. 3.4.5.

3.4.5 Color Band Characteristics.

Bands for structures of any height (see Figure A-6) should be:

1. Equal in width, provided each band is not less than 1 1/2 feet (0.46 m) or more than 100 feet (30.48 m) wide.
2. Perpendicular to the vertical axis with the bands at the top and bottom painted orange.
3. An odd number of bands on the structure.
4. Equal and in proportion to the structure’s AGL height.
5. Approximately one-seventh the height, if the structure is equal to or less than 700 feet (213.36 m) AGL. For each additional 200 feet (60.96 m) or fraction thereof, add one additional orange and one additional white band. Table 4-1 shows the required band widths based on the height of the structure.

Table 3-1. Structure Height to Bandwidth Ratio

If a structure is:		Then Band Width:
Greater Than	Equal to or Less Than	Band Width
10.5 feet (3.20 m)	700 feet (213.36 m)	1/7 of
700 feet (213.36 m)	900 feet (274.32 m)	1/9 of
900 feet (274.32 m)	1,100 feet (335.28 m)	1/11 of
1,100 feet (335.28 m)	1,300 feet (396.24 m)	1/13 of

3.4.6 Structures With a Cover or Roof.

If the structure has a cover or roof, the highest orange band should be continued to cover the entire top of the structure (see Figures A-3 and A-4).

3.4.7 Skeletal Structures Atop Buildings.

If a flagpole, skeletal structure, or similar object is erected on top of a building, the combined height of the object and building will determine whether marking is recommended. However, only the height of the object filed with the FAA determines the width of the color bands.

3.4.8 Partial Marking.

If marking is recommended for only a portion of a structure because the lower portion of the structure is shielded by other objects or terrain, the width of the bands on the exposed portion should still be determined by the overall height of the structure. Paragraph 3.4.5 provides details on calculating the width of the paint bands. A minimum of three bands should be displayed on the exposed portion of the structure. If the exposed portion of the structure is not large enough to have at least three bands, the width of the bands may be reduced equally so that three equally sized bands can be fit. This will ensure that the marking pattern provides sufficient contrast for a pilot to locate the structure.

3.4.9 Teardrop Pattern.

Spherical water storage tanks with a single, circular standpipe support may be marked in a teardrop-striped pattern. The tank should show alternate stripes of aviation orange and white. The stripes should extend from the top center of the tank to its supporting standpipe. The width of the stripes should be equal, and the width of each stripe at the greatest girth of the tank should not be less than five feet (1.52 m) nor more than 15 feet (4.57 m) (see Figure A-5).

3.4.10 Community Names.

If it is desirable to paint the name of the community on the side of a tank or other structure, the stripe pattern may be broken to serve this purpose. This open area should have a maximum height of three feet (0.91 m) (see Figure A-5).

3.4.11 Exceptions.

Structural designs not conducive to standard markings may be marked as follows:

1. If it is not practical to paint the roof of a structure in a checkerboard pattern, it may be painted solid orange.
2. If a spherical structure is not suitable for an exact checkerboard pattern, the shape of the rectangles may be modified to fit the shape of the surface.
3. Storage tanks not suitable for a checkerboard pattern may have alternating bands of aviation orange and white or a limited checkerboard pattern applied to the upper one-third of the structure.
4. The skeletal framework of certain water, gas, and grain storage tanks may be excluded from the checkerboard pattern.

3.5 Unlighted Markers.

Unlighted markers are used to identify structures and to make them more conspicuous when it is impractical to paint them. Unlighted markers may also be used with aviation orange and white paint when additional conspicuity is necessary for aviation safety. Unlighted markers should be displayed in conspicuous positions on or adjacent to the structures so as to retain the general definition of the structure. They should be recognizable in clear, daytime visibility from a distance of at least 4,000 feet (1,219.20 m) and in all directions from which aircraft are likely to approach. Unlighted markers should be distinctively shaped, i.e., spherical or cylindrical, so that they are not mistaken for items that are used to convey other information. They should be replaced when faded or otherwise deteriorated.

3.5.1 Spherical Markers.

Spherical markers are primarily used to identify overhead wires and catenary transmission lines that are less than 69 kilovolts (kV). Markers may be of another shape, i.e., cylindrical, provided the projected area of such markers is not less than that presented by a spherical marker.

1. Size and Color.

The diameter of the markers used on extensive catenary wires (catenary wires that cross canyons, lakes, rivers, etc.) should not be less than 36 inches (91.44 centimeter (cm)). Smaller 20-inch (50.80-cm) spheres are permitted on less extensive catenary wires or on power lines below 50 feet (15.24 m) AGL and within 1,500 feet (457.20 m) of an airport runway end. Each marker should be a solid color, specifically aviation orange, white, or yellow.

