

MAINE TURNPIKE AUTHORITY

NOTICE TO CONTRACTORS

Sealed Proposals will be received by the MTA for Contract 2015.06, Toll Plaza lane addition and Variable Message Sign Relocation, at 2360 Congress Street, Portland, ME 04102, until 11:00 a.m. on March 17, 2015. Bids will be accepted from Contractors pre-qualified by the Maine DOT for Highway and Bridge Construction Projects). All other bids may be rejected.

Please visit our website at <http://www.maineturnpike.com/project-and-planning/Construction-Contracts.aspx> for information regarding the Contract, Schedule of Items, and plan holders list.

Nate Carll
Purchasing Manager

CONTRACT DOCUMENTS

CONTRACT 2015.06

SACO TOLL PLAZA LANE ADDITION (INTERCHANGE 36 SACO TOLL PLAZA)
& VARIABLE MESSAGE SIGN (VMS) RELOCATION TO MAINLINE IN ARUNDEL
(MM 28.3)

MAINE TURNPIKE AUTHORITY

SPECIFICATIONS

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

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

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& VARIABLE MESSAGE SIGN (VMS) RELOCATION TO MAINLINE IN ARUNDEL
(MM 28.3)

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 March 17, 2015 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 and Bridge 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 the addition of a dedicated lane to the right side of the existing on ramp toll plaza beginning 600 feet west of the Saco Exit 36 Toll Plaza on I-195 and extending easterly 1160 feet to approximately 400 feet east of the Saco Exit 36 Toll Plaza. The widening will include widening existing road embankment with geofoam and granular material, replacement/relocation of existing guardrail, constructing a separating island, provisions for toll equipment including an overhead gantry and maintenance or traffic. In addition the project includes relocating an existing overhead Variable Message Sign (VMS) and its structure, controls and controller cabinet at Interchange 36 in the Saco side plaza to a location on the southbound mainline near Limerick Road in Arundel (MM 28.3); constructing two new VMS drilled shaft foundations; constructing a new controller cabinet foundation, adding new guardrail; widening the embankment and extending a drainage pipe for the new guardrail; modifying the median guardrail; providing electrical service; and all other work incidental thereto in accordance with the Plans and Specifications.

The general limits of work are at Mile 28.3 (Station 1360+00) in Arundel and at Mile 36.0 (Exit 36 Interchange at Saco Toll Plaza on 195) in Saco.

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 full size Plans** and Contract Documents may be obtained from the Authority upon payment of One Hundred and Fifteen (\$115.00) Dollars for each set, which payment will not be returned. **The half size plans** and Contract documents may be obtained from the Authority upon payment of Eighty Five (\$85.00) 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 <http://www.maineturnpike.com/project-and-planning/Construction-Contracts.aspx>.

For general information regarding Bidding and Contracting procedures, contact Nate Carll, Purchasing Manager, at (207) 871-7771 Ext. 115. For information regarding Schedule of Items, plan holders list and bid results, visit our website at <http://www.maineturnpike.com/project-and-planning/Construction-Contracts.aspx> . For Project specific information, fax all questions to Nate Carll, Purchasing Manager, at (207) 871-7739, 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 December 2002", "Standard Details, Revision of December 2002" 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 March 9, 2015 at 9:00 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

CONTRACT DOCUMENTS

CONTRACT 2015.06

SACO TOLL PLAZA LANE ADDITION (INTERCHANGE 36 SACO TOLL PLAZA)
& VARIABLE MESSAGE SIGN (VMS) RELOCATION TO MAINLINE IN ARUNDEL
(MM 28.3)

MAINE TURNPIKE AUTHORITY

PROPOSAL

CONTRACT 2015.06

SACO TOLL PLAZA LANE ADDITION (INTERCHANGE 36 SACO TOLL PLAZA)
& VARIABLE MESSAGE SIGN (VMS) RELOCATION TO MAINLINE IN ARUNDEL
(MM 28.3)

TO MAINE TURNPIKE AUTHORITY:

The work consists of the addition of a dedicated lane to the right side of the existing on ramp toll plaza beginning 600 feet west of the Saco Exit 36 Toll Plaza on I-195 and extending easterly 1160 feet to approximately 400 feet east of the Saco Exit 36 Toll Plaza. The widening will include widening existing road embankment with geofam and granular material, replacement/relocation of existing guardrail, constructing a separating island, provisions for toll equipment including an overhead gantry and maintenance or traffic. In addition the project includes relocating an existing overhead Variable Message Sign (VMS) and its structure, controls and controller cabinet at Interchange 36 in the Saco side plaza to a location on the southbound mainline near Limerick Road in Arundel (MM 28.3); constructing two new VMS drilled shaft foundations; constructing a new controller cabinet foundation, adding new guardrail; widening the embankment and extending a drainage pipe for the new guardrail; modifying the median guardrail; providing electrical service; and all other work incidental thereto in accordance with the Plans and Specifications.

The general limits of work are at Mile 28.3 (Station 1360+00) in Arundel and at Mile 36.0 (Exit 36 Interchange at Saco Toll Plaza on 195) in Saco.

This Work will be done under a Contract known as Contract 2015.06 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. 2015.06
Interchange 36
Saco Toll Plaza Lane Addition (MM 36.0) &
Variable Message Sign Relocation (MM 28.3)

Item No	Item Description	Units	Approx. Quantities	Unit Prices in Numbers		Bid Amount in Numbers	
				Dollars	Cents	Dollars	Cents
202.1271	REMOVING EXISTING BITUMINOUS PAVEMENT	Cubic Yard	200				
202.203	PAVEMENT BUTT JOINTS	Square Yard	350				
203.2	COMMON EXCAVATION	Cubic Yard	4,905				
203.24	COMMON BORROW	Cubic Yard	90				
203.25	GRANULAR BORROW	Cubic Yard	15				
203.43	GEOFOAM LIGHTWEIGHT FILL	Cubic Yard	2,550				
203.45	LEVELING SAND	Cubic Yard	500				
206.082	STRUCTURAL EARTH EXCAVATION - MAJOR STRUCTURES	Cubic Yard	30				
304.09	AGGREGATE BASE COURSE - CRUSHED	Cubic Yard	450				
304.1	AGGREGATE SUBBASE COURSE - GRAVEL	Cubic Yard	1,800				
403.207	HOT MIX ASPHALT, 19.0 mm NOMINAL MAXIMUM SIZE	Ton	450				

CARRIED FORWARD:

Item No	Item Description	Units	Approx. Quantities	Unit Prices in Numbers		Bid Amount in Numbers	
				Dollars	Cents	Dollars	Cents
BROUGHT FORWARD:							
403.208	HOT MIX ASPHALT, 12.5 mm NOMINAL MAXIMUM SIZE, SURFACE	Ton	300				
403.209	HOT MIX ASPHALT, 9.5 mm NOMINAL MAXIMUM SIZE (ISLAND & INCIDENTALS)	Ton	70				
403.21	HOT MIX ASPHALT, 9.5 mm	Ton	100				
403.213	HOT MIX ASPHALT, 12.5 mm NOMINAL MAXIMUM SIZE, BASE	Ton	400				
409.15	BITUMINOUS TACK COAT, APPLIED	Gallon	200				
419.3	SAWING BITUMINOUS PAVEMENT	Linear Foot	1,300				
502.111	STRUCTURAL CONCRETE FOOTING	Cubic Yard	10				
502.266	STRUCTURAL CONCRETE PLAZA SLAB ON GRADE	Cubic Yard	25				
502.56	CONCRETE FILL	Cubic Yard	10				
503.14	EPOXY - COATED REINFORCING STEEL, FABRICATED AND DELIVERED	Pound	1,350				
503.15	EPOXY - COATED REINFORCING STEEL, PLACING	Pound	1,350				
503.18	GLASS FIBER REINFORCED POLYMER (GFRP) REINFORCING BARS, FABRICATED AND DELIVERED	Pound	1,810				

CARRIED FORWARD:

Item No	Item Description	Units	Approx. Quantities	Unit Prices in Numbers		Bid Amount in Numbers	
				Dollars	Cents	Dollars	Cents
BROUGHT FORWARD:							
503.19	GLASS FIBER REINFORCED POLYMER (GFRP) REINFORCING BARS, PLACING	Pound	1,810				
503.9	SYNTHETIC FIBER REINFORCEMENT	Pound	175				
506.3	SHOP COATING OF STRUCTURAL STEEL	Lump Sum	1				
515.202	CLEAR PROTECTIVE COATING FOR CONCRETE SURFACES	Square Yard	210				
515.23	EPOXY OVERLAY	Square Yard	12				
518.51	REPAIR OF UPWARD FACING SURFACES - BELOW REINFORCING STEEL, <200 mm	Square Foot	22				
526.306	TEMPORARY CONCRETE BARRIER, TYPE I - SUPPLIED BY AUTHORITY (1,810 LF)	Lump Sum	1				
526.311	PERMANENT CONCRETE BARRIER TYPE I	Linear Foot	70				
526.342	PERMANENT CONCRETE BARRIER TYPE I TRANSITION	Each	2				
527.342	WORK ZONE CRASH CUSHIONS TL-2	Each	1				
602.3	FLOWABLE CONCRETE FILL	Cubic Yard	15				
603.152	16 INCH HDPE PIPE	Linear Foot	38				

CARRIED FORWARD:

Item No	Item Description	Units	Approx. Quantities	Unit Prices in Numbers		Bid Amount in Numbers	
				Dollars	Cents	Dollars	Cents
BROUGHT FORWARD:							
603.175	18 INCH REINFORCED CONCRETE PIPE - CLASS III	Linear Foot	23				
604.248	CATCH BASIN TYPE F6	Each	1				
606.1724	BRIDGE TRANSITION - TYPE III (MODIFIED)	Each	2				
606.24	GUARDRAIL TYPE 3D - SINGLE RAIL	Linear Foot	1,850				
606.2401	GUARDRAIL TYPE 3D - DOUBLE RAIL	Linear Foot	1,225				
606.2652	TERMINAL END - REMOVE AND STACK	Each	3				
606.278	TERMINAL END - ANCHORED END	Each	2				
606.279	TERMINAL END - ANCHORED END, THRIE BEAM	Each	1				
606.352	REFLECTORIZED BEAM GUARDRAIL DELINEATOR	Each	18				
606.353	DELINEATOR POST	Each	9				
606.354	DELINEATOR POST - REMOVE AND RESET	Each	6				
606.3605	GUARDRAIL - REMOVE, MODIFY AND RESET, SINGLE RAIL	Linear Foot	112.5				

CARRIED FORWARD:

Item No	Item Description	Units	Approx. Quantities	Unit Prices in Numbers		Bid Amount in Numbers	
				Dollars	Cents	Dollars	Cents
BROUGHT FORWARD:							
606.3631	GUARDRAIL - REMOVE AND DISPOSE	Linear Foot	1,612.5				
606.48	SINGLE GALVANIZED STEEL POST	Each	16				
606.65	GUARDRAIL THRIE BEAM - SINGLE RAIL	Linear Foot	150				
606.701	ASYMMETRICAL THRIE BEAM TRANSITION	Each	3				
606.8	GUARDRAIL 350 FLEAT TERMINAL	Each	1				
609.11	VERTICAL CURB TYPE 1	Linear Foot	430				
609.12	VERTICAL CURB TYPE 1 - CIRCULAR	Linear Foot	20				
609.234	TERMINAL CURB TYPE 1 - 4 FT	Each	2				
609.441	CURBING REMOVE AND STACK	Linear Foot	100				
610.08	PLAIN RIPRAP	Cubic Yard	10				
610.18	STONE DITCH PROTECTION	Cubic Yard	10				
613.319	EROSION CONTROL BLANKET	Square Yard	4,350				

CARRIED FORWARD:

Item No	Item Description	Units	Approx. Quantities	Unit Prices in Numbers		Bid Amount in Numbers	
				Dollars	Cents	Dollars	Cents
BROUGHT FORWARD:							
615.07	LOAM	Cubic Yard	510				
618.1401	SEEDING METHOD NUMBER 2, PLAN QUANTITY	Unit	10				
618.1411	SEEDING METHOD NUMBER 3, PLAN QUANTITY	Unit	34				
619.1201	MULCH, PLAN QUANTITY	Unit	44				
619.1202	TEMPORARY MULCH	Unit	34				
620.58	EROSION CONTROL GEOTEXTILE	Square Yard	40				
620.625	CELLULAR CONFINEMENT SYSTEM	Square Yard	300				
620.7	HDPE GEOMEMBRANE	Square Yard	2,900				
626.11	PRECAST CONCRETE JUNCTION BOX	Each	1				
626.31	18 in FOUNDATION	Each	8				
626.32	24 in FOUNDATION	Each	1				
626.331	30-INCH DIA., GREATER THAN 8- FEET LONG, AND ALL 36-INCH AND 42-INCH DIA. FOUNDATIONS	Cubic Yard	13				

CARRIED FORWARD:

Item No	Item Description	Units	Approx. Quantities	Unit Prices in Numbers		Bid Amount in Numbers	
				Dollars	Cents	Dollars	Cents
BROUGHT FORWARD:							
626.36	REMOVE OR MODIFY CONCRETE FOUNDATION	Each	8				
626.38	GROUND MOUNTED CABINET FOUNDATION	Each	1				
627.73	TEMPORARY 6 INCH PAVEMENT MARKING TAPE	Linear Foot	4,900				
627.731	TEMPORARY 6 INCH BLACK PAVEMENT MARKING TAPE	Linear Foot	2,900				
629.05	HAND LABOR, STRAIGHT TIME	Hour	28				
631.1	AIR COMPRESSOR (INCLUDING OPERATOR)	Hour	8				
631.12	ALL PURPOSE EXCAVATOR (INCLUDING OPERATOR)	Hour	20				
631.13	BULLDOZER (INCLUDING OPERATOR)	Hour	20				
631.172	TRUCK - LARGE (INCLUDING OPERATOR)	Hour	40				
631.22	FRONT END LOADER (INCLUDING OPERATOR)	Hour	20				
631.32	CULVERT CLEANER (INCLUDING OPERATOR)	Hour	20				
631.36	FOREMAN	Hour	8				

CARRIED FORWARD:

Item No	Item Description	Units	Approx. Quantities	Unit Prices in Numbers		Bid Amount in Numbers	
				Dollars	Cents	Dollars	Cents
BROUGHT FORWARD:							
631.5	JACKHAMMER (AIR TOOL INCLUDING OPERATOR)	Hour	8				
631.51	BUCKET TRUCK	Hour	8				
631.52	SCISSOR LIFT	Hour	8				
631.53	ELECTRICIAN	Hour	8				
631.54	ELECTRICIAN'S APPRENTICE	Hour	8				
634.25	SERVICE POLE COMPLETE WITH CABINET AND CONTROLS	Each	1				
643.712	LANE USE SIGNAL	Each	1				
645.105	REMOVE AND STACK SIGN	Each	6				
645.109	REMOVE AND RESET SIGN	Each	18				
645.123	REMOVAL, DISASSEMBLY AND RELOCATION OFVMS AND SUPPORTING STRUCTURE	Lump Sum	1				
645.161	BREAKAWAY DEVICE SINGLE POLE	Each	1				
645.289	STEEL H-BEAM POLES	Pound	1,150				

CARRIED FORWARD:

Item No	Item Description	Units	Approx. Quantities	Unit Prices in Numbers		Bid Amount in Numbers	
				Dollars	Cents	Dollars	Cents
BROUGHT FORWARD:							
645.303	REMOVE AND RESET DELINEATOR	Each	6				
645.403	INSTALLATION OF TYPE 1 SIGNS	Each	13				
652.3	FLASHING ARROW	Each	3				
652.312	TYPE III BARRICADES	Each	3				
652.33	DRUM	Each	150				
652.35	CONSTRUCTION SIGNS	Square Foot	1,529.5				
652.361	MAINTENANCE OF TRAFFIC CONTROL DEVICES	Lump Sum	1				
652.41	PORTABLE - CHANGEABLE MESSAGE SIGN	Each	2				
652.45	TRUCK MOUNTED ATTENUATOR	Cal. Day	10	125	00	1,250	00
655.012	INSTALLATION OF CASH LANE CONTROLLER CABINET	Each	1				
655.02	DVAS MOUNT INSTALLATION	Each	1				
655.04	INSTALLATION OF SENSOR LOOPS	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:							
655.05	INSTALLATION OF AVI ANTENNAS	Each	1				
655.07	TRAFFIC CONTROL PEDESTAL PREPARATION WORK	Each	1				
655.11	#10 AWG WIRE	Linear Foot	450				
655.12	#12 AWG WIRE	Linear Foot	600				
655.13	#14 AWG WIRE	Linear Foot	50				
655.14	4pr/24 (CATEGORY 5e) CABLE	Linear Foot	1,700				
655.16	FIBER OPTIC CABLE - 6 FIBER	Linear Foot	600				
655.17	IVIS HOMERUN LOOP CABLE (IMSA 50-2 #16)	Linear Foot	400				
655.203	1 1/2" SCHEDULE 80 PVC CONDUIT	Linear Foot	50				
655.2031	2" SCHEDULE 80 PVC CONDUIT	Linear Foot	175				
655.204	3" SCHEDULE 80 PVC CONDUIT	Linear Foot	10				
655.2071	2" GALVANIZED RIGID METAL CONDUIT	Linear Foot	190				

CARRIED FORWARD:

Item No	Item Description	Units	Approx. Quantities	Unit Prices in Numbers		Bid Amount in Numbers	
				Dollars	Cents	Dollars	Cents
BROUGHT FORWARD:							
655.2102	2" LIQUID TIGHT METALLIC FLEX CONDUIT	Linear Foot	20				
655.223	TYPE D PULL BOX OUTDOOR CANOPY	Each	4				
655.81	KEY SWITCH	Each	2				
656.5	BALED HAY, IN PLACE	Each	60				
656.6	TEMPORARY BERMS	Linear Foot	600				
656.62	TEMPORARY SLOPE DRAINS	Linear Foot	30				
656.632	30 INCH TEMPORARY SILT FENCE	Linear Foot	1,750				
659.1	MOBILIZATION	Lump Sum	1				
669.01	BOLLARD	Each	4				
800.501	TOLL GANTRY INSTALLATION	Lump Sum	1				
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)

PARTNERSHIP - Name and Address of General Partners:

_____	_____
(Name)	(Address)

_____	_____
(Name)	(Address)

_____	_____
(Name)	(Address)

_____	_____
(Name)	(Address)

INCORPORATED COMPANY:

_____	_____
(President)	(Address)

_____	_____
(Vice-President)	(Address)

_____	_____
(Secretary)	(Address)

_____	_____
(Treasurer)	(Address)

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., 201____

Witnesses:

CONTRACTOR

_____	_____ (SEAL)
_____	_____ (SEAL)
_____	_____ (SEAL)

SURETY

_____	_____ (SEAL)
_____	_____ (SEAL)
_____	_____ (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 – GENERAL PROVISIONS

(Rev. May 18, 2009)

DIVISION 100 - GENERAL PROVISIONS

100.1 Replacement of Former Standard Specifications and Details

The following paragraphs are added:

The Maine Department of Transportation Standard Specifications Revisions of 2002 as modified herein is referenced and incorporated in all Maine Turnpike Authority Construction Contracts. These Maine Turnpike General Provisions replace all previous Maine Turnpike General Provisions and are additions and alterations to the Maine Department of Transportation Standard Specifications. Maine Department of Transportation Consolidated Special Provisions or corrections, additions, and revisions to their Standard Specifications are not referenced or incorporated unless specifically included in the Contract. Applicable MaineDOT December 28, 2004 Consolidated Special Provisions, corrections, additions, and revisions have been incorporated into this document.

All references to components or employees of the Maine Department of Transportation listed in Column A shall also refer to components or employees of the Maine Turnpike Authority in Column B unless otherwise stated.

<u>A</u>	<u>B</u>
Maine Department of Transportation Department Commissioner Contracts Engineer Contracts Section Chief Engineer Bureau of Project Development	Maine Turnpike Authority Authority Executive Director Purchasing Manager Purchasing Department Director of Engineering Maine Turnpike Authority

SECTION 101 – CONTRACT INTERPRETATION

101.2 Definitions

The following definitions are added or revised:

Authority - The Maine Turnpike Authority, a body corporate and politic duly created and existing under and by virtue of an act of the Legislature of the State of Maine, Chapter 69 of the Private and Special Laws of 1941, as amended.

Award - The resolution of the Authority at an official meeting expressly authorizing the Executive Director or his designee to notify the successful Bidder that his/her Proposal has been accepted and that he/she is required to execute the Contract Agreement and to furnish satisfactory Bonds.

Environmental Information - Hazardous waste assessments, dredge material test results, boring logs, geophysical studies, and other records and reports of the environmental conditions. For a related provision, see Subsection 104.3.14, Interpretation and Interpolation.

Fabrication Engineer - The Department's representative responsible for Quality Assurance of pre-fabricated products that are produced off-site.

Geotechnical Information - Replace with the following: "Boring logs, soil reports, geotechnical design reports, ground penetrating radar evaluations, seismic refraction studies, and other records of subsurface conditions. For a related provision, see Subsection 104.3.14, Interpretation and Interpolation.

Holidays - The following are extended to include the Holiday Period:

<u>HOLIDAY</u>	<u>HOLIDAY PERIOD</u>
Martin Luther King Day	12:01 a.m. (Midnight) to 11:59 p.m. Martin Luther King Day.
President's Day	12:01 a.m. (Midnight) preceding Friday to 12:01 p.m. following Tuesday.
Easter	12:01 a.m. (Midnight) preceding Friday to 12:01 p.m. following Monday.
Memorial Day	12:01 p.m. preceding Thursday to 6:00 a.m. following Tuesday.
Labor Day	12:01 p.m. preceding Thursday to 6:00 a.m. following Tuesday.
Columbus Day	12:01 a.m. (Midnight) preceding Friday to 12:01 p.m. following Tuesday.
Veterans' Day	12:01 a.m. (Midnight) to 11:59 p.m. Veterans' Day.
Thanksgiving Day	12:01 a.m. (Midnight) preceding Wednesday to 12:01 p.m. following Monday.

Project - The following sentence is added:

All the Work to be performed under the Contract.

Solicitation - Contract proposal sent to a select list of Contractors. Solicitations do include a requirement for a bid bond. Solicitations do not need Maine Turnpike Board Approval for an award.

Turnpike - The entire toll highway, including all approaches, bridges, interchanges, toll facilities, and structures owned by the Maine Turnpike Authority, and authorized by Chapter 69, Private and Special Laws of Maine, 1941, as amended, and located on properties held in the name of the Authority.

Working Day - The Contractor shall not work during the period from 1/2-hour after sunset to 1/2-hour before sunrise, unless otherwise approved by the Resident.

If, after approval, Work is performed on a Saturday, Sunday, or a holiday, the day shall be considered a Working Day.

SECTION 102 - BIDDING

102.1.1 Basic Requirements

This Subsection is amended by the addition of the following:

To be eligible to Bid, prospective Bidders must not have been debarred or suspended from Bidding by the Authority or the Maine Department of Transportation.

102.6 Bid Guaranty

The second paragraph is deleted and replaced with the following:

No Proposal will be considered unless accompanied by a "Proposal Guaranty" in the form of an original bid bond, certified or cashier's check in favor of the Maine Turnpike Authority, in the amount of not less than five (5%) percent of the Total Amount of the Proposal, except that the amount of the check or Proposal Guaranty shall not be less than \$500.00. Solicitations do not require a Bid Guaranty.

Sentence (C) of the third paragraph is deleted and not replaced.

102.7.1 Location and Time

The first paragraph is deleted and replaced with the following:

The Proposal and the Proposal Guaranty shall be enclosed in a sealed envelope furnished by the Authority for this purpose, and shall bear on the outside, the name and address of the Bidder as well as the designation of the Project as named in the Proposal form. Proposals will be received at the place and time stated in the Notice to Contractors, Solicitation, or Addendum as determined by the Authority. Proposals received after the time for opening of bids will be returned to the Bidder unopened. See also Subsection 102.11, Bid Responsiveness.

102.7.2 Effects of Signing and Delivery of Bids

Paragraph C, Certifications, is deleted and not replaced.

SECTION 103 - AWARD AND CONTRACTING

103.3.1 Notice and Information Gathering

This Subsection is deleted and replaced with the following:

The Authority will review the Bid Proposals. As a condition for Award of a Contract, the Authority may require an Apparent Successful Bidder to demonstrate to the Authority's satisfaction that the Bidder is responsible and qualified to perform the Work. If such information is required, the Authority, or the Authority's agent, will contact the Apparent Successful Bidder and request specific information. If requested by the Apparent Successful Bidder, this request can be in writing. The Apparent Successful Bidder shall respond to the request within 24-hours (one work day) unless both parties agree in writing to extend the deadline.

103.3.2 Notice of Determination

The first paragraph is deleted and replaced with the following:

If the Authority determines that a Bidder is "Not Qualified", the Authority or its representative will notify the Bidder in writing of its determination. The notice will set forth the specific reasons therefore to the extent practical. Such reasons may include the following:

- N. Bidder has previously performed Work for the State or for the Authority in an unsatisfactory manner;
- O. Bidder does not have the capacity to perform the required Work in the opinion of the Authority;
- P. This Project combined with other projects committed to by the Bidder puts him in excess of his capacity in the opinion of the Authority;

- Q. Reasonable grounds for believing that the Bidder is interested in more than one Proposal for the Work contemplated;
- R. Developments arise which, in the opinion of the Authority, adversely affect the Bidder's responsibility; and/or,
- S. Lack of qualifications as determined by the Authority.

The Maine Turnpike Authority Board or Executive Director must approve the Award of a Contract. Once approved, the Contractor will be provided with a "Notice of Award". See Subsection 103.4.

103.3.3 Appeal

"Commissioner" is replaced with "Chief Operations Officer".

The third and fourth paragraphs are deleted and replaced with the following:

Within 14 Days of Receipt of such information and arguments, the Chief Operations Officer will notify the Bidder in writing as to whether the decision of "Not Qualified" is upheld, modified, or reversed. The Chief Operations Officer's decision is final.

After a final determination of "Not Qualified" the Bidder's Bid Guaranty will be returned and the Bidder will be ineligible to bid on future MTA Contracts until the Bidder has been determined "Qualified" by the Maine Turnpike.

103.4 Notice of Award

This Subsection is deleted and replaced with the following:

Within five (5) days of the Maine Turnpike Authority Board or Executive Director approval of a Contract Award, the Authority will transmit to the successful Bidder a Notice of Award along with the Contract Documents for execution by the Contractor. The Authority has the option of notifying the successful low Bidder that the above noted material is available at the Authority for the Contractor to pick-up. The Contractor has 20 days following the Bid Opening to deliver to the Authority the signed Contract Documents, required bonds, insurance certificates, and other required information from the successful Bidder. Once these Documents are submitted to the Authority, the Authority will execute the Contract. If the Authority does not execute the Contract within 30 days of receipt of all the proper requested information, the successful Bidder may withdraw their bid without forfeiture of its Bid Guaranty or bidding eligibility. If the Authority and the successful Bidder agree in writing, an extension may be allowed.

103.5.4 Execution of Contract by Bidder

The first sentence is deleted and replaced with the following:

The properly completed and signed Contract Agreement form provided in the Contract Documents constitutes the Bidder's offer.

103.8 Execution of Contract by Department

This Subsection is deleted and replaced with the following:

The Contract will be awarded or Proposals rejected within twenty (20) days from the date of Proposal openings, except that by mutual written agreement between the Bidders and the Authority, the award may be withheld for any length of time. Any Bidder not agreeing to extend the award date shall be eliminated from the Bid List without prejudice, and their Bid Bond released.

The Contract shall not be binding until the Contract has been executed by the Authority, nor shall any Work be performed on account of the proposed Contract until the Contract has been fully executed and delivered.

SECTION 104 - GENERAL RIGHTS AND RESPONSIBILITIES

104.2.1 Furnishing of Right-of-Way

The first sentence is deleted and replaced with the following:

The Maine Turnpike Authority will secure all necessary rights to real property within the Project Limits shown on the Plans.

104.2.3 Authority of Project Manager and Resident

The following sentences are added:

The Resident is not responsible for supervising the construction Work and is not responsible for monitoring jobsite safety.

The Resident is not authorized to increase the obligation of the Authority to the Contractor, except as specifically set forth in the Specifications.

104.3.5 Duties Regarding Inspection of Work

The following paragraphs are added at the end of Paragraph A. Safe Access:

The Contractor shall furnish the Resident with every reasonable facility for ascertaining whether or not the Work is performed and the materials are furnished in accordance with the requirements and intent of the Contract. Such inspection may include mill, plant or shop inspection. If at any time before acceptance of the Work, the Resident requests it in writing, the Contractor shall remove or uncover such portion of the finished Work as directed. After examination, the Contractor shall restore said portions of the Work to the standards required by the Specifications. Should the Work exposed or examined meet the requirements of the Plans and Specifications, the uncovering or removing and the restoration of the uncovered Work shall be paid for as Extra Work except that no such payment will be made in those cases for which such removal is required by the Plans and Specifications as a part of the Work under the Project. Should the Work not meet the requirements of the Plans and Specifications, the uncovering or removing and restoration shall be at the Contractor's own expense. Any Work done or materials used without suitable supervision or inspection may be ordered to be removed and replaced by the Contractor without extra compensation.

No Work shall be done at night, on weekends, or legal holidays, without prior notice and approval of the Resident. No night Work shall be done until the Contractor has provided an adequate and sufficient source of artificial light to permit examination by the Resident of the suitability of the materials being used and the quality and character of the workmanship.

104.3.7 Laws to be Observed

This Subsection is amended by the addition of the following:

Any section of roadway open to the traveling public is a public way and subject to the applicable rules, regulations, and laws.

104.3.8 Wage Rates and Labor Laws

This Subsection is amended as follows:

- A. Federal Wage Rates and Labor Laws is deleted and not replaced.
- B. State Wage Rates and Labor Laws.

This Subsection is amended by the addition of the following:

This Contract is governed by the Prevailing Wage Provisions in Title 26, Chapter 15 of the Maine Revised Statutes Annotated. State Wage Rates, if applicable to the Contract, will be included in the Special Provisions.

Fair Minimum Wages

The hourly wage rate paid to laborers of the General Contractor and all Subcontractors shall not be less than the prevailing hourly rate of wages for Work of similar character in the State of Maine. The fair minimum hourly rates determined by the State of Maine Department of Labor for this Contract are included as part of this Contract.

A copy of the Wage Determination(s) shall be provided by the Contractor to all Subcontractors on the Project. In addition, the Wage Determination(s) must be kept posted at the Work site by the Contractor and by all Subcontractors at a prominent location, easily accessible by the workers. On a Project where there is no such location, a Contractor may comply with this requirement by providing each worker with a copy of the Wage Determination(s) within the first full day that the worker works on that Project. The Contractor must be able to document that each worker has received a copy of the Wage Determination(s).

Records

The Contractor and all Subcontractors shall keep an accurate record noting:

- The name and occupation of each and all laborers, workmen, and mechanics employed by them, and all independent Contractors working under Contract to them in connection to the Project;
- Number of hours worked;
- Title of the job;
- Hourly rate or other method of remuneration for the job; and,
- Actual wages or other compensation paid to each of the laborers, workmen, mechanics, and independent Contractors.

A copy of this record must be kept at the jobsite and shall be available at all reasonable hours to the inspection of the Bureau of Labor and/or the Maine Turnpike Authority, its officers and agents. These records must be preserved for a minimum of three (3) years after the completion of the Contract.

A copy of each record must be filed monthly with the Maine Turnpike Authority. This information shall be sent directly to the Maine Turnpike Authority, Director of Engineering and Building Maintenance, Attention: Wage Rate Records, 2360 Congress Street, Portland, ME 04102. The records shall note the Maine Turnpike Contract Number.

The Contractor and all Subcontractors are subject to penalties described in Title 26, Chapter 15 of the Maine Revised Statutes Annotated, for any violations of the Fair Minimum Wage Rates Policy for the State of Maine.

104.3.11 Responsibility for Property of Others

This Subsection is amended by the addition of the following:

The Contractor shall respond to all damage claims in writing, within 30 days, to the party making a damage claim. The response shall state that the Contractor accepts responsibility for the damage or outlines the reasons why the claim has been denied. If the Contractor has turned the claim over to their insurance agent or carrier, the name of the agent or carrier, along with the contact person, address and telephone information shall be included in the response to the claimant and a copy to the Authority. A standard form letter denying the claim without an explanation of the situation shall be unacceptable. A copy of the response letter shall be submitted to the Authority within the 30 day response time. The Authority shall review the response letter and will determine if the Contractor has replied in a responsive manner. If the Authority does not receive a response letter or action report from the Contractor within the 30 day response time, the Authority will determine if the Contractor is responsible for the claimed damage. If, in the absence of the Contractor's response or action report, the Authority deems the claim to be valid, the Authority will at its option pay the damage claim and deduct the amount of the claim from the Contractor. The Contractor will not be entitled to recoup these funds if their response was not transmitted within the 30 day response time. The Authority will not intervene in any claim actions where the Contractor's insurance carrier is conducting a valid, ongoing claim investigation.

104.3.14 Interpretation and Interpolation

The first sentence is change from "...and Geotechnical Information." to "...Environmental Information, and Geotechnical Information".

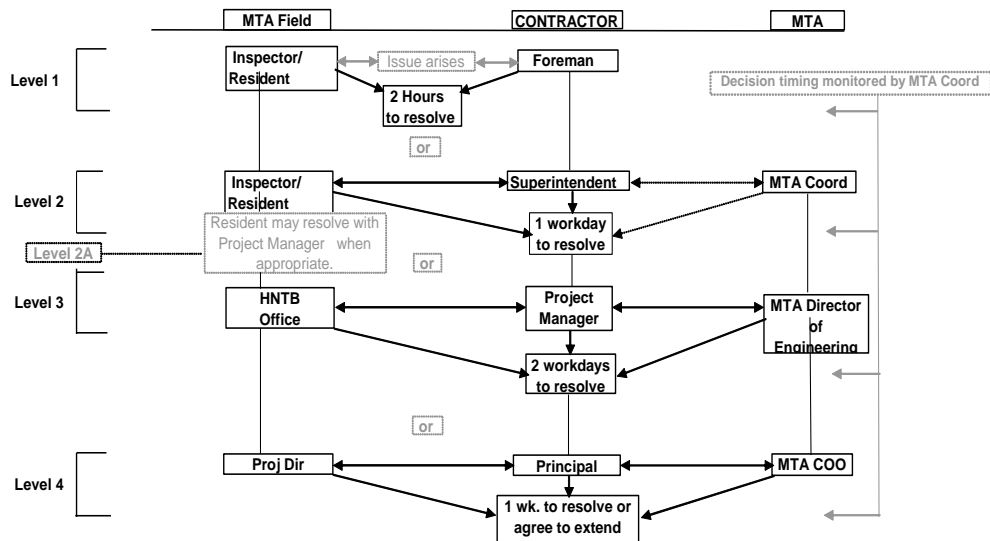
104.4.2 Preconstruction Conference

The following Matrix is added:

Project Decision Matrix

A Project "communication decision tree" will be developed mutually by the Authority and the Contractor during either the preconstruction meeting or partnering session. This Decision Matrix will clearly define, by descriptive job title and name, the respective counterparts for the Authority, and the Contractor who will be responsible for resolving issues at their respective levels of communication. Each level of communicators will be assigned a dollar magnitude of authority and a designated period of time within which all disputed issues must either be resolved or referred to the next higher level of communicators. The purpose of this Decision Matrix is to accelerate the resolution of decisions, to promote resolution at the lowest possible level, and to reduce the number of issues that become disputes.

The following is a sample of the Decision Matrix:



Level 5 If an issue is not resolved at Level 4, the matter becomes a Dispute. Refer to Section 111

Notes:

- 1) Each project will enter names in all title boxes at Preconstruction or Partnering sessions.
- 2) Substitute names will be provided for all key decision levels.
- 3) Each decision level will be empowered with a maximum dollar guidance value.
- 4) Issues will automatically bounce up to next level if decision time limits are surpassed.

104.4.5 Early Negotiation

The second paragraph in Part A is deleted and replaced with the following:

Such notice may not be verbal. Notice shall be in the form of a written memo with signatures representing both the Owner and Contractor or shall be in the form of meeting minutes within 14 days of the date that the issue became known. Meeting minutes shall not be valid documentation until they are accepted by the Resident and the Contractor.

Paragraph C, Additional Consideration, is deleted and not replaced. See related Subsection 104.4.2.

104.4.7 Cooperation With Other Contractors

This Subsection is amended by the addition of the following:

The Contractor shall cooperate with the Maine Turnpike Authority. The Authority reserves the right to conduct maintenance operations and to erect and remove traffic control devices as deemed necessary by the Authority or the Resident within or adjacent to the Project.

The Contractor shall note that other contracts may be awarded for Work adjacent to this Contract and these shall be considered adjacent contracts. The Contractor shall cooperate with other Contractors and the Resident so that all Work can be completed in a safe and timely manner. The Resident may direct the Contractor to revise the Work or schedule based on Work that is ongoing in the adjacent Contract. The Contractor's Superintendent or Project Manager shall attend coordination meetings with the Resident and the adjacent Contractors at least once every two weeks. All Contractors bear the full responsibility of cooperation and coordination with each other in the planning and scheduling of traffic closures, stoppages, and other construction activity. The Resident's responsibility for coordination is limited to the timely dissemination of all schedules and information submitted by adjacent Contractors. Neither the Resident, nor the Maine Turnpike Authority, shall bear any responsibility for costs resulting from a Contractor's failure to submit all information as required. Issues and concerns not presented for review and discussion at joint Contractor meetings will not later be cause for claims. This cooperation shall be completed at no additional cost to the Authority.

The Contractor working on an adjacent section may require the placement of temporary construction signs and traffic control devices within this Project area. The placement and maintenance of these devices by another Contractor shall be allowed in this Contract at no additional cost to the Authority.

104.4.10 Coordination of Bridge Closure/Bridge Width Restriction Notification

This Subsection is deleted and replaced with the following:

The Contractor shall notify the Authority a minimum of two (2) weeks prior to the date of closure/restriction with the date on which the closure/restriction will begin and the anticipated duration of the closure/restriction. The Authority will be responsible for notification to others.

104.5.9 Landscape Subcontractors

This Subsection is deleted and replaced with the following:

The Contractor shall retain only Landscape Subcontractors that are certified by the Maine Department of Transportation Environmental Office Landscape Unit.

SECTION 105 – GENERAL SCOPE OF WORK

Scope of Section

The second paragraph is deleted and replaced with the following:

This Contract is not federally funded.

105.1 Intent of the Contract

This Subsection is amended by the addition of the following:

The Plans and Specifications complement and supplement each other. Should any Work be required, which is not denoted on the Plans or in the Specifications because of an omission, but which is nevertheless necessary for the proper performance and completion of the Project, such Work shall be fully performed as if it were described and delineated. Should any misunderstanding arise as to the intent or meaning of said Plans and Specifications, refer to Subsection 104.4.4, Requests for Information.

The silence of the Specifications, Plans, or other supplemental documents as to any detail, or the apparent omission from them of a detailed description concerning any point, shall be regarded as meaning that only material and workmanship of excellent quality are to be used.

105.2.3 Joint Duty Regarding Safety

The first sentence is amended as follows:

The “Contractor’s TCP” is deleted and replaced with “Traffic Control Plan”.

This Subsection is amended by the addition of the following:

Nothing in the foregoing paragraphs shall be construed as relieving the Contractor from full responsibility for safe prosecution of the Work at all times. The Resident is not responsible for jobsite safety.

The following Subsection is added:

105.2.4.1 Lockout/Tagout Procedures

Prior to the start of Work, the Contractor and the Maine Turnpike Authority shall exchange and review the other party's Lockout/Tagout Procedures for the control of hazardous energy. If the Lockout/Tagout Procedures are similar and neither party has concerns, the two parties shall agree to abide by the procedures of the other party. Only the authorized individual who locked or tagged-out a circuit or piece of equipment is permitted to remove the lockout/tagout, except as provided for in the respective Lockout/Tagout Procedures.

Should either the Contractor or the Maine Turnpike Authority have concerns with the other party's Lockout/Tagout Procedures, the Safety Officers of the Contractor and the Maine Turnpike Authority shall meet, discuss and resolve the areas of concern. The Authority reserves the right to have the Contractor comply with the restrictions and prohibitions of the Maine Turnpike Authority's Lockout/Tagout Procedures if the Authority determines the Contractor's Lockout/Tagout Procedures are inadequate to protect the Authority's employees and patrons.

105.4.1 Maintenance During Construction

This Subsection is amended by the addition of the following:

Paved Surface - The Contractor is responsible for maintaining the existing paved shoulder, ramps, and travel lanes on the Maine Turnpike in good condition. The presence of tracked-dirt on the paved surfaces is unacceptable. The Resident shall have the sole authority to determine the acceptability of the paved surfaces. The use of stabilized construction entrances and frequent sweeping of the shoulder are the responsibility of the Contractor and shall be completed at no additional costs to the Authority.

Gravel Surface - The Contractor is responsible for maintaining gravel surfaces that are used for traffic in good condition. Potholes and wheel ruts are unacceptable. The Resident shall have the sole authority to determine the acceptability of the surfaces. Repairing the surfaces are the responsibility of the Contractor and shall be completed at no additional costs to the Authority.

Signs and Delineators - The Contractor is responsible for maintaining all mile markers, delineator, and signs including regulatory, warning, and guide signs during construction. Maintenance of signs shall mean that signs are clearly visible to motorists at the required height during construction. These items shall be kept in their existing location as long as is practicable. At no time shall any signs not be visible to the

driver. Construction material or equipment shall not obscure signs. This Work shall be accomplished at no additional cost to the Authority.

Erosion and Sedimentation Control - The Contractor shall plan their operations to protect existing Work from erosion. The Contractor is responsible for the inspection and maintenance of all erosion and sedimentation control devices until final acceptance. No payment will be made to repair failed areas if the Best Management Practices had not been utilized prior to a weather event.

105.4.3 Maintenance During Winter Construction

This Subsection is amended by the addition of the following:

The Maine Turnpike Authority will be responsible for winter maintenance including snow removal and application of salt on Maine Turnpike pavement open to traffic.