2. Installation.

- a. Spacing. Unlighted markers should be spaced equally along the wire at approximately 200-foot (60.96 m) intervals, or fraction thereof. There should be less space between markers in critical areas near runway ends (i.e., 30 feet to 50 feet (9.14 m to 15.24 m)). They should be displayed on the highest wire or by another means at the same height as the highest wire. Where there is more than one wire at the highest point, the markers may be installed alternately along each wire if the distance between adjacent markers meets the spacing standard of 200 feet or less. This method distributes the weight and wind-loading factors (see Figures A-21 and A-22).
- b. Pattern. An alternating color scheme provides the most conspicuity against all backgrounds. Unlighted markers should be installed by alternating solid-colored markers of aviation orange, white, and yellow. Normally, an orange marker is placed at each end of

a line and the spacing is adjusted (not to exceed 200 feet (60.96 m)) to accommodate the rest of the markers. When less than four markers are used, they should all be aviation orange.

- c. Wire Sag. Wire Sag, or droop, will occur due to temperature, wire weight, wind, etc. Twenty-five feet (7.62 m) is the maximum allowable distance between the highest wire installed with marker balls and the highest wire without marker balls, and must not violate the sag requirements of the transmission line design.
- d. Adjacent Lines. Catenary crossings with multiple transmission lines require appropriate markers when the adjacent catenary structure's outside lines are greater than 200 feet (60.96 m) away from the center of the primary structure. If the outside lines of the adjacent catenary structure are within 200 feet (60.96 m) or less from the center of the primary structure, markers are not required on the adjacent lines.

3.5.2 Flag Markers.

Flags are used to mark certain structures or objects when it is technically impractical to use spherical markers or paint. Flag markers must be mounted at the highest point of the structure to ensure visibility. Some common examples of structures that may utilize this type of markers include, temporary construction equipment and vehicles, oil and drilling rigs, cranes, and derricks.

1. Minimum Size. Each side of the flag marker should be at least two feet (0.61 m) in length.
2. Color Patterns. Flags should be colored as follows:
 - a. Solid. Aviation orange.
 - b. Orange and White. Arrange two triangular sections, one aviation orange, and the other white to form a rectangle.
 - c. Checkerboard. Flags three feet (0.91 m) or larger should be a checkerboard pattern of aviation orange and white squares, each one foot (0.30 m) plus or minus 10 percent.
3. Shape. Flags should be rectangular in shape and have stiffeners to keep them from drooping in calm wind.
4. Display. Flag markers should be displayed around, on top, or along the highest edge of the obstruction. When flags are used to mark extensive or closely grouped obstructions, they should be displayed approximately 50 feet (15.24 m) apart. The flag stakes should be strong enough to support the flags and be higher than the surrounding ground, structures, and/or objects of natural growth.

3.6 Unusual Complexities.

The FAA may also recommend appropriate marking in an area in which grouped obstructions present a common obstruction to air navigation.

3.7 Omission or Alternatives to Marking.

The alternatives listed below require FAA review and concurrence prior to making changes. See subsequent chapters for specific guidance. High-Intensity Flashing White Lighting Systems are more effective than aviation orange and white paint and therefore can be recommended instead of paint marking. This is particularly true under certain ambient light conditions involving the position of the sun relative to the direction of flight. High-intensity lighting systems should not be used on structures 700 feet (213.36 m) AGL or less, however, when operated during daytime, twilight, or 24 hours a day, other methods of marking and lighting may be omitted.

- 3.7.1 Medium-Intensity Flashing White Lighting Systems are operated during daytime and twilight on structures 700 feet (213.36 m) AGL or less, but generally not on structures less than 200 feet (60.96 m) AGL. When used, other methods of marking may be omitted.

Note: Sponsors must ensure that alternatives to marking are coordinated with the FCC for structures under its jurisdiction prior to making the change.

CHAPTER 14. MARKING AND LIGHTING TEMPORARY STRUCTURES

14.1 Purpose.

This chapter provides general guidelines for marking and lighting temporary structures, such as construction equipment, cranes, derricks, oil and drilling rigs, etc. The purpose of marking and lighting these obstructions is to indicate the presence and general outline of the structure to assist pilots when approaching from any direction to identify and avoid these obstacles. These guidelines are not to be considered all-inclusive, each obstacle must be evaluated individually and the determination will provide lighting requirements that are specific to the structure.

14.2 General Standards.

Due to the temporary nature, potential mobility, and ability to instantaneously extend to full height, accommodations must be made to mitigate the effects of these structures on the airspace for safe operations. Temporary structures are unique based on the structure type, size, and use, and the aeronautical study evaluates the potential effect on airspace. Proximity to airports, navigational aids (NAVAIDS), air routes, and local flight activity, as well as the duration of the project are considered during the evaluation process.

Marking and/or lighting of these structures is intended to provide day and night conspicuity and to assist pilots in identifying and avoiding these obstacles. In some cases, the Sponsor will also be required to initiate a NOTAM to provide additional mitigation procedures for the safe operation of the temporary obstacle due to the proximity of these aviation elements.

14.3 Marking Standards.

Marking is used to increase conspicuity of structures for daytime conditions. Flags are used to mark certain structures or objects when it is technically impractical to use paint. When using paint, various types of paint colors and patterns are used to mark structures and the pattern should ensure the paint contrasts with the surrounding environment.

14.3.1 Flag Markers.

Flag markers must be mounted at the highest point of the structure to ensure visibility. Some common examples of structures that may utilize this type of markers include, temporary construction equipment and vehicles, oil and drilling rigs, cranes, and derricks. Refer to Section 3.5.2 for full details.