105.5.1 General Requirements

This Subsection is amended by the addition of the following:

Toll Free Passage on the Turnpike

The Contractor shall be granted free use of the turnpike for movement of vehicles, labor and equipment and for delivery of material essential to the Work. The Contractor will be issued cards with the Contract Number and Contractor Name while working on the Project. The cards shall be transferable and distributed by the Contractor to employees and vehicles working on the Project. The cards may only be used while working on the Project designated on the cards. Such free use shall be limited to the portion of the turnpike between the site of the Work and the nearest practicable exit including movement of vehicles, labor, equipment and materials from one site to another Work site. All vehicles must stop at a manned lane at the toll plazas to present the cards to the toll attendant. Vehicles without the required cards shall pay the required toll. This shall not be a reimbursable expense. The Contractor shall advise the Resident of the number of cards that are required. All cards shall be returned to the Resident at the completion of the Project. The use of the cards for toll free travel shall be revoked if the cards are misused. The Contractor shall nevertheless comply with regulations of the Authority relating to use of the turnpike and with established controls for non-revenue vehicles.

Existing Access

All existing access from local roads to the Maine Turnpike shall remain passable to emergency vehicles at all time. At no time shall construction equipment or material block these roads. Any misuse of this privilege will result in the Contractor's loss of access through these gates. The Contractor shall provide a lock and a piece of chain to link to the existing padlock on the gate allowing access to the Contractor and emergency vehicles.

Access From Local Roads

The Contractor shall not impact wetlands or streams to construct access to the Project. The Contractor may construct temporary access to the turnpike to facilitate the Project. Any damage caused to private property or local roads as a result of the access shall be repaired at the Contractor's own expense. The Contractor shall prepare a written plan outlining the proposed access.

At a minimum, the plan shall outline the following:

- Estimated number of vehicles;
- Time and duration of operation;

- Types of vehicles to use the access;
- Plans to construct a stabilized construction entrance;
- Plan to keep the local road free of tracked-mud and dust;
- Plan to control access to prevent unauthorized use;
- Restoration plan; and,
- Written permission from private property owners (if required).

The Contractor is required to retain the services of qualified flaggers to control the Contractor's operation at the local road access. Flaggers shall be present whenever construction vehicles are utilizing the access. The Contractor shall be responsible for constructing a gate across the access point to prohibit unauthorized access. The Contractor shall also construct a stabilized construction entrance in accordance with the MaineDOT Best Management Practices. All cost associated with the access including, but not necessarily limited to, the construction, restoration, flaggers, gate, and stabilized construction entrance shall be the responsibility of the Contractor. Failure to utilize flaggers will result in termination of permission to use local roads for access. Failure to keep local roads clear of tracked-mud will result in termination of permission to use local roads for access.

Construction Access

The Contractor shall construct a stabilized construction entrance in accordance with the Best Management Practices at all locations where construction vehicles will exit the mainline and/or enter the existing paved shoulder from a non-paved area. The Resident shall approve of the locations. The stabilized construction entrance shall be constructed in conjunction with the clearing activities or other early activities. Additional stabilized construction entrances may be required due to the Contractor's operations as well as site conditions. The construction and maintenance of the stabilized construction entrance shall be incidental.

Change of Direction

The Contractor will not be permitted to reverse directions (U-turns) at the toll plazas or at interchanges. All vehicles must exit the turnpike prior to reversing directions.

The Contractor shall not use the median openings on the turnpike unless the opening is located within passing lane closures on both roadways. The Contractor will be assessed a fine every time any employee of the Contractor, Subcontractor or supplier is observed using a median opening by a Resident or turnpike employee anywhere on the Maine Turnpike throughout the duration of the Contract. The fine will be deducted from monies owed to the Contractor.

The fines will be levied on a per occurrence basis as follows:

<u>NUMBER OF OCCURRENCES</u>	<u>FINE</u>
First	\$100

For the second occurrence, and any occurrence thereafter, the fine is increased by \$100 per each occurrence. The number of occurrences is not specific to a Contract, an individual or a vehicle, but based solely on the number of times any employee of the Contractor, Subcontractor or supplier is observed using a median opening anywhere on the Maine Turnpike. The Contractor shall be notified in writing of the violation by the Authority.

105.6 Construction Surveying

This Subsection is deleted in its entirety and replaced with the following:

105.6.1 Authority Provided Services

The Authority will provide the Contractor with the description and coordinates of vertical and horizontal control points, set by the Authority, within the Project Limits, for full construction Projects and other Projects where survey control is necessary. For Projects of 1,500 feet in length, or less: The Authority will provide three points. For Projects between 1,500 and 5,000 feet in length: The Authority will provide one set of two points at each end of the Project. For Projects in excess of 5,000 feet in length: The Authority will provide one set of two points at each end of the Project, plus one additional set of two points for each mile of Project length. For non-full construction Projects and other Projects where survey control is not necessary, the Authority will not set any control points and, therefore, will not provide description and coordinates of any control points: Upon request of the Contractor, the Authority will provide the Authority's survey data management software and Survey Manual to the Contractor, or its survey Subcontractor, for the exclusive use on the Authority's Projects.

105.6.2 Contractor Provided Services

Utilizing the survey information and points provided by the Authority, described in Subsection 105.6.1, Authority Provided Services, the Contractor shall provide all additional survey layout necessary to complete the Work. This may include, but not necessarily be limited to, reestablishing all points provided by the Authority, establishing additional control points, running axis lines, providing layout and maintenance of all other lines, grades, or points, and survey quality control to ensure conformance with the Contract. The Contractor is also responsible for providing construction centerline, or close reference points, for all utility facility relocations and adjustments as necessary to complete the Work. When the Work is to connect with existing structures, the Contractor shall verify all dimensions before proceeding with the Work. The Contractor shall employ or retain competent engineering and/or surveying personnel to fulfill these responsibilities.

The Contractor must notify the Authority of any errors or inconsistencies regarding the data and layout provided by the Authority as provided by Subsection 104.3.3, Duty to Notify Department If Ambiguities Discovered.

105.6.2.1 Quality Control

The Contractor is responsible for all construction survey quality control. Construction survey quality control is generally defined as, first, performing initial field survey layout of the Work and, second, performing an independent check of the initial layout using independent survey data to assure the accuracy of the initial layout; additional iterations or checks may be required if significant discrepancies are discovered in this process. Construction survey layout quality control also requires written documentation of the layout process such that the process can be followed and repeated, if necessary, by an independent survey crew.

105.6.3 Quality Assurance

It is the Authority's prerogative to perform construction survey quality assurance. Construction survey quality assurance may or may not be performed by the Authority. Construction survey quality assurance is generally defined as an independent check of the construction survey quality control. The construction survey quality assurance process may involve physically checking the Contractor's construction survey layout using independent survey data, or may simply involve reviewing the construction survey quality control written documentation. If the Authority elects to physically check the Contractor's survey layout, the Contractor's designated surveyor may be required to be present. The

Authority will provide a minimum notice of 48-hours to the Contractor, whenever possible, if the Contractor's designated surveyor's presence is required. Any errors discovered through the quality assurance process shall be corrected by the Contractor, at no additional cost to the Authority.

105.6.4 Boundary Markers

The Contractor shall preserve and protect from damage all monuments or other points that mark the boundaries of the right-of-way or abutting parcels that are outside the area that must be disturbed in order to perform the Work. The Contractor indemnifies and holds harmless the Authority from all claims to reestablish the former location of all such monuments or points including claims arising from 14 MRSA § 7554-A. For a related provision, see Subsection 104.3.11, Responsibility for Property of Others.

105.7.1 General

The following paragraphs are added:

Within ten (10) days after the date of execution of the Contract, the Contractor shall inform the Resident in writing of the sources from which he proposes to obtain the materials required for the Project and statements of quality of these materials as hereinafter required in Subsection 106.01, Roles Regarding Quality. Information or materials not required to be incorporated in the Work within six (6) months after said date of execution, may be furnished within thirty (30) days.

Prior to the approval of the submittal, any Work done or materials ordered shall be at the Contractor's own risk. All submittals shall be stamped and signed by the Contractor verifying their approval of the Shop Drawings.

Prior to forwarding submittals to the Resident for review and approval, the Contractor shall mark the Item Number on each submittal for identification, thoroughly check the submittals for compliance with the Contract Documents, and place its stamp of approval on each sheet certifying that the Contractor has so checked each submittal. The Contractor shall certify that "This Shop Drawing has been thoroughly checked and complies with the Contract Documents and field measurements and the item fits with adjoining Work except as noted". Submittals which do not contain this stamp of approval and certification, or which are incomplete, have not been checked, have been checked only superficially, or contain numerous errors, will be returned un-reviewed by the Resident for resubmission by the Contractor. Delays in obtaining approvals, other than those caused by the Authority, are not grounds for granting an extension of time. Disclaimers by the Contractor, any Subcontractor, or supplier of responsibility for any requirements of the Contract Documents, will not be accepted by the Authority and will be deemed invalid.

The following submissions are required if applicable to the Work:

- Construction plans for access
- Project master schedule
- Updated schedules as required
- Shop Drawings
- Spill Prevention Control and Countermeasure (SPCC) Plan
- Traffic control plans
- Temporary earth support system submission
- Bridge beam or structural steel erection plan

105.7.4 Submittal Requirements

The second paragraph is deleted and replaced with the following:

For the first and subsequent submittals, the Contractor shall submit a minimum of seven (7) sets of drawings to the Resident on the size sheets required unless otherwise directed by the Resident.

105.8.1 Temporary Soil Erosion and Water Pollution Control

This Subsection is amended by the addition of the following:

Spill Prevention Control and Countermeasure (SPCC) Plan

Any areas where petroleum products, oils or hazardous materials are handled or stored will require a Spill Prevention Control and Countermeasure (SPCC) Plan. The Plan will be submitted to the Resident before construction begins for review and approval. At a minimum, the Plan shall provide the following information:

1. Name of person who is responsible for spill prevention;
2. Description of handling or storage location, noting setbacks from water bodies where relevant. Significant sand and gravel aquifers and other sensitive resources must be avoided wherever possible;
3. Description of storage and containment facilities;
4. Description of equipment and/or materials used to prevent discharges (including sorbent materials);
5. Preventative measures to minimize the possibility of a spill; and,
6. Contingency plan if spill should occur.

The approved plan must be posted at the jobsite. All personnel working in the area are required to read and be familiar with the plan.

There shall be no separate payment for preparation of a SPCC Plan acceptable to the Resident and preparation is considered incidental to the Work.

ENVIRONMENTAL STANDARDS

The Project will be performed in accordance with the MaineDOT Best Management Practices (BMP) latest issue. The Contractor shall fully comply with all erosion and sedimentation control requirements outlined in the BMP's or contained herein. Non-compliance with these requirements as determined by the Resident shall result in a financial penalty of \$1,000 per day, per violation. Any fines assessed to the Maine Turnpike Authority as a result of the Contractor's non-compliance shall be paid by the Contractor. If the Contractor fails to pay, the cost of the fine will be deducted from monies due, or which may become due to the Contractor under this Contract.

In the event of conflict between these Specifications and other erosion and pollution control laws, rules or regulations of other Federal, State and local agencies, the more restrictive law, rules or regulations shall apply.

The standards as described below shall be met on the Project:

1. Temporary erosion control measures shall be maintained until the site is permanently stabilized with vegetation or other permanent control measures.
2. The Contractor will immediately take appropriate measures to prevent erosion or sedimentation from occurring or to correct any existing problems regardless of the time of year.
3. Work in wetlands is prohibited except to the minimum extent necessary for completion of the Work as detailed on the Plans. Excavated and other material shall not be stockpiled in wetlands. Haybales, silt fence or other suitable barriers shall be used, where necessary, to prevent sedimentation from eroding materials.
4. Uncured concrete shall not be placed directly into the water body. Concrete may be placed in forms and shall cure at least one (1) week prior to form removal. No washing of tools, forms, etc. shall occur in or adjacent to the water body or wetland. Any additional requirements are outlined in Subsection 107.261 of the Special Provisions.
5. Disturbance of natural resources beyond the construction limits shown on the Plans is not allowed.
6. Bare earth slopes shall be roughened to dissipate sheet flow. This shall be accomplished by "tracking" the slope perpendicular to the centerline. No bare earth shall be maintained for more than five days without surface roughening. This Work will not be measured separately for payment, but shall be incidental to the Excavation item.
7. No wheeled or tracked equipment shall be operated in the water. Equipment operating on the shore may reach into the water with a bucket or similar extension. Equipment may NOT cross streams.
8. Existing ditches shall be maintained until the new ditches are stabilized. Stone check dams shall be placed in existing ditches prior to construction as to prevent the release of sedimentation. Stone check dams shall be installed at the outlets of all existing and proposed ditches adjacent to all stream and wetlands.
9. The Contractor's operation may require the placement of temporary pipes and fill over a ditch line to provide access to the Work area. The Resident shall approve the size of the pipe. The placement and removal of the temporary access will not be measured separately for payment, but shall be incidental to the Excavation item.

105.10 Equal Opportunity and Civil Rights

105.10.1 Requirements Applicable to Federally Funded Contracts

This Subsection is deleted and not replaced.

105.10.2 Requirements Applicable to All Contracts

The following is added after Paragraph (A), Maine Code of Fair Practice and Affirmative Action, Paragraph 4).

The Maine Turnpike Authority is an equal opportunity employer and as such, requires all Contractors to pursue in good faith affirmative action programs.

THEREFORE;

The Contractor hereby agrees to the following requirements:

1. The Contractor will pursue an affirmative action program which includes procedures designed to increase the numbers of minorities, women, and handicapped at all levels and in all segments of the workforce where imbalances exist. Such a program should include an assessment of the existing situation, and the development of realistic goals for necessary actions. These goals and related procedures and timetables should not require rigid quotas but are commitments which the Contractor should make every good faith effort to achieve.
2. In connection with Contracts in excess of \$250,000, the Contractor will insure contractually that all Subcontractors shall also pursue an affirmative action program meeting the above requirements. The Contractor shall also ensure contractually that all Subcontractors with Contracts in excess of \$50,000 pursue an affirmative action program meeting the above requirements.
3. An affirmative action program will provide that no Contractor and/or Subcontractor will discriminate against an employee or applicant for employment because of race, color, religious creed, sex, national origin, ancestry, age, physical handicap or mental handicap unless based upon a bona fide occupational qualification. Such action shall include, but not necessarily be limited to, the following; employment, upgrading, demotions, transfers, recruitment or recruitment advertising, layoffs or terminations, rates of pay and compensation, and selection for training and apprenticeship.

Paragraph (D), Prevention of Sexual Harassment, is deleted and replaced with the following:

Contractors are responsible, under Maine State Law, for ensuring and maintaining a Work environment that is free from sexual harassment. The Contractor shall comply with all relevant provisions of Maine State Law in regard to sexual harassment including, but not necessarily limited to, 5 MRSA 4572, 26 MRSA 806-807, and the regulations of the Maine Human Rights Commission.

Subsections 105.10.2 (E), DBE Reporting Requirements, and (F), Certification of Continuing EEO Efforts, are deleted and not replaced.

105.11 Other Federal Requirements

This Subsection is deleted in its entirety and not replaced.

The following Subsection is added:

105.12 Limitations of Operations

The Contractor shall keep the existing shoulder clear of construction activity except for the period of shoulder reconstruction. The Contractor shall not park or store construction equipment, vehicles, or materials on the shoulder. Construction vehicles shall not enter the mainline travel lane until they can safely merge with the traffic in the travel lane. The construction access shall be in accordance with the details in the Plans. The Resident must approve all shoulder closures.

Existing drainage shall be maintained at all times. All ditches that discharge into wetlands shall have a series of stone check dams installed in the ditch near the outlet prior to the commencement of clearing activities in the area.

SECTION 106 – QUALITY

106.3.3 Sources

Paragraph A, General, is amended by the addition of the following:

Preference in the purchase of supplies and materials, other considerations being equal, shall be given in favor first of supplies and materials manufactured and sold within the State of Maine, and second, of supplies and materials manufactured within the United States. Materials and supplies sold outside the United States will be considered third in the preference order.

106.3.4 Storage

This Subsection is amended by the addition of the following:

The Contractor shall be responsible for the security of all storage areas. Materials and supplies that are stolen, damaged or otherwise made unacceptable while in storage shall be replaced in kind at the Contractor's own expense.

106.3.7 Sampling and Testing

The forth paragraph is deleted in its entirety and not replaced.

106.6 Acceptance

All paragraphs after the first paragraph are deleted and not replaced.

106.8.3 Unauthorized Work

The following paragraphs are added:

No omission or failure on the part of the Resident to disapprove or reject any Work or material shall be taken to be an acceptance of any defective Work or material. Within the time set by the Resident, the Contractor shall remove any Work or material condemned by the Resident and shall rebuild and replace the same without extra compensation and in default thereof the removal and replacement may be done by the Authority at the expense of the Contractor; or, in case the Resident should not consider the defect of sufficient importance to require the Contractor to rebuild or replace any imperfect Work or material, he shall have power, and is hereby authorized, to make an equitable deduction from the Contract price.

Materials which do not conform to the requirements of these Specifications shall be considered as defective and will be rejected, whether in place or not, and shall be removed from the Project. No material which has been rejected, the defects of which have been corrected or removed, shall be used until approved by the Resident in writing.

SECTION 107 – TIME

The following Subsection is added:

107.1.1 Substantial Completion

An 80 percent reduction of retainage will be considered by the Authority when the Project is substantially complete. The Contractor shall include an explanation of the outstanding Work, an estimate of the cost to complete the Work, and a schedule for completing the Work. Seasonal limitations as well as warranty and establishment periods (for vegetation) shall be addressed.

107.3.1 General

This Subsection is amended as follows:

See related Subsection 101.2, Definitions: Holidays.

Work that impacts traffic may be subjected to further restrictions. See related Special Provision Section 652.

107.3.2 Night Work

This Subsection is amended by the addition of the following:

- The Maine Turnpike encourages the Contractor to construct the Project cost effectively while maintaining quality and conformance with all Federal, State and local laws. To facilitate this process, the Maine Turnpike recognizes that the Contractor may choose to construct portions of the Project at night.
- The following is a partial list of activities that would be favorably considered for night construction. The final determination of applicability by the Authority will be based on the Contractor's plan of operation. The Contractor shall demonstrate that the Work can be accomplished in conformance with the appropriate regulations.

Highway Related Work

- Installation and removal of traffic control devices (drums, concrete barrier, impact attenuators)
- Installation and removal of painted pavement markings
- Placement of pavement
- Sawcutting of pavement
- Installation and removal of guardrail

Bridge Related Work

- Delivery of materials (except oversize loads)
- Placement and removal of pier forms
- Shielding of old and new bridge
- Installation and removal of deck and diaphragm forms
- Installation and removal of overhang brackets
- Field painting and preparation of damaged paint areas
- Application of penetrating sealers
- Installation of sign panels on sign bridges

107.3.3 Sundays and Holidays

This Subsection is amended by the addition of the following:

“Saturday” is added before Sunday.

Requests to work outside of the allowable periods must be submitted in writing and approved by the Resident prior to the start of Work. Approval for Work, that in the Authority’s opinion will not significantly impact traffic flow, will not be unreasonably withheld.

107.4.2 Schedule of Work Required

This Subsection is amended by the addition of the following:

No Pay Requisition will be approved for payment until the schedule requirement is fulfilled and accepted by the Maine Turnpike Authority.

In addition to the Schedule required hereinbefore, the Contractor shall submit, no later than 12:00-noon every Thursday, a detailed plan of his operations for the following week. This plan shall show the type of Work to be done and the traffic lanes that are to be impacted. This updated plan will be used by the Resident to schedule the appropriate resources and inform other interested parties of the proposed Work.

107.4.4 Schedule Revisions

This Subsection is amended by the addition of the following:

The progress of Work shall be compared against the Schedule of Work at a job meeting once every month. If the Authority determines that the Contractor’s actual progress is not in substantial conformity with the Schedule of Work, then the Contractor shall submit a revised Schedule of Work to the Authority depicting the increased or decreased variations in activity durations and milestones as compared to previously submitted schedule(s). If noted in the meeting minutes, or directed in writing by the Resident, the Contractor shall submit a revised Schedule to the Authority within one week of the request. If a revised realistic Schedule is not received within one week of the request, the monthly pay requisition will be withheld. Failure to modify completion dates without a commitment to modify Project resources shall be deemed an unrealistic Schedule unless the particular activity had adequate float.

107.7.2 Schedule of Liquidated Damages

The table of liquidated damages is deleted and replaced with the following:

Original Contract Amount From More Than	Original Contract Amount up to and Including	Amount of Liquidated Damages per Calendar Day
\$0	\$100,000	\$100
\$100,000	\$300,000	\$200
\$300,000	\$500,000	\$400
\$500,000	\$1,000,000	\$575
\$1,000,000	\$2,000,000	\$750
\$2,000,000	\$4,000,000	\$900
\$4,000,000	and more	\$1,875

This Subsection is amended by the addition of the following:

At the option of the Authority, the Contractor may be held responsible for all costs incurred by the Authority which are due to any Work that remains incomplete after the time specified for the completion of the Contract, in addition to the daily calendar day charge.

107.9.1 Final Clean-up and Finishing

This Subsection is amended by the addition of the following:

No separate payment will be made for final clean-up and restoration of property, but the cost thereof shall be included in the prices bid for the various items scheduled in the Proposal.

SECTION 108 - PAYMENT

108.1 Measurement of Quantities for Payment

This Subsection is amended by the addition of the following:

The quantities in the Schedule of Items are the approximate totals. The breakdown of quantities for various locations is approximate and is for information only. No change in the bid price will be considered for changes in the actual quantities at each location except as provided for in Subsection 109.1, Changes in Quantities.

108.1.2 General Measurement Provisions

The first sentence is deleted and replaced with the following:

The Maine Turnpike Authority will utilize the U.S. Customary system for all units of measurement.

108.1.3 Provisions Relating to Certain Measurements

This Subsection is amended by the addition of the following:

No allowance will be made for surface laid over a greater area than indicated on the Plans or otherwise authorized, or for excavation removed or embankment placed beyond the slope lines shown on the cross-sections, except as otherwise specifically noted or authorized by the Resident in writing.

108.2.1 Generation of Progress Payment Estimates

The first paragraph is deleted and replaced with the following:

The Resident will make current estimates in writing once each month, on or before the date set by the Resident at the time of starting Work, or from time to time as the Work progresses. Progress payments twice per month will not be allowed. The estimate shall include all materials complete in place and the amount of Work performed in accordance with the Contract, during the preceding month or period and the value thereof figured at the unit prices contracted together with estimates of the cost of Extra Work performed during the same period. Estimates or payments will not be made, if in the opinion of the Resident, the Work is not proceeding in accordance with the provisions of the Contract. The Contractor agrees to waive all claims relating to the timing and amount of such estimates.

108.2.2 Payment

The first two sentences are deleted and replaced with the following:

The Maine Turnpike Authority will make payment within 30 days of Contractor and Resident concurrence of progress payment.

108.2.3 Mobilization Payments

The second paragraph is deleted and replaced with the following:

- A. The first payment of 50 percent of the lump sum price for mobilization or five percent of the original Contract Amount, whichever is less, will be made with the first monthly estimate.
- B. The second payment of 25 percent of the lump sum price for mobilization or 2.5 percent of the original Contract Amount, whichever is less, will be made following completion of 25 percent of the proposed Contract Amount.
- C. The third payment of 25 percent of the lump sum price for mobilization or 2.5 percent of the original Contract Amount, whichever is less, will be made following completion of 50 percent of the proposed Contract Amount.
- D. Upon substantial completion of the Work on the Project, as determined by the Resident, payment of any amount bid for mobilization in excess ten percent of the original Contract Amount will be paid.

All payments are subject to standard retainage.

Demobilization will not be measured separately for payment, but shall be incidental to Item 659.10, Mobilization.

108.3 Retainage

This Subsection is deleted and replaced with the following:

From the total of the amounts so ascertained there will be deducted an amount equivalent to 7.5 percent of the whole, to be retained by the Authority until after the completion of the entire Contract in an acceptable manner, and the balance, or a sum equivalent to 92.5 percent of the whole shall be certified by the Resident to the Authority for payment.

If it became evident, on the basis of approved progress schedules, or otherwise, that the completion date for the Contract will not be met, the Authority reserves the right to retain the amount of the liquidated damages which have apparently accumulated, in addition to 7.5 percent of the value of the Work done to date.

If at any time there shall be evidence of any lien or claim for which, if established, the Authority might become liable and which is chargeable to the Contractor, the Authority shall have the right to retain out of any payment, then due or thereafter to become due, an amount sufficient to completely indemnify the Authority against such lien or claim.

If the Contractor elects to furnish to the Authority a surety bond in the amount of twice the amount of all liens or claims pending against the Contractor, then the Authority will not exercise the aforementioned right to make retention out of payments on account of such liens or claims.

The payment of any current estimates or of any retained percentages shall in no way affect the obligations of the Contractor to repair or renew any defective parts of the construction and to be responsible for all damage due to such defect.

All material estimates and payments shall be subject to correction in subsequent partial estimates and payments and on the final estimate and payment.

108.4 Payment for Materials Obtained and Stored

The first paragraph is amended as follows:

In the second sentence, the words "...Delivered on or near the Work site at acceptable storage places." are deleted and not replaced.

108.4.1 Price Adjustment for Hot Mix Asphalt

This Subsection is deleted and replaced with the following:

For Contracts containing an excess of 5,000 tons of bituminous pavement, an asphalt price adjustment will be made for all bituminous concrete placed six (6) months after the bid date of the Contract. No asphalt price adjustment will be allowed for Contracts containing less than 5,000 tons. For Contracts containing more than 5,000 tons, no adjustment will be made for asphalt placed at any time within six months of the bid date.

Price adjustment will be based on the variance in cost for the performance-graded binder component of the hot mix asphalt. The quantity of hot mix asphalt for each pay item will be multiplied by performance graded binder given in the table below, times the difference in price in excess of ten percent between the base price and the period price of asphalt cement. Adjustments will be made upward or downward, as prices increase or decrease. The quantity of Hot Mix Asphalt will be determined from the quantity shown on the progress estimate for each pay period. The base price of performance graded binder to be used is the price per standard ton current with the bid opening date. The period price shall be determined by the Authority and shall be the price per standard ton current with the ending date of the progress estimate. The prices shall be determined by using the average N.E. Barge Price, FOB, as listed in the Asphalt Weekly Monitor.

Plant Mix B Pavement	4.0%
Hot Bituminous Pavement Grading B	4.5%
Hot Bituminous Pavement Grading C	5.5%
Hot Bituminous Pavement Grading D	5.5%
Hot Bituminous Pavement Grading E	5.5%

108.5 Right to Withhold Payment

This Subsection is amended by the addition of the following:

- L. Contractor's failure to, or refusal to, remove within 24-hours after receipt of proper notice, any employee or person engaged in Work under Contract.
- M. Contractor's failure to submit required schedule or schedule updates.

108.6 Taxes, Fees, Allowances, and Notices

This Subsection is amended by the addition of the following:

The Maine Turnpike Authority, an agency of the State of Maine, is exempt from payment of sales tax, under the present Maine Sales Tax Law, on any property purchased by it at retail for consumption. The Maine Tax Bureau has interpreted this to mean that all materials purchased by the Contractor which ultimately remain the property of the Maine Turnpike Authority, even though in a changed form, are not subject to the sales tax.

108.8 Final Payment

This Subsection is amended by the addition of the following:

Before final payment is made, the Contractor shall furnish to the Authority, on the forms prescribed (Sheet F-1), a sworn affidavit to the effect that no claims are pending. If such affidavit that claims have been paid cannot be given because of a dispute as to the amount or legality of such claim, the Contractor's affidavit shall clearly set out the facts as to the name, address, amount, and nature of the dispute. The Authority will review the matter and will make payment that the Authority deems is appropriate to the Contractor.

SECTION 109 – CHANGES

109.1.1 Changes Permitted

The following is added to the end of the paragraph:

There will be no adjustment to Contract Time due to an increase or decrease in quantities, compared to those estimated, except as addressed through Contract Modification(s).

109.1.2 Substantial Changes to Major Items

The following is added to the end of the paragraph:

Contract Time adjustments may be made for substantial changes to Major Items when the change affects the Critical Path, as determined by the Authority.

109.3 Extra Work

The following paragraphs are added:

No Extra Work shall be performed except pursuant to the written orders of the Resident, expressly and unmistakably indicating its intention to treat the Work described therein as Extra Work.

If the Contractor determines that Work directed by the Resident is Extra Work, he shall, within 48-hours, give written notice thereof to the Resident stating why he deems it to be Extra Work and shall furnish to the Resident daily time slips and memoranda for the purpose of affording to the Authority an opportunity to verify the Contractor's claim at the time and (if it desires to do so) cancel promptly such order, direction or requirement of the Resident.

Accordingly, the failure of the Contractor to serve such notice or to furnish such time slips and memoranda shall be deemed to be a conclusive and binding determination on his part that the direction, order or requirement of the Resident does not involve the performance of Extra Work, and shall be deemed to be a waiver by the Contractor of all claims for additional compensation or damages by reason thereof.

Refer to related Subsections 104.4.2, Preconstruction Conference, and 109.7.5, Force Account Work.

109.4 Differing Site Conditions

109.4.1 Definition

This Subsection is amended by the addition of the following:

Paragraph (A) is the definition of Differing Site Conditions. Paragraphs (B), (C) and (D) are not all required along with Paragraph (A) to prove Differing Site Conditions. However, they will be considered by the Maine Turnpike Authority as part of the evaluation of Differing Site Conditions. See related Subsection 102.3, Examination of Documents, Site, and Other Information.

109.4.4 Investigation / Adjustment

This Subsection is amended as follows:

In the third sentence, delete the words “Subsections (A) - (E)”.

109.5.1 Definitions - Types of Delays

This Subsection is amended as follows:

B. Compensable Delay -

Replace (1) with the following:

1(A) a weather related Uncontrollable Event of such an unusually severe nature that a Federal Emergency Disaster is declared. The Contractor will only be entitled to an Equitable Adjustment if the Project falls within the geographic boundaries prescribed under the disaster declaration.

1(B) a weather related Uncontrollable Event of such an unusually severe nature that the Contractor's critical path schedule is disrupted.

109.5.2 Entitlement to Adjustments

This Subsection is amended as follows:

A. Types of Adjustments -

Paragraph 2. is deleted and replaced with the following:

2. If a Compensable Delay 1(A), (2), or (3), the Contractor is entitled to an extension of time and an equitable adjustment as set forth in Subsection 109.7, Equitable Adjustment to Compensation. If a Compensable Delay 1(B), the Contractor is entitled to an extension of time and an equitable adjustment as set forth in Subsection 109.7, Equitable Adjustment to Compensation, except that Cost of extended jobsite overhead and time will not be allowed.

109.5.5 Documenting the Delay and Request for Adjustments

The last paragraph is deleted and replaced with the following:

The Authority may require that all cost shown in the report be certified by an accountant.

109.5.6 Decision by Program Manager

This Subsection is deleted and not replaced.

Refer to related Subsection 104.4.2, Preconstruction Conference.

109.5.7 Additional Consideration by Department

This Subsection is deleted and not replaced.

Refer to related Subsection 104.4.2, Preconstruction Conference.

109.6.1 Overview - General Requirements

This Subsection is amended by the addition of the following:

The Maine Turnpike will not participate in any costs borne by the Contractor that are not in accordance with Maine Turnpike policies. All money paid to a business or resident as compensation for impacts created by the Contractor's operation will not be reimbursed by the Authority. All Contractor costs must be documented. Monies paid by the Contractor to others must be documented by a receipt for the cost to be considered as part of the VECP. Copies of all receipts shall be submitted to the Resident.

109.7.2 Basis of Payment

This Subsection is deleted in its entirety and replaced with the following:

Equitable Adjustments will be established by mutual Agreement for compensable items listed in Subsection 109.7.3, Compensable Items, based upon Unit or Lump Sum Prices. If Agreement cannot be reached, the Contractor shall accept payment on a Force Account basis as provided in Subsection 109.7.5, Force Account Work, as full and complete compensation for all Work relating to the Equitable Adjustment.

109.7.3 Compensable Items

This Subsection is deleted and replaced with the following:

The Contractor is entitled to compensation for the following items, with respect to agreed upon Unit or Lump Sum Prices:

1. Labor expenses for non-salaried workers and salaried foremen.
2. Costs for Materials.
3. A markup on the totals of Items 1 and 2 of this Subsection (109.7.3) for home office overhead and profit of the Contractor, its Subcontractors and suppliers, and any lower tier Subcontractors or suppliers, with no mark-ups on mark-ups.

4. Cost for Equipment, based on Blue Book Rates or leased rates, as set forth in Subsection 109.7.5(C), or the Contractor's Actual Costs.
5. Costs for extended jobsite overhead.
6. Time.
7. Subcontractor quoted Work, as set forth below in Subsection 109.7.5, Force Account Work.

109.7.5 Force Account Work

This Subsection is amended by the addition of the following:

C. Equipment

When the Contractor is paid for furnishing and operating equipment on an hourly or daily basis, it shall be operated as approved by the Resident in such a manner as to obtain maximum production under the prevailing conditions. The Resident may order the removal and require replacement of any unsatisfactory equipment.

The first sentence of the second paragraph, which begins: "Equipment leased...", is deleted.

The second sentence of the sixth paragraph is changed from "The Contractor may furnish..." to read "If requested by the Authority, the Contractor will produce cost data to assist the Authority in the establishment of such rental rate, including all records that are relevant to the Actual Costs including rental Receipts, acquisition costs, financing documents, lease Agreements, and maintenance and operational cost records."

The following sentence is added:

Equipment leased by the Contractor for Force Account Work and actually used on the Project will be paid for at the actual invoice amount plus 10 percent markup for administrative costs.

The following sentence is added:

F. Subcontractor Quoted Work - When accomplishing Force Account Work that utilizes Subcontractor quoted Work, the Contractor will be allowed a maximum markup of five percent for profit and overhead.

SECTION 110 - INDEMNIFICATIONS, BONDING AND INSURANCE

110.2.1 Bonds

The first three paragraphs are deleted and replaced with the following:

The Bidder to whom the Contract is awarded shall furnish a Surety Corporation Bond, satisfactory to the Authority, on the form of the Contract Bond bound herewith, as security for the faithful performance of the Work. The Contract Bond must be executed or countersigned on the part of such Surety by the Resident Agent of the Surety for the State of Maine.

The Bond shall be in an amount not less than the Total Amount bid in the Proposal and shall be maintained by the Contractor until the final payment under the Contract is made. In the event of insolvency of the Surety, the Contractor shall forthwith furnish and maintain as above provided, other security satisfactory to the Authority.

If the Contractor is unable to continue the Work, then the completion of the Contract shall be the sole responsibility of the Surety. The Surety shall assume the role of and become the Contractor. Work shall not commence until the Authority has approved, in writing, the Subcontractor's employed by the Surety. All Work to complete the Contract will be paid for at Contract bid prices as shown on the Proposal bid sheets. All payments made by the Authority will be paid directly to the Surety who in turn will then pay the Subcontractors and suppliers. Regardless of the amounts previously paid to the Contractor as Progress Estimates for Work reported to have been put in place by the Contractor or his Subcontractors, the full Scope of the Contract Work shall be completed by the Surety and its designates for compensation not to exceed the Contract Price less the aggregate of prior payments to the Contractor.

110.2.3 Bonding for Landscape Subcontractors

This Subsection is deleted and replaced with the following:

110.2.3 Bonding for Landscape Establishment Period

The Contractor shall provide a signed, valid, and enforceable Performance, Warranty, or Maintenance Bond complying with the Contract, to the Department at Final Acceptance.

The Bond shall be in the full amount for all Pay Items for Work pursuant to Section 621, Landscape, made payable to the Maine Turnpike Authority.

The Contractor shall pay all premiums and take all other actions necessary to keep said Bond in effect for the duration of the Landscape Establishment Period as described in Special Provision 621.0036, Establishment Period. If the Surety becomes financially insolvent, ceases to be licensed or approved to do business in the State of Maine, or stops operating in the United States, the Contractor shall file new Bonds complying with this Subsection and within 10 days of the date the Contractor is notified or becomes aware of such change.

All Bonds shall be procured from a company organized and operating in the United States, licensed or approved to do business in the State of Maine by the State of Maine Department of Business Regulation, Bureau of Insurance, and listed on the latest Federal Department of the Treasury listing for "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies."

By issuing a Bond, the Surety agrees to be bound by all terms of the Contract, including those related to payment, time for performance, quality, warranties, and the Department's self help remedy as provided in Subsection 112.1, Default, to the same extent as if all terms of the Contract are contained in the Bond(s).

Regarding claims related to any obligations covered by the bond, the Surety shall provide, within 60 Days of Receipt of written notice thereof, full payment of the entire claim or written notice of all bases upon which it is denying or contesting payment. Failure of the Surety to provide such notice within the 60-day period constitutes the Surety's waiver of any right to deny or contest payment and the Surety's acknowledgment that the claim is valid and undisputed.

110.3 Insurance

This Subsection is amended by the addition of the following:

Each policy shall be signed by the President and Secretary of the insurance company and shall be countersigned by a licensed Resident Agent of the State of Maine as an authorized representative of the company.

Before Work is commenced pursuant to the Agreement, the Contractor shall file with the Authority a Certificate of Insurance, executed by an insurance company or companies satisfactory to the Authority and licensed or approved by the State of Maine Department of Business Regulation, Bureau of Insurance to do business in the State of Maine, stating that the Contractor carries insurance in accordance with the requirements of the Contract.

If at any time, any of the said policies shall be or become unsatisfactory to the Authority, the Contractor shall promptly obtain new and satisfactory policies and furnish certificates therefor as required above. All policies shall contain a valid provision or endorsement providing that the insurance company will notify the Authority in writing at least thirty (30) days prior to the termination of any policy or before any changes are made in any policies. The policy shall also indicate which exclusions have been deleted and any additional coverages.

Neither approval by the Authority, nor a failure to disapprove insurance furnished by a Contractor, shall release the Contractor of full responsibility for liability, damages and accidents as set forth herein.

No separate payment shall be made for any insurance that the Contractor may be required to carry, but all costs thereof shall be included in the prices bid for the various items scheduled in the Proposal.

The following Subsection is added:

110.3.05 Umbrella Liability

An Umbrella Liability Policy in excess of Employer's Liability, General Liability, and Automobile Liability shall be provided with a limit of \$4,000,000.

110.3.2 Commercial General Liability

This Subsection is amended by the addition of the following:

Where the Work to be performed has to do with railroads, then railroad Protective Liability Insurance shall be provided, with the Maine Turnpike Authority as a named insured.

The Contractual Liability Insurance shall cover the Contractor's obligation to indemnify the Authority as provided in Subsection 110.1, Indemnification.

110.3.4 Professional Liability

The first sentence is deleted and replaced with the following:

Contractors who engage in design Work, preliminary engineering Work, and environmental consulting Work for the Authority shall maintain a Professional Liability policy for errors and omissions with a minimum limit of liability of \$5,000,000. The Authority reserves the right to require increased insurance limits for certain major Projects.

110.3.5 Owner's and Contractor's Protective Liability

This Subsection is deleted and replaced with the following:

For Projects with a Contract price in excess of \$500,000, an "Owner's Protective" policy in the name of the Maine Turnpike Authority, with a \$5,000,000 limit, shall also be provided.

110.3.6 Builder's Risk Insurance

This Subsection is amended by the addition of the following:

The Contractor shall provide Builder's Risk Insurance if the Project requires it. This determination will be made by the Authority and shall be so stated in the Special Provisions. The insurance coverage shall be shown on a special form and provide for transient and off-premise coverage and materials intended for use at the Project site. Any exclusion related to design, materials, or workmanship shall not apply to resulting damage.

110.3.8 Administrative and General Provisions

A. Additional Insured

This paragraph is deleted and replaced with the following:

Each policy, with the exception of Workers' Compensation and Professional Liability Insurance, shall name the Authority as an additional named insured. The Maine Turnpike Authority Contract Number shall be clearly stated on each policy.

SECTION 111 - RESOLUTION OF DISPUTES

111.1.2 Escalation Process

This Subsection is deleted and replaced with the following:

To resolve Issues and Disputes, the Contractor and the Maine Turnpike Authority will develop a Decision Matrix at the preconstruction or partnering meeting. See related Subsection 104.4.2, Preconstruction Conference. If an issue is not resolved, the matter becomes a Dispute and is eligible for settlement by an Alternate Dispute Resolution (ADR) process as outlined in this Section. Either the Authority or the Contractor may request an ADR process. If a Contractor is dissatisfied with an ADR recommendation, the decision may be appealed to the MTA Executive Director. A decision by the MTA Executive Director may be appealed to either Mediation or Arbitration. All costs of ADR, including Neutral Evaluations, Dispute Review Boards (DRBs), Mediation or Arbitration shall be shared equally.

ALTERNATIVE DISPUTE RESOLUTION

Preliminary ADR:

The purpose of the optional use of ADR is to assist the consenting parties to resolve disputes in a manner that complies with the Contract, that is fair, impartial, less expensive, faster and less formal than litigation. A Project issue becomes a Dispute eligible for ADR only when mutually acceptable resolution can not be achieved within the Decision Matrix-prescribed time period at the level of the Authority's Chief Operating Officer (COO), and the Contractor's Principal.

The Contractor and the Authority shall select a mutually acceptable form of Preliminary ADR from the following options, with the preference expressed in the order of listing.

1. **NEUTRAL EVALUATION:** Jointly selected by the disputing parties, the Neutral would conduct a third party, neutral investigation of both sides of the dispute, resulting in the submission of a Report of Recommended Settlement to the disputing parties.
2. **DISPUTE REVIEW BOARD (DRB):** The parties would jointly select two to three mutually acceptable experts who would hear and weigh a presentation of positions and evidence by the parties; resulting in the issuance by the DRB of a Recommended Settlement of the matter.

Recommendations by either a Neutral or a DRB will be non-binding unless the parties mutually agree in writing at the time of process selection that such recommendations will be binding.

Appeal to the Executive Director:

If either party rejects a recommendation resulting from ADR, the Dispute may be appealed to the Executive Director of the Authority. Once a dispute has been submitted to ADR, no party shall discuss the elements of the dispute with the Executive Director.