1. Minimum Size. Each side of the flag marker should be at least two feet (0.61 m) in length.
2. Color Patterns. Flags should be colored as follows:
 - a. Solid colored flag must be aviation orange.

- b. When using two colors, arrange two triangular sections, one aviation orange and the other white to form a rectangle.
 - c. Flags three feet (0.91 m) or larger should be a checkerboard pattern of aviation orange and white squares, each one foot (0.30 m) plus or minus 10 percent.
3. Display. Flag markers should be displayed around, on top, or along the highest edge of the obstruction. The flag staff should be strong enough to support the flag and be higher than the surrounding ground, structures, and/or objects of natural growth.

14.3.2 Paint.

1. Ideally cranes should be painted aviation orange or alternating aviation orange and white, however with flags and/or lights, contrasting bright colors that do not merge into the surrounding environment are acceptable. Colors that camouflage with the surrounding environment (i.e., sky blue, forest green, etc.) should be avoided.
2. Refer to paragraph 3.2, Paint Standard, for details.

14.3.3 Alternative to Marking.

1. Along with, or as an alternative to paint, medium intensity white lighting can be used to make the obstacle more conspicuous during daytime conditions for structures over 200 feet AGL.
2. High intensity lighting is not recommended on temporary structures.

14.4 Lighting Standards.

Lighting is used to increase conspicuity of structures for day or nighttime conditions and must be visible to a pilot approaching in any direction. When a temporary structure cannot be removed from site or lowered below the no-effect height, the addition of lighting will be used to alert pilots of their presence. Generally, red lights are recommended during the hours between sunset and sunrise and periods of reduced visibility, using marking for the remainder of the time with occasional exceptions. Lights must be mounted at the highest point of the structure, and in cases of more extensive structures additional lights may be necessary at intermediate levels and furthest horizontal points (i.e., horizontal boom ends, etc.) to clarify the outline of the structure (see Figure A-31).

1. Structures 150 feet (45.72 m) AGL or less. Two or more steady-burning or flashing red (L-810/L-810 F) lights should be installed on the highest part of the structure in a manner to ensure an unobstructed view of one or more lights by a pilot.
2. Structures exceeding 150 feet (45.72 m) AGL and not more than 350 feet (106.68 m) AGL. At least one red flashing (L-864) light should be installed on the highest part of the structure and intermediate levels of one or more flashing red lights (L-810 F) should be mounted in a manner to ensure an unobstructed view of one or more lights by a pilot.

- a. Mounting Intermediate Level Lights. The number of light levels required is determined by the height of the structure, including all appurtenances, as shown in, Figure A-6. The number of lights on each level is determined by the shape and width of the structure. At least two or more of these lights (L-810 F) should be mounted diagonally or on diametrically opposite positions to ensure an unobstructed view of at least one light at each level by a pilot approaching in any direction. These lights should be configured to flash simultaneously with the L-864 flashing light on the top of the structure at a rate of 30 flashes per minute (fpm) (± 3 fpm). Steady burning lights (L-810) and red flashing lights (L-864) are not used as intermediate level lights on these types of structures.
3. Structures exceeding 350 feet (106.68 m) AGL. At least one red flashing (L-864) light should be installed on the highest part of the structure in a manner to ensure an unobstructed view of one or more lights by a pilot. In addition, intermediate levels of lights of flashing red (L-864) will be required.
 - a. Intermediate Levels Lights. The number of light levels required is determined by the height of the structure, including all appurtenances, as shown in, Figure A-6. The number of lights on each level is determined by the shape and width of the structure. At least two or more of these lights (L-864) should be mounted diagonally or on diametrically opposite positions to ensure an unobstructed view of at least one light at each level by a pilot approaching in any direction. These lights should be configured to flash simultaneously with the L-864 flashing light on the top of the structure at a rate of 30 flashes per minute (fpm) (± 3 fpm). Steady burning lights are not used on these types of structures.

14.4.1 Construction Cranes or Rigs (Oil and Drilling).

When a crane or rig cannot be removed from site or lowered below the no-effect height, the addition of lighting will be used to alert pilots of their presence during the hours between sunset and sunrise and periods of reduced visibility. Lights must be mounted at the highest point, and in cases of more extensive structures additional lights may be necessary at intermediate levels and furthest horizontal (i.e., horizontal boom ends, etc.) points to clarify the outline of the structure (see Figure A-32).

1. Systems. Steady burning and flashing red lights (L-864/L-810) may be used to light cranes and rigs. High-intensity lights (L-856) are not recommended.
2. Display. The flashing light (L-864) should be displayed on the highest point, and the steady light (L-810) at the ends of boom, and other various locations along the top of the structure to best define the outline. Additionally, in certain cases, intermediate level lighting or sidelights (L-810) may be required. For construction cranes with angular booms, the lights must be mounted on a pivot axis so the fixture remains level when the boom tilts to ensure the lights remain level and is not obscured by the structure.