Final ADR - Mediation or Arbitration:

At the request of the Contractor, appeal decisions rendered by the Executive Director may be appealed by the Contractor to a Final ADR process of either Mediation or Arbitration. The costs of Mediation or Arbitration shall be borne equally by the Contractor and the Authority. Decisions by either a Mediator or an Arbitrator(s) will be non-binding unless the parties mutually agree in writing at the time of process selection that such recommendations will be binding.

NOTE: It is the intent of this Specification to retain maximum flexibility for the specific procedures for either Preliminary or Final Alternative Dispute Resolution. The processes shall follow the guidelines of construction industry ADR practices in general. The Authority and the Contractor will contribute equal input to the selection of location, methods, experts and timing of such processes. When a Dispute Review Board is utilized, the Authority and the Contractor shall have equal veto power in the selection of DRB composition.

111.1.8 Commissioner Communications Before Appeal

This Subsection is deleted and not replaced.

111.2 Project Level Negotiation to 111.6 Judicial Review

These Subsections (inclusive) are deleted and not replaced.

SECTION 112 - DEFAULT AND TERMINATION

112.2 Termination

This Subsection is amended by the addition of the following:

When the Contract is terminated, the Contractor shall, if so required by the Authority, promptly remove any or all of his/her equipment and supplies from the Project site or from other property of the Authority, failing which the Authority may remove such equipment and supplies at the expense of the Contractor.

SECTION 203 - EXCAVATION AND EMBANKMENT

203.01 Description

The following is added at the end of the last paragraph:

Unclassified bids are submitted at the sole risk of the Bidder. The Contractor shall only be entitled to compensation at the unit prices submitted for the actual quantity of Common Excavation and Rock Excavation. No additional compensation shall be considered for changes from the estimated quantities to the actual quantities regardless of the reason for the change.

203.18 Method of Measurement

The seventh paragraph is amended as follows:

Elevations for final cross sections shall be determined as shown and calculated on the Plans. Measurements shall be determined at the bottom of loam line unless otherwise noted.

SECTION 502 - STRUCTURAL CONCRETE

502.10 Forms and False Work

D. Removal of Forms and False Work

The first paragraph is amended as follows:

In the first, second, and third sentences, "forms and false work" are replaced with "forms".

502.11 Placing Concrete

G. Concrete Wearing Surface and Structural Slabs on Precast Superstructures

The last paragraph is amended as follows:

In the third sentence, replace "The temperature of the concrete shall not exceed 24°C [75°F] at the time of placement." with "The temperature of the concrete shall not exceed 24°C [75°F] at the time the concrete is placed in its final position."

502.15 Curing Concrete

The first paragraph is amended as follows:

The first sentence is replaced with: "All concrete surfaces shall be kept wet with clean, fresh water for a curing period of at least seven (7) days after concrete placing, with the exception of vertical surfaces as provided for in Subsection 502.10 (D), Removal of Forms and False Work.

The second paragraph is amended as follows:

The first two sentences are deleted.

The third paragraph is amended as follows:

The entire paragraph, which starts "When the ambient temperature....", is deleted.

The fourth paragraph is amended as follows:

Delete "approved" to now read "...continuously wet for the entire curing period...".

The fifth paragraph is amended as follows:

The second sentence is changed from "...as soon as it is possible to do so without damaging the concrete surface." to: "...as soon as possible."

The seventh paragraph is amended as follows:

The first sentence is changed from "...until the end of the curing period." to "...until the end of the curing period, except as provided for in Subsection 502.10(D), Removal of Forms and False Work."

SECTION 503 - REINFORCING STEEL

503.06 Placing and Fastening

The second paragraph is amended as follows:

The third sentence is changed from "All tack welding shall be done in accordance with Section 504, Structural Steel." to "All tack welding shall be done in accordance with AWS D1.4, Structural Welding Code - Reinforcing Steel."

SECTION 504 - STRUCTURAL STEEL

504.09 Facilities for Inspection

The following is added to the last paragraph:

Failure to comply with the above requirements will be consider to be a denial to allow access to Work by the Contractor. The Department will reject any Work done when access for inspection is denied.

504.18 Plates for Fabricated Members

The second paragraph is amended as follows:

The first sentence is changed from "...ASTM A 898/A 898 M..." to "...ASTM A 898/A 898 M or ASTM A 435/A 435 M as applicable and...".

504.31 Shop Assembly

The following is added to the last sentence:

The minimum assembly length shall include bearing centerlines of at least two substructure units.

SECTION 535 - PRECAST, PRESTRESSED CONCRETE SUPERSTRUCTURE

535.02 Materials

"Steel Strand for Concrete Reinforcement" is changed to "Steel Strand."

The following is added to the beginning of the third paragraph:

Concrete shall be Class P conforming to the requirements in this Subsection. Twenty-eight day compressive strength shall be as stated on the Plans. Coarse aggregate...

535.05 Inspection Facilities

The following is added to the last paragraph:

Failure to comply with the above requirements will be considered to be a denial to allow access to Work by the Contractor. The Department will reject any Work done when access for inspection is denied.

535.26 Lateral Post-Tensioning

The first paragraph is replaced with the following:

Overstressing strands for setting losses cannot be accomplished for chuck to chuck lengths of 7.6 m [25 feet] and less. In such instances, refer to the Plans for all materials and methods. Otherwise, post-tensioning shall be in accordance with PCI standards and shall provide the anchorage force as noted in the Plans. The applied jacking force shall be no less than 100 percent of the design jacking force.

SECTION 603 - PIPE CULVERTS AND STORM DRAINS

603.0311 Corrugated Polyethylene Pipe for Option III

Minimum Mandrel Diameter Table is replaced with the following:

Nominal Size US Customary (in)	Minimum Mandrel Diameter (in)	Nominal Size Metric (nun)	Minimum Mandrel Diameter (mm)
12	11.23	300	280.73
15	14.04	375	350.91
18	16.84	450	421.09
24	22.46	600	561.45
30	28.07	750	701.81
36	33.69	900	842.18
42	39.30	1050	982.54
48	44.92	1200	1122.90

SECTION 604 - MANHOLES, INLETS, AND CATCH BASINS

604.02 Materials

The following are added:

Tops and Traps	712.07
Corrugated Metal Units	712.08
Catch Basin and Manhole Steps	712.09

SECTION 605 - UNDERDRAINS

605.05 Underdrain Outlets

The first paragraph is amended as follows:

In the second sentence, the words "metal pipe" are deleted.

SECTION 606 - GUARDRAIL

606.02 Materials

The fourth paragraph, which reads "Retroreflective beam guardrail delineators..." is deleted and replaced with the following:

Reflectorized sheeting for Guardrail Delineators shall meet the requirements of Subsection 719.01, Reflective Sheeting. Delineators shall be fabricated from high-impact, ultraviolet and weather resistant thermoplastic.

The eighth paragraph, which reads "The sole patented supplier of multiple mailbox..." is deleted and replaced with the following:

Acceptable multiple mailbox assemblies shall be listed on the Department's Approved Products List and shall be NCHRP 350 tested and approved.

606.09 Basis of Payment

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

Butterfly-type guardrail reflectorized delineators shall be mounted on all W-beam guardrail at an interval of every 10 posts [62.5 feet] on tangents sections and every five posts [31.25 feet] on curved sections as directed by the Resident. On divided highways, the delineators shall be yellow on the left hand side and silver/white on the right hand side. On two-way roadways, the delineators shall be silver/white on the right hand side. All delineators shall have retroreflective sheeting applied to only the traffic facing side. Reflectorized guardrail delineators will not be paid for directly, but will be incidental to the guardrail items.

SECTION 615 - LOAM

615.02 Materials

This Subsection is amended as follows:

One hundred percent of the loam material must pass the two inch sieve.

Organic Content

Percent by Volume

Humus

"5% - 10%", as determined by Ignition Test

SECTION 618 - SEEDING

618.01 Description

The first sentence is amended to read:

This Work shall consist of furnishing and applying seed.

The words "and cellulose fiber mulch" are deleted from 618.01(a).

618.03 Rates of Application

The last sentence in 618.03(a) is deleted and replaced with the following:

These rates shall apply to Seeding Method 2, 3, and Crown Vetch.

In 618.03(c), "1.8 kg [4 lb]/unit." is deleted and replaced with "1.95 kg [4 lb]/unit."

618.09 Construction Method

In 618.09(a) 1, sentence two, "100 mm [four inches]" is replaced with "25 mm [one inch] (Method 1 areas) and 50 mm [two inches] (Method 2 areas)".

618.15 Temporary Seeding

The Pay Unit is changed from "Unit" to "Kg [lb]".

SECTION 620 - GEOTEXTILES

620.03 Placement

Section (c): Replace "Non-woven" in title with "Erosion Control".

The word "Non-woven" in the first paragraph is replaced with "Woven monofilament".

The word "Non-woven" in the second paragraph is replaced with "Erosion Control".

620.07 Shipment, Storage, Protection and Repair of Fabric

Section (a): the second sentence is replaced with the following:

Damaged geotextiles, as identified by the Resident, shall be repaired immediately.

620.09 Basis of Payment

Pay Item 620.58: "Non-woven" is replaced with "Erosion Control".

Pay Item 620.59: "Non-woven" is replaced with "Erosion Control".

SECTION 621 - LANDSCAPING

621.0036 Establishment Period

In the fourth and fifth paragraphs, "time of Final Acceptance" is replaced with "end of the period of establishment".

In the seventh paragraph, "Final Acceptance date" is replaced with "end of the period of establishment"; and "date of Final Acceptance" is replaced with "end of the period of establishment".

SECTION 626 - HIGHWAY SIGNING

626.034 Concrete Foundations

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

Pre-cast and cast-in-place foundations shall be warranted against leaning and corrosion for two years after the Project is complete. If the lean is greater than two degrees from normal or the foundation is spalling within the first two years, the Contractor shall replace the foundation at his own cost.

SECTION 639 - ENGINEERING FACILITIES

639.04 Field Offices

This Subsection is amended by the addition of the following:

The Field Office location shall be approved by the Resident and shall be provided when the Contract starts and shall remain until the Contract is complete. The Contractor shall be responsible for furnishing and maintaining electricity, heat, facsimile machine and appliances for the entire duration of the Contract, which includes periods of time which Work has been suspended.

The Contractor shall provide a plain paper (8-1/2" x 11") fax/copier machine with a 10 page (minimum) auto document feeder, 15 page (minimum) fax memory, 50 sheet (minimum) paper capacity, and a transmission speed of six pages (minimum) per minute for the Resident's use during the Project. All maintenance and supplies shall be the responsibility of the Contractor. The fax machine shall be connected to a separate telephone line so that the fax machine operates independent of the telephone and answering machine. A total of three phone lines shall be provided by the Contractor. All of the costs associated with the above shall be the responsibility of the Contractor except for the monthly telephone charges.

The following are not required:

- Accessible route conforming to the Americans with Disabilities Act
- Wheelchair accessible toilet

639.09 Telephone

This Subsection is amended as follows:

The Contractor shall be reimbursed at cost for the monthly telephone service charges. Telephone service shall remain throughout the Contract including periods of seasonal shutdowns.

639.11 Basis of Payment

The following is added after the first paragraph:

The Contractor shall be reimbursed at cost for the monthly telephone service charges. No additional markup will be allowed. The Contractor shall submit copies of the monthly bills to the Resident for payment.

SECTION 652 - MAINTENANCE OF TRAFFIC

652.2 Materials

The first sentence in the second paragraph is replaced with the following:

All construction signs shall be fabricated with super high intensity (ASTM 4956 – Type VII) retroreflective sheeting. All construction signs and construction sign packages shall have the Type VII sheeting material. 3924 Diamond Grade fluorescent orange sheeting manufactured by 3M conforms to ASTM 4956 – Type VII.

652.2.4 Other Devices

The eighth paragraph is amended by the addition of the following:

The Portable Message Signs shall be capable of being programmed remotely by telephone, of monitoring the speed of traffic in a travel lane, and of displaying a message in response to a vehicle exceeding an allowable speed threshold. The Contractor shall submit a catalog cut to the Resident for approval, establish a cellular account so that signs may be programmed remotely and provide training for the operation of the sign to the Resident.

The portable-changeable message signs may be moved throughout the Project area as required to provide advance warning of construction operations which may impact the flow of traffic as well used during lane closures to display messages relative to the speed of traffic. The Contractor shall remove, transport and maintain the signs as directed and approved by the Resident.

The Authority will be responsible for the actual programming of the signs.

A deduction will be made from money due the Contractor for signs that fail to operate for extended periods of time.

The following Subsection is added:

652.2.5 Safety Vests

All jobsite personnel shall wear a safety vest labeled as ANSI 107-199 standard performance for Class 2 risk exposure or an equivalent.

652.3.1 Responsibility of the Department

The first paragraph is deleted and replaced with the following:

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 following sentence is added to the end of this Subsection:

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 Resident.

652.3.2 Responsibility of the Contractor

The first paragraph is amended as follows:

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 following paragraph is added:

The Contractor shall designate a supervisor to be responsible for the safe placement and maintenance of all traffic control devices. This individual shall be trained to safely install and maintain the devices. The Contractor shall submit to the Resident, in writing, documentation stating that this individual has reviewed and understands the traffic control requirements of the Contract and the Manual of Uniform Traffic Control Devices.

652.3.3 Submittal of Traffic Control Plan

This Subsection is deleted and not replaced.

652.3.4 General

This Subsection is deleted in its entirety and replaced with the following:

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 the 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. The Contractor shall correct all problems or violations upon observation by the Contractor or upon notification by the Resident. Failure to correct a problem within one hour of notification during non-working hours or to respond immediately to a problem during Work hours, shall result in a penalty of \$150.00 per occurrence. The Resident shall be the sole judge as to the time and response.

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 (including loading or unloading vehicles) 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 Cones and Drums. These devices shall be installed and maintained at the spacing shown on the Traffic Control Plans, or determined by the MUTCD, through the Work area.

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 or approved by the Resident.

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, unless approved by the Resident, will be prohibited.

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 following Subsection is added:

652.3.41 Local Road General Requirements

Channelization devices consisting of barricades or drums, at a maximum spacing of 50 feet, shall be used in guardrail areas when neither the existing nor the new guardrail is in place. The Contractor shall not remove guardrail until absolutely necessary for construction operations in that area. The guardrail shall be replaced as soon as possible thereafter.

All excavation areas adjacent to the roadway shall be channelized continuously in both directions for the length of the Project in all areas where the centerline strip is not effective in accordance with the latest edition of MUTCD.

Where the roadway is adjacent to an area being excavated or filled, a minimum two foot shoulder should be maintained and the effective slope of the earth excavation or fill slope, beyond the two foot shoulder, shall not be steeper than 1-1/2 horizontal to 1 vertical. The effective slope of rock excavation shall not be steeper than 1 horizontal to 1 vertical beyond the two foot shoulder. In the case of cuts over five feet deep, an earth berm or other approved barrier shall be placed between the travel lane and the excavated area. In this instance, travel speeds shall be limited by specific advisory signing to 20 miles per hour in all cases. When excavation does not leave sufficient usable widths to maintain two-way traffic as provided in Subsection 105.4, Maintenance of Work, one-lane traffic controlled by a traffic signal or continuous flagging may be considered. Closely spaced vertical panels, drums or other channelizing devices shall be used on any of these types of areas that are left exposed for short durations.

When paving operations or shoulder grading leave a three inch or less exposed vertical face at the edge of the traveled way, channelization devices shall be placed two feet outside of the pavement at intervals not exceeding 600 feet and a 48 inch by 48 inch W8-9 “Low Shoulder” sign shall be placed at a maximum spacing of 1/2 mile. When paving operations or shoulder grading leave a three inch or greater exposed vertical face at the edge of the traveled way, the Contractor shall place shoulder material for a width of at least four feet to meet the pavement grade, and place channelizing devices as above, before the lane is opened to traffic.

652.3.5 Installation of Traffic Control Devices

The first paragraph is deleted and replaced with the following:

Portable signs shall be erected on temporary sign supports approved crashworthy devices in conformance with NCHRP 350 requirements so that the bottom is either 1) 300 mm [12 inches]; or 2) greater than 1.5 m [five feet] above the traveled way. Post-mounted signs shall be erected so the bottom is no less than 1500 mm [five feet] above the traveled way, and 2100 mm [seven feet] above the traveled way in business, commercial, and residential areas. All post-mounted signs on the turnpike mainline shall be erected so the bottom is no less than 2100 mm [seven feet] above the traveled way. Post-mounted signs must also be erected so that the sign face is in a true vertical position. All signs shall be mounted within four feet of the existing edge of pavement. All signs shall be placed so that they are not obstructed in any manner and immediately modified to ensure proper visibility if obstructed. Due to Contractor or Project staging, it may be necessary to relocate previously erected portable or post-mount signs so they are clearly visible. Signs may be mounted lower or higher to fit the situation when authorized by the Resident. Cones shall either be weighted or nailed. Tires will not be allowed as weights.

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

NHCRP 350 tested drums with tire sidewall ballasts are acceptable. 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 snow banks.

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

The method of covering existing signs must be approved by the Resident. The use of adhesives on the sign face is prohibited.

The sixth paragraph is deleted and replaced with the following:

The Contractor shall replace damaged or missing traffic control devices with similar devices of acceptable quality.

The following paragraph is added to the end of this Subsection:

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.

652.3.6 Traffic Control

The first sentence of the first paragraph is deleted and replaced with the following:

The minimum roadway width for local road one-way and two-way traffic, and minimum number of lanes and lane widths for the Maine Turnpike, are identified on the Project's traffic control plans and/or in Special Provision Section 652, Maintenance of Traffic (Specific Project Maintenance of Traffic).

The last sentence of the third paragraph is deleted and not replaced.

652.41 Traffic Officers

The first paragraph is deleted and replaced with the following:

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.

652.6 Night Work

The sixth and seventh paragraphs are deleted and not replaced.

The following Subsection is added:

652.61 Construction Vehicles

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, Type VII. The older type "Construction Vehicle - Do Not Follow" may be used until the end of their service life.

All vehicles used on the Project shall be equipped with amber flashing lights, visible from both front and rear, or by means of a single, approved type, revolving, flashing or strobe lights mounted so as to be visible 360 degrees. The vehicle flashing system shall be in continuous operation while the vehicle is on any part of the Project. Dump trucks and utility trucks shall have a strobe light mounted on each side of the vehicle.

652.7 Method of Measurement

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

The per unit measurement for payment of the portable-changeable message sign shall include the establishment and payment of a cellular phone account so that the portable-changeable message sign may be programmed remotely.

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

The number and locations of Flaggers will be determined by the Resident. Flaggers 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. 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.

652.8.2 Other Items

The last paragraph is deleted and replaced with the following:

There will be no payment made under any 652 pay items after the expiration of the adjusted total Contract time.

SECTION 653 - POLYSTYRENE PLASTIC INSULATION

653.05 Placing Backfill

In the second sentence, "...shall be not less than 150 mm [six inches] loose measure." is changed to "...shall be not less than 250 mm [10 inches] loose measure."

In the third sentence "...crawler type bulldozer of not more than 390 kg/m² [80 lb/ft²] ground contact pressure..." is changed to "...crawler type bulldozer of not more than 4875 kg/m² [2000 lb/ft²] ground contact pressure..."

653.06 Compaction

In the final sentence "...crawler type bulldozer of not more than 390 kg/m² [80 lb/ft²] ground contact pressure..." is change to "...crawler type bulldozer of not more than 4875 kg/m² [2000 lb/ft²] ground contact pressure..." it]."

SECTION 656 - TEMPORARY SOIL EROSION AND WATER POLLUTION CONTROL

Section 656 is deleted in its entirety and replaced with the following:

656.01 Description

This Work shall consist of providing temporary erosion control during construction in accordance with these Specifications, standard details, Best Management Practices, or as otherwise directed.

All temporary erosion control devices shall be in place and approved by the Resident prior to any embankment and excavation operations. The Contractor is responsible for repairing and replacing damaged or missing sandbags, haybales, and silt fence material. The Contractor shall maintain these devices in a clean and properly operating condition as described herein.

The Contractor is responsible for all temporary drainage and erosion control measures. The Contractor shall review his construction operations and staging to determine if additional erosion control measures are required. The Resident may also request additional erosion control measures. The cost for all erosion control devices necessary, due solely to the Contractor's construction operations and are not shown on the Plans, shall be borne solely by the Contractor. The frequency of inspection of these devices by the Contractor and the Erosion Control Compliance Officer (ECCO) shall be bi-weekly and immediately following a rainfall of greater than 1/2 inch in a 24-hour period.

In areas of ledge or frozen ground only, the Contractor may opt to furnish and install an erosion control filter berm in lieu of silt fence. The erosion control filter berm shall be a water permeable windrow of a composted bark mix to remove suspended soil particles from water moving off the site.

Erosion control filter berm shall be considered an erosion control device. This material and specific application shall be submitted to the Resident for approval.

656.02 General

Baled hay shall be bales at approximately 350 by 450 by 750 mm [14 by 18 by 30 inch], or an equivalent, securely tied to form a firm bale.

Sandbags shall consist of heavy cloth or woven plastic bags, approximately 0.03 m³ [one cubic foot] capacity, filled with sand or gravel.

Dumped stone shall be a graded mixture of large and small stone with approximately 50 percent of the stones larger than 150 mm [six inch].

Flexible drainage pipe shall consist of collapsible neoprene pipe, a minimum of 12 inches in diameter or equal.

656.03 Silt Fence

(a) Posts

Either hardwood posts or steel posts shall be used.

Hardwood posts shall be straight, at least 450 mm [18 inches] longer than the height of the silt fence and at least 32 mm by 32 mm [1 inch by 1 inch].

Staples shall be of No. 9 wire.

Steel posts shall be at least 450 mm [18 inches] longer than the height of the silt fence and have the means provided for fastening wire to the fence.

(b) Wire Support Fence

If required, wire support fence shall be at least 50 mm [2 inches] higher than the height of the silt fence. Horizontal and vertical wires shall be spaced no more than 150 mm [6 inches] apart. The top and bottom wires shall be at least 10 gauge; all other wires at least 12 gauge.

(c) Silt Fence

The woven geotextile fabric and components shall be made from polypropylene, polyester, polyimide or other chemically stable material and be resistant to ultraviolet radiation degradation for at least 12 months of installation. Silt retention capacity shall be no less than 75 percent. The fabric shall have a Mullen burst test of no less than 1790 kPa [260 pounds per square inch] with a maximum average sieve opening size of 850 µm to 250 µm [No. 20 to No. 60]. Roll width of the fabric shall be no less than 150 mm [6 inches] wider than the height of the fence, except fabric for boom supported floating silt fence which shall be no less than 600 mm [two feet] wider than the design width.

(d) Flotation Devices

The flotation boom and weighing devices for boom supported floating silt fence shall be sufficient to hold the fence in an approximately vertical position.

656.04 Temporary Erosion Checks

Temporary erosion checks shall be constructed in ditches and at other locations designated. Checks shall be in accordance with the Standard Detail unless otherwise directed.

Baled hay, sandbags, or both, shall be used in other areas as necessary to inhibit soil erosion.

Sediment deposits behind haybales and silt fence shall be removed when the depth of sediment reaches 50 percent of the erosion control device height.

The Contractor is also required to have on-site, at all times, 25 percent additional Contract quantities of silt fence for use as backup devices.

656.041 Erosion Control Filter Berm

The erosion control berm shall be placed uncompacted, in a windrow in locations approved by the Resident. The cross section of the berm shall be four feet wide at the base and 1-1/2 feet high at the center. The erosion control filter berm shall be removed when no longer required, as determined by the Resident, and shall be distributed over an adjacent area.

656.05 Temporary Berms

When designated, temporary barriers shall be constructed along the edge of the embankment. The barriers shall be of embankment earth material, gravel or sand as available and shaped approximately as shown in the Standard Details. The barriers shall be compacted with the wheels of construction equipment. When placed on pavement, the berms shall be constructed of asphalt grindings or other non-erodible soil material as approved by the Resident, and shaped as shown in the Standard Details.

At designated intervals, temporary slope drains shall be constructed with a crescent shaped barrier placed at each slope drain to direct the water into the inlet pipe.

656.06 Temporary Slope Drains

Collapsible pipe with corrugated metal pipe inlet shall be placed down the embankment slopes at designated locations and in accordance with the Best Management Practices.

At the outlet end of the drain, dumped stone shall be placed to prevent scoring unless otherwise directed.

656.07 Dumped Stone

Dumped stone shall be placed at designated locations and shaped to the extent necessary to spread the stone over the area and in sufficient depth to prevent soil erosion.

656.08 Silt Fence

The silt fence shall be installed at all environmentally sensitive areas as shown on the Plans or as directed. The Contractor shall have the option to provide a reinforced filter fabric or an unreinforced filter fabric attached to a wire fence.

The fence posts shall be spaced as specified by the Resident, however, not to exceed a maximum of 2.5 m [eight feet] apart when either type of silt fence is used and be driven a minimum of 450 mm [18 inches] into the ground.

The geotextile fabric shall be secured to the post or fence by suitable staples, tie wire or hog rings in such a manner as to prevent tearing and sagging of the fabric. The bottom of the geotextile fabric shall be entrenched into the ground a minimum depth of 150 mm [six inches] to prevent water from flowing under the fence. The geotextile shall be spliced together only at support posts with a minimum 150 mm [six inches] overlap and secure post connection which prevents leakage of silt. The top of the geotextile shall be installed with a reinforced top end section.

The Contractor shall maintain the silt fence in a functional condition at all times. All deficiencies shall be immediately corrected by the Contractor. The Contractor shall make a daily inspection of the silt fences in areas where construction activity causes drainage runoff, to ensure that the silt fences are properly located for effectiveness. Where deficiencies exist, additional silt fences shall be installed as approved or directed.

Sediment deposits shall be removed when sediments reach 50 percent of the height of the device. All sediment deposits remaining in place after the device is no longer required shall be graded to conform with the existing ground, seeded, and mulched immediately.

Geotextile fabric which has decomposed or has become ineffective and is still needed shall be replaced with material equal to the original design.

656.081 Boom Supported Floating Silt Fence

The silt fence fabric shall be securely attached to the flotation boom with a continuous weight placed the entire length of the fence to maintain the fence in a vertical submerged position from the surface of the water to the design depth.

Anchor's shall be placed at the ends of the fence, and intermediate locations if necessary, to hold the fence securely in place.

656.082 Maintenance

The erosion control devices will be cleaned, repaired, or replaced as necessary. All deficiencies shall be corrected immediately by the Contractor.

656.085 Erosion Control Compliance Officer

The Contractor shall designate an Erosion Control Compliance Officer (ECCO) on this Project who shall accompany the Resident's ECCO in the inspection of all erosion control devices. An inspection log shall be maintained by the Resident and the log shall be signed by the Resident's ECCO and the Contractor's ECCO after each inspection. Failure to comply with the erosion and sedimentation control requirements herein or as directed by the Resident's ECCO within 24-hours after the violation is noted in the inspection log, will result in the \$1,000 per day per violation penalty until the violation is corrected to the satisfaction of the Resident.

656.09 Removing and Disposing

When no longer needed, material and devices for temporary erosion control shall be removed or may be left in place and dispersed over an adjacent area, as directed.

When removed, such devices may be reused in other locations provided they are in good condition and suitable to perform the erosion control for which they are intended.

When dispersed over adjacent areas, the material shall be scattered to the extent that it causes no unsightly conditions nor creates future maintenance problems. Dumped stone shall be dispersed or covered in such a manner that it will not interfere with future mowing operations.

656.10 Method of Measurement

Baled hay and sandbags will be measured for payment by the number of bales or bags satisfactorily placed. Dumped stone will be measured for payment by the cubic meter [cubic yard] in vehicles.

Temporary berms and temporary slope drains will be measured for payment by the meter [linear foot] measured parallel with the flow line including the pipe inlet.

Temporary silt fence will be measured by the meter [linear foot] along the gradient of the fence, end post to end post.

Boom supported floating silt fence will be measured by the meter [linear foot] not including anchorages.

Erosion control filter berm shall be measured by the linear foot.

The quantity of additional haybales and silt fence material required herein will be measured for payment only when and if they are actually put to use as additional measures on the Project as directed by the Resident. Haybales and silt fence material used for maintenance or replacement of existing devices will not be measured for payment.

The removal of silt and other material from behind the haybales and silt fence will not be measured separately for payment, but shall be incidental to the Erosion Control items.

656.11 Basis of Payment

The accepted quantity of baled hay or sandbags will be paid for at the Contract unit price each for each bale or bag which price shall be full compensation for furnishing and placing the bales or sandbags, for furnishing and driving the stakes for baled hay and for the removing and disposing of the bales, stakes and sandbags when no longer needed.

The accepted quantity of temporary berms will be paid for at the Contract unit price per meter [linear foot] of berm which price shall be full compensation for furnishing, placing and compacting material, for maintaining and for removing the berm when no longer needed.

There will be no separate payment for excavation done in the construction of temporary erosion control items under this Section and all necessary excavation shall be incidental to the Work.

The accepted quantity of dumped stone will be paid for at the Contract unit price per cubic meter [cubic yard] which price shall be full compensation for furnishing the stone, transporting, placing and shaping. Payment for removal or for covering will be made under Item 629.05, Hand

Labor, and the appropriate equipment rental items.

The accepted quantity of temporary silt fence and boom supported floating silt fence will be paid for at the Contract unit price per meter [linear foot] complete in place. Payment shall be full compensation for furnishing, installing, maintaining, for replacing deteriorated geotextile and clogged geotextile when required and for removing and disposing of the fence when no longer needed.

The accepted quantity of erosion control filter berm will be paid for at the Contract unit price per linear foot under Item 656.632, 30 Inch Temporary Silt Fence, which price shall be full compensation for furnishing, placing, and removing the erosion control filter berm.

The removal of sediments and debris that accumulate around erosion control devices, when directed by the Resident, will be paid for under the appropriate Contract items.

Cost of seeding and mulching the area after removal of the temporary silt fence will be paid for at the Contract unit prices for Item 618, Seeding, and Item 619, Mulch.

Payment will be made under:

<u>Pay Item</u>	<u>Pay Unit</u>
656.50 Baled Hay, in place	Each
656.51 Sandbag, in place	Each
656.55 Dumped Stone	Cubic Meter [Cubic Yard]
656.60 Temporary Berms	Meter [Linear Foot]
656.62 Temporary Slope Drains	Meter [Linear Foot]
656.631 375 mm [15 inch] Temporary Silt Fence	Meter [Linear Foot]
656.632 750 mm [30 inch] Temporary Silt Fence	Meter [Linear Foot]
656.64 Boom Supported Floating Silt Fence	Meter [Linear Foot]

SECTION 701 – STRUCTURAL CONCRETE RELATED MATERIALS

701.10 Fly Ash - Chemical Requirements

All references to “ASTM C311” are changed to “ASTM C114”.

SECTION 703 - AGGREGATES

703.06 Aggregate for Base and Subbase

The first paragraph is deleted and replaced with the following:

The material shall have a minimum degradation value of 15 as determined by Washington State DOT Test Method T113, Method of Test for Determination of Degradation Value (March 2002 version), except that the reported degradation value will be the result of testing a single specimen from that portion of a sample that passes the 12.5 mm [1/2 inch] sieve and is retained on the 2.00 mm [No. 10] sieve, minus any reclaimed asphalt pavement used.

703.22 Underdrain Backfill Material

The first paragraph is amended as follows:

"...for Underdrain Type B..." is changed to "... for Underdrain Type B and C..."

SECTION 706 - NON-METALLIC PIPE

706.06 Corrugated Polyethylene Pipe for Underdrain, Option I and Option II in Culvert Pipe

The first sentence is changed from "...300 mm diameters to 900 mm" to "...300 mm diameters to 1,200 mm".

The last sentence which begins "This pipe and resins..." is deleted in its entirety and replaced with the following:

The manufacturing plants of polyethylene pipe shall be certified by the Eastern States Consortium. Polyethylene pipe shall be accepted based on third party certification by the AASHTO's National Transportation Product Evaluation Program.

SECTION 709 - REINFORCING STEEL AND WELDED STEEL WIRE FABRIC

709.03 Steel Strand

The second paragraph is changed from "...shall be 12mm [1/2 inch] AASHTO M203M/M203 (ASTM A416/A416M)..." to "...shall be 15.24 mm [0.600 inch] diameter AASHTO M203 (ASTM A416)...".

SECTION 712 - MISCELLANEOUS HIGHWAY MATERIALS

The following Subsections are added:

712.07 Tops and Traps

These metal units shall conform to the Plan dimensions and to the following Specification requirements for the designated materials:

Gray iron castings shall conform to the requirements of AASHTO M105, Class 30, unless otherwise designated.

Carbon steel castings shall conform to the requirements of AASHTO M103/M103M. Grade shall be 450-240 [65-35] unless otherwise designated.

Structural steel shall conform to the requirements of AASHTO M183/M183M or ASTM A283/A283M, Grade B or better. Galvanizing, where specified for these units, shall conform to the requirements of AASHTO M 111.

712.08 Corrugated Metal Units

The units shall conform to Plan dimensions and the metal to AASHTO M36/M36M. Bituminous coating, when specified, shall conform to AASHTO M 190 Type A.

712.09 Catch Basin and Manhole Steps

Steps for catch basins and for manholes shall conform to ASTM C478M [ASTM C478], Section 13 for either of the following material:

- (a) Aluminum steps-ASTM B221M, [ASTM B21 1] Alloy 6061-T6 or 6005-T5.
- (b) Reinforced plastic steps steel reinforcing bar with injection molded plastic coating copolymer polypropylene. Polypropylene shall conform to ASTM D 4101.

712.23 Flashing Lights

Flashing lights shall be power operated or battery operated as specified.

- (a) Power operated flashing lights shall consist of housing, adapters, lamps, sockets, reflectors, lens, hoods and other necessary equipment designed to give clearly visible signal indications within an angle of at least 45 degrees and from three to 90 m [10 to 300 feet] under all light and atmospheric conditions.

Two circuit flasher controllers with a two-circuit filter capable of providing alternate flashing operations at the rate of not less than 50 nor more than 60 flashes per minute shall be provided.

The lamps shall be 650 lumens, 120 volt traffic signal lamps with sockets constructed to properly focus and hold the lamp firmly in position.

The housing shall have a rotateable sun visor not less than 175 nun [seven inches] in length designed to shield the lens.

Reflectors shall be of such design that light from a properly focused lamp will reflect the light rays parallel. Reflectors shall have a maximum diameter at the point of contact with the lens of approximately 200 mm [eight inches].

The lens shall consist of a round one-piece convex amber material which, when mounted, shall have a visible diameter of approximately 200 mm [eight inches]. They shall distribute light and not diffuse it. The distribution of the light shall be asymmetrical in a downward direction. The light distribution of the lens shall not be uniform, but shall consist of a small high intensity portion with narrow distribution for long distance throw and a larger low intensity portion with wide distribution for short distance throw. Lenses shall be marked to indicate the top and bottom of the lens.

- (b) Battery operated flashing lights shall be self- illuminated by an electric lamp behind the lens. These lights shall also be externally illuminated by reflex reflective elements built into the lens to enable it to be seen by reflex reflection of the light from the headlights of oncoming traffic. The batteries must be entirely enclosed in a case. A locking device must secure the case. The light shall have a flash rate of not less than 50 nor more than 60 flashes per minute from minus 30°C [minus 20°F] to plus 65°C [plus 150°F]. The light shall have an on time of not less than 10 percent of the flash cycle. The light beam projected upon a surface perpendicular to the axis of the light beam shall produce a lighted rectangular projection whose minimum horizontal dimension shall be five degrees each side of the horizontal axis. The effective intensity shall not have an initial value greater than 15.0 candelas or drop below 4.0 candelas during the first 336-hours of continuous flashing. The illuminated lens shall appear to be uniformly bright over its entire illuminated surface when viewed from any point within an angle of nine degrees each side of the

vertical axis and five degrees each side of the horizontal axis. The lens shall not be less than 175 mm [seven inches] in diameter including a reflex reflector ring of 13 mm [1/2 inch] minimum width around the periphery. The lens shall be yellow in color and have a minimum relative luminous transmittance of 0.440 with a luminance of 2854° Kelvin. The lens shall be one-piece construction. The lens material shall be plastic and meet the luminous transmission requirements of this Specification. The case containing the batteries and circuitry shall be constructed of a material capable of withstanding abuse equal to or greater than 1.21 mm thick steel [No. 18 U.S. Standard Gage Steel]. The housing and the lens frame, if of metal shall be properly cleaned, degreased and pretreated to promote adhesion. It shall be given one or more coats of enamel which, when dry shall completely obscure the metal. The enamel coating shall be of such quality that when the coated case is struck a light blow with a sharp tool, the paint will not chip or crack and if scratched with a knife will not powder. The case shall be so constructed and closed as to exclude moisture that would affect the proper operation of light. The case shall have a weep hole to allow the escape of moisture from condensation. Photoelectric controls, if provided, shall keep the light operating whenever the ambient light falls below 215 lx [20 foot candles]. Each light shall be plainly marked as to the manufacturer's name and model number.

If required by the Resident, certification as to conformance to these Specifications shall be furnished based on results of tests made by an independent testing laboratory. All lights are subject to random inspection and testing. All necessary random samples shall be provided to the Resident upon request without cost to the Authority. All such samples shall be returned to the Contractor upon completion of the tests.

712.32 Copper Tubing

Copper tubing and fittings shall conform to the requirements of ASTM B88M Type A [ASTM B88, Type K] or better.

712.33 Non-metallic Pipe, Flexible

Non-metallic pipe and pipe fittings shall be acceptable flexible pipe manufactured from virgin polyethylene polymer suitable for transmitting liquids intended for human or animal consumption.

712.34 Non-metallic Pipe, Rigid

Non-metallic pipe shall be Schedule 40 polyvinylchloride (PVC) that meets the requirement of ASTM D 1785. Fittings shall be of the same material.

712.341 Metallic Pipe

Metallic pipe shall be ANSI, Standard B36. 10, Schedule 40 steel pipe conforming to the requirements of ASTM A53 Types E or S, Grade B. End plates shall be steel conforming to ASTM A36/A36M.

Both the sleeve and end plates shall be hot dip galvanized. Pipe sleeve splices shall be welded splices with full penetration weld before galvanizing.

712.35 Epoxy Resin

Epoxy resin for grouting or sealing shall consist of a mineral filled thixotropic, flexible epoxy resin having a pot life of approximately one hour at 10°C [50°F]. The grout shall be an approved product suitable for cementing steel dowels into the preformed holes of curb inlets and adjacent

curbing. The sealant shall be an approved product, light gray in color and suitable for coating the surface.

712.36 Bituminous Curb

The asphalt cement for bituminous curb shall be of the grade required for the wearing course, or shall be Viscosity Grade AC-20 meeting the current requirements of Subsection 702.01, Asphalt Cement. The aggregate shall conform to the requirements of Subsection 703.07. The coarse aggregate portion retained on the 2.36 mm [No. 8] sieve may be either crushed rock or crushed gravel.

The mineral constituents of the bituminous mixture shall be sized and graded and combined in a composite blend that will produce a stable durable curbing with an acceptable texture. Bituminous material for curb shall meet the requirements of Section 403, Hot Bituminous Pavement.

712.37 Precast Concrete Slab

Portland Cement concrete for precast slabs shall meet the requirements of Section 502, Structural Concrete, Class A.

The slabs shall be precast to the dimension shown on the Plans and cross section and in accordance with the Standard Detail Plans for Concrete Sidewalk Slab. The surface shall be finished with a float finish in accordance with Subsection 502.14(c). Lift devices of sufficient strength to hold the slab while suspended from cables shall be cast into the top or back of the slab.

712.38 Stone Slab

Stone slabs shall be of granite from an acceptable source, hard, durable, predominantly gray in color, free from seams which impair the structural integrity and be of smooth splitting character. Natural color variations characteristic of the deposit will be permitted. Exposed surfaces shall be free from drill holes or indications of drill holes. The granite slabs in any one section of backslope must be all the same finish.

The granite slabs shall be scabble dressed or sawed to an approximately true plane having no projections or depressions over 13 mm [1/2 inch] under a 600 mm [two foot] straightedge or over 25 mm [one inch] under a 1200 mm [four foot] straightedge. The arris at the intersection of the top surface and exposed front face shall be pitched so that the arris line is uniform throughout the length of the installed slabs. The sides shall be square to the exposed face unless the slabs are to be set on a radius or other special condition which requires that the joints be cut to fit, but in any case shall be so finished that when the stones are placed side by side no space more than 20 mm [3/4 inch] shall show in the joint for the full exposed height.

Lift pin holes in all sides will be allowed except on the exposed face.

SECTION 717 - ROADSIDE IMPROVEMENT MATERIAL

717.03 C. Method #3 - Roadside Mixture #3

Seed proportions are amended as follows:

Crown Vetch	25.0%
Perennial Lupine	25.0%
Red Clover	12.5%
Annual Rye	37.5%

717.05 Mulch Binder

The third sentence is amended as follows:

"Paper fiber mulch may be used as a binder at the rate of 2.3 kg/unit [5 lb/unit]."

MAINE TURNPIKE AUTHORITY

SPECIFICATIONS

PART II – SPECIAL PROVISIONS

MAINE TURNPIKE AUTHORITY

SPECIFICATIONS

PART II - SPECIAL PROVISIONS

All work shall be governed by the Maine Department of Transportation Standard Specifications, 2002 Edition, except for that work which applies to sections of the Maine Department of Transportation Standard Specifications which are amended by the Maine Turnpike General Provisions and the following modifications, additions and deletions.

General Description of Work

The work consists of the addition of a dedicated lane to the right side of the existing on ramp toll plaza beginning 600 feet west of the Saco Exit 36 Toll Plaza on I-195 and extending easterly 1160 feet to approximately 400 feet east of the Saco Exit 36 Toll Plaza. The widening will include widening existing road embankment with geofoam and granular material, replacement/relocation of existing guardrail, constructing a separating island, provisions for toll equipment including an overhead gantry and maintenance or traffic. In addition the project includes relocating an existing overhead Variable Message Sign (VMS) and its structure, controls and controller cabinet at Interchange 36 in the Saco side plaza to a location on the southbound mainline near Limerick Road in Arundel (MM 28.3); constructing two new VMS drilled shaft foundations; constructing a new controller cabinet foundation, adding new guardrail; widening the embankment and extending a drainage pipe for the new guardrail; modifying the median guardrail; providing electrical service; and all other work incidental thereto in accordance with the Plans and Specifications

The general limits of work are at Mile 28.3 (Station 1360+00) in Arundel and at Mile 36.0 (Exit 36 Interchange at Saco Toll Plaza on 195) in Saco.