3. Exceptions.

- a. Architectural lighting or floodlights may be used in addition to, but not in place of, standard lighting provided they do not cause an adverse effect on the obstruction light fixture's photometrics and do not result in an obscured view of one of more obstruction lights by a pilot.
- b. In some cases, the boom or rig may be lowered below the no-effect height or removed from site, and nighttime lighting is not required.

14.4.2 Container Cranes.

1. These structures are generally used in brightly lit areas, however lighting must be used to alert pilots of the current configuration and presence of the obstruction during the hours between sunset and sunrise and periods of reduced visibility. Extensive structures require additional lights at intermediate levels and furthest horizontal points, (i.e., horizontal boom ends, etc.), as well as horizontal mid-points as necessary, to clarify the outline of the structure for pilots approaching from any direction.
2. Systems. Medium intensity white lights (L-865) may be used, however high-intensity lights (L-856) are not recommended.
3. Display. The lights should be displayed on the highest point, ends of boom, and other various ways to best define the size and shape of the structure. Lights must be mounted at the highest point at all times during usage. For large container cranes with angular booms, the lights must be mounted on a pivot axis so the fixture remains level when the boom tilts to ensure the lights remain level and is not obscured by the structure (see Figure A-33).
4. Exceptions. Architectural lighting or floodlights may be used in addition to, but not in place of, standard lighting provided they do not cause an adverse effect on the obstruction light fixture's photometrics and do not result in an obscured view of one of more obstruction lights by a pilot.

14.5 Operational Characteristics.

When using flashing lights, the lights should flash simultaneously.

CHAPTER 15. MARKING AND LIGHTING EQUIPMENT AND INFORMATION

15.1 Purpose.

This chapter lists documents relating to obstruction marking and lighting systems and where they may be obtained.

15.2 Paint Standard.

15.2.1 Paint and aviation colors/gloss, referred to in this AC, with the exception of wind turbines, should conform to Aerospace Material Specification Standard, SAE-AMS- STD-595, *Colors Used in Government Procurement*, previously known as FED-STD- 595 (cancelled February 14, 2017). Wind turbines must meet the standards in Chapter 13, paragraph 13.4, of this AC.

15.2.2 Approved colors must be formulated without using lead, zinc chromate, or other heavy metals to match international aviation orange, white, and yellow, as listed in Table 3-1. All coatings must be manufactured and labeled to meet Federal Environmental Protection Act Volatile Organic Compound(s) guidelines, including the National Volatile Organic Compound Emission Standards for architectural coatings.

1. Exterior Acrylic Waterborne Paint. Coatings should be ready-mixed, 100 percent acrylic, exterior latex formulated for application directly to galvanized surfaces. Ferrous iron and steel or non-galvanized surfaces must be primed with a manufacturer-recommended primer compatible with the finish coat.
2. Exterior Solvent-Borne Alkyd-Based Paint. Coatings should be ready-mixed, alkyd-based, exterior enamel for application directly to non-galvanized surfaces, such as ferrous iron and steel. Galvanized surfaces must be primed with a manufacturer-recommended primer compatible with the finish coat.

Table 15-1. Aerospace Material Specification Standard, SAE-AMS-STD-595

Color	Number
Orange	EA 12197
White	EA 17875
Yellow	EA 13538

15.3 Availability of Specifications and Advisory Circulars.

1. Federal and military specifications describing the technical characteristics of various paints and their application techniques are available through the ASSIST Database at <https://assist.dla.mil/online/start/>. ASSIST is a robust, comprehensive website used by standardization management activities to develop, coordinate, distribute, and manage defense and federal specifications and standards, military handbooks, commercial item descriptions, data item descriptions, and related technical documents prepared in accordance with the policies and procedures of the Defense Standardization Program (DSP).
2. For Federal Product Description line items only (for download, refer to ASSIST), use the following Uniform Resource Locator (URL):

<https://www.gsa.gov/buying-selling/purchasing-programs/requisition-programs/gsa-global-supply/supply-standards/index-of-federal-specifications-standards-and-commercial-item-descriptions>.

3. Copies of FAA Advisory Circulars may be obtained online at:

https://www.faa.gov/regulations_policies/advisory_circulars/

15.4 Lights and Associated Equipment Standards.

The lighting equipment referred to in this AC should conform to the latest edition of one of the following specifications, as applicable:

1. Obstruction Lighting Equipment.
 - a. AC 150/5345-43, *FAA Specification for Obstruction Lighting Equipment.*
 - b. Military Specifications MIL-L-6273, *Light, Navigational, Beacon, Obstacle, or Code, Type G-1.*
 - c. Military Specifications MIL-L-7830, *Light Assembly, Marker, Aircraft Obstruction.*
2. Certified Equipment.
 - a. AC 150/5345-53, *Airport Lighting Certification Program*, lists the manufacturers that have demonstrated compliance with the specification requirements of AC 150/5345-43, *FAA Specification for Obstruction Lighting Equipment.*
 - b. Other manufacturers' equipment may be used provided the equipment meets the specification requirements of AC 150/5345-43, *FAA Specification for Obstruction Lighting Equipment.*
3. Airport Lighting Installation and Maintenance.

AC 150/5340-30, *Design and Installation Details for Airport Visual Aids.*

4. Vehicles and Structures.







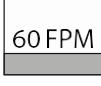
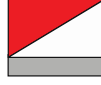

- a. AC 150/5210-5, *Painting, Marking, and Lighting of Vehicles Used on an Airport*, contains provisions for marking vehicles principally used on airports.
- b. FAA Standard FAA-STD-003, *Paint Systems for Structures*. Obstruction marking for FAA facilities must conform to FAA Drawing Number D-5480 (page 39 of 42).

15.5 Availability of Military Specifications.

The military standards and specifications listed above may be obtained from:

DAP/DODSSP
Building 4, Section D
700 Robbins Avenue
Philadelphia, PA 19111-5904
Telephone: (215) 737-8000
FAX: (215) 737-7155

URL: <https://quicksearch.dla.mil/> (ASSIST Database)

Type	Symbol	Description
L-810 L-810 F		Steady-Burning or Flashing (30 FPM) - RED Single Obstruction Light
L-810 L-810 F		Steady-Burning or Flashing (30 FPM) – RED Double Obstruction Light
L-856		High-Intensity Flashing – WHITE Obstruction Light (40 FPM)
L-857		High-Intensity Flashing – WHITE Catenary Light (60 FPM)
L-864		Medium-Intensity Flashing – RED Obstruction Light (20-40 FPM)(30 FPM when used with L-810 F)
L-865		Medium-Intensity Flashing – WHITE Obstruction Light (40-FPM)
L-866		Medium-Intensity Flashing - WHITE Catenary Light (60-FPM)
L-864/L-865		Medium-Intensity Flashing Dual – RED / WHITE Obstruction Light (20-40 FPM) Obstruction Light (40 FPM)
L-885		Flashing Obstruction Light - RED Obstruction Light (60 FPM)