The major components of work are listed below:

- Lane addition at Interchange 36 Saco Toll Plaza
- Installing provisions for the tolling system included with this contract and coordinating with the tolling system integrator on all items
- Relocation of a Variable Message Sign (VMS) from the Saco Toll Plaza to Mile 28.3 near Limerick Road in Arundel.

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 2015.06 INTERCHANGE 36 SACO TOLL PLAZA LANE ADDITION (MM 36.0) & VARIABLE MESSAGE SIGN RELOCATION (MM 28.3)”. The right is reserved by the Resident to make such minor corrections or alterations in the Plans as he deems necessary without change in the unit prices on the Schedule of Prices of the Proposal.

101.2 Definition

Holidays

The following is added after Memorial Day in the General Provisions:

Independence Day 2015	6:00 a.m. preceding Friday to 6:00 a.m. the following Monday.
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103.4 Notice of Award

The following sentence is added:

The Maine Turnpike Authority Board is scheduled to consider the Contract Award on March 26, 2015.

104.2.2 Furnishing of Permits

The following sentences are added:

The Contractor shall obtain the following permit:

- Electrical.

See related Subsection 105.8.2, Permit Requirements (Environmental).

104.3.8 Wage Rates and Labor Laws

The fourth paragraph under Records on GP Page 7 of 53 has been amended as follows:

A copy of each record must be filed monthly with the Maine Turnpike Authority. This information shall be sent directly to the Maine Turnpike Authority, Director of Engineering and Building Maintenance, Attention: Wage Rate Records, 2360 Congress Street, Portland, ME 04102. The records shall note the Maine Turnpike Contract Number.

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 THE PERTAINING STATE FUNDED PREVAILING WAGE
CONSTRUCTION SITE**

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

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

Title of Project -----E-Z Pass Lane Addition Exit 36 Toll Plaza- 2015.06

Location of Project -Saco, York County

**2015 Fair Minimum Wage Rates
Highway & Earthwork York County**

Occupation Title	Minimum			Occupation Title	Minimum		
	Wage	Benefit	Total		Wage	Benefit	Total
Asphalt Raker	\$16.25	\$0.48	\$16.73	Ironworker - Reinforcing	\$20.00	\$1.23	\$21.23
Backhoe Loader Operator	\$19.50	\$0.71	\$20.21	Ironworker - Structural Laborers (Incl. Helpers & Tenders)	\$22.65	\$6.06	\$28.71
Bricklayer	\$23.24	\$1.80	\$25.04	Laborer - Skilled	\$15.50	\$3.60	\$19.10
Bulldozer Operator	\$18.83	\$3.23	\$22.06	Line Erector - Power/Cable Splicer	\$27.42	\$8.05	\$35.47
Carpenter	\$19.00	\$1.75	\$20.75	Loader Operator - Front-End	\$17.00	\$2.68	\$19.68
Carpenter - Rough	\$24.00	\$1.90	\$25.90	Mechanic- Maintenance	\$18.00	\$2.47	\$20.47
Cement Mason/Finisher	\$16.81	\$0.74	\$17.55	Painter	\$16.75	\$3.50	\$20.25
Concrete Pump Operator	\$19.00	\$3.35	\$22.35	Paver Operator	\$20.00	\$1.57	\$21.57
Crane Operator =>15 Tons)	\$24.00	\$4.81	\$28.81	Pipelayer	\$15.16	\$1.73	\$16.89
Crusher Plant Operator	\$19.38	\$3.44	\$22.82	Pump Installer	\$22.00	\$2.70	\$24.70
Diver	\$23.00	\$8.25	\$31.25	Reclaimer Operator	\$20.75	\$10.84	\$31.59
Driller - Rock	\$17.50	\$4.86	\$22.36	Rigger	\$20.00	\$3.18	\$23.18
Earth Auger Operator	\$22.50	\$8.14	\$30.64	Roller Operator - Pavement	\$17.00	\$1.17	\$18.17
Electrician - Licensed	\$27.77	\$13.76	\$41.53	Screed/Wheelman	\$17.00	\$4.32	\$21.32
Electrician Helper/Cable Puller (Licensed)	\$16.39	\$3.23	\$19.62	Stone Mason	\$17.00	\$0.00	\$17.00
Excavator Operator	\$18.50	\$2.40	\$20.90	Truck Driver - Light	\$17.00	\$1.46	\$18.46
Fence Setter	\$11.00	\$0.00	\$11.00	Truck Driver - Medium	\$17.00	\$0.30	\$17.30
Flagger	\$9.00	\$0.00	\$9.00	Truck Driver - Heavy	\$15.00	\$1.75	\$16.75
Grader/Scraper Operator	\$20.00	\$4.90	\$24.90	Truck Driver - Tractor Trailer	\$15.00	\$0.53	\$15.53
Highway Worker/Guardrail Installer	\$16.80	\$3.56	\$20.36	Truck Driver - Mixer (Cement)	\$13.79	\$3.62	\$17.41
Hot Top Plant Operator	\$20.75	\$10.84	\$31.59				

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.

Posting of Schedule - Posting of this schedule is required in accordance with 26 MRSA §1301 et. seq., by any contractor holding a State contract for construction valued at \$50,000 or more and any subcontractors to such a contractor.

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 with the Secretary of State.

Determination No: HI-030-2015

Filing Date: January 14, 2015

Expiration Date: 12-31-2015

A true copy

Attest: Pamela D Megathlin
Pamela D Megathlin
Director
Bureau of Labor Standards

BLS 424HI (R2015) (Highway & Earthwork York)

**THIS DOCUMENT MUST BE CLEARLY POSTED AT THE PERTAINING STATE FUNDED PREVAILING WAGE
CONSTRUCTION SITE**

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

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

Title of Project -----E-Z Pass Lane Addition Exit 36 Toll Plaza- 2015.06

Location of Project -Saco, York County

**2015 Fair Minimum Wage Rates
Heavy & Bridge York County**

Occupation Title	Minimum Wage	Minimum Benefit	Minimum Total	Occupation Title	Minimum Wage	Minimum Benefit	Minimum Total
Asphalt Raker	\$14.00	\$0.00	\$14.00	Line Erector - Power/Cable Splicer	\$28.50	\$7.70	\$36.20
Backhoe Loader Operator	\$18.00	\$2.23	\$20.23	Loader Operator - Front-End	\$17.50	\$3.02	\$20.52
Bulldozer Operator	\$18.00	\$2.77	\$20.77	Mechanic- Maintenance	\$21.50	\$3.58	\$25.08
Carpenter	\$22.00	\$2.18	\$24.18	Mechanic- Refrigeration	\$22.00	\$4.43	\$26.43
Carpenter - Rough	\$17.90	\$2.67	\$20.57	Millwright	\$24.73	\$3.42	\$28.15
Cement Mason/Finisher	\$16.81	\$0.74	\$17.55	Painter	\$16.00	\$0.00	\$16.00
Communication Equip Installer	\$23.57	\$5.63	\$29.20	Pile Driver Operator	\$22.52	\$4.06	\$26.58
Comm Transmission Erector-Microwave & Cell	\$18.00	\$2.92	\$20.92	Pipe/Steam/Sprinkler Fitter	\$21.50	\$4.30	\$25.80
Crane Operator <15 Tons	\$25.00	\$1.45	\$26.45	Pipelayer	\$23.06	\$9.55	\$32.61
Crane Operator =>15 Tons)	\$24.35	\$2.25	\$26.60	Plumber (Licensed)	\$24.00	\$3.63	\$27.63
Crusher Plant Operator	\$18.65	\$3.62	\$22.27	Plumber Helper/Trainee (Licensed)	\$17.88	\$2.39	\$20.27
Diver	\$23.00	\$8.25	\$31.25	Propane & Natural Gas Servicer & Inst	\$24.00	\$3.13	\$27.13
Driller - Rock	\$17.50	\$4.86	\$22.36	Pump Installer	\$22.00	\$2.70	\$24.70
Earth Auger Operator	\$22.50	\$10.46	\$32.96	Reclaimer Operator	\$20.75	\$10.84	\$31.59
Electrician - Licensed	\$28.00	\$14.20	\$42.20	Rigger	\$20.00	\$3.18	\$23.18
Electrician Helper/Cable Puller (Licensed)	\$17.50	\$8.16	\$25.66	Roller Operator - Earth	\$12.50	\$4.76	\$17.26
Excavator Operator	\$21.05	\$3.52	\$24.57	Roller Operator - Pavement	\$18.75	\$5.25	\$24.00
Fence Setter	\$14.00	\$0.00	\$14.00	Screed/Wheelman	\$17.00	\$3.42	\$20.42
Flagger	\$9.00	\$0.00	\$9.00	Track Moving Machine Operator	\$17.71	\$4.08	\$21.79
Ironworker - Reinforcing	\$20.00	\$1.23	\$21.23	Truck Driver - Light	\$17.00	\$1.46	\$18.46
Ironworker - Structural	\$23.70	\$1.36	\$25.06	Truck Driver - Medium	\$12.25	\$0.93	\$13.18
Laborers (Incl.Helpers & Tenders)	\$15.00	\$1.04	\$16.04	Truck Driver - Heavy	\$15.94	\$2.34	\$18.28
Laborer - Skilled	\$17.69	\$2.79	\$20.48	Truck Driver - Tractor Trailer	\$20.50	\$2.85	\$23.35

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.

Posting of Schedule - Posting of this schedule is required in accordance with 26 MRSA §1301 et. seq., by any contractor holding a State contract for construction valued at \$50,000 or more and any subcontractors to such a contractor.

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 with the Secretary of State.

Determination No: HB-012-2015
Filing Date: January 14, 2015
Expiration Date: 12-31-2015

A true copy
Attest: Pamela D Megathlin
Pamela D Megathlin
Director
Bureau of Labor Standards

BLS 424HB (R2015) (Heavy & Bridge York)

104.4.4 Request for Information (RFI)

This Subsection is amended by the addition of the following:

RFI's shall be submitted on company letterhead or on a standard company form with a tracking number. The General Contractor shall maintain a corresponding RFI log.

RFI's may be attached to an e-mail, but shall not be in the form of an e-mail, and at a minimum, must reference the subject Plan or Specification in question.

RFI's with multiple questions may be treated as a submittal and the allowed 21 calendar days for review and response will govern.

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 his 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 his 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:

Existing utilities at the site include:

Central Maine Power
Mark Weiner
162 Canco Road
Portland, Maine 04103

Fairpoint
Martin Pease
5 Davis Farm Road
Portland, Maine 04103

Time Warner Cable
Mark Pelletier
118 Johnson Road
Portland, Maine 04102-1911

104.4.7 Cooperation With Other Contractors

This Subsection is amended by the addition of the following:

TransCore is the system integrator for installation of the tolling system outside the scope of Contractor's work. The Contractor shall work with the Resident to communicate with TransCore and schedule time periods for planning and oversight of installations as needed. TransCore will be onsite at times to provide the Contractor guidance with installation of tolling components.

105.3 Traffic Control and Management

See Special Provision Section 526, Concrete Barrier.

See Special Provision Section 652, Maintenance of Traffic.

105.4.1 Maintenance During Construction

This Subsection is amended by the addition of the following:

Once paid for mobilization, the Contractor is responsible for maintenance of the road that is open to local traffic within the Project limits. This does not include winter maintenance of deicing and snow removal.

Mobilization payment is defined as the Pay Requisition being submitted by the Resident to the Authority for payment.

Paved Surface - The Contractor is responsible for maintaining the existing paved shoulder, ramps and travel lanes on the Maine Turnpike in good condition. The presence of tracked-dirt on the paved surfaces is unacceptable. The Resident shall have the sole authority to determine the acceptability of the paved surfaces. The use of stabilized construction entrances and frequent sweeping of the shoulder are the responsibility of the Contractor and shall be completed at no additional costs to the Authority.

Erosion and Sedimentation Control - The Contractor shall plan their operations to protect existing work from erosion. The Contractor is responsible for the inspection and maintenance of all erosion and sedimentation control devices until final acceptance. No payment will be made to repair failed areas if the Best Management Practices had not been utilized prior to a weather event.

105.4.3 Maintenance During Winter Construction

This Subsection is amended by the addition of the following:

The Contractor is responsible for the maintenance of erosion control and traffic control devices. The Authority will be responsible for winter road maintenance for lanes open to traffic.

The Contractor is also responsible for snow and ice removal from all drainage paths and catch basins located behind traffic control devices, in order to maintain drainage away from the paved travel way.

105.5 Hauling of Materials and Equipment

The Contractor may use the Maine Turnpike service access roadway from Limerick Road to access the Arundel (MM 28.3) work area. The Contractor shall lock the gate during non-working-hours. The Contractor shall be subject to a daily fine of \$400 for failure to have a locked gate.

Access to the Saco lane addition and toll work shall be from I-195 westbound.

This Subsection is deleted from the General Provisions and replaced with the following:

105.5.1 General Requirements

Construction Access

The Contractor shall construct a stabilized construction entrance in accordance with the Best Management Practices at all locations where construction vehicles will exit and/or enter existing paved shoulders or travel ways from non-paved areas. The Resident shall approve of the locations. The stabilized construction entrance shall be constructed in conjunction with the clearing activities or other early activities. Additional stabilized construction entrances may be required due to the Contractor's operations as well as site conditions. The construction and maintenance of the stabilized construction entrance including frequent sweeping of the paved surfaces shall be incidental to the Contract.

The Contractor shall be granted free use of the turnpike for movement of vehicles, labor and equipment and for delivery of material essential to the Work. The Contractor will be issued cards with the Contract Number and Contractor Name while working on the Project. The cards shall be transferable and distributed by the Contractor to employees and vehicles working on the Project. The cards may only be used while working on the Project designated on the cards. Such free use shall be limited to the portion of the turnpike between the site of the Work and the nearest practicable exit including movement of vehicles, labor, equipment and materials from one site to another Work site. All vehicles must stop at a manned lane at the toll plazas to present the cards to the toll attendant. Vehicles without the required cards shall pay the required toll. This shall not be a reimbursable expense. The Contractor shall advise the Resident of the number of cards that are required. All cards shall be returned to the Resident at the completion of the Project. The use of the cards for toll free travel shall be revoked if the cards are misused. The Contractor shall nevertheless comply with regulations of the Authority relating to use of the turnpike and with established controls for non-revenue vehicles.

Existing Access

All existing access from local roads to the Maine Turnpike shall remain passable to emergency vehicles at all time. At no time shall construction equipment or material block these roads. Any misuse of this privilege will result in the Contractor's loss of access through these gates. The Contractor shall provide a lock and a piece of chain to link to the existing padlock on the gate allowing access to the Contractor and emergency vehicles.

Access From Local Roads

Any damage caused to private property or local roads as a result of the access shall be repaired at the Contractor's own expense.

Change of Direction

The Contractor will not be permitted to reverse directions (U-turns) at the toll plazas or at interchanges. All vehicles must exit the turnpike prior to reversing directions.

The Contractor shall not use the median openings on the turnpike unless the opening is located within passing lane closures on both roadways. The Contractor will be assessed a fine every time any employee of the Contractor, Subcontractor or supplier is observed using a median opening by a Resident or turnpike employee anywhere on the Maine Turnpike throughout the duration of the Contract. The fine will be deducted from monies owed to the Contractor.

The fines will be levied on a per occurrence basis as follows:

NUMBER OF OCCURRENCES	FINE
First	\$100

For the second occurrence, and any occurrence thereafter, the fine is increased by \$100 per each occurrence. The number of occurrences is not specific to a Contract, an individual or a vehicle, but based solely on the number of times any employee of the Contractor, Subcontractor or supplier is observed using a median opening anywhere on the Maine Turnpike. The Contractor shall be notified in writing of the violation by the Authority.

105.7.4 Submittal Requirements

The following paragraph is added:

In addition to the hardcopy requirement, the contractor shall also make submittals in PDF electronic file format via email. Submittals shall be accompanied by a cover sheet, which identifies the submittal number, subject date, and any revision numbers associated with the submittal.

105.8.1 Temporary Soil Erosion and Water Pollution Control

This Subsection in the General Provisions is deleted and replaced with the following:

The Contractor shall certify in writing to the Resident that an On-Site Responsible Party (OSRP) has been trained and is knowledgeable in erosion and sediment control (ECS) through the MaineDEP's Non-Point Source Training Center, or an equivalent program, or is licensed in the State of Maine as a Professional Engineer, Landscape Architect or Soil Scientist. Proof of certification for the OSRP, and any other Contractor employees charged with conducting ESC inspections, must be submitted to the Authority's Environmental Coordinator prior to starting work.

Spill Prevention Control and Countermeasure (SPCC) Plan

Any areas where petroleum products, oils or non-petroleum hazardous materials are handled or stored will require a Spill Prevention Control and Countermeasure (SPCC) Plan. These materials may not be stored or handled in areas of the site draining to an infiltration area. The Plan will be submitted to the Resident before construction begins. In addition to petroleum products and hazardous materials, controls must be used to prevent additional pollutants (i.e., fertilizers, pesticides, salt/brine, litter, construction demolition debris, etc.) from being discharged from materials on-site, including storage practices to minimize exposure of the materials to stormwater, and appropriate spill prevention, containment, and response planning and implementation. The Plan shall provide the following information at a minimum:

1. The name and emergency response numbers (telephone number, cellular phone and pager numbers, if applicable) of the Contractor's representative responsible for spill prevention and response;
2. Description of handling or storage location noting setbacks from water bodies where relevant. Significant sand and gravel aquifers and other sensitive resources, including infiltration areas, must be avoided wherever possible;
3. Description of storage and containment facilities, such as dikes, berms, sumps, and other forms of secondary containment that prevent discharge to groundwater or surface water;
4. Description of equipment and/or materials used to prevent discharges (including sorbent materials);
5. Preventative measures to minimize the possibility of a spill; and,
6. Contingency plan if spill should occur.

The approved plan must be posted at the Project site. All personnel working in the area are required to read and be familiar with the plan.

There shall be no separate payment for preparation of a SPCC Plan acceptable to the Resident and preparation shall be incidental to the work.

Notification of Authority of Hazardous Material Spills

In addition to MaineDEP reporting requirements for spills greater than five (5) gallons, the Contractor shall notify the on-site Resident Inspector. The on-site Resident Inspector shall notify the Maine Turnpike Radio Room at 207-871-7701. When the on-site Resident Inspector is not available, the Contractor shall notify the Maine Turnpike Radio Room directly at 207-871-7701.

In addition to MaineDEP reporting requirements for all spills where any stream or water body is threatened, the Contractor shall notify the on-site Resident Inspector. The on-site Resident Inspector shall notify the Maine Turnpike Radio Room at 207-871-7701. When the on-site Resident Inspector is not available, the Contractor shall notify the Maine Turnpike Radio Room directly at 207-871-7701.

These notification procedures shall be incorporated into the Spill Prevention Control and Countermeasure (SPCC) Plan.

Responsibility for Control and Cleanup of Hazardous Material Spills

The Contractor shall be responsible to control spills and properly cleanup, containerize, and dispose of petroleum and/or other hazardous material waste that results from the actions and/or equipment of the Contractor or his employees, subcontractors and suppliers. Chemicals, exposed to stormwater must be prevented from becoming a pollutant source.

The Contractor shall also be responsible for all direct and indirect costs associated with the control of spills and proper cleanup, containerization, and disposal of petroleum and/or other hazardous material waste that results from the actions and/or equipment of the Contractor or his employees, subcontractors and suppliers.

The following Subsections are added:

105.8.1.1 Environmental Standards

The Project will be performed in accordance with the MaineDOT Best Management Practices (BMP) latest issue. The Contractor shall fully comply with all erosion and sedimentation control requirements outlined in the BMP's or contained herein. Non-compliance with these requirements as determined by the Resident shall result in a financial penalty of \$1,000 per day, per violation. Any fines assessed to the Maine Turnpike Authority as a result of the Contractor's non-compliance shall be paid by the Contractor. If the Contractor fails to pay, the cost of the fine will be deducted from monies due, or which may become due, to the Contractor under this Contract.

In the event of conflict between these Specifications and other erosion and pollution control laws, rules or regulations of other Federal, State and local agencies, the more restrictive law, rules or regulations shall apply.

The standards as described below shall be met on the Project:

105.8.1.1.1 Water Pollution Control Requirements

(a) General

1. The Contractor must comply with the applicable Federal, State and local laws and regulations relating to prevention and abatement of water pollution.
2. Except as allowed by an approved permit or otherwise authorized by the Authority in writing, pollutants containing construction debris including excavated material, aggregate, residue from cleaning, sandblasting or painting, cement mixtures, chemicals, fuels, lubricants, bitumens, raw sewage, wood chips, and other debris shall not be discharged into water bodies, wetlands or natural or manmade channels leading thereto and such materials shall not be located alongside water bodies, wetlands, or such channels such that it will be washed away by high water runoff. Furthermore, liquid petroleum products and other hazardous materials with the potential to contaminate groundwater may not be stored or handled in the areas of the site draining to an infiltration area,

unless these portions of the site (where storage and handling of these materials) are isolated using dikes, berms, sumps and other forms of secondary containment that prevent discharge to groundwater.

3. Temporary winter stabilization must be used between November 1st and April 15th or outside of said time period if the ground is frozen or snow covered. Temporary winter stabilization involves, at a minimum, covering all disturbed soils and seeded ground that is not Acceptable Work with an approved method. Use of these methods for over-winter temporary erosion control will be paid for under the appropriate Erosion Control items included in the Contract.
4. Construction operations in water bodies or wetlands shall be restricted to the construction limits shown on the Plans and to those areas that must be entered for the construction of temporary or permanent structures, except as allowed by approved permit or otherwise authorized by the Authority in writing. Mechanized equipment shall not be operated in water bodies or wetlands except as allowed by approved permit or otherwise authorized by the Authority in writing.
5. Upon completion of the work, water bodies or wetlands shall be promptly cleared of all falsework, piling, debris or other obstructions caused by the construction operations, except as allowed by approved permit or otherwise authorized by the Authority in writing.

(b) Earthwork

If earthwork disturbance is part of the Project scope:

1. Newly disturbed earth shall be mulched or otherwise stabilized by the end of each workday. Mulch shall be maintained on a daily basis.
2. All disturbed ditches shall be stabilized by the end of each workday. Stabilization shall be maintained on a daily basis.
3. Erosion control blanket shall be installed in the bottom of all ditches except where a stone lining is planned. Seed shall be applied prior to the placement of the blanket.
4. Permanent slope stabilization measures shall be applied within one (1) week of the last soil disturbance. Newly seeded or sodded areas must be protected from vehicle traffic, excessive pedestrian traffic, and concentrated runoff until the vegetation is well-established. If necessary, areas must be reworked and restabilized if germination is sparse, plant coverage is spotty, or topsoil erosion is evident.
5. Dust control items, other than those under Standard Specification Section 637, Dust Control, if applicable, shall be included in the plan.

105.8.1.1.2 Construction Requirements

1. The Contractor, to the maximum extent practicable, shall install temporary and permanent sedimentation control measures prior to conducting clearing and grubbing operations.
2. The Contractor shall conduct inspections of disturbed and impervious areas, erosion control measures, materials storage areas that are exposed to precipitation, and locations where vehicles enter or exit the site. Inspections shall be conducted (1) at least once a week as well as before and after a storm event and prior to completing

- permanent stabilization measures; and (2) by a person knowledgeable of erosion and stormwater control, including the standards and conditions in the permit.
3. The Contractor shall maintain all measures in effective operating condition until areas are permanently stabilized. If BMPs need to be modified (i.e., corrective action, additional BMPs installed, etc.), implementation must be completed within seven (7) calendar days and prior to any storm event.
 4. Temporary erosion control measures shall be maintained until the site is permanently stabilized with vegetation or other permanent control measures.
 5. The Contractor will immediately take appropriate measures to prevent erosion or sedimentation from occurring or to correct any existing problems regardless of the time of year.
 6. During periods of approved suspension, the Contractor shall inspect and maintain temporary and permanent erosion and sedimentation controls.
 7. Work in wetlands is prohibited except to the minimum extent necessary for completion of the work as detailed on the Plans. Excavated and other material shall not be stockpiled in wetlands. Haybales, silt fence or other suitable barriers shall be used, where necessary, to prevent sedimentation from eroding materials.
 8. Disturbance of natural resources beyond the construction limits shown on the Plans is not allowed.
 9. Existing ditches shall be maintained until the new ditches are stabilized. Stone check dams shall be placed in existing ditches prior to construction as to prevent the release of sedimentation. Stone check dams shall be installed at the outlets of all existing and proposed ditches adjacent to all stream and wetlands.
 10. For proposed ditches, stabilize the outlet first and build from the bottom up. Only excavate what can be stabilized or protected by the end of the work day.
 11. Before permitting permanent channels to carry water, they shall be stabilized. This may require the installation of temporary erosion control BMP's or temporarily diverting flows.
 12. All cross culvert outlets shall be armored before the end of the work day.
 13. The Contractor's operation may require the placement of temporary pipes and fill over a ditch line to provide access to the work area. The Resident shall approve the size of the pipe. The placement and removal of the temporary access shall not be measured for payment and shall be incidental to the Excavation item.
 14. Bare earth slopes shall be roughened to dissipate sheet flow. This shall be accomplished by "tracking" the slope perpendicular to the centerline. This work will not be measured separately for payment, but shall be incidental to the Excavation item.
 15. Uncured concrete shall not be placed directly into the water body. Concrete may be placed in forms and shall cure at least one (1) week prior to form removal. No washing of tools, forms, etc. shall occur in or adjacent to the water body or wetland.
 16. The Contractor shall contain all demolition debris (including debris from wearing surface removal, sawcut slurry, dust, etc.) and shall not allow it to discharge to any resource. Litter, construction debris, and chemicals exposed to stormwater must be prevented from becoming a pollutant source. The Contractor shall dispose of debris in accordance with Maine Solid Waste Law, Title 38 M.R.S.A., Section 1301 et. seq.
 17. No wheeled or tracked equipment shall be operated in the water. Equipment operating on the shore may reach into the water with a bucket or similar extension. Equipment may NOT cross streams.

18. The Contractor shall not remove rocks from below the normal high water line of any wetland, great pond, river, stream or brook, except to the extent necessary for completion of the work and as allowed by environmental permits.

105.8.2 Permit Requirements

The Project is being constructed under the Maine Department of Environmental Protection (DEP). Natural Resources Protection Act Permit by Rule (PBR) regulations Section 2 – Activities Adjacent to Protected Natural Resources. A copy of the PBR Section 2 regulations and permit conditions are attached in **Appendix C**. The PBR Section 2 permit for this project requires that an undisturbed buffer be maintained between construction activities and the stream and wetland located at approximately Station 117+00 to Station 118+00 left. The buffer width shall be as shown on project plans, as indicated by the clearing limits and silt fence boundaries. Compliance with the PBR permit will require that no vegetation removal or soil disturbance occur within the undisturbed buffer.

The Project permitting also requires that Contractor shall not clear, disturb or otherwise impact other wetlands at the site during construction, including those located near approximate Station 118+00 to 119+00, and near Station 124+00 left, as shown on the project plans.

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 Administred by the Maine Department of Environmental Protection (DEP).

For construction activities including one acre or more of disturbance, a General Permit for Construction Activity (MPDES) is required. This Construction General Permit (CGP) is implemented with the filing of a Notice of Intent (NOI). 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 on-site 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 this Contract, which were submitted as part of the NOI, has been estimated to be 2.59 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.
- The Contractor shall submit a NOI form to Maine DEP within 20 days of the completion of construction or permanent stabilization of the site and disturbed areas.

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 Maine Department of Environmental Protection NRPA Permit by Rule, 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:

Contract start date shall be on or before April 6, 2015 at the discretion of the Authority, and all work shall be completed on or before October 30, 2015. The construction of all lane additions, guardrail, tolling equipment shall be substantially complete by August 28, 2015.

107.1.1 Substantial Completion

This Subsection is amended by the addition of the following:

Substantially complete for the work at the Saco Exit 36 toll Plaza shall be defined by the Authority as the following:

- Additional lane open to traffic with final striping complete, guardrail installed, tolling equipment operational and signage completed at Saco Toll Plaza.

Liquidated damages on a calendar day basis in accordance with Subsection 107.7.2 shall be assessed for each calendar day that project completion is not achieved. Liquidated damages of Two Thousand Five Hundred (\$2,500) Dollars per calendar day shall be assessed for each calendar day that the Saco

Exit 36 Toll plaza substantial completion is not achieved. Liquidated damages for substantial completion will end when substantial completion is accepted by the Resident. If the work remains incomplete at the Contract Completion Date, liquidated damages on a calendar day basis in accordance with Subsection 107.7.2 shall be assessed for each calendar day that contract completion is not achieved. If substantial completion is not completed by the contract completion date both liquidated damages for substantial completion and liquidated damages for contract completion will be incurred. A calendar day begins at 12:01 a.m. and ends at midnight.

107.3.2 Night Work

The contractor shall be responsible to determine and adhere to the local regulations pertaining to night work restrictions and noise regulations.

The following Subsection is added:

107.4.2 Schedule of Work Required

A 2 week schedule shall be submitted by the Contractor weekly, the first week shall be detailed. The weekly detailed schedule shall show all lane closures that are anticipated for the following week. Lane closures that are not shown on this schedule will only be allowed if they are deemed emergency lane closures by the Resident. Lane closures will be prohibited during the Memorial Day Weekend Holiday period.

The following Subsection is added:

107.4.6 Prosecution of Work

The following activities must be completed during the time period specified:

- VMS sign and structure relocated to the Arundel site (MM 28.3) and in service with traffic fully operational with all guardrail in place by July 1, 2015.
- Longer term median lane closure with temporary concrete barrier for median VMS sign structure foundation, median guardrail installation, and minor median grading work shall not exceed seven (7) consecutive calendar days.
- The oversize load restrictions at the Saco Toll plaza, that occur during Phase 2 of the construction, shall not exceed fourteen (14) consecutive calendar days.

Supplemental liquidated damages of One Thousand (\$1000.00) Dollars per calendar day per activity shall be assessed for each calendar day that the VMS sign and structure relocated to the Arundel site (MM 28.3) and in service with traffic fully operational with all guardrail in place exceed the date specified. Supplemental liquidated damages of One Thousand (\$1000.00) Dollars per calendar day per activity shall be assessed for each calendar day that longer term median lane closure with temporary concrete barrier for median VMS sign structure foundation, median guardrail installation, and minor median grading work exceed the time period specified. Supplemental liquidated damages of Five Thousand (\$5000.00) Dollars per calendar day per activity shall be assessed for each calendar day that the oversize load restrictions at the Saco Toll plaza, that occur during Phase 2 of the construction exceed the time period specified. The assessments shall continue until the activities are complete.

The following Subsection is added:

107.4.7 Limitations of Operations

Care shall be taken when working near catch basins to ensure foreign material and contaminants do not enter the basin. If foreign material and/or contaminants enter the basin, it 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.

The following Subsection is added:

107.4.9 Failure to Stop Work When Directed

In the event the Authority determines that the safety of the turnpike users (public) might be unduly compromised if work on the Project is not halted; the Resident Engineer, Resident Inspector or other authorized Authority representative will notify the Contractor to stop work. This may include directive to the Contractor to remove lane closures due to significant traffic delays. If the Contractor refuses to stop work within the time frame determined by the Authority, the Contractor will not be allowed to recommence work until after the Contractor meets with the Authority. In addition, work completed after the time allotted by the Authority to stop work, will not be measured for payment.

107.7.2 Schedule of Liquidated Damages

The table of liquidated damages is deleted and replaced with the following:

Original Contract Amount From More Than	Original Contract Amount up to and Including	Amount of Liquidated Damages per Calendar Day
\$0	\$100,000	\$225
\$100,000	\$300,000	\$350
\$300,000	\$500,000	\$475
\$500,000	\$1,000,000	\$675
\$1,000,000	\$2,000,000	\$900
\$2,000,000	\$4,000,000	\$1,000
\$4,000,000	and more	\$2,100

107.8.1 Fabrication Time

The Authority has budgeted for the following amounts of continuous full time fabrication/shop inspection for certain Work components:

<u>Element</u>	<u>Time</u>	<u>Supplemental LD</u>
1) Structural Steel	14 calendar days	\$500 per calendar day

The Contractor is responsible for requiring their fabricators and suppliers to produce these products for the Work continuously until finished, including any needed actions to correct unacceptable workmanship or materials. If the Authority determines that shop inspection beyond these times is required, then the corresponding Supplemental Liquidated Damages will be deducted

as they occur from the amounts otherwise due the Contractor. The Contractor will be notified by the Department when these times begin and when the allotted time will expire.

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

Inspection is required for the following activities:

For metal fabrication work – welding, including tack welding, heat correcting, nondestructive examination, assembly verification.

108.4 Payment for Materials Obtained and Stored

This Subsection in the General Provisions is deleted and not replaced.

This Subsection of the Standard Specifications is deleted and replaced with the following:

Acting upon a request from the Contractor, accompanied by the required documentation, the Authority will pay for all or part of the value of acceptable, non-perishable Materials that are to be incorporated in the Work, including Materials that are to be incorporated into the Work not delivered on the Work site, and stored at places acceptable to the Authority (e.g. at a facility controlled by the Contractor or his Subcontractor\Fabricator). Examples of such Materials include steel piles, structural steel, prestressed concrete beams and slabs, stone masonry, curbing, timber and lumber, metal culverts, and other similar Materials. The Authority will not make payment on living or perishable Materials until acceptably planted in their final locations.

For structural steel fabrication, the Authority will not make partial payments for expenses such as shop drawing development, overhead, transportation, rent, storage, heat, Contractor mark-ups or other items until after fabrication has commenced. Payment will be based on the Authority's determination of percent complete at the close of the period.

As a condition of payment, the Contractor or his Subcontractor\Fabricator shall provide the following:

1. Proof that all Materials are stored in a secure location acceptable to the Authority.
2. Detailed invoices from the material supplier including a summary of the Materials provided, quantities shipped and received, unit costs, taxes, transportation fees, and all other charges included in the invoice total.
3. Copies of mill certifications, or other material certifications, as required by the Specifications relevant to the Materials.
4. Right of access for the Authority, or its duly authorized agent, to inspect and quantify the Materials at the approved storage site.
5. Proof of insurance for the stored Materials. The Contractor or his Subcontractor\Fabricator shall carry insurance, equal to 100% of the replacement value of the Materials, for all stored Materials. The Maine Turnpike Authority shall be named as an Additional Insured on the insurance policy.

If payment for Materials obtained and stored by the Contractor's Subcontractor\Fabricator is made to the Contractor, then the Contractor must provide proof of payment from his

Subcontractor\Fabricator within 14 calendar days of the date the Contractor receives payment for the Materials. Failure by the Contractor to provide timely proof of payment for these Materials will result in the paid amount being withheld from the subsequent progress payment, or payments, until such time proof of payment is received by the Authority.

Materials paid for by the Authority will become the property of the Authority, but the risk of loss shall remain with the Contractor. Payment for Materials does not constitute acceptance of the Material. If Materials for which the Authority has paid are later found to be unacceptable, then the Authority may withhold amounts reflecting such unacceptable Materials from payments otherwise due the Contractor.

In the event of Default, the Authority may use, or cause to be used, all paid-for-Materials in any manner that is in the best interest of the Authority.

108.4.1 Price Adjustment for Hot Mix Asphalt

This Subsection in the General Provisions is deleted and replaced with the following:

For Contracts containing an excess of 500 tons of bituminous pavement, an asphalt price adjustment will be made for all bituminous concrete placed after the bid date of the Contract. No asphalt price adjustment will be allowed for Contracts containing less than 500 tons.

Price adjustments will be based on the variance in cost for the performance-graded binder component of the hot mix asphalt. The quantity of hot mix asphalt for each pay item will be multiplied by performance graded binder given in the table below, times the difference in price between the base price and the period price of asphalt cement. Adjustments will be made upward or downward, as prices increase or decrease. The quantity of Hot Mix Asphalt will be determined from the quantity shown on the progress estimate for each pay period. The base price of performance graded binder to be used is the price per standard ton current with the bid opening date. The period price of performance grade binder shall be determined by the Authority by using the average New England Selling Price and shall be the price per standard ton current with the ending date of the progress estimate. The Authority will determine the price adjustment weekly as prices increase or decrease and the sum of the weekly totals will be included in the monthly payment. No price adjustment will be made after the substantial completion date of August 28, 2015. The last price listed before August 28, 2015 will be used for pavement placed after the substantial completion date. The prices shall be determined by using the average New England Selling Price, as listed in the Asphalt Weekly Monitor.

Item 403.206	Hot Mix Asphalt - 25 mm	4.8%
Item 403.207	Hot Mix Asphalt - 19 mm	5.2%
Item 403.208	Hot Mix Asphalt - 12.5 mm	5.6%
Item 403.209	Hot Mix Asphalt - 9.5 mm (sidewalks, drives, & incidentals)	6.2%
Item 403.210	Hot Mix Asphalt - 9.5 mm	6.2%
Item 403.211	Hot Mix Asphalt - Shim	6.2%
Item 403.212	Hot Mix Asphalt - 4.75 mm	6.8%
Item 403.213	Hot Mix Asphalt - 12.5 mm (base and intermediate course)	5.6%

109.7.3 Compensable Items

The following is added to Item 3.:

3. “A maximum 15% markup will be allowed on the total...”

The following is added to the end of the paragraph:

4. ...“if determined by the Authority to be lower.”

SPECIAL PROVISION

SECTION 201

CLEARING RIGHT-OF-WAY

(Clearing)

201.03 General

The following paragraph is added:

The Contractor is advised, that pursuant to Maine State law, the sale of harvested forest products must be reported to the Maine Forest Service at the end of each year. The Contractor is designated as the Authority's agent for reporting such harvesting. The Contractor shall prepare and submit the appropriate forms to the Maine Forest Service.

201.04 Clearing

The following is added at the end of the second paragraph:

Stumps that remain in areas not grubbed shall be cut flush with the ground. The stumps shall be treated with a herbicide, covered with two inch loam and seeded.

Vegetation within the clearing limit that has a height greater than the distance measured from the edge of existing pavement to the base of the tree shall be cleared by a means that assures that the tree will not fall onto the pavement. The Contractor shall submit his method of clearing to the Resident for approval.

The Contractor shall flag the clearing limits at 100 foot intervals two feet beyond the clearing limit line such that the flags remain in place at the completion of the clearing operation. This work shall be completed a minimum of one (1) week prior to the clearing. The flags shall be removed by the Contractor prior to the completion of the Contract. This work will be incidental to Clearing.

201.07 Disposal

The second paragraph is deleted and replaced with the following:

All clearing materials must be disposed of off-site by an approved method. Materials chipped on-site must be transported off-site for disposal. The Contractor will not be permitted to bury any brush or logs in the embankment slopes or within the turnpike right-of-way.

The loading of chips and logs for transport off the Project site shall not be conducted on the existing pavement. This activity shall be located at least 20 feet from the edge of pavement. The Resident may increase the required offset distance if it is determined that chips are spraying onto the pavement.

Stumps may be burned if the Contractor can demonstrate that the activity may be conducted without releasing smoke and that permission has been received in writing from the local municipality. The burning pit location shall be approved by the Resident prior to burning. All remaining woodash shall be mixed with topsoil at a ratio of five parts topsoil to one part woodash. The woodash/topsoil mixture shall be used as loam as approved by the Resident. The Resident may stop the burning operation if, in the Resident's opinion, the burning creates an unsafe condition. The burning shall be in accordance with all Federal, State and local requirements.

201.10 Basis of Payment

The following paragraphs are added:

The excavation and backfill of the burning pits will be incidental to Item 203.20, Common Excavation. The mixing of all woodash with topsoil shall be incidental to Item 615.07, Loam.

Loam and seed will be measured for payment under their respective pay items.

SPECIAL PROVISION

SECTION 202

REMOVING STRUCTURES AND OBSTRUCTIONS

(Removing Existing Structural Concrete)

202.01 Description

The following paragraphs are added:

This work shall include removal and disposal of the existing VMS support structure foundation to below grade located in the median and the complete removal of the VMS foundation located in the embankment side slope at the Saco (MM 36.0) site.

202.07 Method of Measurement

The first and third sentences of the first paragraph are deleted and replaced with the following:

Removing Existing Structural Concrete at the VMS support structure foundations will not be measured separately for payment, but shall be incidental to Item 645.123, Removal, Disassembly, and Relocation of VMS and Supporting Structure.

SPECIAL PROVISION

SECTION 202

REMOVING STRUCTURES AND OBSTRUCTIONS

(Removing Existing Bituminous Pavement)

202.01 Description

The following paragraphs are added:

All existing bituminous concrete pavement within the limits of pavement construction shall be removed and reused on the Project as aggregate base course – crushed or as recycled bituminous pavement (RAP). The Contractor has the option of using all the material as aggregate base course-crushed or RAP or a combination of both.

The material, if used as aggregate base course – crushed, shall be crushed and processed, containing no particles greater than two inches in any dimension and blended with suitable granular material(s) such that the final blended material conforms to the gradation requirement of Subsection 703.06 - Type A. The degradation requirement shall not apply to the blended mixtures. Placing, shaping, compacting, stabilizing, and surface tolerance shall be in accordance with the applicable provisions of Section 304 except that the material shall be placed in a layer of uniform thickness not to exceed four inches.

The material, if used as RAP, shall meet the requirements of Section 401.

202.07 Method of Measurement

The second paragraph is deleted and replaced with the following:

The quantity of bituminous concrete pavement removed will be measured by the cubic yard in place. The width and thickness for measurement will be the width and thickness as determined by the Resident in the field. The length will be along the centerline unless modified by other methods generally recognized as conforming to good engineering practice.

202.08 Basis of Payment

The fifth paragraph is deleted and replaced with the following:

The accepted quantity of full depth bituminous concrete pavement removed will be paid for at the Contract unit price per cubic yard which price shall be full compensation for removing, temporary stockpiling, processing and rehandling. It shall also include furnishing all materials, labor, and equipment for all work and all incidentals necessary to complete the work.

The material reused in the roadway as aggregate base course shall be measured and paid for under Item 304.09, Aggregate Base Course - Crushed.

The material reused in the roadway as RAP will not be measured separately for payment, but shall be incidental to the applicable Pavement item.