FPM = Flashes Per Minute

Table A-1. FAA-Approved Obstruction Lighting Fixtures

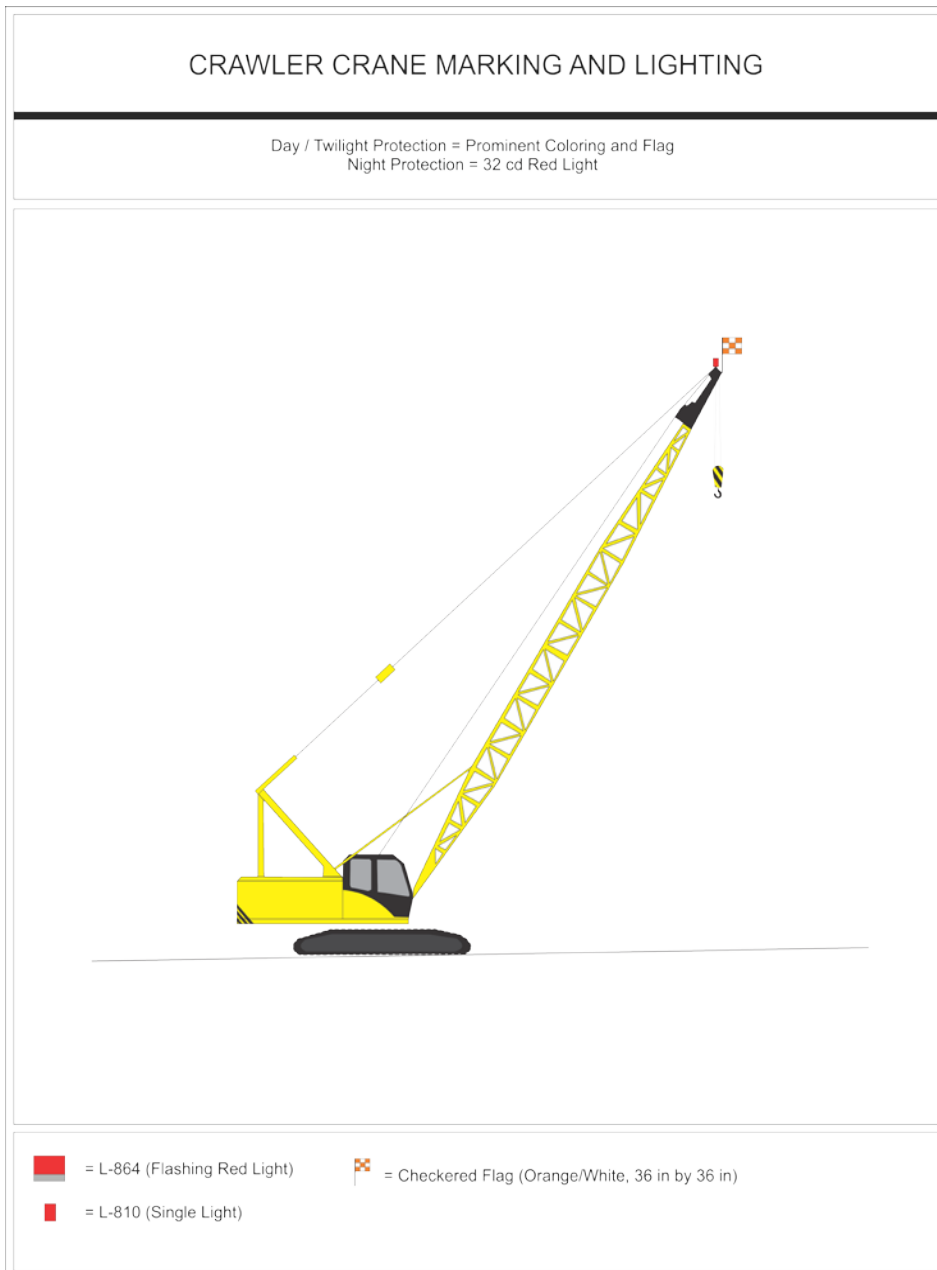


Figure A-31. Crawler Crane Marking and Lighting

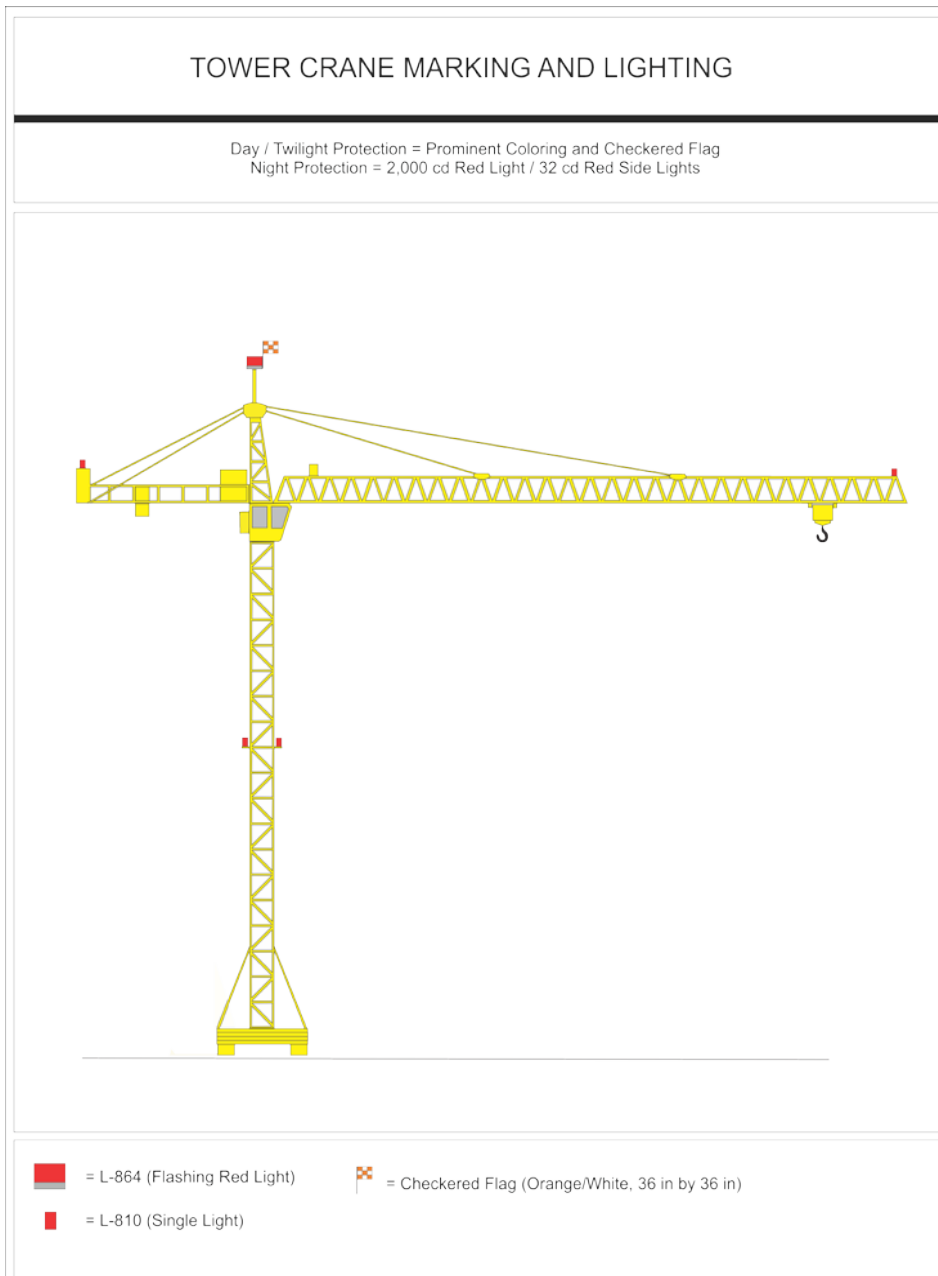


Figure A-32. Tower Crane Marking and Lighting

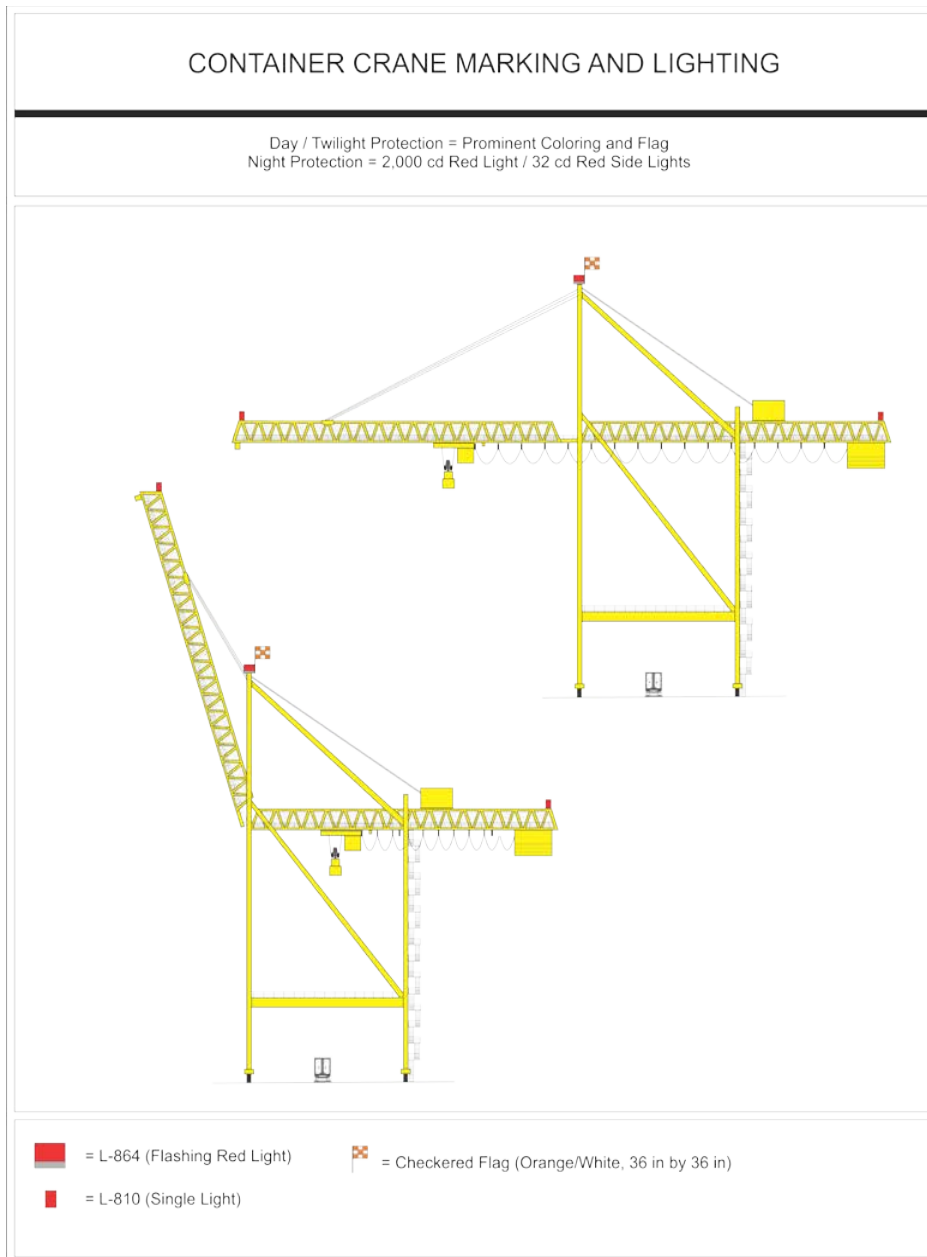


Figure A-33. Container Crane Marking and Lighting

APPENDIX B: MISCELLANEOUS

B-1. Rationale for Obstruction Light Intensities.

Sections 91.117, 91.119 and 91.155 of 14 CFR Part 91, *General Operating and Flight Rules*, prescribe aircraft speed restrictions, minimum safe altitudes, and basic visual flight rules (VFR) weather minimums for governing the operation of aircraft, including helicopters, within the United States.

B-2. Distance Versus Intensities.

Table B-1 indicates at what distance the various candela intensities are visible under one and three statute mile meteorological visibilities:

Table B-1. Distance and Intensity

Time Period	Meteorological Visibility Statute Miles	Distance Statute Miles	Intensity Candelas
Night		2.9 (4.67 km)	1,500 (±25%)
	3 (4.83 km)	3.1 (4.99 km)	2,000 (±25%)
		1.4 (2.25 km)	32
Day		1.5 (2.41 km)	200,000
	1 (1.61 km)	1.4 (2.25 km)	100,000
		1.0 (1.61 km)	20,000 (±25%)
Day		3.0 (4.83 km)	200,000
	3 (4.83 km)	2.7 (4.35 km)	100,000
		1.8 (2.90 km)	20,000 (±25%)
Twilight	1 (1.61 km)	1.0 (1.61 km) to 1.5 (2.41 km)	20,000 (±25%)
Twilight	3 (4.83 km)	1.8 (2.90 km) to 4.2 (6.76 km)	20,000 (±25%)

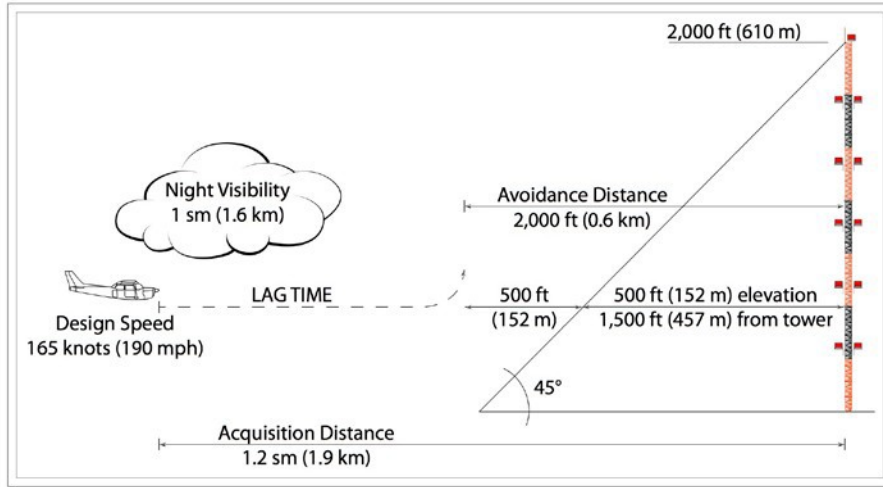
Note: Distance calculated for north sky illuminance

B-3. Conclusion.

Aircraft pilots travelling at 165 knots (189.88 miles per hour (mph)/305.58 kilometers per hour (kph)) or less should be able to see obstruction lights in sufficient time to avoid the structure by at least 2,000 feet (609.60 m) horizontally under all conditions of operation, provided the pilot is operating in accordance with 14 CFR Part 91. Pilots operating 250 knots (287.70 mph/463.00 kph) aircraft should be able to see the obstruction lights unless the weather deteriorates to 1 SM (1.61 km) visibility at night, during which time period 2,000 candelas enables the light to be seen at 1.2 SM (1.93 km). To provide an acquisition distance of 1.5 SM (2.41 km), a higher intensity of 20,000 candelas would be required. This light, with 3 SM visibility at night, could generate a residential annoyance factor. In addition, aircraft at these speeds can normally be expected to operate under instrument flight rules (IFR) at night when the visibility is 1 SM (1.61 km).

Figure B-1. Illustration of Acquisition Distance Calculation

B-4. Definitions.



Note: The 2,000-foot avoidance distance comes from the guy wires of a 2,000-foot structure. The guy wires at a 45-degree angle would be at a distance of 1,500 feet from the structure at a 500-foot elevation. Since the aircraft is to be 500 feet clear of obstacles (the guy wire), the distance of avoidance from the structure is 1,500 + 500 = 2,000 feet (see Figure B-1).

B-4.1 Flight Visibility.

The average forward horizontal distance, from the cockpit of an aircraft in flight, at which prominent unlighted objects may be seen and identified by day and prominent lighted objects may be seen and identified by night.

Reference: *Airman’s Information Manual Pilot/Controller Glossary.*

B-4.2 Meteorological Visibility.

A term that denotes the greatest distance, expressed in statute miles, that selected objects (visibility markers) or lights of moderate intensity (25 candelas) can be seen and identified under specified conditions of observation.

B-4.2 Lighting System Configuration.

1. Configuration A. Red Obstruction Lighting System.
2. Configuration B. High-Intensity White Obstruction Lights for structures with appurtenance 40 feet or less.
3. Configuration C. High-Intensity White Obstruction Lights for structures with appurtenance greater than 40 feet.
4. Configuration D. Medium-Intensity White Obstruction Lights.
5. Configuration E. Medium-Intensity Dual White and Red Obstruction Lights.
6. Configuration F. High-Intensity Dual Obstruction Lights for structures with appurtenance greater than 40 feet.
7. Configuration G. High-Intensity Dual Obstruction Lights for structures with appurtenance 40 feet or less.

Example: “Configuration B 3” denotes a high-intensity lighting system with three levels of light.

APPENDIX C: ACRONYMS

Abbreviation	Meaning
AC	Advisory Circular
ADLS	Aircraft Detection Lighting System
AGL	Above Ground Level
AMSL	Above Mean Sea Level
CFR	Code of Federal Regulations
CM	Centimeter
DSP	Defense Standardization Program
F	Flashing Lights
FAA	Federal Aviation Administration
FCC	Federal Communications Commission
FPM	Flashes Per Minute
IFR	Instrument Flight Rules
IR	IFR Military Training Route
KHZ	Kilohertz
KM	Kilometers
KPH	Kilometre Per Hour
KV	Kilovolts
LED	Light Emitting Diode
LUX	Lumen Per Square Meter
M	Meter
MET	Meteorological Evaluation Tower
MHZ	Megahertz
MPH	Miles Per Hour
NAS	National Airspace System
NAVAIDS	Navigational Aids
NM	Nautical Mile
NOTAM	Notice to Airmen
NVG	Night Vision Goggles
OEG	Obstruction Evaluation Group
SM	Statue Mile
URL	Uniform Resource Locator
UV	Ultra Violet
US	United States
VFR	Visual Flight Rules