Payment will be made under:

Pay Item

Pay Unit

202.1271 Removing Existing Bituminous Pavement

Cubic Yard

SPECIAL PROVISION

SECTION 203

EXCAVATION AND EMBANKMENT

This Section is amended as follows:

All references to “waste storage areas” shall be deleted.

203.04 General

The third paragraph is deleted and replaced with the following:

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.

Any temporary earth support required to install or remove drainage structures and utilities and support existing or proposed utilities will not be measured separately for payment, but shall be incidental to the Excavation items.

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.

After excavation in clay areas, the surface of the clay material must be scarified or roughened prior to placing loam and seed. Failed slopes shall be repaired at the Contractor’s own expense.

The following Subsection is added:

203.043 Sampling and Testing

The Contractor is responsible for quality control. Quality assurance testing and sampling, to monitor the conformance of the embankment fill materials, placement, and compaction will be completed by the Resident. Particular emphasis will be placed on the gradation characteristics and the in-place density of the embankment fill.

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.

203.11 Construction of Earth Embankment - Layer Method

The second, third, and fourth paragraphs are deleted and replaced with the following:

Layers shall be placed in lifts not to exceed 12 inches after compaction. Common borrow shall be compacted using vibratory compaction equipment to 92 percent of the material's maximum dry density as determined by ASTM D-1557. The compacted material shall appear firm and stable. Strict moisture control shall be utilized by the Contractor when using a cohesive fill material and the moisture content of the compacted material should not exceed four percent above the material's optimum moisture content.

The first sentence of the fourth paragraph is amended as follows:

Satisfactory compaction of granular borrow is defined as not less than 95 percent of the maximum density.

203.12 Construction of Earth Embankment with Moisture and Density Control

The last sentence of the second paragraph is amended as follows:

Each granular borrow layer placed with controlled moisture shall be compacted to not less than 95 percent of the maximum density.

The following paragraph is added:

Common borrow shall be placed in lifts not to exceed 12 inches after compaction. Common borrow shall be compacted using vibratory compaction equipment to 92 percent of the material's maximum dry density as determined by ASTM D-1557. The compacted material shall appear firm and stable. Strict moisture control shall be utilized by the Contractor when using a cohesive fill material and the moisture content of the compacted material should not exceed four percent above the material's optimum moisture content.

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

Any reference to borrow will be deleted from the first paragraph.

The pay quantity of common borrow and granular borrow shall be 115 percent of the compacted quantity measured in place.

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

(Geofoam Lightweight Fill)

203.01 Description

The following sentence is added:

This work shall include furnishing all qualifications, shop drawings, material and equipment, placing and providing approved field quality control personnel to oversee and certify the installation of the Geofoam Lightweight Fill, referred to in this Specification as expanded polystyrene (EPS), complete, as specified herein, and shown on the approved shop drawings.

The following Subsection is added:

203.011 Reference Publications

Some or all of the publications referred to hereinafter form a part of this Specification to the extent referenced. The publications are referred to in the text by the basic designation only. The latest edition of the referenced publication shall govern.

AMERICAN SOCIETY OF TESTING MATERIALS (ASTM) PUBLICATIONS

ASTM DESIGNATION	TEST METHOD FOR
C203	Breaking Load and Flexural Properties of Block-Type Thermal Insulation
C578	Rigid Cellular Polystyrene EPS Thermal Insulation
D732	Strength of Plastics by Punch Tool
C272	Water Absorption of Core Materials for Structural Sandwich Construction
D1621	Compressive Properties of Rigid Cellular Plastics
D1622	Apparent Density of Rigid Cellular Plastics
D1623	• Tensile and Tensile Adhesion Properties of Rigid Cellular Plastics
D6817	• Standard Specification for Rigid Cellular Polystyrene Geofoam

203.02 Materials

The EPS block supplier shall provide the EPS blocks, mechanical fasteners, shop drawings for installation, and full time on-site supervision of the EPS block installation. Upon completion of the installation, the EPS block supplier shall provide a letter certifying that the EPS blocks were manufactured and installed in accordance with the Plans and Specifications and the approved shop drawings.

The following Subsections are added:

203.021 EPS Block Supplier Qualifications Submittal

- List at least three (3) similar projects using EPS blocks in a load bearing or embankment application.
- Provide contact reference for each project with telephone number and address.
- Provide resumes of the Project Manager and the field quality control personnel listing specific geofoam lightweight fill project experience. Personnel to be assigned to this Project must be identified by the supplier and approved by the Geotechnical Consultant. Alternate personnel may be used only after their qualifications are reviewed and approved by the Geotechnical Consultant.
- Provide detailed description of manufacturing and field QA services to be provided for this Project.

A review of the EPS block supplier's qualifications will be completed by the Geotechnical Consultant within 10 days of receipt.

203.022 EPS Block Supplier Shop Drawing Submittal

The approved EPS block supplier shall submit complete shop drawings for the installation. The drawings shall indicate a placement pattern for all blocks in each layer. The blocks shall be labeled to match the approved shop drawings.

A review of the shop drawings or revised shop drawings will be completed by the Geotechnical Consultant within 10 working days of receipt. If revisions are required, the supplier shall submit the revised shop drawings for review. EPS blocks shall not be shipped to the site prior to notification that the shop drawings have been approved for construction.

203.023 Geofoam Lightweight Fill

Geofoam Lightweight Fill shall be ASTM C 578 Type IX (or AASHTO EPS 100), 1.8 pcf minimum, conforming to this Specification, as supplied by:

Poly Molding Corp.

96 4th Avenue
Haskell, NJ 07420

Tel.: 800.229.7161
Fax: 973.835.2438

Thermal Forms, Inc.

P.O. Box 1981
6173 South Bay Road
Cicero, NY 13039
Tel.: 315.699.8734
Fax: 315.699.4969

Insulation Technology, Inc.

P.O. Box 578
35 First Street
Bridgewater, MA 02324
Tel.: 508.697.6926
Fax: 508.697.6934

Branch River Plastics

15 Thurber Boulevard
Smithfield, RI 02917
Tel.: 401.232.0270
Fax: 401.231.3434

or an approved equal.

EPS shall be fabricated using virgin feedstock manufactured into blocks having no more than five percent regrind content. Blocks shall have a height of at least two feet, a width of at least four feet, and length of at least eight feet except blocks under proposed guardrail which shall be one foot thick. All blocks shall be shop-trimmed as necessary so that all surfaces are smooth and flat, and are within tolerances of 0.5 percent of respective height, width and length dimensions. The blocks shall be labeled to match the approved shop drawings. Additional field and/or shop trimming and cutting will be required as necessitated by the geometry of the fill being constructed.

EPS blocks shall conform to the specified type category in ASTM C-578 and have the following physical properties:

Physical Property	ASTM Test Procedures	Accepted Value	
		Type IX	Units
Density	D1622	1.8 (29)	pcf (Kg/m ³)
Compressive Resistance	D1621	25 (173)	psi (kN/m ²) Minimum @ yield or 10% Deformation
Flexural Strength	D203	50 (345)	psi (kN/m ²) Minimum
Tensile Strength	D1623	23 (159)	psi (kN/m ²) Minimum
Water Absorption	C272	2	%, Less than by volume

The EPS shall contain a flame retardant additive and shall have UL Certification of Classification as to External Fire Exposure and Surface Burning Characteristics. EPS should be considered combustible and should not be exposed to open flame or any source of ignition. EPS shall be treated to prevent insect attack and shall be protected from burrowing animals. The manufacturer shall present proposed treatment methods to the Resident for review and approval.

The Contractor shall furnish the Resident with a certified test report from the manufacturer showing all data required to indicate compliance with the Specifications.

Connectors shall be galvanized steel multi-barbed connectors. Each connector shall have a lateral holding strength of at least 60 lbs. when tested with ASTM D 6817 EPS, with a safety factor of two.

The following Subsections are added:

203.041 Sampling and Testing

Quality assurance testing and sampling, to monitor the conformance of the EPS with the Specification requirements, will be completed as approved by the Resident. Density and geometry (dimensional tolerances) testing shall be conducted using full-size blocks. Blocks in conformance with Contract requirements can be used to make required fills.

Testing to monitor the quality of the EPS shall be done at the discretion of the Geotechnical Consultant. Geotechnical Consultant has the right to randomly sample at the manufacturing plant

and/or at the jobsite. If any block does not conform to the physical requirements, or if it is damaged in any way, it may be rejected by the Resident.

203.042 Protection

The Contractor shall prevent damage to the EPS during delivery, storage, and construction. Prior to delivery of EPS to the Project site, the Contractor shall review and be thoroughly knowledgeable with the manufacturer's care and handling recommendations. Any EPS to be exposed to sunlight for more than 30 days shall be covered with opaque material which will prevent ultraviolet light degradation.

Placement of embankment will require special procedures and careful selection of appropriate construction equipment to prevent damage to the EPS. No heavy construction equipment or vehicles shall be allowed directly on the EPS. EPS must be protected from petroleum-based solvents such as gasoline and diesel fuel.

Damage to EPS shall be corrected as follows:

Slight damage (less than 0.12 cubic feet) with no linear dimension greater than one foot may be left in place as-is.

Moderate damage (less than 0.35 cubic feet) with no linear dimension greater than 3.3 feet shall be filled with leveling sand.

EPS blocks with excessive damage (i.e., exceeding the "moderate" category) shall be replaced with EPS blocks which meet the damage criteria. EPS blocks not meeting the damage criteria may be cut to eliminate the excessive damage and the remaining undamaged portion of the block may be used within the fill, provided the undamaged portion of the block meets all other requirements.

Leveling sand, HDPE Geomembrane and embankment fill over the side slopes of the EPS shall be placed starting at the bottom of the slope in such a manner as to prevent damage to the EPS. Finished EPS on side slopes shall have a minimum of two feet of embankment fill cover.

The embankment fill over the side slopes shall be compacted using approved manually-operated compaction equipment.

203.043 Subgrade Preparation

Clear and grub site in accordance with Section 202, Clearing Right-of-Way, and Section 203, Excavation and Embankment. Provide temporary construction dewatering during subgrade preparation, geofoam installation and filling until adequate cover is in place to prevent flotation of geofoam blocks. Temporary construction dewatering shall be provided at no additional cost to the Authority.

Bench into existing slope as required to provide a level subgrade to support each layer of geofoam. Recompact subgrade to a minimum of 92 percent of maximum dry density as determined by AASHTO T180. Place a uniform layer of leveling sand over the prepared surface, with a six inch minimum thickness. Level to 1/4 inch per 10 feet horizontal. Compact leveling sand to a minimum of 92 percent of maximum dry density as determined by AASHTO T180.

203.044 Placement

EPS shall be placed to the lines and grades shown in the approved shop drawings and as directed by the Geotechnical Consultant. The surface of a layer of EPS blocks to receive additional EPS blocks shall be constructed with a variation in surface tolerance of no more than 1/2 inch in any 10 foot interval. All blocks shall accurately fit relative to adjacent blocks and structures. No gaps greater than 3/4 inch will be allowed on vertical joints. The finished surface of the EPS beneath pavement sections shall be constructed to within the tolerances of zero to minus 0.2 foot of the indicated grade. The finished surface of the EPS on side slopes that receive soil cover shall be constructed to within a tolerance of plus 0.3 feet to minus 0.3 feet of the indicated grade.

Blocks placed in a row in a particular layer shall be offset two feet relative to blocks placed in adjacent rows of the same layer as shown on the approved shop drawings. In order to avoid continuous joints, each subsequent layer of blocks shall be offset two feet relative to blocks placed in the previous layer. The long axis of all blocks will be placed perpendicular to the embankment centerline. Connector plates should be placed between horizontal layers of blocks. Blocks shall be cut using a saw or hot wire, where necessary.

Because of the light unit weight of the EPS, it is the Contractor's responsibility to provide temporary weighing and/or guying as necessary until all blocks are built into a homogeneous mass, and the soil cover and pavement section are in place.

Install a minimum of three connectors for each four foot by eight foot section of geofoam material, as shown on approved shop drawings, or directed by the Geotechnical Consultant. Press firmly into the rigid foam until the connector is flush with the surface. Position the next foam block as specified and set firmly before placing subsequent blocks.

203.18 Method of Measurement

The following sentences are added:

Geofoam Lightweight Fill furnished and placed in accordance with the Plans and Specifications shall be measured by the cubic yard in place and accepted.

203.19 Basis of Payment

The following paragraphs are added:

Geofoam Lightweight Fill will be paid for at the Contract unit price per cubic yard which shall be full compensation for furnishing all qualifications, on-site supervision from supplier, shop drawings, labor, materials, equipment, dewatering and incidentals necessary to complete the work.

Payment will be made under:

Pay Item

Pay Unit

203.43 Geofoam Lightweight Fill

Cubic Yard

SPECIAL PROVISION

SECTION 203

EXCAVATION AND EMBANKMENT

(Leveling Sand)

203.01 Description

The following sentence is added:

This work shall include furnishing, placing, grading and densifying leveling sand as shown on the Plans or as approved by the Resident.

203.02 Materials

The following sentence is added:

Leveling sand shall meet the requirements of Subsection 703.05, Aggregate for Sand Leveling.

203.04 General

The following paragraph is added:

Leveling sand shall be placed and graded to a uniform slope as shown on the Plans. Densification shall be achieved with an approved manually-operated power compactor or as directed by the Geotechnical Consultant.

203.18 Method of Measurement

The following sentence is added:

Leveling Sand shall be measured by the cubic yard complete and accepted in place.

203.19 Basis of Payment

The following sentences are added:

Leveling Sand will be paid for at the Contract unit price per cubic yard which shall be full compensation for all labor, materials, equipment, and incidentals necessary to complete the work.

Payment will be made under:

Pay Item

Pay Unit

203.45 Leveling Sand

Cubic Yard

SPECIAL PROVISION

SECTION 206

STRUCTURAL EXCAVATION

This Section is amended as follows:

All references to “waste storage areas” shall be deleted.

206.01 Description

The following is added after the first paragraph:

This work also shall consist of excavating and removal of earth materials at the bridge abutments at areas requiring repair within the limits of work as shown on the Plans or as approved by the Resident.

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.

The bituminous pavement shall be disposed of by the Contractor off the Turnpike Right-of-Way. All bituminous pavement shall be disposed of in accordance with Chapter 404 of the Maine Department of Environmental Protection Solid Waste Management Regulations.

206.04 Method of Measurement

The following paragraph is added:

Excavation required to expose repair areas will be paid for under Item 206.082, Structural Earth Excavation - Major Structures. Backfill of the repair areas, not requiring gravel or hot bituminous pavement, will not be measured separately for payment, but shall be incidental to the Structural Earth Excavation item.

206.05 Basis of Payment

The following is added after the first paragraph:

The work shall also include all materials, equipment and labor associated with excavating, backfilling and compacting areas of structural excavation.

Payment will be made under:

Pay Item

Pay Unit

206.082

Structural Earth Excavation – Major Structures

Cubic Yard

SPECIAL PROVISION

SECTION 401

HOT MIX ASPHALT PAVEMENT

The following Specification is based on the MaineDOT February 11, 2009 Specification for Division 400, Pavements.

Section 401, Hot Mix Asphalt is deleted in its entirety and replaced with the following:

401.01 Description

The Contractor shall furnish and place one or more courses of Hot Mix Asphalt Pavement (HMA) on an approved base in accordance with the Contract documents and in reasonably close conformity with the lines, grades, thickness, and typical cross sections as shown on the Plans or established by the Resident. The Authority will accept this work under Quality Assurance provisions, in accordance with these Specifications and the requirements of Section 106, Quality, the provisions of AASHTO M 323, except where otherwise noted in Sections 401 and 703 of these Specifications, and the MaineDOT Policies and Procedures for HMA Sampling and Testing.

401.02 Materials

Materials shall meet the requirements specified in Section 700, Materials:

- | | |
|-------------------------------|--------|
| ▪ Asphalt Cement | 702.01 |
| ▪ Aggregates for HMA Pavement | 703.07 |
| ▪ HMA Mixture Composition | 703.09 |

401.021 Recycled Asphalt Materials

Recycled Asphalt Pavement (RAP) may be introduced into the mixture at percentages approved by the Authority according to the MaineDOT Policies and Procedures for HMA Sampling and Testing. If approved by the Authority, the Contractor shall provide documentation stating the source, average test results for average residual asphalt content, and stockpile gradations showing RAP materials have been sized to meet the maximum aggregate size requirements of each mix designation. The Authority will obtain samples for verification and approval prior to its use.

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 minimum of 72-hours prior to the change to allow for obtaining new samples and approval.

The RAP shall be from an interstate highway and be from a Class I designated stockpile source.

401.03 Composition of Mixtures

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 base, binder, surface, or shim course. The Contractor may be allowed to use more than 15 percent RAP, up to a maximum of 25 percent RAP, in a base, intermediate, or shim course provided that PG 58-34 asphalt binder is used in the mixture.

The MaineDOT (Department), or an independent consultant approved by the Authority, will be providing the mix design verification (Job Mix Formula) for the Authority's approval. The Job Mix Formula (JMF) will be sent to the Department Central Laboratory in Bangor, Maine. The samples will be obtained by the Department for laboratory testing. Before the start of paving, the Contractor and the Department will split a sample for verification of design before production will be allowed. The Contractor shall submit for Authority approval a JMF for each mixture to be supplied. The Authority may approve one (1) active design per nominal maximum size, per traffic level, per plant, plus a 9.5 mm "fine" mix @ 50 gyrations for shimming, and where required, a non-RAP design for bridge decks. The Authority shall then have 15 calendar days in which to process a new design before approval. 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.
- 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 asphalt contents.
- Design Aggregate Structural for at least three trial blends.
- Test results for the selected aggregate blend at a minimum of three binder contents.
- Specific Gravity and temperature/viscosity charts for the PGAB to be used.
- Recommended mixing and compaction temperatures from the PGAB supplier.
- Material Safety Data Sheets (MSDS) 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 stone stockpiles, 75 ton for sand stockpiles, and 50 ton of blend sand before the Authority will

sample. 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 sufficient 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 shall split a production sample for evaluation. The Contractor shall test its split of the sample and determine if the results meet the requirements of the Department's written policy for mix design verification (See Maine DOT Policies and Procedures for HMA Sampling and Testing available at the Central Laboratory in Bangor). If the results are found to be acceptable, the Contractor will forward their results to the Authority's Lab, which will test the Authority's split of the sample. The results of the two split samples will be compared and shared between the Authority and the Contractor. If the Department finds the mixture acceptable, an approved JMF will be forwarded to the Authority. 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 mix 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.

The Contractor shall submit a new JMF for approval each time a change in material source or materials properties is proposed. The same approval process shall be followed. The cold feed percentage of any aggregate may be adjusted up to 10 percentage points from the amount listed on the JMF, however no aggregate listed on the JMF shall be eliminated. The cold feed percentage for RAP may be reduced up to 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}	25	19	12.5	9.5	4.75		
<0.3	≤91.5	96.0	≤98.0	13.0	14.0	15.0	16.0	16.0	70-80	0.6-1.2
0.3 to <3	≤90.5								65-80	
3 to <10	≤89.0								65-80*	
10 to <30										
> 30										

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

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

*For 4.75mm nominal maximum aggregate size mixtures, the Fines/Effective Binder Ratio is 0.6-1.4

401.031 Warm Mix Technology

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

401.04 Temperature Requirements

After the JMF is established, the temperatures of the mixture shall conform to the following tolerances:

- In the truck at the mixing plant – allowable range 275° to 325°F.
- At the paver – allowable range 275° to 325°F.
- Or the recommendations, approved by the Authority, from the Asphalt Binder supplier.

The JMF and the mix subsequently produced shall meet the requirements of Table 1 and Subsection 703.07.

401.05 Performance Graded Asphalt Binder

Unless otherwise noted in Special Provision Section 403, Hot Bituminous Pavement, PGAB shall be 64-28, except that for mixtures containing greater than 15 percent but no more than 25 percent RAP the PGAB shall be PG 58-34. The PGAB shall meet the applicable requirements of AASHTO M320 - Standard Specification for PGAB. The Contractor shall request approval from the Authority for a change in PGAB supplier or source by submitting documentation stating the new supplier or source a minimum of 24-hours prior to the change. In the event that the PGAB supplier or source is changed, the Contractor shall make efforts to minimize the occurrence of PGAB co-mingling.

401.06 Weather and Seasonal Limitations

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 40°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 45°F or higher. For the purposes of this Section, the traveled way includes truck lanes, ramps, approach roads and auxiliary lanes. The atmospheric temperature for all courses on bridge decks shall be 50°F or higher.

Hot Mix Asphalt Pavement used for curb, driveways, sidewalks, islands, or other incidentals is not subject to seasonal limitations, except that conditions shall be satisfactory for proper handling and finishing of the mixture. All mixtures used for curb, driveways, sidewalks, islands, or other incidentals shall conform to Subsection 401.04, Temperature Requirements. Unless otherwise specified, the Contractor shall not place Hot Mix Asphalt Pavement on a wet or frozen surface and the air temperature shall be 40°F or higher.

On all sections of overlay with wearing courses one inch thick or less, the wearing course for the travelway and adjacent shoulders shall be placed provided the air temperature is determined as above 50°F or higher.

401.07 Hot Mix Asphalt Plant

401.071 General Requirements

HMA plants shall conform to AASHTO M156.

- a. Truck Scales - When the hot mix asphalt is to be weighed on scales meeting the requirements of Section 108, Payment, the scales shall be inspected and sealed by the State Sealer as often as the Authority deems necessary to verify their accuracy.

Plant scales shall be checked prior to the start of the paving season, and each time a plant is moved to a new location. Subsequent checks will be made as determined by the Resident. The Contractor will have at least ten 50 pound masses for scale testing.

401.072 Automation of Batching

Batch plants shall be automated for weighing, recycling, and monitoring the system. In the case of a malfunction of the printing system, the requirements of Subsection 401.074 c. of this Specification will apply.

The batch plant shall accurately proportion the various materials in the proper order by weight. The entire batching and mixing cycle shall be continuous and shall not require any manual operations. The batch plant shall use auxiliary interlock circuits to trigger an audible alarm whenever an error exceeding the acceptable tolerance occurs. Along with the alarm, the printer shall print an asterisk on the delivery slip in the same row containing the out-of-tolerance weight. The automatic proportioning system shall be capable of consistently delivering material within the full range of batch sizes. When RAP is being used, the plant must be capable of automatically compensating for the moisture content of the RAP.

All plants shall be equipped with an approved digital recording device. The delivery slip load ticket shall contain information required under Subsection 108.1.3, Provisions Relating to Certain Measurements, Mass and Paragraphs a, b, and c of Subsection 401.073.

401.073 Automatic Ticket Printer System on Automatic HMA Plant

An approved automatic ticket printer system shall be used with all approved automatic HMA plants. The requirements for delivery slips for payment of materials measured by weight, as given in the following Sections, shall be waived: 108.1.3 a., 108.1.3 b., 108.1.3 c., and 108.1.3 d. The automatic printed ticket will be considered as the Weight Certificate.

The requirements of Subsection 108.1.3 f., Delivery Slips, shall be met by the weigh slip or ticket, printed by the automatic system, which accompanies each truckload, except for the following changes:

- a. The quantity information required shall be individual weights of each batch or total net weight of each truckload.

- b. Signatures (legible initials acceptable) of Weighmaster (required only in the event of a malfunction as described in 401.074 c.).
- c. The MaineDOT designation for the JMF.

401.074 Weight Checks on Automatic HMA Plant

At least twice during each five days of production either of the following checks will be performed:

- a. A loaded truck may be intercepted and weighed on a platform scale that has been sealed by the State Sealer of Weights and Measures within the past 12 months. The inspector will notify the producer to take corrective action on any discrepancy over 1.0%. The producer may continue to operate for 48 hours under the following conditions:
 - 1. If the discrepancy does not exceed 1.5%; payment will still be governed by the printed ticket.
 - 2. If the discrepancy exceeds 1.5%, the plant will be allowed to operate as long as payment is determined by truck platform scale net weight.

If, after 48 hours the discrepancy has not been addressed and reduced below 1.0%, then plant operations will cease. Plant operation may resume after the discrepancy has been brought within 1.0%.

- b. Where platform scales are not readily available, a check will be made to verify the accuracy and sensitivity of each scale within the normal weighing range and to assure that the interlocking devices and automatic printer system are functioning properly.
- c. In the event of a malfunction of the automatic printer system, production may be continued without the use of platform truck scales for a period not to exceed the next two working days, providing total weights of each batch are recorded on weight tickets and certified by a Licensed Public Weighmaster.

401.08 Hauling Equipment Trucks for Hauling Hot Mix Asphalt

Trucks for hauling Hot Mix Asphalt Pavement shall have tight, clean, and smooth metal dump bodies, which have been thinly coated with a small amount of approved release agent to prevent the mixture from adhering to the bodies. Solvents based agents developed to strip asphalts from aggregates will not be allowed as release agents.

All truck dump bodies shall have a cover of canvas or other water repellent material capable of heat retention, which completely covers the mixture. The cover shall be securely fastened on the truck, unless unloading.

All truck bodies shall have an opening on both sides, which will accommodate a thermometer stem. The opening shall be located near the midpoint of the body, at least 12 inches above the bed.

401.09 Pavers

Pavers shall be self-contained, self-propelled units with an activated screed (heated if necessary) capable of placing courses of Hot Mix Asphalt Pavement in full lane widths specified in the Contract on the mainline, shoulder or similar construction.

On projects with no price adjustment for smoothness, pavers shall be of sufficient class and size to place Hot Mix Asphalt Pavement over the full width of the mainline travel way with a 10 feet minimum main screed with activated extensions.

The Contractor shall place Hot Mix Asphalt Pavement on the mainline with a paver using an automatic grade and slope controlled screed, unless otherwise authorized by the Authority. The controls shall automatically adjust the screed and increase or decrease the layer thickness to compensate for irregularities in the preceding course. The controls shall maintain the proper transverse slope and be readily adjustable so that transitions and super elevated curves can be properly paved. The controls shall operate from a fixed or moving reference such as a grade wire or ski type device (floating beam) with a minimum length of 30 ft, a non-contact grade control with a minimum span of 24 ft, except that a 40 ft reference shall be used on mainline projects.

The Contractor shall operate the paver in such a manner as to produce a visually uniform surface texture and a thickness within the requirements of Subsection 401.101, Surface Tolerances. The paver shall have a receiving hopper with sufficient capacity for a uniform spreading operation and a distribution system to place the mixture uniformly, without segregation in front of the screed. The screed assembly shall produce a finished surface of the required evenness and texture without tearing, shoving, or gouging the mixture. Pavers with extendible screeds shall have auger extensions and tunnel extenders as per the manufacturer's recommendations, a copy of which shall be available if requested.

The Contractor shall have the paver at the Project site sufficiently before the start of paving operations to be inspected and approved by the Authority. The Contractor shall repair or replace any paver found worn or defective, either before or during placement, to the satisfaction of the Authority. Pavers that produce an unevenly textured or non-uniform mat will be repaired or replaced before continuing to place HMA on MTA projects. On a daily basis, the Contractor shall perform density testing across the uncompacted mat being placed, at 12 inch intervals. If the values vary by more than 2.0 percent from the mean, the Contractor shall make adjustments until the inconsistencies are remedied.

Failure to replace or repair defective placement equipment may result in a letter of suspension of work and notification of a quality control violation resulting in possible monetary penalties as governed by Section 106, Quality.

401.10 Rollers

Rollers shall be static steel, pneumatic tire, oscillatory, or approved vibrator type. Rollers shall be in good mechanical condition, capable of starting and stopping smoothly, and be free from backlash when reversing direction. Rollers shall be equipped and operated in such a way as to prevent the picking up of hot mixed material by the roller surface. The use of rollers, which result in crushing of the aggregate or in displacement of the HMA will not be permitted. Any Hot Mix Asphalt Pavement that becomes loose, broken, contaminated, shows an excess or deficiency of Performance Graded Asphalt Binder, or is in any other way defective shall be removed and

replaced at no additional cost with fresh Hot Mix Asphalt Pavement, which shall be immediately compacted to conform to the adjacent area.

The Contractor shall repair or replace any roller found to be worn or defective, either before or during placement, to the satisfaction of the Authority. Rollers that produce grooved, unevenly textured or non-uniform mat will be repaired or replaced before continuing to place HMA on MTA projects.

The type of rollers to be used and their relative position in the compaction sequence shall generally be the Contractor's option, provided Specification densities are attained and with the following requirements:

- a. On variable-depth courses, the first lift of pavement over gravel, reclaimed pavement, an irregular or milled surfaces, or on bridges, at least one roller shall be a 16 ton pneumatic-tired. Unless otherwise allowed by the Resident, pneumatic-tired rollers shall be equipped with skirting to minimize the pickup of HMA materials from the paved surface. When required by the Resident, the roller shall be ballasted to 20 ton.
- b. Compaction with a vibratory or steel wheel roller shall precede pneumatic-tired rolling, unless otherwise authorized by the Authority.
- c. Vibratory rollers shall not be operated in the vibratory mode when checking or cracking of the mat occurs, or on bridge decks.
- d. Any method, which results in cracking or checking of the mat, will be discontinued and corrective action taken.
- e. The use of an oscillating steel roller shall be required to compact all mixtures placed on bridge decks.

The maximum operating speed for a steel wheel or pneumatic roller shall not exceed the manufacturer's recommendations, a copy of which shall be available if requested.

401.101 Surface Tolerances

The Authority will check surface tolerance utilizing the following methods:

- a. A 16 ft straightedge or string line placed directly on the surface, parallel to the centerline of pavement.
- b. A 10 ft straightedge or string line placed directly on the surface, transverse to the centerline of pavement.

The Contractor shall correct variations exceeding 6 mm [1/4 in] by removing defective work and replacing it with new material as directed by the Authority. The Contractor shall furnish a 10 foot straightedge for the Authority's use.

401.11 Preparation of Existing Surface

The Contractor shall thoroughly clean the surface upon which Hot Mix Asphalt Pavement is to be placed of all objectionable material. When the surface of the existing base or pavement is

irregular, the Contractor shall bring it to uniform grade and cross section. All surfaces shall have a tack coat applied prior to placing any new HMA course. Tack coat shall conform to the requirements of Section 409, Bituminous Tack Coat, Section 702, Bituminous Material, and all applicable sections of the Contract.

401.12 Hot Mix Asphalt Documentation

The Contractor and the Authority shall agree on the amount of Hot Mix Asphalt Pavement that has been placed each day. All delivery slips shall conform to the requirements of 401.073.

401.13 Preparation of Aggregates

The Contractor shall dry and heat the aggregates for the HMA to the required temperature. The Contractor shall properly adjust flames to avoid physical damage to the aggregate and to avoid depositing soot on the aggregate.

401.14 Mixing

The Contractor shall combine the dried aggregate in the mixer in the amount of each fraction of aggregate required to meet the JMF. The Contractor shall measure the amount of PGAB and introduce it into the mixer in the amount specified by the JMF.

The Contractor shall produce the HMA at the temperature established by the JMF.

The Contractor shall dry the aggregate sufficiently so that the HMA will not flush, foam excessively, or displace excessively under the action of the rollers. The Contractor shall introduce the aggregate into the mixer at a temperature of not more than 25°F above the temperature at which the viscosity of the PGAB being used is 0.150 Pa's (Pascal-second).

The Contractor shall store and introduce into the mixer the Performance Graded Asphalt Binder at a uniformly maintained temperature at which the viscosity of the PGAB is between 0.150 Pa's and 0.300 Pa's. The aggregate shall be coated completely and uniformly with a thorough distribution of the PGAB. The Contractor shall determine the wet mixing time for each plant and for each type of aggregate used.

401.15 Spreading and Finishing

On areas where irregularities or unavoidable obstacles make the use of mechanical spreading and finishing equipment impracticable, the Contractor shall spread, rake, and lute the HMA with hand tools to provide the required compacted thickness. Solvent based agents developed to strip asphalts from aggregates will not be allowed as release agents.

On roads opened to two-way traffic, the Contractor shall place each course over the full width of the traveled way section being paved that day, unless otherwise noted by the Authority in Section 403, Hot Mix Asphalt Pavement.

In addition, hot mix asphalt pavement placed on bridges shall also conform to Section 508.04 and the following requirements.

- a. The bottom course shall be placed with an approved rubber mounted paver of such type and operated in such a manner that the membrane waterproofing will not be damaged in any way.
- b. The top course shall not be placed until the bottom course has cooled sufficiently to provide stability.
- c. The Contractor will not be required to cut sample cores from the compacted pavement on the bridge deck, unless otherwise directed by Special Provisions.
- d. After the top course has been placed, the shoulder areas shall be sealed 3 ft wide with two applications of an emulsified bituminous sealer meeting the requirements of Section 612.03 – Sealing and Section 702.12 – Emulsified Bituminous Sealing Compound. The first application shall be pre-mixed with fine, sharp sand, similar to mortar sand, as needed to fill all voids in the mix in the area being sealed. The second application may be applied without sand. The sealer shall be carried to the curb at the gutter line in sufficient quantity to leave a bead or fillet of material at the face of curb. The area to be sealed shall be clean, dry and the surface shall be at ambient temperature.
- e. The furnishing and applying of the required quantity of sealer for the bridge shoulder areas shall be incidental to placing the hot mix asphalt pavement.
- f. The atmospheric temperature for all courses placed on bridge decks shall be 50°F or higher.

401.16 Compaction

Immediately after the Hot Mix Asphalt Pavement has been spread, struck-off, and any surface irregularities adjusted, the Contractor shall thoroughly and uniformly compact the HMA by rolling.

The Contractor shall roll the surface when the mixture is in the proper condition and when the rolling does not cause undue displacement, cracking, or shoving. The Contractor shall prevent adhesion of the HMA to the rollers or vibrating compactors without the use of fuel oil or other petroleum based release agents. Solvents designed to strip asphalt binders from aggregates will not be permitted as release agents on equipment, tools, or pavement surfaces.

The Contractor shall immediately correct any displacement occurring as a result of the reversing of the direction of a roller or from other causes to the satisfaction of the Authority. Any operation other than placement of variable depth shim course that results in breakdown of the aggregate shall be discontinued. Any new pavement that shows obvious cracking, checking, or displacement shall be removed and replaced for the full lane width as directed by the Resident at no cost to the Authority.

Along forms, curbs, headers, walls, and other places not accessible to the rollers, the Contractor shall thoroughly compact the HMA with mechanical vibrating compactors. The Contractor shall only use hand tamping in areas inaccessible to all other compaction equipment. On depressed areas, the Contractor may use a trench roller or cleated compression strips under a roller to transmit compression to the depressed area.

Any HMA that becomes unacceptable due to cooling, cracking, checking, segregation or deformation as a result of an interruption in mix delivery shall be removed and replaced, with material that meets Contract Specifications at no cost to the Authority.

401.162 Voids

The HMA will be accepted for percent air voids on a subplot basis. Percent air voids will be determined in accordance with AASHTO T 312. Point of sampling will be from the truck at the plant. A subplot will consist of 500 tons. The number of samples per day will be computed as one for every 500 tons plus one for any additional fractional subplot that is equal to or greater than 100 tons or as directed by the Resident. There shall be a minimum of one subplot per day per JMF. One sample shall be taken and tested for each 500 tons of production or portions thereof. Full payment will be made for each 500 tons of production that meets the specified void range of 2.5 to 5.5 percent.

Payment reduction will be applied to each subplot (500 tons) that falls outside of this range. See Subsection 401.21.

401.163 PGAB Content

The HMA will be accepted for PGAB content on a subplot basis. PGAB content will be determined in accordance with AASHTO T 308. Point of sampling will be from the truck at the plant. A subplot will consist of 500 tons. The number of samples per day will be computed as one for every 500 tons plus one for any additional fractional subplot that is equal to or greater than 100 tons or as directed by the Resident. There shall be a minimum of one subplot per day per JMF.

Payment reduction will be applied to each subplot (500 tons) that falls outside the allowable limits. Note minimum asphalt content specified in Special Provision Section 403. See Subsection 401.21.

401.164 Density

Pavement density will be determined by comparing the density of six inch diameter full depth cores (for the course being laid) taken from the compacted pavement to the Theoretical Maximum Density of that core. Core locations shall be by random samples in conformance with ASTM-D979 & D3665. The Contractor shall supply a masonry saw with a 12 inch deep diamond wet cutting saw blade capable of cutting the six inch diameter cores.

For determination of pavement density, core samples six inches in diameter, for the full depth of the course being laid, shall be taken by the Contractor from the mixture incorporated in the work after finishing operations have been completed and the pavement has cooled to 70°F. Ice or dry ice shall be used to reduce temperature as necessary.

Vertical surface of the core area shall be coated with rubberized joint sealer prior to refilling with bituminous mixture. Cores will not be cut for shim pavement.

The joint sealer, bituminous mixture and the labor for obtaining these samples in the field and restoring the surface shall be furnished without charge by the Contractor. The joint sealant shall conform to Federal Specification SS-S-1401C and shall be incidental to the pavement items.

Care must be exercised to avoid excess joint material on top of the finish mat and at the bottom of the joint.

No additional course shall be constructed on a course until the density of the sample has been established and approved.

The densities of the completed pavement shall be 92.5 to 97.0 percent of the theoretical maximum density obtained.

The pavement will be accepted for density on a subplot basis. A subplot will consist of 500 tons. The number of cores per day will be computed as one for every 500 tons plus one for any portion that does not equal 500 tons or as directed by the Resident. There shall be a minimum of one subplot per day per JMF.

Each subplot will be evaluated separately and full or partial payment will be made based on the results of tests performed on the cores.

Payment reduction will be applied to each core that has a density outside of the allowable range (92.5 to 97.0). See Subsection 401.21.

401.17 Joints

The Contractor shall construct wearing course transverse and longitudinal joints in such a manner that minimum tolerances shown in Subsection 401.101, Surface Tolerances, are met when measured with a straightedge.

The paver shall always maintain a uniform head of HMA during the joint construction.

The HMA shall be free of segregation and meet temperature requirements outlined in Subsection 401.04. Transverse joints of the wearing course shall be straight and neatly trimmed. The Contractor may form a vertical face exposing the full depth of the course by inserting a header, by breaking the bond with the underlying course, or by cutting back with hand tools. The Authority may allow feathered or "lap" joints on lower base courses or when matching existing base type pavements.

Longitudinal joints shall be generally straight to the line of travel, and constructed in a manner that will best ensure joint integrity. Methods or activities that prove detrimental to the construction of straight, sound longitudinal joints will be discontinued.

Extra care shall be taken to insure satisfactory vertical joints in the pavements. The Contractor shall apply a coating of joint sealant immediately before paving all cold joints (temperatures less than 120°F) to the vertical face of the wearing surface unless otherwise directed by the Resident. A heavy application of tack coat shall be applied to the vertical face of all cold joints on lower lifts. The Contractor shall use an approved spray apparatus designed for covering a narrow surface. The Authority may approve application by a brush for small surfaces, or in the event of a malfunction of the spray apparatus, but for a period of not more than one (1) working day. Joint sealer shall conform to Federal Specification SS-S-1401C. The Contractor shall submit to the Resident a manufacturer's certification for the joint sealant (SS-S-1401C).

Where pavement under this Contract joins an existing pavement or when the Authority directs, the Contractor shall cut the existing pavement along a smooth line, producing a neat, even, vertical joint. The Authority will not permit broken or raveled edges. The cost of all work necessary for the preparation of joints is incidental to related Contract pay items.

401.18 Quality Control

The Contractor shall submit for approval and operate in accordance with the approved Quality Control Plan (QCP) to assure a product meeting the contract requirements. The QCP shall meet the requirements of Section 106.4 – Quality Control and this Section. The Contractor shall not begin paving operations until the Authority approves the QCP in writing. Prior to placing any mix, the Authority and the Contractor shall hold a Pre-paving conference to discuss the paving schedule, source of mix, type and amount of equipment to be used, sequence of paving pattern, rate of mix supply, random sampling, project lots and sublots and traffic control.

A copy of the QC random numbers to be used on the project shall be provided to the Resident. The Authority's random numbers for Acceptance testing shall be generated and on file with the Resident and the Project Manager. All personnel of the Authority and the Contractor who have significant information relevant to the paving items shall attend, including the responsible onsite paving supervisor for the Contractor. The Resident will prepare minutes of the conference and distribute them to all attendees. Any requests to revise the minutes must be made to the Resident within 7 days of receipt. These minutes will constitute the final record of the pre-paving conference.

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

- a. JMF(s)
- b. Hot mix asphalt plant details.
- c. Stockpile Management (to include provisions for a minimum 2 day stockpile).
- d. Make and type of paver(s).
- e. Make and type of rollers including weight, weight per inch of steel wheels, and average contact pressure for pneumatic tired rollers.
- f. Name of QCP Administrator, and certification number.
- g. Name of Process Control Technician(s) and certification number(s).
- h. Name of Quality Control Technician(s) and certification number(s).
- i. Mixing and transportation including process for ensuring that truck bodies are clean and free of debris or contamination that could adversely affect the finished pavement.
- j. Testing plan.
- k. Laydown operations including longitudinal joint construction, procedures for avoiding paving in inclement weather, type of release agent to be used on trucks tools and rollers, compaction of shoulders, tacking of all joints, methods to ensure that segregation is minimized, procedures to determine the maximum rolling and paving speeds based on best engineering practices as well as past experience in achieving the best possible smoothness of the pavement. Solvent based agents developed to strip asphalts from aggregates will not be allowed as release agents.
- l. Examples of Quality Control forms including a daily plant report, daily paving report and delivery slip template for any plant to be utilized.

- m. Silo management and details (can show storage for use on project of up to 36 hours).
- n. Provisions for varying mix temperature due to extraordinary conditions or production limitations. If a warm-mix technology is utilized, a proposed target production range (not to exceed 50 F) will be provided for each mix design.
- o. Name and responsibilities of the Responsible onsite Paving Supervisor.
- p. Method for calibration/verification of Density Gauge.
- q. A note that all testing will be done in accordance with AASHTO and the Maine DOT Policies and Procedures for HMA Sampling and Testing.
- r. A detailed description of RAP processing, stockpiling and introduction into the plant as well as a note detailing conditions under which the percent of RAP will vary from that specified on the JMF.
- s. A detailed procedure outlining when production will be halted due to QC or Acceptance testing results.
- t. A plan to address the change in PGAB source or supplier and the potential comingling of differing PGAB's.
- u. Provisions for how the QCP will be communicated to the Contractor's field personnel.

The QCP shall include the following technicians together with following minimum requirements:

- a. QCP Administrator – A qualified individual shall administer the QCP. The QCP Administrator must be a full-time employee of or a consultant engaged by the Contractor or paving subcontractor. The QCP Administrator shall have full Authority to institute any and all actions necessary for the successful operation of the QCP. The QCP Administrator (or its designee in the QCP Administrator's absence) shall be available to communicate with the Authority at all times. The QCP Administrator shall be certified as a Quality Assurance Technologist certified by the New England Transportation Technician Certification Program (NETTCP).
- b. Process Control Technician(s) (PCT) shall utilize test results and other quality control practices to assure the quality of aggregates and other mix components and control proportioning to meet the JMF(s). The PCT shall inspect all equipment used in mixing to assure it is operating properly and that mixing conforms to the mix design(s) and other Contract requirements, and that delivery slips and plant recordation accurately reflects the mix being produced with all required information. The QCP shall detail how these duties and responsibilities are to be accomplished and documented, and whether more than one PCT is required. The Plan shall include the criteria to be utilized by the PCT to correct or reject unsatisfactory materials. The PCT shall be certified as a Plant Technician by the NETTCP.
- c. Quality Control Technician(s) (QCT) shall perform and utilize quality control tests at the job site to assure that delivered materials meet the requirements of the JMF(s). The QCT shall inspect all equipment utilized in transporting, laydown, and compacting to assure it is operating property and that all laydown and compaction conform to the Contract requirements. The QCP shall detail how these duties and responsibilities are to be accomplished and documented, and whether more than on QCT is required. The QCP shall include the criteria utilized by the QCT to correct or reject unsatisfactory materials. The QCT shall be certified as a Paving Inspector by the NETTCP.

The QCP shall detail the coordination of the activities of the Plan Administrator, the PCT and the QCT. The Project Superintendent shall be named the QCP, and the responsibilities for successful implementation of the QCP shall be outlined

401.191 Inspection/Testing

All quality control testing at the plant and paving site for bituminous concrete paving shall be provided by the Contractor and will be incidental to the various items of the Contract. Quality control testing to verify the job mix formula at the plant shall be comprised of a sample taken and tested for each 500 tons of production. The plant will be shut down for two consecutive out of Specification test results for VMA, VFB, Fbe, PGAB content, gradation, and/or voids. Prior to resuming paving operations, the plant quality control unit shall satisfy the Authority that the plant production is in compliance with the Specifications. The plant, at no additional cost to the Authority, shall assign qualified quality control staff personnel and have an on-site laboratory equipped to perform all tests.

The Contractor shall submit a list of on-site laboratory and sampling facilities, including available equipment.

Adequate and convenient sampling facilities shall be provided, allowing the Resident and the Authority's designated quality assurance personnel to obtain representative samples from the full width and depth of the discharge area of each aggregate bin. The sampling tray shall be structurally supported during the sampling operation. Access to the sampling facilities shall be provided. The use of such access shall not be more difficult than climbing a ladder leading to a secure platform with railings.

Final acceptance shall be based on quality assurance tests to assure compliance with the job mix formula as established. Samples and certified quality control reports shall be available to the Resident and the Authority's designated quality assurance personnel as often as requested. Sample locations will be random in compliance with ASTM D3665 or as directed by the Resident.

When plant inspection is maintained, the material will be considered acceptable for use when the specified tests from samples obtained at the production plant indicate conformance to the approved job mix formula.

Quality assurance testing services for bituminous concrete pavement shall be provided by the Authority. The Contractor shall provide adequate space and all lab equipment, materials and chemicals at the bituminous plant necessary to verify job mix formula (asphalt content (AASHTO T 164 or T 308) and gradations). Upon completion, the Contractor shall be responsible for the proper disposal of all materials and chemicals. This work will not be measured separately for payment, but shall be incidental to the various items of the Contract.

A. Inspection. The Resident, or his authorized representative, shall have access and use of the laboratory facilities at any time and access to all parts of the plant for:

1. Inspection of the condition and operations of the plant.
2. Confirmation of the adequacy of equipment in use.
3. Verification of the character and proportions of the mixture.
4. Determination of temperatures being maintained in the preparation of the mixtures.

5. Inspection of incidental related procedures.
6. Performing quality assurance testing.

B. Plant Testing Laboratory. The Contractor shall provide a plant testing laboratory for use by the Authority's quality assurance personnel for acceptance testing functions.

The plant laboratory shall be available at the following times for use by the Authority's quality assurance personnel:

1. During periods of pavement production;
2. During periods of sampling and testing; and,
3. Whenever materials subject to the provisions of these Specifications are being supplied or tested.

The Authority's quality assurance personnel will always have priority in use of the laboratory. The laboratory shall have sufficient equipment in order for both (Authority's and Contractor's) testing representatives to operate efficiently.

The plant testing laboratory shall have a floor space area of not less than 150 square feet, with a ceiling height of not less than 7-1/2 feet. The laboratory shall be weather tight, sufficiently heated in cold weather and air-conditioned in hot weather, to maintain temperatures for testing purposes of $70^{\circ}\text{F} \pm 5^{\circ}\text{F}$.

As a minimum the plant testing laboratory shall have:

1. Adequate artificial lighting.
2. Electrical outlets sufficient in number and capacity for operating the required testing equipment and drying samples.
3. Two fire extinguishers, Underwriter's Laboratory approved.
4. Work benches for testing, minimum 2-1/2 feet by 10 feet.
5. Desk with two chairs.
6. Sanitary facilities convenient to testing laboratory.
7. Exhaust fan to outside air, minimum 12 inch blade diameter.
8. A direct telephone line and telephone including answering machine and FAX machine, operating 24-hours per day, seven days a week.
9. File cabinet with lock for Resident.
10. Sink with running water, attached drain board and drain.
11. Metal stand for holding washing sieves.
12. A Two element hot plate or other comparable heating device, with dial type thermostatic controls for drying aggregates.
13. Mechanical shaker and appropriate sieves (listed in 639.06) meeting the requirements of ASTM E11.
14. Superpave gyratory compactor.
15. Oven, thermostatically controlled, inside minimum one cubic foot.
16. Two volumetric specific gravity flasks, 500 CC.
17. Other necessary hand tools required for sampling and testing.
18. Library containing Contract Specification, latest ASTM Volumes 4.03 and 4.04, AASHTO Materials Parts I and II, and Asphalt Institute Publications MS-2 and SS-1.

19. Equipment for Maximum Theoretical Density meeting the requirements of AASHTO T209 and equipment for Bulk Spec. Gravity meeting the requirements of AASHTO T166.
20. Infra-red temperature measuring device for use at both plant and Project site.
21. Necessary equipment for extraction (wet sample) testing.
22. Diamond blade saw for trimming pavement cores.
23. Two ovens.
24. All equipment (scales, Superpave gyratory compactor, etc.) to have current calibrations and certifications.

Approval of the plant and testing laboratory by the Resident requires all the above facilities and equipment to be in good working order during pavement production, sampling and testing. Failure to provide any of the above shall be sufficient cause for disapproving the bituminous plant operations.

401.21 Method of Measurement

The Authority will measure Hot Mix Asphalt Pavement by the ton in accordance with Subsection 108.1, Measurement of Quantities for Payment.

This Subsection is amended by the following:

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 and 401.164. 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 \$100.00 for each additional core tested. Pavement restoration will not be measured separately for payment, but shall be incidental to the respective pay item.

Any lot resulting in zero payment shall be removed, disposed of and replaced at no additional cost to the Authority. Replacement pavement will be paid for based on the accepted and payment criteria specified herein.

<u>CORE DENSITY VS. CORE THEORETICAL MAXIMUM DENSITY COMPACTION (SURFACE) 92.5-97 PERCENT</u>	
<u>PERCENT COMPACTION</u>	<u>PERCENT PAYMENT</u>
92.5 - 97.0	100
91.5 - 92.4, 97.1 - 97.9	95
90.5 - 91.4, 98.0 - 98.9	90
89.5 - 90.4, 99.0 - 99.9	75
<89.5, > 99.9	0
Note: Percent compaction is the percentage of the field core density as compared to the Theoretical Maximum Density (TMD) of that core.	

*AIR VOIDS – 2.5 – 5.5 PERCENT	
<u>VOIDS</u>	<u>PAYMENT PERCENT</u>
2.5 to 5.5	100
2.0 - 2.4, 5.6 - 6.1	95
1.5 – 1.9, 6.2 – 6.6	90
1.0 - 1.4, 6.7-7.1	75
<1.0, >7.1	0
<u>Note:</u> Voids are based on the average of the test specimens fabricated at the plant for each subplot (500 tons). *Air voids payment does not apply for ARGG, but does for shut down criteria	

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 outside of the following ranges shall not be permitted

9.5 mm	5.7 – 7.5
12.5 mm	5.2 – 6.4
12.5mm (ARGG)	7.6 min.
19.0 mm	4.7 – 6.1

9.5 mm PGAB CONTENT	
% PGAB	% PAYMENT
JMF Aim \pm 0.4	100
JMF Aim + 0.5 , - 0.5 , < 5.7	95
JMF Aim + 0.6 , - 0.6 , < 5.6	85
JMF Aim + 0.7 , - 0.7 , < 5.5	75
JMF Aim + 0.8 , - 0.8 , \leq 5.4, > 7.5	50
<u>Note:</u> PGAB content is based on samples tested at the plant for each 500 Ton subplot	

12.5 mm PGAB CONTENT	
% PGAB	% PAYMENT
JMF Aim \pm 0.4	100
JMF Aim + 0.5 , - 0.5 , < 5.1	95
JMF Aim + 0.6 , - 0.6 , < 5.0	85
JMF Aim + 0.7 , - 0.7 , < 4.9	75
JMF Aim + 0.8 , - 0.8 , \leq 4.8, > 6.4	50
<u>Note:</u> PGAB content is based on samples tested at the plant for each 500 Ton subplot	

12.5 mm PGAB CONTENT(ARGG)	
% PGAB	% PAYMENT
JMF Aim \pm 0.4	100
JMF Aim + 0.5 , - 0.5	95
JMF Aim + 0.6 , - 0.6	85
JMF Aim + 0.7 , - 0.7	75
JMF Aim + 0.8 , - 0.8	50
<u>Note:</u> PGAB content is based on samples tested at the plant for each 500 Ton subplot	

19.0 mm PGAB CONTENT	
% PGAB	% PAYMENT
JMF Aim ± 0.4	100
JMF Aim + 0.5 , - 0.5 , < 4.6	95
JMF Aim + 0.6 , - 0.6 , < 4.5	85
JMF Aim + 0.7 , - 0.7 , < 4.4	75
JMF Aim + 0.8 , - 0.8 , ≤ 4.3 , > 6.1	50
<u>Note:</u> PGAB content is based on samples tested at the plant for each 500 Ton subplot	

As an example of payment reduction, if a subplot of 500 tons was tested and found to have 96 percent TMD compaction, 5.8 percent air voids and asphalt content of 5.58 percent, the payment reduction would be as follows:

$$\begin{array}{llll}
 500 \text{ tons} \times 1.00 & = 500 \text{ tons payment} & = & 0 \text{ tons reduction (compaction)} \\
 500 \text{ tons} \times 0.95 & = 475 \text{ tons payment} & = & 25 \text{ tons reduction (voids)} \\
 500 \text{ tons} \times 0.95 & = 475 \text{ tons payment} & = & 25 \text{ tons reduction (asphalt content)}
 \end{array}$$

$$\text{Payment} = 500 \text{ tons} - (0 + 25 + 25) = 450 \text{ tons}$$

401.22 Basis of Payment

The Authority will pay for the work, in place and accepted, in accordance with the applicable sections of this Section, for each type of HMA specified.

The Authority will pay for the work specified in Subsection 401.11, for the HMA used, except that cleaning objectionable material from the pavement and furnishing and applying bituminous material to joints and contact surfaces is incidental.

Payment for this work under the appropriate pay items shall be full compensation for all labor, equipment, materials, and incidentals necessary to meet all related Contract requirements, including design of the JMF, implementation of the QCP, obtaining core samples, transporting cores and samples, filling core holes, applying specified material to joints, and providing testing facilities and equipment.

SPECIAL PROVISION

SECTION 403

HOT MIX ASPHALT PAVEMENTS

Desc. of Course	Grad. Design	Item Number	Bit Cont. % of Mix	Total Thick	No. Of Layers	Comp. Notes
Full Depth Roadway Widening						
Wearing	12.5 mm	403.208	5.2 min. to 6.4	1-1/2 in.	1	A, B, D, E, L
Binder	12.5 mm	403.213	5.2 min. to 6.4	1-1/2 in.	1	A, B, D, E, L
Base	19 mm	403.207	4.7 min. to 6.1	4 in	2	A, B, D, E, L
Traffic Island						
Wearing	9.5 mm	403.209	5.7 min. to 6.4	2 in	1	A, B, D, F, G, L
Full Width I-195 Westbound (Station 109+00 +/- to Station 111+50 +/-, left)						
Wearing	9.5 mm	403.21	5.7 min. to 6.4	1-1/2 in	1	A, B, D, F, L

COMPLEMENTARY NOTES

- A. The bituminous binder material for this mixture shall be PG 64-28.
- B. The contractor shall furnish a quality control technician with a thin lift nuclear density gauge to ensure density requirements are met.
- C. Bridge decks. No RAP is allowed. The use of an oscillating steel roller shall be used to compact all hot mix asphalts placed on
- D. The aggregate qualities shall meet the design traffic level of 3 to <10 million ESALS for mix placed under this contract. The design verification, Quality Control, and Acceptance tests for this mix will be performed at **75 gyrations**. (N design)
- E. Section 106.6, Acceptance, (1) Method A. (MaineDOT Standard Specification-December 2002).
- F. Section 106.6, Acceptance, (2) Method C (MaineDOT Standard Specification-December 2002).
- G. A **“FINE”** 9.5 mm mix with a gradation above or through the restricted zone shall be used for this item.
- H. A mixture meeting the gradation of 12.5 mm hot mix asphalt may be used at the option of the Contractor.
- I. A mixture meeting the gradation of 9.5 mm hot mix asphalt may be used at the option of the Contractor.
- J. A mixture meeting the requirements of Subsection 703.09, Grading ‘D’, with a minimum PGAB content of six percent, and the limits of Special Provision 401, Table 9 (Drives and Sidewalks) for PGAB content and gradation may be substituted for this item. A job mix formula shall be submitted to the Resident for approval.

- K. Any base or binder mix left exposed to traffic over the winter shall have a layer of 12.5 mm mix substituted for the 19 mm mix. If this substitution is made, the specified layers may need to be modified, as approved by the Resident.
- L. Joints shall conform to Subsection 401.17 below.
- M. Match existing pavement thickness.

401.03 Composition of Mixture

This Subsection is deleted in its entirety and replaced with the following:

The Contractor shall submit a current MaineDOT approved job mix formula to the Resident at least 30 days prior to the placement of bituminous pavement. Submission shall include a description of where the submitted mix is currently in use on a MaineDOT Project. Bituminous pavement shall not be placed until after the job mix formula is approved by the Resident.

401.6 Weather and Seasonal Limitations

This Subsection is deleted in its entirety and replaced with the following:

The Contractor shall not place any hot mix asphalt on a wet or frozen surface. The air temperature shall be 40°F or higher when placing non-surface mix, and 45°F or higher when placing shim or surface mix.

401.17 Joints

All cold joints with temperatures less than 120°F shall be sealed as specified herein.

The fourth paragraph is amended as follows:

The words “emulsified asphalt” are deleted and replaced with “joint sealant, conforming to Federal Specification SS-S-1401C”.

The following sentence is added after the last paragraph:

The Contractor shall submit to the Resident a manufacturer’s certification for the joint sealant (SS-S-1401C).

401.204 Opening to Traffic

No vehicular traffic or 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.

401.205 Additional Lifts of Pavements

No additional lifts of pavement shall be permitted on a newly completed pavement layer until the material has cooled sufficiently and adequate stability has been attained to prevent mat distortion or loss of fines. No subsequent lift of pavement shall be placed until the internal temperature of the previously placed pavement layer has cooled to 120°F. The Resident will test the internal temperature of the previously placed pavement layer and shall be the sole judge as to whether a subsequent lift of pavement can be placed. No equipment or traffic will be permitted on the compacted pavement layer until the internal temperature has cooled to 120°F.

SPECIAL PROVISION

SECTION 409

BITUMINOUS TACK COAT

409.02 Bituminous Material

This Subsection is deleted in its entirety and replaced with the following:

Bituminous material shall conform to the Specifications for Emulsified Asphalt RS-1, of the AASHTO Designation M-140.

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-brooming or scraping, or a combination of both. Small areas otherwise inaccessible may be broomed 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, 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 Item 409.15, Bituminous Tack Coat, Applied.

SPECIAL PROVISION

SECTION 419

SAWING 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:

Pay Item

Pay Unit

419.30 Sawing Bituminous Pavement

Linear Foot

SPECIAL PROVISION

SECTION 502

STRUCTURAL CONCRETE

This Subsection is deleted in its entirety and replaced with the following:

502.01 Description

This work shall consist of furnishing and placing Portland Cement Concrete for structures and incidental construction in accordance with these Specifications and in conformity with the lines, grades and dimensions shown on the Plans or established, or for placing concrete fill or underwater seals for foundations where called for on the Plans.

502.02 Classification

The Portland Cement Concrete shall be the class indicated on the Plans.

502.03 Materials

Materials shall meet the requirements specified in the following Subsections of Division 700, Materials:

Portland cement and Portland-pozzolan cement	701.01
Water	701.02
Air-Entraining Admixtures	701.03
Water Reducing Admixtures	701.04
High Range, Water Reducing, Admixture	701.0401
Set-retarding Admixtures	701.05
Curing Materials	701.06
Waterstops	701.07
Smoothed Surfaced Asphalt Roll Roofing (formerly heavy roofing felt)	701.08
Fly Ash	701.10
Calcium Nitrite Solution	701.11
Silica Fume	701.12
Ground Granulated Blast Furnace Slag	701.13
Fine Aggregate for Concrete	703.01
Coarse Aggregate for Concrete	703.02
Alkali Silica Reactive Aggregates	703.0201
Preformed Expansion Joint Filler	705.01
Bridge Drains	711.04

In Subsection 701.10, Fly Ash, the “Loss on Ignition (LOI)” paragraph is deleted and replaced with the following:

Loss on Ignition (LOI) - Shall be 6.0 percent maximum per AASHTO T105 (ASTM C311) provided the Fly Ash has a documented history of not adversely affecting the concrete air content, otherwise the LOI shall be 3.0 percent maximum per AASHTO T105 (ASTM C311).

502.04 Shipping and Storage

Cement may be shipped in bags or in bulk from pre-tested and approved silos at the cement mill. The cement shall be completely protected from rain and moisture. Any cement damaged by moisture or which fails to meet any of the specified requirements shall be rejected and removed from the site. If requested by the Resident, cement stored for a period longer than 60 days shall be retested before being used in the work.

Bags of cement in shipment or storage shall not be piled more than eight (8) bags high. Bags of cement which for any reason have become partially set or which contain lumps of caked cement shall be rejected. Shipments of cement in bags shall be separately stored in a manner as to provide easy access for identification and inspection of each shipment.

Fly ash and slag shall be stored in weather tight silos approved by the Resident. All silos shall be completely empty and clean before material is deposited therein, unless the silo already contains material of the same type and properties.

Fly ash or slag remaining in bulk storage for a period greater than one (1) year after completion of tests will be resampled and retested by the supplier before shipment or use.

Handling, shipping and stockpiling of aggregates shall be done in such a way as to minimize segregation and breakage.

Fine aggregate and each size of coarse aggregate shall be stored in completely separate stockpiles on prepared bases constructed of the same material as that to be stockpiled, with a minimum thickness of 300 mm [1 ft.]. The ground under the prepared bases shall be reasonably graded to drain away from the stockpile and shall be free of brush or other harmful vegetation. The base shall be left in place, undisturbed for the duration of the use of the stockpile. Prepared bases can be salvaged for reuse provided this material is reprocessed. Barge floors, wood, metal or other approved hard surfaces shall be considered acceptable alternates for the prepared bases described above.

502.041 Testing Equipment

The Contractor shall provide testing equipment and materials as specified below for use by the Resident or their representative exclusively. The equipment shall be available and acceptable to the Resident one (1) week prior to placing any concrete. All costs associated with providing and maintaining testing equipment shall be incidental to the work and no additional payment will be made.

The Resident will maintain the test equipment in reasonable condition. However, the Contractor shall replace any equipment that becomes unusable due to normal wear and tear or which is stolen or damaged from other than the Resident's neglect or mistreatment. All such replacement costs shall be incidental to the work and no additional payment will be made.

- A. Pressure air meter meeting requirements of AASHTO T152 (Type B) and all accessory pay items required for use with the particular design of apparatus. This shall include one nine inch mason trowel, one metal scoop nine inches long x five inches wide, one tamping rod conforming to AASHTO T119, one rubber mallet as described in AASHTO T152, one strike off bar (flat straight bar of steel). The air

meter shall be functional and shall bear a current calibration certificate issued by a recognized testing laboratory. Current shall mean within the calendar year.

- B. Two pocket dial thermometers 0°F to 200°F, one inch diameter dial, five inch pointed stem, unbreakable poly carbonate crystal, stainless steel case, stem and bezel. Accuracy required is one percent over entire range.
- C. “Contractors” rubber tired wheelbarrow.
- D. Two D-handle square end shovels 9-1/2 inches wide.
- E. Two pair heavy duty, long cuff, rubber gloves.
- F. Miscellaneous equipment: 16 oz. plastic squeeze bottle, five gallon bucket, scrub brush, paper towels, folding rule, and rubber syringe.
- G. Small rod – one tamping rod conforming to AASHTO T277
- H. Slump Cone.
- I. 10 foot straightedge as required by Resident.

502.05 Composition and Proportioning

Concrete shall be composed of a homogenous mixture Portland Cement, fly ash, or ground granulated blast furnace slag, fine aggregate, coarse aggregate, water and admixtures proportioned according to these Specifications and shall conform to the requirements of Table 1.

At least 45 days prior to placement of any concrete to be incorporated in the bridge or other concrete structure, the Contractor shall submit mix designs that meet the requirements of Table 1 along with the proposed sources of aggregates, cement, water and admixtures for each class of cement concrete specified. Sufficient material shall be obtained by the Authority's designated testing personnel at the proposed sources for verification of acceptability by test and for mix design. Materials failing to meet the specified requirements shall be rejected and new materials shall be resubmitted to the laboratory. The Authority's testing laboratory will determine the proportions of cement, aggregate, water, air entraining agents, and other admixtures of all specified and proposed concrete mixtures by means of trial design batches and tests using the consistencies, air content and other properties suitable for the work and in accordance with the latest applicable AASHTO or ASTM Standards and designations.

TABLE 1
MASTER LIMITS TABLE

Class of Concrete	Minimum Compressive Strength at 28 Days	Minimum Cementitious Content	Water Cement Ratio	Slump	Air Content	Maximum Coarse Aggregate Size (703.02)	Notes
	PSI	LB/CY		INCHES	%	INCHES	
A	4000	611	0.38±0.02	6 ± 2	6 ± 1	1	3, 4
AA	4000	658	0.38±0.02	3.5	5 to 7	3/4	1, 3
AAA	4500	658	0.38±0.02	6 ± 2	6 ± 1	3/4	3, 4
AAA – Deck	4500	658	0.42±0.02	6 ± 2	7.5 ± 1.5	3/4	3,4,6
AAA - Modified	4500	752	0.38±0.02	6 ± 2	6 ± 1.5	3/8	3,4
B	3000	517	0.40±0.02	6 ± 2	5 ± 1	1-1/2	1, 3
S	3500	635	0.38±0.02	6 ± 2	6 ± 1	1-1/2	1, 3
P	SEE PLANS	658	0.38±0.02	6 ± 2	5 ± 1	3/4	3, 4, 5
IS	3000	470	0.58	5 ± 1	3.0% Max	1-1/2	2, 3

NOTES:

1. All concrete shall contain either a normal water reducing admixture (Type A) or a high range water reducing admixture (HRWR) meeting the requirements of Subsection 701.0401. When a HRWR is used, a maximum of an 8.0” slump is allowed.
2. All concrete shall contain a non-chloride based, mid-range water reducing admixture (MRWR) meeting the requirements of ASTM C494.
3. All concrete shall contain a Portland Cement replacement. Portland Cement pre-blended with either fly ash or ground granulated blast-furnace slag may be used when accepted by the Resident.

Due to the lower heat of hydration effect of high cement replacements, the Contractor is responsible for selecting a replacement level which is appropriate for the time of year if cold weather conditions are anticipated.

4. All concrete shall contain a high range water reducing admixture (HRWR) meeting the requirements of Subsection 701.0401. A minimum of one-half the design dosage of the HRWR should be added at the plant to insure thorough mixing. The HRWR should be added in strict accordance with the manufacturer’s guidelines and limitations. The HRWR Guidelines need to be submitted to the Resident for review and approval. The concrete will not be slump tested by the Authority prior to the addition of the HRWR. The supplier shall provide the aggregate moisture adjustment and plant-added water on the delivery tickets. If additional slump is required in the field, it will be achieved with additional HRWR (in accordance with the manufacturer's recommendations and limitations).

5. A calcium nitrate corrosion inhibitor meeting the requirements of ASTM 494 Type C shall be added at a rate of not less than three gallons per cubic yard.
6. Synthetic Fiber Reinforcement shall be added to all Concrete Pavement Slabs and ORT Slabs and Grade Beams concrete mixes in accordance with Special Provision 503 "Synthetic Fiber Reinforcement".

Deck concrete (Class AAA – Deck) is a new mix design and trial batching will be required per specifications. The mix design may gain strength slower than other MTA mix designs, and the contractor shall plan construction operation accordingly.

The mix design submitted by the Contractor shall include the following information:

- A. Description of individual coarse aggregate stockpiles, original source, bulk specific gravity, absorption, gradation and alkali silica reactivity test results. A combined coarse aggregate blended gradation shall be provided.
- B. Description of fine aggregate, original source, bulk specific gravity, absorption, colorimetric, gradation and Fineness Modulus (F.M.).
- C. Description and amount of cement and cement replacement material.
- D. Target water cement ratio.
- E. Target water content by volume.
- F. Target strength.
- G. Target air content, slump, and concrete temperature.
- H. Target concrete unit weight.
- I. Type and dosages of air entraining and chemical admixtures.

Approval by the Authority will be contingent upon the ability of the mix design proportions to meet the concrete strength requirement and other factors that affect durability. Cement replacements are included in the cementitious material.

Concrete mix designs shall contain 15 to 30 percent fly ash replacement by weight, or 25 to 50 percent slag cement replacement by weight. Deck concrete mix designs shall have a maximum of 30% slag cement replacement by weight.

Cast-in-place concrete shall contain no more than 660 lb/cy of cementitious material, except for Class AAA-Modified which shall contain no more than 760 lb/cy of cementitious material.

All concrete mixes must be designed in accordance with the criteria of this Section. The design proportions with the fine aggregates designated as a percent of the total aggregate must be stated in terms of aggregate in a saturated, surface dry condition and the batch weights will be adjusted by the Contractor for the actual moisture of the aggregate at the time of use.

Based on the design parameters, including minimum cement factor and maximum water cement ratio, a curve representing the relation between the water/cement ratio and the average seven day and 28 day compressive, or earlier strength at which the concrete is to receive its full working load, will be established by the Authority's laboratory for a range of values including all of the compressive strengths required. The curves shall be established by at least three points, each point representing average values from at least three test specimens. Amount of water used in the concrete, as determined from the curve, shall correspond to the required average strength called for in the Specifications in accordance with the ACI 301-89, Table for Laboratory Mix Design Data – Required Average Compressive Strength below. When required, the consistency of the basic mix selected shall be adjusted by the use of high range water reducers.

LABORATORY MIX DESIGN DATA
REQUIRED AVERAGE COMPRESSIVE STRENGTH

SPECIFIED f'_c	REQUIRED f'_{cr}
LESS THAN 3000 PSI	$f'_c + 1,000$ PSI
3000 PSI TO 5000 PSI	$f'_c + 1,200$ PSI
OVER 5000 PSI	$f'_c + 1,400$ PSI
The curves shall be established by at least three (3) points, each point representing the average values from at least three (3) test specimens for each age of seven (7) and twenty-eight (28) days. Laboratory tests are valid for ninety (90) days.	

The laboratory adjusted mix design will then be forwarded to the Contractor for his use. No change in the source or character of the mix ingredients may be made without notice to the Resident, and no new mix ingredients shall be used until the Resident has approved such ingredients and new mix proportions, if they change. Additional testing, if required, shall be paid for by the Contractor.

502.0501 Quality Control

The Contactor shall control the quality of the concrete through testing, inspection and quality control practices which shall be sufficient to assure a product meeting the Contract requirements.

Concrete sampling for QC shall be taken at the discharge point with pumped concrete sampling taken at the discharge end of the pump line.

For each truckload of concrete, the Contractor shall provide a Certificate of Compliance to the Authority at the time of the load placement. The Certificate of Compliance shall be a form acceptable to the Authority and shall include the following:

- Contract Name & Number
- Bridge Name
- Manufacturing Plant (Batching Facility)
- Name of Contractor (Prime Contractor)

- Date
- Time Batched/Time Discharged
- Truck No.
- Quantity (Quantity Batched this Load)
- Type of Concrete by Class and Producer Design Mix No.
- Cement Brand or Type, and Shipment Certification No.
- Temperature of Concrete at Discharge
- Target Weights per Cubic Yard and Actual Batched Weights for:
 1. Cement
 2. Pozzolanic additives, including fly ash, slag cement, and microsilica
 3. Coarse concrete aggregate
 4. Fine concrete aggregate
 5. Water (including free moisture in aggregates and water added at the Project)
 6. Admixtures brand and quantity (fl. oz./cubic yard)
 - Air-entraining admixture
 - Water reducing admixture
 - Other admixtures
- Placement Location

502.0502 Quality Assurance

The Authority will determine the acceptability of the concrete through a quality assurance program and field measurement of surface tolerance, alignment and trueness, plumb and batter, and finish.

The Authority will take verification tests at times deemed appropriate by the Resident. Verification tests will include compressive strength, air content and permeability.

Concrete sampling for verification tests will be taken at the discharge point, with pumped concrete sampling taken at the discharge end of the pump line.

Compressive strength test will be completed by the Authority in accordance with AASHTO T22 at 28 days except that no slump will be taken. The average of two cylinders will be used to determine compressive strength.

Testing for entrained air in concrete, at the rate of one test per load, shall be in accordance with AASHTO T152.

Determination of the concrete cover over reinforcing steel for structural concrete shall be made prior to concrete being placed in the forms. Bar supports, chairs, slab bolsters, and side form spacers shall meet the requirements of CRSI Chapter 3, Section 2.5 Class 1, Section 2.6 Class 1A or Section 4. All supports shall meet the requirements for type and spacing as stated in the Concrete Reinforcing Steel Institute (CRSI) Manual of Standard Practice, Chapter 3. Concrete will not be placed until the placing of the reinforcing steel and supports have been approved by the Resident. If the Contractor fails to secure Authority approval prior to placement, the Contractor's failure shall be cause for removal and replacement at the Contractor's expense. The Contractor shall notify the Resident, at least 48-hours prior to the placement, when the reinforcing steel will be

ready for checking. Sufficient time must be allowed for the checking process and any needed repairs.

Rejection by Resident - For material not meeting Project Specifications, the Authority at its sole discretion will:

- A. Require the Contractor to remove and replace the entire affected placement with concrete meeting the Contract requirements at no additional expense to the Authority; or,
- B. Accept the material at a reduced payment as determined by the Authority.

Surface Tolerance, Alignment and Trueness, Plumb and Batter, and Finish - The Resident will measure each of these properties as follows:

A. Surface Tolerance - Exposed horizontal and sloping portions of the substructure, superstructure slabs, wearing surface, sidewalks, parapets, barriers, and wingwalls will be measured at randomly generated locations with a 10 foot straightedge once per 100 ft². Measurements beyond tolerances given in Table 5, Subsection 502.14(E) will be cause for removal or pay adjustment and potential corrective action as determined by the Resident. The Contractor shall furnish the 10 foot straightedge. At the Resident's discretion, measurements may be taken with a lightweight profiler. When the Resident uses the lightweight profiler to measure tolerance, and the International Ride Index (IRI) is between 250 and 300 in./mile for any one placement, a pay adjustment will be made. When tolerances exceed 300 in./mile, there will be cause for removal or a pay adjustment and potential corrective action.

B. Alignment and Trueness - Alignment and trueness may be measured by the Resident longitudinally along any vertical surface of any portion of the structure and shall not exceed a deviation of 1/4 inch in three feet for structures up to 30 feet in length. Structures in excess of 30 feet in length will be subject to a maximum tolerance of two inches. Measurements exceeding these tolerances will be cause for removal or pay adjustment and potential corrective action as determined by the Resident.

C. Plumb and Batter - The Resident will measure all columns and other vertical surfaces that will remain exposed to determine actual plumbness and batter. Measurements will be taken subsequent to every placement. Vertical faces of columns will be measured at a minimum of two faces at right angles to each other. Other vertical surfaces will be measured once every 15 feet along the face of longitudinal wall. All measurements will be made on a per placement basis and will be subject to a tolerance of 1/4 inch in 10 feet. Measurements between 1/4 inch and 1/2 inch in 10 feet will result in pay adjustments. Measurements beyond 1/2 inch in 10 feet will be cause for removal or pay adjustment and potential corrective action as determined by the Resident.

D. Finish - The Resident will measure and determine the areas to be repaired in accordance with Subsections 502.10(d), 502.13, and 502.14(e) for each placement. Areas to be repaired will be measured as a percentage of the total surface area of the placement. Those areas to be repaired that are between zero and five percent of the total surface area of the placement will result in no pay adjustments. Areas to be repaired that are between five percent and 10 percent will result in pay adjustments. Areas greater than 10 percent of the total surface area of the placement will be cause for removal or pay adjustment and corrective action as determined by the Resident.

Appropriate pay adjustments, as described in Subsection 502.194, will be made for any or all of the properties described above that do not meet Specification requirements.

502.0505 Resolution of Disputed Acceptance Test Results

The Contractor shall work cooperatively with the Resident in maintaining Control Charts in order to identify potential issues with any test results and take appropriate actions to address these issues before they become disputed issues. Circumstances may arise where the Authority's test results indicate that a material is unacceptable and removal is warranted. If the material is marginally acceptable, it may remain in place and be paid for at a reduced rate determined by the Authority. This Subsection provides recourse for the Contractor to contest the Authority's QA test results as follows, at no additional cost to the Authority:

A. Compressive Strength - The Contractor shall take appropriate corrective measures when the Resident advises the Contractor that the average of three consecutive compressive strength test results fall to less than 150 psi above the specified strength, or any single test falls more than 200 psi below the specified strength. The Contractor shall make corrective changes in materials, mix proportions, or in the concrete manufacturing procedure before additional concrete of the same class is placed.

There may be situations where there is the possibility that an underlying structural element could be built-upon before test results for the underlying element have been reported, based upon the normal frequency of testing. In these instances, it is in the Contractor's best interest to perform additional testing that will provide indications that the concrete will meet the requirements of the applicable Specifications, prior to continuing to build upon this underlying element. In the extreme case where an underlying structural element has been built-upon before test results for the underlying element have been reported, the above mentioned safeguards of tracking and additional testing have failed and the final test results for the concrete of the underlying element indicate that removal is warranted and the Contractor's QC results do not confirm the Authority's test results, the following procedure concerning compressive strength may be undertaken by the Contractor and witnessed by the Authority, within 36 days of the placement date:

1. Drilled core specimens shall be retrieved from the concrete in question in accordance with the requirements of ASTM C42/C42M, Standard Test Method for Obtaining and Testing Drilled Cores and Sawed Beams of Concrete. The core strength acceptance and evaluation criteria included in ACI 318 shall not apply.
2. Three drilled core specimens shall be taken from each subplot in question, from randomly selected locations to be representative to the entire volume of the subplot. The Resident and the Contractor's representative shall agree on the sample locations prior to drilling. The specimens shall have a minimum diameter of four inches and a minimum length of eight inches.
3. The concrete cores shall be taken directly from the Project to the Authority's designated independent testing laboratory where they will be tested. The cores shall be protected from drying and damage during transport. The Contractor shall make arrangements with the Authority's designated independent testing laboratory for testing prior to beginning the coring process.

4. Core test results will be evaluated by the Authority with the understanding that the strength of drilled cores is, in general, 85 percent of that of corresponding standard-cured molded cylinders. Therefore, the test results of the three cored cylinders shall be averaged, and then divided by a factor of 0.85. The resulting compressive strength shall be used by the Authority in the final determination of the acceptability of the material in question and shall replace the contested test result in computing pay adjustments for the subplot in question. If coring is not done with the 36 day time limit, the Authority will not allow dispute testing of the subplot.
5. If the Authority concludes that the strength of the structural element in question is adequate as a result of the above procedure, then the concrete shall remain in place and will be paid for at a reduced rate, as determined by the Authority. If the Authority concludes that the strength of the structural element in question is unsatisfactory as a result of the above procedure, then the Authority will direct the Contractor to take appropriate actions, as determined by the Authority, and at no additional cost to the Authority.

B. Entrained Air – In order to dispute the Authority's test results, the Contractor must test material from the same sample as the Authority. If the difference between the Authority's and the Contractor's air tests is equal to or greater than 0.8 percent, then the material shall be retested by both parties. If the difference between the retests is equal to or greater than 0.8 percent, the concrete placement will be suspended immediately, and 1) both air meters shall be calibrated immediately, or 2) the Contractor shall immediately replace both air meters. Once it is demonstrated the QC and Acceptance air meters are in agreement with 0.8 percent, the concrete placement may resume.

502.06 Batching

Measuring and batching shall be performed at an approved batching plant, unless otherwise approved by the Resident. The batching plant shall meet the requirements of AASHTO M-157.

502.0701 Delivery

A. Delivery and discharge of the concrete from the mixer shall be completed within a maximum of 1-1/2-hours from the time the cement is added to the aggregate, except that in hot weather when the concrete mix temperature exceeds 70°F or under other conditions contributing to quick stiffening of the concrete, delivery and discharge from the mixer shall be completed within one hour. When approved by the Resident, the use of a retarding admixture (Type D) may be used for increasing the one hour discharge time to 1-1/2-hours, provided concrete temperatures are kept below 80°F and conditions contributing to quick stiffening of the concrete are not present.

B. Concrete, which has been condemned for any reason, shall be removed immediately from the jobsite and disposed of properly.

C. Concrete temperature before placement shall not exceed 85°F.

D. All concrete trucks must have working revolution counters, and be set to zero at the start of mixing. Any truck without a counter will be rejected from the job unless the Contractor can assure the Resident that adequate mixing has been achieved.

502.08 Cold Weather Concrete

All frost, ice, and snow shall be removed from all material that will be in contact with fresh concrete.

Unless authorized by the Resident, the mixing and placing of concrete shall be discontinued when the atmospheric temperature is below 40°F in the shade and dropping and shall not be resumed until the atmospheric temperature is as high as 35°F in the shade and rising. If authorization is granted for the mixing and placing of concrete under atmospheric conditions different from those specified above, the water shall be heated to a temperature not exceeding 180°F. When either the aggregate or water is heated to above 120°F, they are to be combined first in the mixer before the cement is added. If the atmospheric temperature is below 25°F, the aggregate shall also be heated when approved by the Resident. Materials containing frost or lumps of frozen material shall not be used. Stockpiled aggregates may be heated by the use of dry heat or steam. Aggregates shall not be heated directly by gas or oil flame or on sheet metal over a fire. When aggregates are heated in bins, steam coil or water coil heating or other methods that will not be detrimental to the aggregates may be used. The heating apparatus shall be capable of heating the mass uniformly and preventing the occurrence of spots of overheated material. The temperature of the mixed concrete shall be between the minimum values shown in Table 4 and 70°F when it is placed in the forms. Salt or other chemicals shall not be added to the concrete for any reason whatsoever, except by written permission of the Resident.

TABLE 4
COLD WEATHER TEMPERATURE TABLE

MINIMUM FORM DIMENSION SIZE

Less than 300 mm (12 in.)	300 – 900 mm (12 - 36 in.)	900 – 1800 mm (36 - 72 in.)	Greater than 1800 mm (72 in.)
13°C (55°F)	10°C (50°F)	7°C (45°F)	5°C (40°F)
MINIMUM CONCRETE TEMPERATURE AS PLACED			

When permitted by the Resident, footings may be protected by completely submerging them by admitting water inside the cofferdam. Until submersion takes place, the temperature of the concrete and its surface shall be controlled as specified above. Submersion shall proceed slowly and the temperature of the air or water shall be maintained sufficient to prevent ice from forming within the cofferdam for a period of seven (7) days after the placing of the concrete.

When depositing concrete under water, there shall be no ice inside the cofferdam.

Permission given to place concrete under the conditions mentioned above shall not relieve the Contractor of responsibility for obtaining satisfactory results. The Contractor shall be wholly responsible for the protection of concrete during cold weather operations and any concrete injured by frost action or overheating shall be removed and replaced at the Contractor's expense.

502.10 Forms and False Work

A. Construction of Forms - All forms shall be well built, substantial and unyielding, securely braced, strutted and tied to prevent motion and distortion while concrete is being placed in them. The forms shall be strong enough to safely support the weight of the concrete and all

superimposed loads (such as runways, concrete buggy loads, workers, scaffolding, etc.) placed upon them.

Forms shall be built to conform to the dimensions, location, contours and details shown on the Plans. The faces of forms against which the concrete is to be placed shall be dressed smooth and uniform and shall be free from winds, twists, buckles and other irregularities.

Stay-in-place forms of any type will not be permitted for any part of the slab structures, unless otherwise indicated on the Plans.

The placing of concrete in excavated pits and trenches without forms will be permitted only in exceptional cases and then at the discretion of the Resident.

All corners within the forms shall be fitted with chamfer strips mitered at their intersections, except that chamfer strips will not be required as follows: (1) on corners of slab blocking of interior steel beams and the inside of exterior steel beams; (2) on corners constructed transversely at the underside of the slab of superstructures which consist of a concrete slab on steel beams; (3) on footings not exposed to view; and (4) on all structures when more than two feet below the final finished ground line.

Chamfer strips shall have a width across the diagonal face between 1/2 inch and 3/4 inch. The size to be adopted for a given portion of the work shall depend upon the general dimensions. Except where special size chamfer strips are shown on the Plans, the size of chamfer strips shall be uniform on individual projects. Provisions shall be made for the chamfering of the top edges of abutment bridge seats and wing walls, tops of piers and retaining walls, tops of through girders, roadway curbs, etc., by nailing chamfer strips inside the forms. Unless otherwise provided, all chamfer strips shall produce plain flat surfaces on the concrete.

The forms for beams, girders and spandrel arches shall be so constructed as to permit the sides to be removed without disturbing the supports.

All foreign matter within the forms shall be removed before depositing concrete in them.

In all cases where metal anchorages or ties within or through the face forms are required to hold the forms in their correct position, such anchorages or ties shall be of ample strength and shall be constructed so that the metal work can be removed to a depth of not less than one inch from the face and back surfaces of the concrete without damaging such surfaces.

Elevations will be taken on the top flanges of structural steel beams and girders for the purpose of determining the depth of blocking necessary for the construction of the forms for the concrete slab, after the following conditions have been satisfied:

1. The satisfactory erection of the superstructure structural steel beams or girders, including any required flooring beams and stringers, unless an alternative plan is submitted by the Contractor and approved by the Authority.
2. All bolt tightening operations must be complete.
3. No foreign loads supported by the beams or girders are present.

The Contractor shall submit working drawings for approval of the proposed forms supporting the superstructure slabs, and of the proposed forms and false work supporting the overhanging portion of the superstructure slab in accordance with Subsection 105.7. The working drawings shall show the size, spacing and location of the supporting members, and the proposed loads and weight of the concrete forms to be carried by the members. The proposed superstructure slab form and false work systems' computations, plans, and working drawings shall be designed and sealed by the Contractor's Professional Engineer, who must be registered in the State of Maine. This Professional Engineer may be directly employed or otherwise retained by the Contractor.

In the construction of forms and false work for the portion of superstructure slabs overhanging the exterior members of beam and girder spans, forms and supporting devices resulting in point loadings on the exterior members shall not be used. Loads resulting from supporting devices shall be distributed directly to the flanges by means of brackets or braces.

All forms shall be inspected and approved by the Professional Engineer responsible for the design of the form and false work systems before the placing of any concrete within them. The Professional Engineer shall, after inspection, provide a sealed certification to the Resident that the systems were erected in conformance with the Professional Engineer's plans and design details.

B. Surface Treatment of Forms - The inside surfaces of forms shall be uniformly coated with form oil or other approved surface treatment.

Form surfaces shall be treated before placing the reinforcing steel.

C. Construction of False Work - All false work used for supporting reinforced concrete superstructures shall be composed of members having ample structural sections to resist all loads imposed upon them, with deformations less than span length / 360.

When the vertical members of false work consist of piles or when framed or other false work is supported upon piles, the piles shall be driven to secure a safe load resistance.

When false work is supported upon mud sills, the foundation pressures resulting from the imposed loads upon the mud sills (false work, forms, fresh concrete, scaffolding, etc.) shall not exceed the capacity of the on-site soils.

All false work systems shall be designed to support all vertical loading and any differential settlement forces, all horizontal and longitudinal forces, and shall account for any temporary unbalanced loading due to the placement sequence of the concrete. Sufficient redundancy shall be designed into centering or false work systems so that the failure of any member shall not cause a collapse. Design computations, layout drawings, and details of materials for the centering or false work systems shall be submitted to the Authority for its records. The erection of centering or false work systems shall be accomplished in strict conformance with the design and details. No concrete shall be placed without prior approval of the Resident.

False work systems adjacent to and/or over traveled ways shall additionally be designed to resist any vibration forces due to traffic and shall incorporate sufficient protection against impact by errant vehicles.

All false work system computations, plans and working drawings shall be designed and sealed by the Contractor's Professional Engineer, who must be registered in the State of Maine. This Professional Engineer may be directly employed or otherwise retained, by the Contractor. Prior to concrete placement, the Professional Engineer responsible for the design of the false work system shall, after false work inspection, provide a sealed certification to the Resident that the system was erected in conformance with the Professional Engineer's plans and design details.

False work shall be so constructed that the forms will have a camber, the amount depending upon the deflection anticipated in the design.

Forms supported upon false work shall be provided with a satisfactory means for their adjustment in the event of settlement or deformation of the false work due to overloading or other causes.

Provisions shall be made for the gradual lowering of false work and rendering the supported structure self-supporting.

D. Removal of Forms and False Work

1. Location, weather conditions, cementitious materials used and the character of the structure involved shall be considered in determining the time for the removal of forms and false work. Forms and false work shall not be removed until concrete cylinders cured with the structure establish that the concrete has developed 80 percent of design strength. The Contractor shall cast and break two cylinders per subplot and furnish the Resident with these test reports before removal of the forms and false work.

When approved by the Resident, the vertical forms of footings, walls, columns and sides of beams and slabs may be removed 48-hours after completion of placement of concrete, exclusive of the time the ambient air temperature is below 45°F and provided the following conditions are met:

Immediately after the forms are removed, defects in the concrete surface shall be repaired in accordance with Subsection 502.13 and the repaired area thoroughly dampened with water. The surfaces of exposed concrete shall be cured for the remainder of the seven day curing period by the application of a product listed on the Maine Department of Transportation Prequalified list of curing compounds. The curing compound shall be applied continuously by an approved pressure spraying or distributing equipment at a rate necessary to obtain an even, continuous membrane, meeting the manufacturer's recommendation but at a rate of not less than 1 gal/200 ft² of surface. Other methods of curing concrete may be used with the prior approval of the Resident.

2. Forms and false work, including blocks and bracing, shall not be removed without the consent of the Resident. The Resident's consent shall not relieve the Contractor of responsibility for the safety of the work. In no case shall any portion of the wood forms be left in the concrete. As the forms are removed, all projecting metal devices that have been used for holding the forms in place shall be removed in accordance with Subsection 502.10. The holes shall be filled as required in Subsection 502.13.

502.11 Placing Concrete

A. General – Concrete shall not be placed until forms and reinforcing steel have been checked and approved by the Resident. The forms shall be clean of all debris. The method and sequence of placing the concrete shall be approved before any concrete is placed.

All concrete shall be placed before it has taken its initial set and, in any case, as specified in Subsection 502.0701. Concrete shall be placed in horizontal layers in such a manner as to avoid separation and segregation. A sufficient number of workers for the proper handling, tamping and operation of vibrators shall be provided to compact each layer before the succeeding layer is placed and to prevent the formation of cold joints between layers. Care shall be taken to prevent mortar from spattering on structural steel, reinforcing steel and forms. Any concrete or mortar that becomes dried on the structural steel, reinforcing steel or forms shall be thoroughly cleaned off before the final covering with concrete. Following the placing of the concrete, all exposed surfaces shall be thoroughly cleaned as required, with care not to injure any surfaces.

Concrete shall not come in direct contact with seawater during placing and for a period of 72- hours thereafter, except as follows:

1. Concrete seals that are located entirely below low tide.
2. Concrete footings constructed in the dry and located entirely below low tide or final ground elevation.
3. Concrete Fill placed under water.

Concrete in any section of a structure shall be placed in approximately horizontal layers of such thickness that the entire surface shall be covered by a succeeding layer before the underlying layer has taken its initial set. Layers shall not exceed 18 inches in thickness and be compacted to become an integral part of the layer below. Should the placement be unavoidably delayed long enough to allow the underlying layer to take initial set or produce a so-called “cold joint”, the following steps shall be taken:

- An incomplete horizontal layer shall be bulk headed-off to produce a vertical joint.
- Horizontal joints shall be treated as required in this Subsection 502.11(F).
- Portland Cement concrete with a high range, water reducing admixture shall not be placed when the concrete mix temperature is below 40°F or above 85°F.

The concrete in superstructures shall be placed monolithically except when construction joints are shown on the Plans or are authorized in accordance with approved details submitted by the Contractor. If the concrete in the stems of T-beams is to be placed independent of the slab section, the construction joint shall be located at the underside of the slab and the bond between stem and slab shall be a mechanical one. The bond shall be produced by embedding two \times four, four inch wooden blocks having a length approximately four inches less than the width of the stem and placed horizontally at right angles to the centerline of the beam in the top surface of the concrete immediately following the completion of the concrete placement. To provide for the uniform spacing of the blocks and their ready removal when the concrete has taken a set sufficient to hold its form, the blocks shall be firmly nailed upon a board at a distance of one foot center to center. The blocks shall be thoroughly oiled to facilitate their ready removal from the concrete.

In arch spans, the order of construction or sequence of the work, as shown on the Plans shall be followed in the placing of concrete.

In no case shall the work on any section or layer be stopped or temporarily discontinued within 18 inches below the top of any face, unless the Plans provide for a coping having a thickness less than 18 inches in which case, at the option of the Resident, the construction joint may be made at the underside of the coping. Concrete in columns shall be placed in one continuous operation, unless otherwise directed.

Fresh concrete, threatened with rain damage shall be protected by approved means. Sufficient material for covering the work expected to be done in one day shall be on hand at all times for emergency use. The covering shall be supported above the surface of the concrete.

Concrete Fill shall be placed at least to the pay limits shown on the Plans. Forms may be omitted at the Contractor's option. Vibration of concrete will not be required. The Contractor has the option of placing concrete fill under water or in the dry.

B. Chutes, Troughs, Pipes and Buckets - Sectional drop chutes or short chutes, troughs, pipes and buckets when used as aids in placing concrete, shall be arranged and used in such a manner that the ingredients of the concrete do not become separated or segregated. Wood and aluminum chutes, troughs, pipes or buckets shall not be used.

Dropping the concrete a distance of more than six feet, unless confined by closed chutes or pipe will not be permitted. The concrete shall be deposited at or as near as possible to its final position.

C. Vibrating - Mechanical, high frequency internal vibrators shall be used, operating within the concrete, for compacting the concrete in all structures and precast and cast-in-place piles, with the exception of concrete placed under water. The vibrators shall be an approved type with a frequency of 5,000 to 10,000 cycles per minute and shall be visibly capable of properly consolidating the designed mixture. A spare vibrator shall be available on the Project at all times during the placing of concrete.

Sufficient vibrators shall be used to consolidate the incoming concrete within five (5) minutes after placing. Vibrators shall neither be held against forms or reinforcing steel, nor shall they be used for flowing the concrete or spreading it into place. Over-vibrating shall not be allowed.

D. Dewatering Forms - All forms shall be dewatered before concrete is placed in them. Pumping will not be permitted from the inside of forms while concrete is being placed. Moving water shall not be permitted to be exposed to fresh concrete.

E. Depositing Concrete Under Water - No concrete shall be deposited under water except for cofferdam seals. Pumping will not be allowed within the cofferdam while concrete is being placed.

Seal concrete shall be placed carefully in a compact mass in its final position by means of a tremie or by other approved means and shall not be disturbed after being deposited. Bottom dump buckets will not be permitted. Special care must be exercised to maintain still water at the point of

deposit. Seal concrete shall not be placed in running water. The method of depositing concrete shall be so regulated as to produce approximate horizontal surfaces. Each seal shall be placed in one continuous operation.

When a tremie is used, it shall consist of a tube not less than 10 inches in diameter. The means of supporting the tremie shall be such as to permit free movement of the discharge end over the entire seal and to permit its being lowered rapidly, when necessary to choke-off or retard flow. The tremie shall be filled by a method that will prevent washing of the concrete. The discharge end shall be completely submerged in concrete at all times and the tremie tube shall be kept full to the bottom of the hopper. The flow shall be regulated by raising or lowering the tremie.

When the horizontal area of the tremie seal is large, several tremie hoppers shall be provided and positioned strategically to allow easy deposit of concrete near the point where it is needed to avoid moving concrete horizontally through the water. The number of tremie hoppers and the work plan shall be approved by the Resident.

All laitance or other unsatisfactory material shall be removed from the surface of the seal before placing additional concrete. The surface shall be cleaned by scraping, chipping or other means that will not injure the concrete.

The placing and dewatering of seal concrete within cofferdams shall be in accordance with Section 511, Cofferdams.

E. Construction Joints - Construction joints shall be located where shown on the Plans or permitted by the Resident. When the concrete is in seawater, except concrete cores for stone masonry, no horizontal construction joint will be permitted between extreme low tide and extreme high tide elevations.

At horizontal construction joints, temporary gage strips having a minimum thickness of 1-1/2 inches shall be placed horizontally inside the forms along all exposed faces to give the joints straight lines. The joint shall be so constructed that the surface of the concrete will not be less than 1/4 inch above the bottom of the gage strip. Before placing fresh concrete, the temporary gage strip shall be removed, the surfaces of construction joints shall be thoroughly cleaned, drenched with water until saturated and kept saturated until the new concrete is placed. Immediately prior to placing new concrete, the forms shall be drawn tight against the concrete already in place. Concrete in substructures shall be placed in such a manner that all horizontal joints will be horizontal and if possible, in locations such that they will not be exposed to view in the finished structure.

Where vertical construction joints are necessary, reinforcing bars shall extend across the joint in such a manner as to make the structure monolithic. Construction joints through paneled wing walls or other large surfaces which are to be treated architecturally will not be allowed except as shown on the Plans. All vertical construction joints in abutments and retaining walls shall contain water stops as shown on the Plans. The water stops shall be one continuous piece at each location.

All horizontal construction joints in abutments and retaining walls shall be constructed using a joint cover, as shown on the Plans.

Construction joints in the wearing surface shall be located where called for on the Plans. No other construction joints will be allowed.

All joints shall be formed in the manner detailed on the Plans. The forms shall not be treated with oil or any other bond breaking material that will adhere to the concrete.

Sealing slots shall be provided at all joints in the wearing surface that are located directly over a slab construction joint.

Construction joints in the wearing surface not receiving a sealing slot shall be brushed with a neat cement paste immediately prior to making the adjacent concrete placement.

After the concrete has been cured, sealing slots, when required, shall be sandblasted with approved equipment to remove all laitance and foreign material on the surfaces of the slots. The bottom of the sealing slots shall receive an approved bond breaker. The joint shall then be filled within 1/8 inch of the surface with a poured sealant conforming to the following requirements and in accordance with the manufacturer's recommendations. The joint sealant supplied shall be an approved two component, elastomeric sealant capable of 50 percent joint movement. Both components shall be in liquid form and the combining ratio of components by volume shall be as recommended by the manufacturer.

G. Concrete Wearing Surface and Structural Concrete Slabs on Precast Superstructures
When called for on the Plans, a separate concrete wearing surface or structural concrete slabs on precast superstructures shall be bonded to the supporting slab. No surface preparation of a new structural concrete slab shall begin before completion of the specified curing period.

When the supporting slab is composed of cast-in-place concrete, the Contractor shall scabble the entire surface of the structural concrete slab and then sandblast the entire structural concrete slab surface. When the supporting slab is comprised of precast units, the Contractor shall sandblast the entire deck surface.

The entire area of the deck surface and the faces of curb and barrier walls or other median devices, up to a height of one inch above the top elevation of the wearing surface or slab, shall be cleaned to a bright, clean appearance which is free from curing compound, laitance, dust, dirt, oil, grease, bituminous material, paint and all other foreign matter. Air lines shall be equipped with effective oil traps. The cleaning of an area of the deck shall be performed within the 24-hour period preceding placement of the wearing surface. The cleaning shall be performed by dry sand blasting or other methods approved by the Resident. All debris from the cleaning operation shall be thoroughly removed by compressed dry air from the cleaned surfaces and adjacent areas. The cleaned areas shall be protected against contamination before placement of the wearing surface. Contaminated areas shall be recleaned by dry sand blasting. Prepared, areas that have not received the wearing surface within 36-hours shall be recleaned.

All horizontal surfaces in contact with the wearing surface shall receive a coating of bonding grout or bonding agent listed on Maine Department of Transportation Prequalified List of Bonding Agents. The vertical faces in contact with the wearing surface shall be broomed-up to the elevation of the top of the wearing surface with bonding grout or an approved bonding agent.

Stiff bristled street brooms shall be used to brush the grout onto the surface. The coating shall not exceed 1/8 inch in thickness. The rate of progress in applying grout shall be limited so

that the grout does not become dry before it is covered with new concrete. During delays in the surfacing operations, should the surface of the grout indicate an extensive amount of drying, the grout shall be removed by methods approved by the Resident and the area should be regouted.

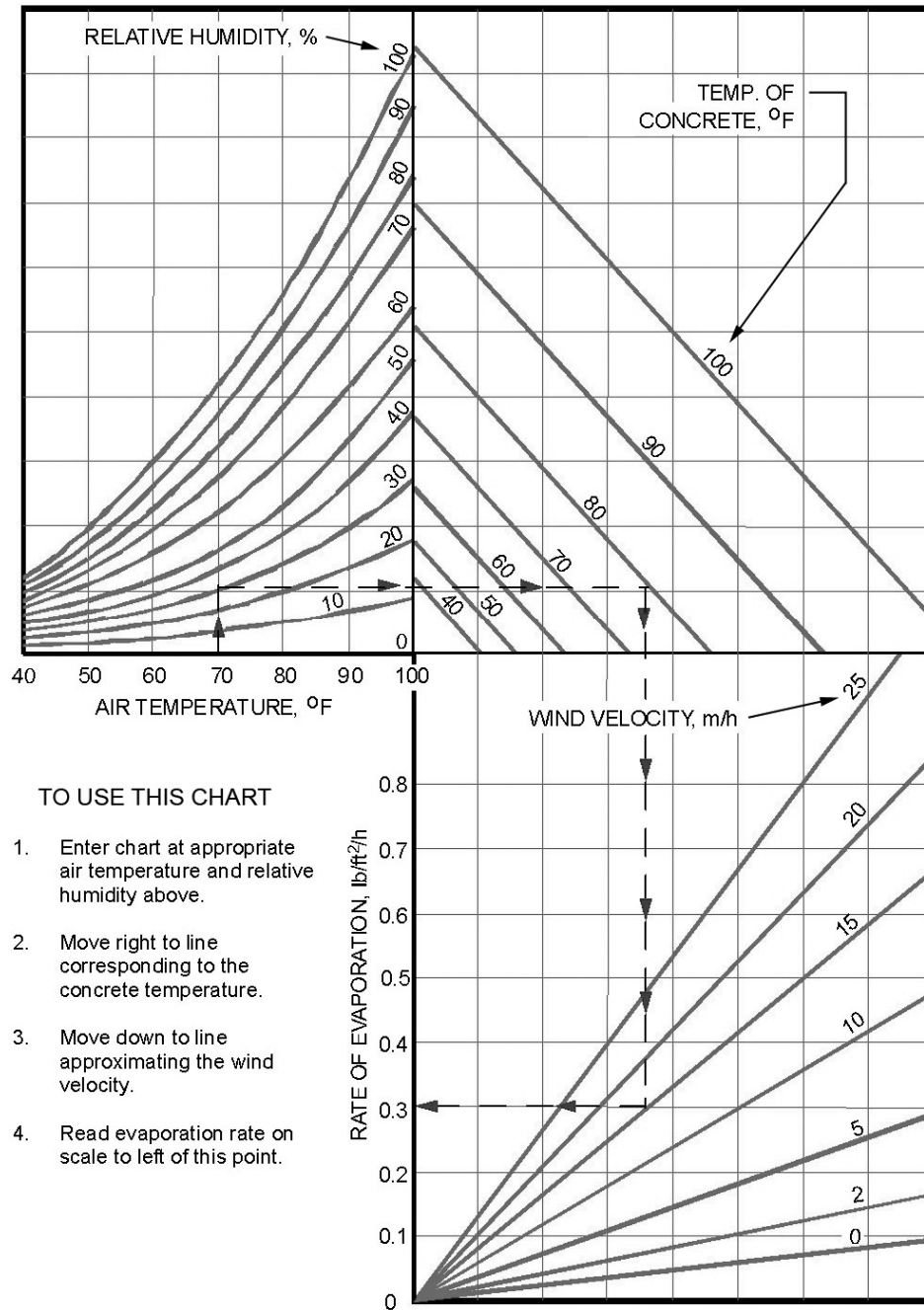
The bonding grout shall have Portland Cement and fine aggregate proportioned 2 to 1 by volume. The fine aggregate from which the material larger than 1/8 inch has been removed shall be the same source as used in the concrete. The cement and fine aggregate shall be measured separately in appropriately sized containers. The fine aggregate shall be deposited in an approved mechanical mortar mixer before adding cement. Water shall be added in sufficient quantity to allow flow of the grout without segregation of the grout ingredients.

No water shall be added after initial mixing. The grout shall not be allowed to separate before placement. The cement to water contact time of the grout shall not exceed 30 minutes before it is placed. Any grout that has dried or become unworkable before application, as determined by the Resident, shall not be incorporated into the work. The use of retarding admixtures for increasing the discharge time limits will be allowed.

The Resident may approve the batching of bonding grout at an approved commercial concrete batch plant. In this case, mixing and delivery shall be in transit truck mixers. The bonding agent shall be one of the products listed on the Maine Department of Transportation's List of Prequalified Bonding Agents and shall be applied in accordance with the manufacturer's recommendations.

No structural concrete slab structure, including but not necessarily limited to, concrete deck slabs, wearing surfaces, simple slab spans and slabs on precast superstructures, shall be commenced if the combination of ambient air temperature, relative humidity, wind speed, and plastic concrete temperature result in a surface moisture evaporation rate theoretically equal to or greater than 0.1 lb/ft²/hr. of exposed surface (refer to the Rate of Evaporation from Concrete Surface Chart). If the surface moisture evaporation rate rises to 0.15 lb/ft²/hr. of exposed surface, the Contractor shall immediately implement remedial actions to reduce the surface moisture evaporation rate. The temperature of the concrete shall not exceed 75°F at the time the concrete is placed in its final position. The maximum temperature of the surface on which concrete will be placed shall be 90°F. The Contractor shall provide all equipment and perform all measurements and calculations in the presence of the Resident to determine the rate of evaporation.

RATE OF EVAPORATION FROM CONCRETE SURFACE NOMOGRAPH



502.12 Expansion and Contraction Joints

Expansion and contraction joints shall be located and constructed as shown on the Plans. Water stops shall be one continuous piece at each location. Joint cover, as shown on the Plans, shall be applied to all joints where water stops cannot physically be installed, as determined by the Resident.

502.13 Repairing Defects and Filling Form Tie Holes in Concrete Surfaces

After the forms are removed, all surface defects and holes left by the form ties shall be repaired.

All fins and irregular projections shall be removed from the following: Surfaces which are visible in the completed work; surfaces to be waterproofed; and the portion of vertical surfaces of substructure units which is below the final ground surface to a depth of 12 inches, not including underwater surfaces.

In patching surface defects, all coarse or fractured material shall be chipped away until a dense uniform surface, exposing solid coarse aggregate is obtained. Feathered edges shall be sawcut away to form faces having a minimum depth of one inch perpendicular to the surface. All surfaces of the cavity shall be saturated thoroughly with water, after which a thin layer of neat cement paste shall be applied. The cavity shall then be filled with thick, reasonably stiff mortar, not more than 30 minutes old, composed of material of the same type and quality and of the same proportions as that used in the concrete being repaired. The surface of this mortar shall be floated before initial set takes place and shall be neat in appearance. The patch shall be water cured for a period of five days.

If the removal of defective concrete materially impairs the soundness or strength of the structure, as determined by the Resident, the affected unit shall be removed and replaced by the Contractor at their expense.

The holes left by form ties, on the portions of substructure concrete that are to be permanently covered in the finished work, may be filled with an acceptable grade of plastic roofing cement. Holes in the bottom of slabs caused by supporting hangers need not be filled with the exception of voids that expose the top side of a girder top flange. Where holes in the deck or haunch are required to be filled, this work shall be completed using an approved high performance elastomeric sealant.

502.14 Finishing Concrete Surfaces

Neat cement paste, dry cement powder or the use of mortar for topping or plastering of concrete surfaces will not be permitted.

A. Float Finish - A float finish for horizontal surfaces shall be achieved by placing an excess of concrete in the form and removing or striking-off the excess with a template or screed, forcing the coarse aggregate below the surface. Creation of concave surfaces shall be avoided. After the concrete has been struck-off, the surface shall be thoroughly floated to the finished grade with a suitable floating tool. Aluminum and steel floats are not allowed.

Float finish, unless otherwise required, shall be given to all horizontal surfaces except those intended to carry vehicular traffic and those of curbs and sidewalks.

B. Structural Concrete Slab Structures – Include, but not limited to, structural concrete deck slabs, wearing surfaces, slabs on precast superstructures, top and bottom slabs of box culverts, approach slabs, rigid frame structures and simple slab spans, as applicable. Screed rails shall be set entirely above the finished surface of the concrete and shall be supported in a manner approved by the Resident. Where shear connector studs are available, welding to the studs will be permitted. No welding will be permitted directly on the stringer flanges to attach either screed rail supports or form supports of any type.

Screed rail supports set in the concrete shall be so designed that they may be removed to at least 50 mm [2 in.] below the surface of the concrete. Voids created by removal of the upper part of the screed rail supports shall be filled with mortar having the same proportions of sand and cement as that of the slab or wearing surface. The mortar shall contain an approved additive in sufficient proportions to produce non-shrink or slightly expansive characteristics.

The rate of placing concrete shall be limited to that which can be finished without undue delay and shall not be placed more than 10 feet ahead of strike-off.

The Contractor shall furnish a minimum of two work bridges behind the finishing operation, capable of spanning the entire width of the deck and supporting at least a 500 lb. load without deflection to the concrete surface, to be supported on the screed rails. These working bridges shall be used by the Contractor for touch-up and curing cover application and shall be available for inspection purposes. When the overall length of the structure is 60 feet or less only one working bridge will be required.

An approved bridge deck finishing machine complying with the following requirements shall be used, except as otherwise specified, for finishing structural concrete slab structures. The finishing machine shall have the necessary adjustments, built in by the manufacturer, to produce the required cross section, line and grade. The supporting frame shall span the section being cast in a transverse direction without intermediate support. The finishing machine shall be self-propelled and capable of forward and reverse movement under positive control. Provisions shall be made for raising all screeds to clear the screeded surface for traveling in reverse. The screed device shall be provided with positive control of the vertical position.

The finishing machine shall be self-propelled with one or more oscillating screeds or one or more rotating cylinder screeds. An oscillating screed shall oscillate in a direction parallel to the centerline of the structure and travel in a transverse direction. A rotating cylinder screed shall rotate in a transverse direction while also traveling in the same direction. Either type of screed shall be operated transversely in overlapping strips in the longitudinal direction not to exceed six inches. One or more powered augers shall be operated in advance of the screed(s) and a drag (pan type) float shall follow the screed(s). For concrete placements less than six inches in depth, vibratory pan(s) having a minimum of 3000 vibrations/min shall be operated between the oscillating screed(s) or rotating cylinder screed(s) and the power auger(s). For concrete placed in excess of 3-1/2 inches but less than six inches thickness, hand- operated spud vibrators shall be used in addition to the machine vibratory pan(s).

The transversely operated rotating cylinder(s) of the bridge deck finishing machine shall be rotated such that the direction of the rotation of the cylinder(s) at the surface of the concrete is in accordance with the manufacturer's recommendations.

Concrete immediately in front of the power auger(s) of a bridge deck finishing machine shall be placed or cut to a depth no higher than the center of the rotating auger(s). The advance auger(s) shall strike-off the concrete to approximately 1/4 inch above the final grade. The concrete shall then be consolidated with the vibrating pan(s) and then finished to final grade.

A small handheld pan vibrator shall be required at edges and adjacent to joint bulkheads. In lieu of the handheld pan vibrator equipment, the Resident may approve small spud vibrator(s).

Lightweight, vibrating screeds may be used on slab structures which are more than 12 inches below the roadway finish grade or have a length of 30 feet or less, or where concrete placements are specified to be less than 16 feet in width and shall have the following features:

1. It shall be portable and easily moved, relocated, or adjusted by no more than four persons.
2. The power unit shall be operable without disturbing the screeded concrete.
3. It shall be self-propelled with controls that will allow a uniform rate of travel and by which the rate of travel can be increased, decreased or stopped.
4. It shall have controlled, uniform, variable frequency vibration, end to end.
5. It shall be fully adjustable for flats, crowns, or valleys.
6. The screed length shall be adjustable to accommodate the available work area.

When a lightweight vibrating screed is utilized, the concrete shall be placed or cut to no more than 1/2 inch above the finished grade in front of the front screed. The screed shall be operated such that at least three feet of concrete is in position in front of the screed.

Supporting slabs for bituminous wearing surfaces shall be finished in accordance with the recommendations of the waterproofing membrane manufacturer.

The texturing of concrete wearing surfaces shall be applied as approved by the Resident. The surface tolerance and texture shall be acceptable to the Resident, or the placement may be suspended until remedial action has been taken. The Resident may order the removal and replacement of material damaged by rainfall.

On all concrete wearing surfaces, a one foot wide margin shall be finished adjacent to curbs and permanent barriers with a magnesium float.

Immediately after screeding, floating and texturing, the surface of the concrete shall be tested for trueness, by the Contractor, with a 10 feet straightedge and all irregularities corrected at once in order to provide a final surface within the tolerance required in Table 5. The surface shall be checked both transversely and longitudinally. Any area that requires finishing to correct surface irregularities shall be retextured.

The straightedges shall be furnished and maintained by the Contractor. They shall be fitted with a handle and all parts shall be made of aluminum or other lightweight metal. The straightedges shall be made available for use by the Resident when requested.

In the event of a delay during a concrete placement, all concrete that cannot receive the final curing cover shall be covered with wet burlap.

No vehicles will be allowed, either directly or indirectly, on reinforcing steel before concrete placement.

C. Curb and Sidewalk Finish on Bridges - Curb and sidewalk finish is a float finish produced by using a short float moved in small circles to produce a shell-like pattern on the surface of the concrete. Alternately, sidewalks may receive a light broom finish perpendicular to the sidewalk.

When a concrete curb is monolithic with a sidewalk, a six inches wide smooth margin shall be made along the top of the curb with a magnesium float.

Unless shown on the Plans, the sidewalk area shall not be divided into sections by transverse grooves.

At all transverse construction and expansion joints, except where steel expansion dams are used, the edges of the joints, on the surface of the sidewalk, shall be finished with a sidewalk edging tool two inches in width with a 1/4 inch radius lip.

D. Form Surface Finish - The character of the materials used and the care with which forms are constructed and concrete placed shall be considered in determining the amount of rubbing required. If using first class form material, well-constructed forms and the exercise of special care, concrete surfaces are obtained that are satisfactory to the Resident, the Contractor may be relieved in part from the requirement of rubbing.

1. Ordinary Finish - An Ordinary Finish is defined as the finish left on a surface after the removal of the forms, the filling of all holes and the repairing of all defects. The surface shall be true and even, free from stone pockets and depressions or projections and of uniform texture. All formed concrete surfaces shall be given an ordinary finish unless otherwise specified.

Repaired areas that do not meet the above requirements or areas that cannot be satisfactorily repaired to meet the requirements for ordinary finish shall be given a rubbed finish. When a rubbed finish is required on any part of a surface, the entire surface shall be given a rubbed finish.

2. Rubbed Finish - Rubbing of the concrete shall occur within seven (7) days of the concrete placement. If rubbing of the concrete is not complete within seven days, the Contractor must apply a latex bonding agent to the concrete as submitted and approved by the Resident.

The concrete shall be thoroughly saturated with water immediately before starting this work. Sufficient time shall have elapsed before wetting-down to allow the mortar used in ordinary finish to become thoroughly set. Surfaces to be finished shall be rubbed with a medium coarse carborundum stone, using a small amount of mortar on its face. The mortar shall be composed of cement and fine sand mixed in proportions as used in the concrete being finished. Rubbing shall be continued until all form

marks, projections and irregularities have been removed, all voids filled and a uniform surface has been obtained. A thin layer of paste produced by this rubbing shall be left on the surfaces.

After all concrete above the surface being treated has been cast, the final finish shall be obtained by a second rubbing with a fine carborundum stone using only water. This rubbing shall be continued until the entire surface is of a smooth texture and uniform color.

After the final rubbing is completed and the surface has dried, it shall be rubbed lightly with clean and dry burlap to remove excess loose powder and shall be left free from all unsound patches, paste, powder and objectionable marks. This finish shall result in a surface of smooth texture and uniform color.

No surface finishing shall be done in freezing weather or when the concrete contains frost. In cold weather the preliminary rubbing necessary to remove the inert sand and cement materials and the surface irregularities may be done without the application of water to the concrete surfaces.

The following portions of concrete roadway grade separation structures shall be given a rubbed finish unless otherwise indicated in the Contract:

- (a) Retaining walls and the breast and wing walls of abutments - face surfaces to 12 inches below the finished ground line.
- (b) Piers - all vertical surfaces and the underside of overhanging portions of caps, except that for overpass structures, the piers beyond the outside limits of the roadway pavement, the vertical surfaces on the back which are not visible from the roadway or sidewalk will not require a rubbed finish.
- (c) Parapets and end posts – all horizontal and face surfaces, excluding overhead surfaces, to 12 inches below the finish ground.

If, in the opinion of the Resident, the general appearance of a concrete structure, due to the excellence of workmanship, cannot be improved by a rubbed finish, this requirement may be waived.

E. Surface Finish - After the concrete has cured, the surface shall be tested with a 10 feet straightedge or a lightweight profiler.

The straightedge shall be furnished and maintained by the Contractor. It shall be fitted with a handle and all parts shall be made of aluminum or other lightweight metal. The straightedges shall be made available for use by the Resident when requested. The lightweight profiler will be furnished by the Authority.

Areas found to not comply with the tolerance of Table 5 shall be brought into conformity by methods proposed by the Contractor and approved by the Resident at no additional cost to the Authority.

TABLE 5
SURFACE TOLERANCE LIMITS

<u>Type of Surface:</u>	<u>* Maximum deviation of surface in millimeters [in.] below 3 m [10 ft.] straightedge</u>
Concrete Wearing Surface, Curbs, Sidewalks, and Barriers	3 mm [1/8 in.]
Concrete Slab Surfaces to be Covered by Membrane Waterproofing or Concrete Wearing Surfaces	6 mm [1/4 in.]
Concrete Slab Surfaces with Integral Concrete Wearing Surface	6 mm [1/4 in.]
Concrete Slab Surfaces to be Covered By Earth or Gravel	10 mm [3/8 in.]
Concrete Surface of Box Culvert Bottom Slab	10 mm [3/8 in.]
Concrete Surface of Abutments, Piers, Pier Shafts, Footings, and Walls	10 mm [3/8 in.]

* Allowance shall be made for crown, camber and vertical curve.

502.15 Curing Concrete

All concrete surfaces shall be kept wet with clean, fresh water for a curing period of at least seven (7) days after concrete placing, with the exception of vertical surfaces as provided for in Subsection 501.10(D), Removal of Forms and False Work.

For concrete wearing surfaces and all concrete containing fly ash or slag, the temperature of the concrete shall be kept above 50°F for the entire seven day period. All other concrete and its surfaces shall be kept above 50°F for the first four days of the curing period and above 32°F for the remainder of the period.

In the 24-hours following the end of the curing period, the temperature of the concrete shall be decreased on a gradual basis, not to exceed a total change of 40°F for moderate sections, such as abutments and pier bents, and 30°F for mass sections such as massive piers.

All slabs and wearing surfaces shall be water cured only and kept continuously wet for the entire curing period by covering with one of the following systems:

- A. Two (2) layers of wet burlap;
- B. Two (2) layers of wet cotton mats;
- C. One (1) layer of wet burlap and either a polyethylene sheet or a polyethylene coated burlap blanket; or,
- E. One (1) layer of wet cotton mats and either a polyethylene sheet or a polyethylene coated burlap blanket.

Except as otherwise specified, curing protection for slabs and wearing surfaces shall be applied within 30 minutes after the concrete is screeded and before the surface of the concrete has

lost its surface “wetness” or “sheen” appearance. The first layer of either the burlap or the cotton mats shall be wet and shall be applied as soon as it is possible. Polyethylene sheets shall not be placed directly on the concrete, but may be placed over the fabric cover to prevent drying.

The covering of concrete wearing surfaces, decks, curbs and sidewalks shall be kept continuously wet for the entire curing period by the use of a continuous wetting system and shall be located to insure a completely wet concrete surface for the entire curing period.

All other surfaces, if not protected by forms, shall be kept thoroughly wet either by sprinkling or by the use of wet burlap, cotton mats or other suitable fabric until the end of the curing period, except as provided for in 502.10(D), Removal of Forms and False Work. Polyethylene sheets shall not be placed directly on the concrete, but may be placed over the fabric cover to prevent drying.

Surfaces of all concrete placements containing silica fume additive shall be coated with an approved evaporation retardant immediately after finishing and texturing the concrete surface. The application of wet burlap or wet cotton mats shall be made within 15 minutes after the finishing of the concrete surface.

The application rate, the desired equipment, and the mixing and application procedures for an approved evaporation retardant shall be as designated by the manufacturer. Successive applications or heavier applications of this evaporation retardant shall be applied as necessary to retain the required surface “wetness” appearance.

502.16 Loading Structures and Opening to Traffic

No superstructure concentrated loads such as structural steel beams, girders and trusses shall be placed upon finished concrete substructures until the concrete has reached its design strength.

No load or work will be permitted on concrete superstructure slabs or rigid frame structures until concrete cylinders cured with the slab establish that design strength has been reached. However, after a shorter period of time, the Resident may permit handwork for form construction and setting stone bridge curb. No curbing or other materials shall be stored on the bridge during the seven day curing period, except that if handwork is permitted, curb stones may be stored in a line near to their final location until ready to be set.

Neither traffic nor fill material shall be allowed on superstructures of concrete bridges or culverts until concrete cylinders cured with the slab establish that design strength has been reached, dependent upon conditions as specified in Subsection 502.10 and with the approval of the Resident.

No traffic will be allowed on the cured concrete of a concrete wearing surface until 24-hours after the completion of the application of protective coating for concrete surfaces.

Concrete approach slabs at the end of structures may be opened to traffic or backfilled if buried when the design strength has been reached.

502.17 Bridge Drains and Incidental Drainage

All drains shall be accurately placed at the locations shown on the Plans or as approved by the Resident, and an adequate means provided for securely holding them in the required positions during the placing of concrete.

Bridge drains shall be galvanized in accordance with Subsection 711.04, Bridge Drains. The Contractor shall furnish an insulator between surfaces of galvanized and weathering steels when erecting the bridge drain support assembly. Epoxy-coated washers shall be used when the support assembly attaches to weathering steel beam webs.

Drains or weep holes through abutments and retaining walls shall be pipe of the size and shape shown on the Plans and shall be of Schedule 40 PVC pipe.

For the purpose of providing drainage for any moisture that may collect between the floor slab and the bituminous concrete roadway surface, approved one inch inside diameter plastic tube drains shall be installed at the low points of the slab surface, adjacent to the end dam or dams. The exact location will be determined in the field by the Resident and the discharge from them shall be such as to clear the bridge seats and any other portion of the structure in their proximity. The tops of the drains shall be depressed 3/8 inch below the surface of the slab and the outlets shall project two inches below the underside of the slab. Care shall be exercised such that the drains are open after the installation of the membrane waterproofing, when it is installed.

502.18 Method of Measurement

A. Structural concrete satisfactorily placed and accepted will be measured by the cubic yard, in accordance with the dimensions shown on the Plans or authorized changes in the Plans, or as one lump sum unit as indicated in the Schedule of Items. Structural concrete satisfactorily placed and accepted for the VMS drilled shafts, the VMS ground mounted cabinet foundation, the traffic control pedestal foundation, and the relocated light bar foundation will not be measured for payment.

Structural Concrete for any irregular shapes may be measured by the cubic yard as determined from the theoretical yield of the design mix or in the case of transit mixed concrete, by delivery ticket as approved by the Resident.

B. The limits to be used in determining the quantities of the aforementioned structural concrete items for arriving at a lump sum price will be as follows:

1. Structural Concrete Plaza Slab on Grade The limits will be the entire concrete slab, outside to outside, both transversely and longitudinally, exclusive of curbing.
2. Structural Concrete Superstructure Slabs, Structural Concrete Roadway and Sidewalk Slabs on Steel Bridges, Structural Concrete Roadway and Sidewalk Slabs on Concrete Bridges and Structural Concrete Superstructure T-Beam Type. The limits will be the entire concrete superstructure, outside to outside, both transversely and longitudinally, exclusive of concrete curbs, sidewalks, permanent transition barrier and concrete transition barriers.

2. Structural Concrete Wearing Surfaces. The limits will be the entire concrete wearing surface bounded transversely by the roadway curbs and longitudinally by the extreme ends.
3. Structural Concrete Box Culverts. The limits will be the entire structure, meaning the bottom floor slab, abutments, wings, superstructure floor slab and headwalls or curbs.
4. Structural Concrete, Approach Slabs. The limit will be the entire approach slab or slabs, as shown on the Plans.
5. Structural Concrete, Abutments and Retaining Walls Structural Concrete, Abutments and Retaining Walls (placed under water), Structural Concrete Piers, and Structural Concrete Piers (placed under water). The limits will be the entire concrete substructure unit or units, from the bottom of the footing to the top of the unit, and outside to outside, both transversely and longitudinally, except for the portion to be placed under water, as indicated on the Plans, which will be the limits of the concrete unit or units, outside to outside, transversely, longitudinally, and vertically.
6. Structural Concrete Rigid Frame Structures. The limits will be the entire concrete structure, meaning the frame walls and top slab. Included within the limits for payment, unless otherwise shown on the Plans, are bottom slab, wing walls and headwalls.
7. Structural Concrete Culvert End Walls. The limit will be the entire concrete end wall or end walls, as shown on the Plans.
8. Structural Concrete Curb and Sidewalks. The limit will be the entire concrete curb or sidewalk, as shown on the Plans.
9. Concrete Fill. Will be measured for payment by the number of cubic yards of concrete, in place, to the vertical pay limits shown on the Plans. If the Contractor elects to omit forms, then any excavation or concrete placed beyond the pay limits indicated on the Plans shall not be paid for, but shall be at the Contractor's expense.
10. Structural Concrete Parapets. The limit will be the entire concrete portion of the parapets and bridge transition barriers measured longitudinally, from end to end on both sides of the structure, as shown on the Plans.

C. No deduction will be made for the volume of concrete displaced by structural steel, reinforcing steel, pile heads, expansion joint material, drains, chamfers on corners, inset panels of 1-1/2 inches or less in depth, pipes, weep holes and authorized openings for utilities of 1/4 yd³ or less in volume, when any of these items occur in structural concrete which is to be paid for on a cubic yard basis.

D. When the bottom of foundations for concrete structures is required to be at a definite elevation within rock excavation, as shown on the Plans or otherwise designated, the quantity to be measured will be the number of cubic yards of concrete actually and satisfactorily placed above a plane at one foot below the above specified plan elevation and within the neat lines of the structure as shown on the Plans or on authorized changes in the Plans. If the ledge rock is excavated below the plane at one foot below the plan elevation, without authorization, then this space shall be

replaced with concrete of the same composition as required for the structure foundation but will not be measured for payment.

502.19 Basis of Payment

The accepted work done under structural concrete, of the classes and for the types of work required, will be paid for at the Contract unit price per cubic yard, or at the Contract lump sum price, for the respective Contract items involved. Payment for both the unit price and the lump sum price items will be full compensation for furnishing and installing bridge drains, pier nose armor, water stops, expansion joint filler, PVC or plastic tube drains, asphalt roll roofing (roofing felt), asphalt for painting or covering various type of joints, all required sandblasting, bonding, curing and joint sealing, joint sawing and all incidentals necessary to complete the work satisfactorily. No direct payment will be made for concrete admixtures with the exception of Synthetic Fiber Reinforcement, which shall be paid for under its respective Pay Item, 503.90.

Payment for structural concrete for the VMS drilled shafts, the VMS ground mounted cabinet foundation, and traffic control pedestal foundation, will not be measured separately for payment, but shall be incidental to the applicable Section 626 Pay Items.

No price adjustments will be made to the lump sum bid for the respective items that are bid lump sum, except when quantity changes are directed by the Authority. It will be the responsibility of the Contractor to verify the estimated quantities prior to submitting bid documents.

Payment for structural concrete culvert connection shall include drilling and grouting the dowels into the existing headwall and excavation. Reinforcing will be paid for under Item 503.12, Reinforcing Steel, Fabricated and Delivered, and Item 503.13, Reinforcing Steel, Placing.

Reinforcing steel, railings, stone curbing and any material that may be required for bridge lighting systems, will be measured and paid for separately as provided in the appropriate sections.

Steel reinforcing and GFRP reinforcing will be measured and paid for separately as outlined in Section 503.

Implementation of the Quality Control Requirements and costs associated with acceptance test sampling shall be incidental.

All work required to construct and remove the bulkheads will not be measured separately for payment, but shall be incidental to Item 502.264.

All costs associated with obtaining, testing and evaluating drilled core specimens for dispute resolution will not be measured separately for payment, but shall be incidental to related items.

Payment will be made under:

<u>Pay Item</u>	<u>Pay Unit</u>
502.111 Structural Concrete Footing	Cubic Yard
502.266 Structural Concrete Roadway Slab on Grade	Cubic Yard
502.56 Concrete Fill	Cubic Yard

SPECIAL PROVISION

SECTION 503

REINFORCING STEEL

(GFRP Reinforcing)

503.01 Description

The first paragraph is amended to read:

This work shall consist of fabrication, delivery and placing glass fiber reinforced polymer (GFRP) reinforcement in accordance with these Specifications and in conformance with the Plans, General Provisions and Special Provisions.

503.02 Materials

The following paragraphs are added:

Materials shall meet the following requirements:

All GFRP reinforcement shall conform to the requirements shown in AASHTO Bridge Design Guide Specifications for GFRP- Reinforced Concrete Bridge Decks and Traffic Railings (November 2009), except as shown on the plans, and as stated herein. All GFRP reinforcement bar shall be deformed or sand coated.

GFRP bars shall be from one of the following approved manufacturers:

1. Aslan 100 by Hughes Brothers Inc.
2. V-Rod by Pultrall Inc.
3. ComBAR by Schoeck Bauteile,
4. Mateen-Bar by Sigma Development Group, LLC

All GFRP bars in the same structural component shall be supplied by the same manufacturer.

Documentation

For all GFRP reinforcement bar used on Authority projects, the bar manufacturer shall furnish the Resident with two (2) copies of written certifications that the GFRP reinforcement meets the requirements of this specification. In addition, the certification shall list the test values and test procedures used to determine the physical properties of the GFRP reinforcement. Certifications bearing the notarized signature of a responsible authorized representative of the bar manufacturer are required. Each bundle of GFRP reinforcement shall be identified with a corresponding lot number with the lot numbers affixed to each bundle by means of a durable tag.

Repair Material

The material used to repair the cut ends of GFRP reinforcement shall comply with the requirements established by the bar manufacturer.

503.04 Protection of Material

The following paragraphs are added:

Delivery, storage and handling of GFRP reinforcing bars shall be in accordance with these specifications. Prevent bending, coating with earth, oil, or other material, or otherwise damaging the reinforcement. When handling reinforcement, use equipment to avoid damaging or abrading the bar. Do not drop or drag reinforcement.

GFRP reinforcement shall be stored on skids or other supports a minimum of 12 inches above the ground surface and protected at all times from damage and surface contamination. The storage supports shall be constructed of wood, or other material that will not damage the surface of the reinforcement. Bundles of bars shall be stored on supports in a single layer. Each bundle shall be placed on the supports out of contact with adjacent bundles. Reinforcing bars expected to be stored outdoors for a period in excess of two months, shall be protected from ultraviolet radiation. Prevent exposure of reinforcing to temperatures above 120 degrees Fahrenheit during storage.

All handling of reinforcing bars by mechanical means shall be done by equipment having padded contact areas, or by the use of nylon webbing slings. The use of chains or wire rope slings shall not be allowed, even when used with padding. All bundles of bars shall be lifted with a strong back, spreader bar, multiple supports or a platform bridge to prevent bar-to-bar abrasion from sags in the bundles. Support points during lifting or transporting of bundled reinforcing bars shall be spaced at a maximum of 15 feet, or as required by the manufacturer, whichever is more restrictive.

Bundled bars shall be strapped together with non-metallic or padded straps in a manner to prevent bar-to-bar abrasion due to relative movement between bars.

Bars loaded for transport shall be loaded and strapped down in a manner that will prevent damage from motion and vibration, to the greatest extent possible. Bundles of bent bars shall be transported strapped to wooden platforms or shall be crated. All individual bundles and layers of bundles shall be separated, and supported by dunnage.

Individual bars shall be handled in a manner that prevents damage due to abrasion or impact, and at no time shall any bar be moved by dragging over any surface, including other reinforcing bars. Sufficient personnel shall be assigned to assure compliance with the above.

For GFRP bars the maximum total visible damage permitted on each linear foot shall not exceed 2 percent of the surface area in that linear foot of bar. The depth of the permissible damage shall not exceed 0.04 inches.

503.06 Placing and Fastening

The following paragraphs are added:

All reinforcement shall be accurately placed in the positions shown on the plans and shall be firmly held there during the placing and setting of the concrete. Immediately before placing concrete the reinforcement shall be free from all foreign material which could decrease the bond between the reinforcing and concrete. Such foreign material shall include, but not be limited to: dirt, paint, oil, bitumen and dried concrete mortar.

Reinforcing bars within the formwork shall be secured to prevent movement during concrete placement. The bars must be adequately supported or tied to resist settlement, floating upward, or movement in any direction during concrete placement.

Field bending of GFRP shall not be allowed.

Field cutting of GFRP will be permitted only with the approval of the Resident. The field cutting shall be with a high speed cutter, fine blade saw, diamond blade or masonry saw. The GFRP bars shall not be shear cut.

Proper distances from the forms shall be maintained by means of stays, blocks, ties, hangers or other approved means. Blocks used for this purpose shall be precast portland cement mortar blocks of approved shape and dimensions. Chairs may be used for this purpose and, when used, must be GFRP or plastic. The use of pebbles, pieces of broken stone or brick, metal pipe or wooden blocks shall not be permitted. The placing of reinforcement as concrete placement progresses, without definite and secure means of holding the bar in its correct position, shall not be permitted. Reinforcing bars used as support bars and spreader bars shall be the same type used for the main reinforcing.

Bars shall be fastened together at all intersections except where spacing is less than 1 foot in either direction, in which case, fastening at alternate intersections of each bar with other bars will be permitted providing this will hold all the bars securely in position. This fastening may be plastic or nylon ties only.

Minimum embedment lengths of reinforcing bars shall comply with the manufacturers published recommendations for the anchoring material selected. These embedment lengths shall be verified by the Resident before installation of the reinforcing bars. The reinforcing bar lengths indicated on the Plans may be reduced, at the Contractor's option, to the determined minimum embedment lengths.

Reinforcement shall be inspected and approved by the Resident before any concrete is placed.

503.07 Splicing

The following sentence is added:

Lap splice length for GFRP bars shall be as per manufactures recommendation.

503.10 Method of Measurement

The first sentence of the first paragraph is amended as follows:

GFRP reinforcing bars shall be measured by the computed number of pounds of reinforcement authorized. The Contractor shall submit the unit weight of each size GFRP used for use in computation of weight placed.

503.11 Basis of Payment

The following is added:

The accepted quantity of GFRP reinforcing will be paid for at the Contract unit price per pound for each item involved, completed, and accepted.

<u>Pay Item</u>	<u>Pay Unit</u>
503.18 Glass Fiber Reinforced Polymer (GFRP) Reinforcing Bars, Fabricated and Delivered	Pound
503.19 Glass Fiber Reinforced Polymer (GFRP) Reinforcing Bars, Placing	Pound

SPECIAL PROVISION

SECTION 503

REINFORCING STEEL

(Synthetic Fiber Reinforcement)

This Subsection is deleted in its entirety and replaced with the following:

503.01 Description

This work shall consist of furnishing synthetic fiber reinforcement to be used as temperature and shrinkage reinforcement in the concrete pavement slabs.

503.02 Materials

The following shall be added:

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

The following subsection shall be added:

503.03 Dosage

The dosage rate for synthetic fibers shall be 5 lb/cy.

503.04 Method of Measurement

The following shall be added:

Synthetic fiber reinforcement will be measured by the pound.

503.05 Basis of Payment

Payment will be made under:

Pay Item

Pay Unit

503.90 Synthetic Fiber Reinforcement

Pound

SPECIAL PROVISION

SECTION 504

STRUCTURAL STEEL

504.04 Facility Requirements

This Subsection is deleted in its entirety and replaced with the following:

Steel shall be fabricated in a facility holding a current AISC shop certification as follows:

Type of Product	Certification Required ^{1,2,3,4}
<ul style="list-style-type: none">• Plate girder bridges• Spliced rolled beam bridges• Complex bridge or truss-type highway sign structures• All structures including the use of HPS 50W or HPS 70W steel	AISC Cbr
<ul style="list-style-type: none">• Unspliced rolled beam bridges• Non truss-type highway sign supports• Misc. bridge components such as cross frames	AISC Cbr or Sbr
<ul style="list-style-type: none">• Non-vehicular bridges• High mast poles and light poles• Other Steel Products	AISC Cbr, Sbr, Cbd, or Sbd

1. Application of protective coatings requires a “P” endorsement or SSPC QP3 Certification.
2. Fabrication of fracture critical members, and of structures utilizing HPS70W steel, requires an “F” endorsement.
3. All materials fabricated in non-certified shop will be rejected.
4. Work shall not be subcontracted to a non-certified facility without approval of the Fabrication Engineer.

504.10 Mill Orders and Mill Test Reports

The following paragraph is added:

In addition, the Contractor shall provide the Manufacturer's Certified Test Report and the Distributor Certified Test Report (if applicable) for all high strength bolts used in structural connections. See related Subsection 504.45 for Rotational Capacity Test requirements.

504.12 Protective Coating

The following paragraphs are added:

Diaphragms, cross frames, and all portions of bearings not welded to the beam or girder shall be galvanized.

Galvanized nuts shall be overlapped to the minimum required for the fastener assembly, and shall meet the requirements of Supplementary Requirement S1 of ASTM A563, Lubricant and Test for Coated Nuts. Overlapping shall not exceed 0.015 inch diametrically for nuts one inch diameter and smaller and 0.025 inch for nuts larger than one inch diameter. Excess hot-dip galvanizing on threaded portions of bolts shall be removed by centrifuging or air blasting immediately upon withdrawal. Flame chasing is prohibited.

504.15 Design

The first sentence is deleted and replaced with the following:

Bridge design, detail and load requirements shall conform to the most current edition of the AASHTO LRFD Bridge Design Specifications, applicable Interim Specifications and these Specifications, unless otherwise noted on the Plans.

504.18 Plates for Fabricated Members

The first sentence in the second paragraph is changed from "...ASTM A 898/A 898 M..." to "...ASTM A 898/A 898 M or ASTM A 435/A 435 M as applicable and...".

504.21 Thermal Cutting

The following sentence is added to the end of the second paragraph:

For painted structures, edge preparation shall be in conformance with Section 506, Painting Structural Steel.

504.25 Die Stamping

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

Any die stamping in unauthorized locations will be removed at the Contractor's own expense.

504.30 Welded Fabrication

The following sentence is added:

Mill scale shall be removed from the surfaces on which flange-to-web, cover plate-to-flange, bearing stiffener-to-web, and connection plate-to-web welds are to be made.

504.41 Methods and Equipment

The following paragraph is added:

When structural steel erection is to take place over travel ways, the Contractor shall submit a structural steel erection plan stamped by a Professional Engineer. The erection plan shall include the number and location of crane(s), the weight of the pick, crane capacities and all other pertinent information.

504.44 Connections Using High Strength Bolts

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

Each wrench shall be accompanied with the necessary sockets, extension handles, and other related equipment and shall be acceptable to the Fabrication Engineer. No separate payments will be made for said testing. Any costs will be incidental to the bid items.

504.45 Bolts, Nuts, Washers and Direct Tension Indicators

This Subsection is amended by the addition of the following:

Should it prove to be impractical to obtain all nuts, bolts and washers for a Project from a single source, the Contractor shall submit a work plan for the Fabrication Engineer's approval that will ensure that all nut, bolts and washers in each individual main structural connection or group of such connections (i.e., beam and girder splices, floor beam end connections, truss members end connections, etc.) will be from a single source. All DTI's will be from one manufacturer and one supplier.

504.50 Calibration, Installation and Tensioning of High Strength Bolts

This Subsection is amended by the addition of the following:

Bolts that are too short for calibration in the tension measuring device may be tightened in a steel joint, using direct tension indicating washers (DTI's). The DTI's shall first be calibrated in a tension measuring device using longer bolts.

504.51 Installation

This Subsection is amended by the addition of the following:

Where an outer face of the bolted parts has a slope of more than one to 20 with respect to a plane normal to the bolt axis, a smooth beveled washer will be used to compensate for the lack of parallelism.

Connections using DTI's shall be brought to a "Snug Tight" condition as above except that, following snugging, no gap on any DTI in a connection shall exceed 0.040 inch, and no DTI shall have a gap less than 0.015 inch. Any DTI having a gap less than 0.015 inch following snugging of a connection shall be removed and the fastener assembly shall be re-snugged using a new DTI.

504.52 Tightening

Item 1 is amended by the addition of the following:

Wrenches shall be recalibrated at any time significant changes are noted in the condition of bolt threads, nuts, washers, lubrication, hose length, environmental conditions, etc., which may affect calibration.

504.54 Reuse of Bolts

This Subsection is amended by the addition of the following:

Reuse of bolts will be allowed only with the approval of the Fabrication Engineer. Galvanized bolts may not be reused.

504.641 Method of Measurement

Unless otherwise specified, structural steel will be measured as one lump sum complete and accepted, consisting of all metal and related materials in the fabricated and erected structure as show on the Plans, excluding railings and drains.

There will be no additional payment for the required erection plan, but the cost shall be incidental to the Structural Steel Erection item.

SPECIAL PROVISION

SECTION 515

PROTECTIVE COATING FOR CONCRETE SURFACES

(Clear Concrete Protective Coating)

This Section 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 new signal and toll equipment foundations, new concrete slabs, new concrete islands and bumpers, existing islands, bumpers and curbing in accordance with what is shown on the Plans or as approved by the Resident and the manufacturer's published recommendations.

515.02 Materials

The penetrating sealer shall be Stand Off 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 Stand Off 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 100°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.

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.

Protection shields shall be used when applying sealer in the vicinity of Authority employees or as directed by the Resident.

515.05 Method of Measurement

Clear Protective Coating for Concrete Surfaces will be measured for payment by the square yard, satisfactorily applied and accepted.

515.06 Basis of Payment

Clear Protective Coating for Concrete Surfaces will be paid at the Contract unit price per square yard which price shall be full compensation for all labor, materials, equipment and incidentals required for furnishing and applying the clear concrete protective coating as shown on the Plans, in accordance with these Specifications or as approved by the Resident.

Surface preparation, vegetation removal, and protection of surfaces not designated for treatment will not be measured separately for payment, but shall be incidental to the Clear Concrete Protective Coating item.

Payment will be made under:

Pay Item

Pay Unit

515.202	Clear Protective Coating for Concrete Surfaces	Square Yard
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SPECIAL PROVISION

SECTION 515

PROTECTIVE COATING FOR CONCRETE SURFACES

(Epoxy Overlay)

515.01 Description

The first paragraph is amended to read:

This special provision describes furnishing and applying two layers of a two-component polymer overlay system in accordance with what is shown on the Plans or as approved by the Resident. The total thickness of the overlay system shall be 1/4 inch.

515.02 Materials

Furnish materials specifically designed for use over concrete. Pre-qualified polymer liquid binders are as follows:

<u>Product Trade Name</u>	<u>Manufacturer or Supplier</u>	<u>Telephone</u>
Mark-163 Flexogrid	PolyCarb, Inc.	(866) 765-9227
Sikadur 22 Lo-mod	Sika Corporation	(248) 569-5665
E-Bond 526 Lo-Mod	E-Bond Epoxies, Inc.	(954) 566-6555
Propoxy DOT Type III	Unitex	(816) 231-7700
Sure Level Epoxy (J-57)	Dayton Superior	(888) 977-9600
ICO Flexi-Coat	International Coatings, Inc.	(800) 624-8919
Flexolith	Euclid Chemical Co.	(800) 321-7628

Polymer Resin

The polymer resin base and hardener shall be composed of two-component, 100 percent solids, 100 percent reactive, thermosetting compound with the following properties:

Property	Requirements	Test Method
Gel Time ^A	15 - 45 minutes @ 75° F	ASTM C881
Viscosity ^A	7 - 70 poises	ASTM D2393, Brookfield RVT, Spindle No. 3, 20 rpm
Shore D Hardness ^B	60-75	ASTM D2240
Absorption ^B	1% maximum at 24 hour	ASTM D570
Tensile Elongation ^B	30% - 70% @ 7 days	ASTM D638
Tensile Strength ^B	>2000 psi @ 7 days	ASTM D638
Flexural Strength ^B	>4500 psi @ 7 days	ASTM D790
Chloride Permeability ^B	<100 coulombs @ 28 days	AASHTO T277

^A Uncured, mixed epoxy binder ^B Cured, mixed epoxy binder

Aggregates

Furnish natural or synthetic aggregates that have a proven record of performance in applications of this type. Furnish aggregates that are non-polishing, clean, free of surface moisture, fractured or angular in shape; free from silt, clay, asphalt, or other organic materials; and meet the following properties and gradation requirements:

Aggregate Properties:

Property	Requirement	Test Method
Moisture Content	$\leq 0.2\%$	ASTM C566
Hardness	≥ 6.5	Mohs Scale
Fractured Faces	100% with at least 1 fractured face & 80% with at least 2 fractured faces of material retained on No.16	ASTM 5821

Gradation:

Sieve Size	% Passing by Weight
No. 4	100
No. 8	30 – 75
No. 16	0 – 5
No. 30	0– 1

515.21 Required Properties of Overlay System

The required properties of the overlay system are listed in the table below:

Property	Requirement ^A	Test Method
Minimum Compressive Strength at 8 Hrs. (psi)	1,000 psi @ 8 hours 5,000 psi @ 24 hours	ASTM C 579 Method B, Modified ^B
Thermal Compatibility	No Delaminations	ASTM C 884
Minimum Pull-off Strength	250 psi @ 24 hours	ACI 503R, Appendix A

^A Based on samples cured or aged and tested at 75°F

^B Plastic inserts that will provide 2-inch by 2-inch cubes shall be placed in the oversized brass molds.

515.22 Approval of Polymer Overlay System

Submit product data sheets and specifications from the manufacturer, and a certified test report to the Resident for approval.

For materials not pre-qualified, in addition to the above submittals, submit product history/reference projects and a certified test report from an independent testing laboratory showing compliance with the requirements of the specification.

Product data sheets and specifications from the manufacture consists of literature from the manufacturer showing general instructions, application recommendations/methods, product properties, general instructions, or any other applicable information.

515.23 Construction

Conduct a pre-installation conference with the manufacturer's representative prior to construction to establish procedures for maintaining optimum working conditions and coordination of work. Furnish the Resident a copy of the recommended procedures and apply the overlay system according to the manufacturer's instructions. The manufacturer's representative familiar with the overlay system installation procedures shall be present at all times during surface preparation and overlay placement to provide quality assurance that the work is being performed properly.

Store resin materials in their original containers in a dry area. Store and handle materials according to the manufacturer's recommendations. Store all aggregates in a dry environment and protect aggregates from contaminants on the jobsite.

Surface Preparation

Determine an acceptable shotblasting machine operation (size of shot, flow of shot, forward speed, and/or number of passes) that provides a surface a profile meeting CSP 5 according to the International Concrete Repair Institute Technical Guideline No. 03732. If the Resident requires additional verification of the surface preparation, test the tensile bond strength according to ACI 503R, Appendix A of the *ACI Manual of Concrete Practice*. The surface preparation will be considered acceptable if the tensile bond strength is greater than or equal to 250 psi or the failure area at a depth of 1/4 inches or more is greater than 50 percent of the test area. Continue adjustment of the shotblasting machine and necessary testing until the surface is acceptable to the Resident or a passing test result is obtained.

Prepare the entire surface using the final accepted adjustments to the shotblasting machine as determined above. Thoroughly blast cleans with hand-held equipment any areas inaccessible by the shotblasting equipment. Do not perform surface preparation more than 24-hours prior to the application of the overlay system.

Just prior to overlay placement, clean all dust, debris, and concrete fines from the concrete surface including vertical faces of curbs and barrier walls up to a height of one inch above the overlay with compressed air. When using compressed air, the air stream must be free of oil. Any grease, oil, or other foreign matter that rests on or has absorbed into the concrete shall be removed completely.

The Resident may consider alternate surface preparation methods per the overlay system manufacture's recommendations. The Resident will approve the final surface profile and cleanliness prior to the Contractor placing the epoxy overlay.

Application of the Overlay

Perform the handling and mixing of the epoxy resin and hardening agent in a safe manner to achieve the desired results according to the manufacturer's instructions. Do not apply the overlay system if any of the following exists:

- a. Ambient air temperature is below 50°F;
- b. Concrete surface temperature is below 50°F;
- c. Moisture content in the concrete exceeds 4.5 percent when measured by an electronic moisture meter or shows visible moisture after two-hours when measured in accordance with ASTM D4263;
- d. Rain is forecasted during the minimum curing periods listed under C.5 ;
- e. Materials component temperatures below 50°F;
- f. Concrete age is less than 28 days unless approved by the Resident.

After the concrete surface has been shotblasted or during the overlay curing period, only necessary surface preparation and overlay application equipment will be allowed on the concrete surface. Begin overlay placement as soon as possible after surface preparation operations.

The polymer overlay shall consist of a two-course application of epoxy and aggregate. Each of the two courses shall consist of a layer of epoxy covered with a layer of aggregate in sufficient quantity to completely cover the epoxy. Apply the epoxy and aggregate according to the manufacturer's requirements. Apply the overlay using equipment designed for this purpose. The application machine shall feature positive displacement volumetric metering and be capable of storing and mixing the polymer resins at the proper mix ratio. Disperse the aggregate using a standard chip spreader or equivalent machine that can provide a uniform, consistent coverage of aggregate. First course applications that do not receive enough aggregate before the epoxy gels shall be removed and replaced. A second course applied with insufficient aggregate may be left in place, but will require additional applications before opening to traffic.

After completion of each course, cure the overlay according to the manufacturer's instructions. Follow the minimum cure times as prescribed by the manufacturer. Remove the excess aggregate from the surface treatment by sweeping, blowing, or vacuuming without tearing or damaging the surface; the material may be re-used if approved by the Resident and manufacturer. Apply all courses of the overlay system before opening the area to traffic. Do not allow traffic on the treated area until directed by the Resident.

After the first layer of coating has cured to the point where the aggregate cannot be pulled out, apply the second layer. Prior to applying the second layer, broom and blow off the first layer with compressed air to remove all loose excess aggregate.

Prior to opening to traffic, clean all debris and polymer from the roadway. If required by the Resident, a minimum of three days following opening to traffic, remove loosened aggregates from the concrete and approach pavement.

Application Rates

Apply the epoxy overlay in two separate courses in accordance with the manufacturer's instructions, but not less than the following rate of application.

Course	Minimum Epoxy Rate ^A (GAL/100 SF)	Aggregate ^B (LBS/SY)
1	2.5	10+
2	5.0	14+

^A The minimum total applications rate is 7.5 GAL/100 SF.

^B Application of aggregate shall be of sufficient quantity to completely cover the epoxy.

Minimum Curing Periods

As a minimum, cure the coating as follows:

	Average temperature of concrete surface, epoxy and aggregate components in °F					
Course	60-64	65-69	70-74	75-79	80-84	85+
1	4 hrs.	3 hrs.	2.5 hrs	2 hrs	1.5 hrs.	1 hr.
2 *	6.5 hrs.	5 hrs.	4 hrs.	3 hrs.	3 hrs.	3hrs.

*Cure course 2 for eight hours if the air temperature drops below 60° F during the curing period.

515.05 Method of Measurement

The Authority will measure Epoxy Overlay in area by square yards completed and accepted, in accordance with the Plans.

515.06 Basis of Payment

Payment is full compensation for preparing the surface; for tensile bond testing; for providing the overlay; for cleanup; for sweeping/vacuuming and disposing of excess materials; and for labor, equipment, tools, and incidentals necessary to complete the work.

Payment will be made under:

Pay Item

Pay Unit

515.23 Epoxy Overlay

Square Yard

SPECIAL PROVISION

SECTION 526

CONCRETE BARRIER

(Temporary Concrete Barrier Type I - Supplied by Authority)
(Permanent Concrete Barrier Type I)
(Permanent Concrete Barrier Type I Transition)

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 of a shape designated on the Plans. The barrier shall have attachments allowing individual sections to be connected into a continuous barrier.

This work also includes loading, transporting and setting new Permanent Concrete Barrier Type I and Permanent Concrete Barrier Type I Transition of a shape designated on the Plans, which transitions from safety shape to Guardrail Type 3D – Double Rail. The barrier shall have attachments allowing connection to Permanent Concrete Barrier Type I.

The work also includes supplying connecting pins and furnishing and mounting retro-reflective delineators, per Subsection 526.03, on both Contractor-supplied and Authority-supplied temporary concrete barriers.

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

<u>Maintenance Area</u>	<u>Linear Feet of Barrier</u>
Crosby Maintenance Area Mile 46 Southbound	1,810

Upon substantial completion of work, the Contractor shall remove and transport the concrete barrier - supplied by Authority to back to Crosby Maintenance Area.

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.
- f. Connecting pins shall be a one inch diameter A36 steel hot rolled round rod that has a 4” long 180 degree bend at the top (“J” shaped). The rod shall be 2’-11” long pre-bend and 2’-7” long post bend.

- g. Permanent concrete barriers shall be new pieces of barrier and shall not be used in any other MOT phases. Only new materials and connecting hardware shall be used.

526.021 Acceptance

The Resident shall have the authority to accept or reject all Temporary Concrete Barrier Type I– Supplied by Authority and Permanent Concrete Barrier Type I used on the Project.

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.

Pins connecting the barrier shall be set flush with the top of the 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 so as to withstand the force of throw from a snow plow.
- 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:

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

The loading, transporting, setting, resetting, removing, transporting and stacking of the barrier including required guardrail overlap, 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.

Permanent Concrete Barrier Type I shall be measured at the Contract unit price per linear foot installed and accepted.

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

Permanent Concrete Barrier Type I Transition will be measured per each.

526.05 Basis of Payment

The fifth paragraph is 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.

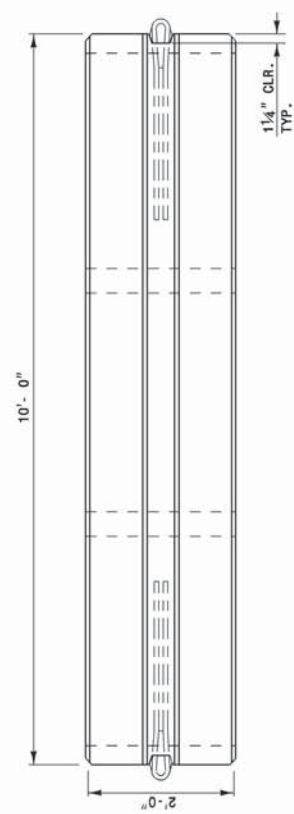
Permanent Concrete Barrier Type I will be paid for at the Contract unit price bid. Such payment shall be full compensation for loading, transporting, setting, temporary storage, furnishing all materials, and all other incidentals necessary to complete the work.

Permanent Concrete Barrier Type I Transition will be paid for at the Contract unit price each complete in place and shall be full compensation for furnishing all labor, equipment and materials necessary to complete the work.

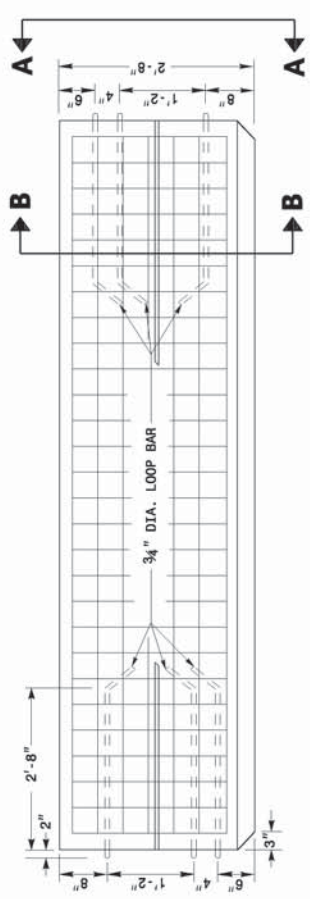
Payment of Concrete Barrier shall be based on a percentage of the work accomplished during that pay period.

Payment will be made under:

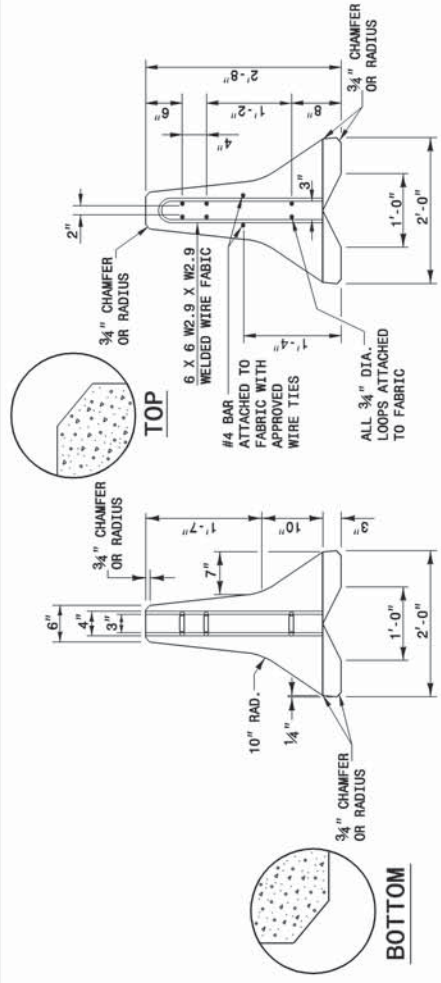
<u>Pay Item</u>	<u>Pay Unit</u>
526.306 Temporary Concrete Barrier, Type I – Supplied by Authority	Lump Sum
526.311 Permanent Concrete Barrier Type I	Linear Foot
526.342 Permanent Concrete Barrier Type I Transition	Each



PLAN

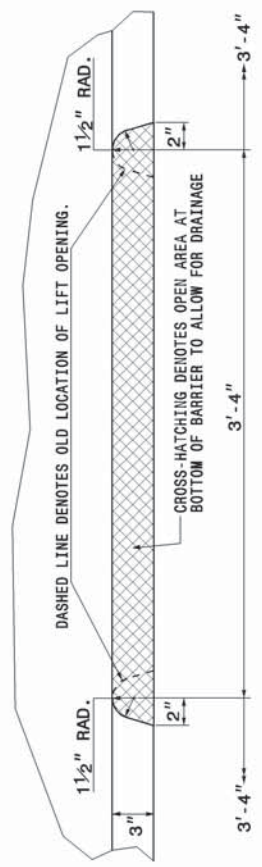


ELEVATION



END VIEW A-A

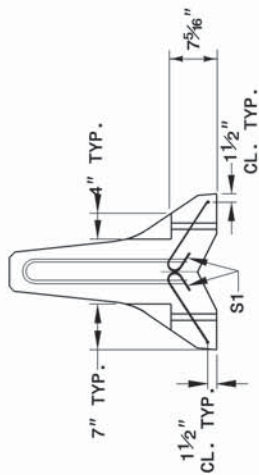
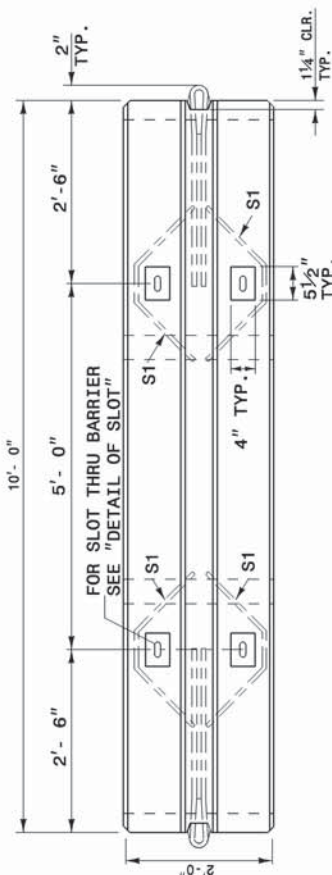
SECTION B-B



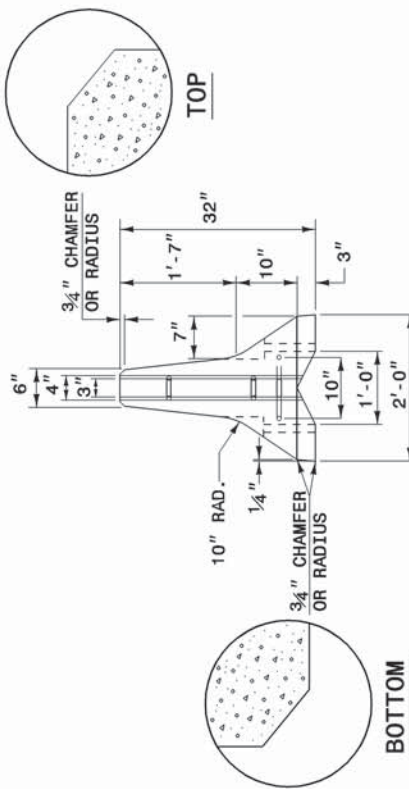
ELEVATION DETAIL OF DRAINAGE/LIFT SLOT

GENERAL NOTES

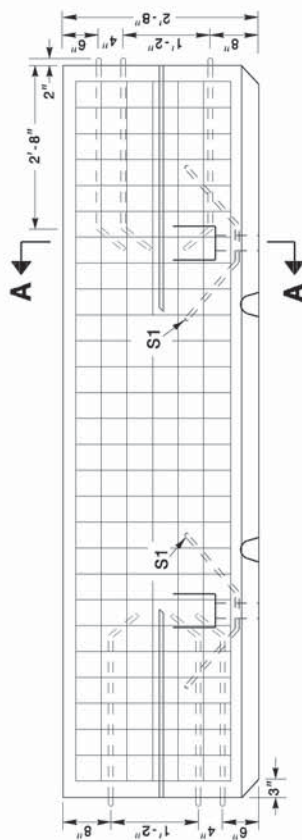
- THE DRAINAGE/LIFT SLOT SHOWN IS A MODIFICATION OF THE LIFT OPENINGS, ALL OTHER DESIGN CRITERIA SUCH AS REINFORCEMENT BARS ETC. ARE THE SAME AS SHOWN ON THE STANDARD DRAWING.
- BARRIER WITH DRAINAGE/LIFT SLOT IS INTENDED TO BE USED IN AREAS WHERE ROADWAY SURFACE WATER RUNOFF CAUSES EXCESS PUDDLING ADJACENT TO THE TEMPORARY BARRIER. INSTALL THE BARRIER AS SHOWN IN THE PLANS, OR AS DIRECTED BY THE ENGINEER.
- DRAINAGE/SLOT CAN BE USED WITH ANCHORED "PORTABLE CONCRETE BARRIER".



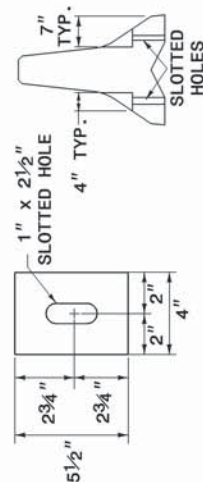
SECTION A-A



END ELEVATION

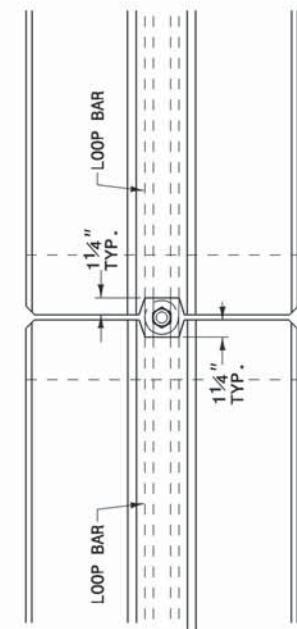


ELEVATION

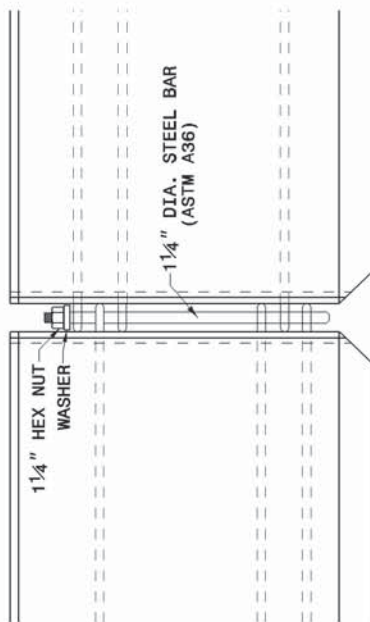


NOTE: AFTER CASTING, THE DIAMETER OF THE
SLOT CAN VARY BETWEEN 1" AND 1 1/8".

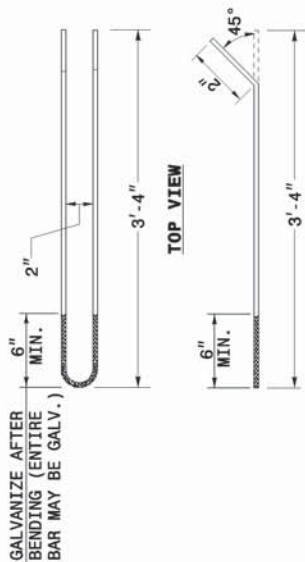
DETAIL OF SLOT



PLAN OF CONNECTION

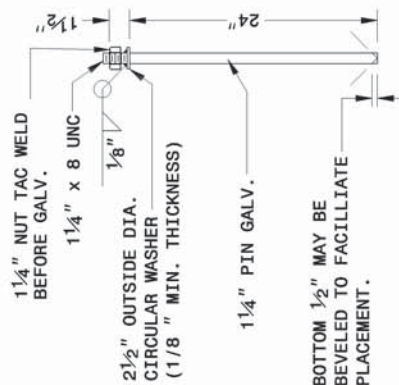


ELEVATION OF CONNECTION

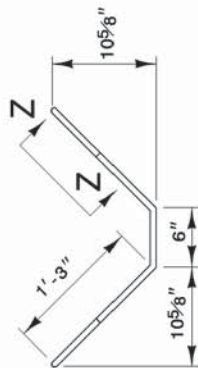


**SIDE VIEW
LOOP BAR
3/4\" DIA. (A36M)**

REINFORCEMENT DETAIL



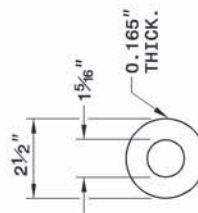
**CONNECTOR PIN
ASSEMBLY**



**S1 BARS
#5 BARS**

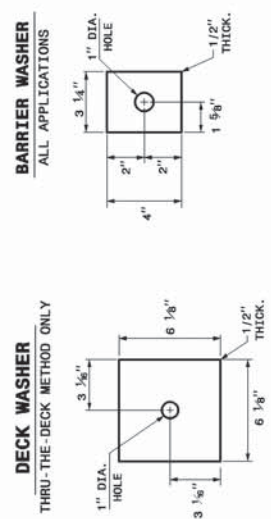


VIEW Z-Z



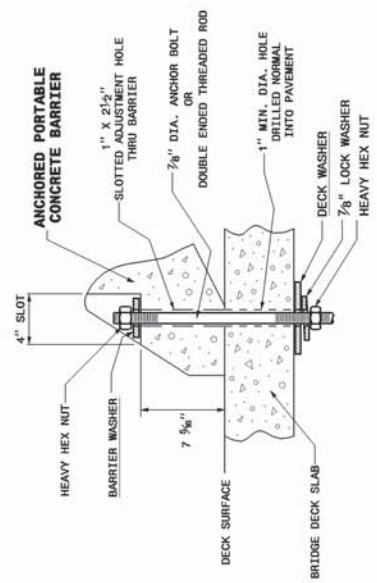
**PLAIN GALVANIZED
STEEL WASHER
FOR 1 1/4\" PIN**

DECK & BARRIER WASHERS



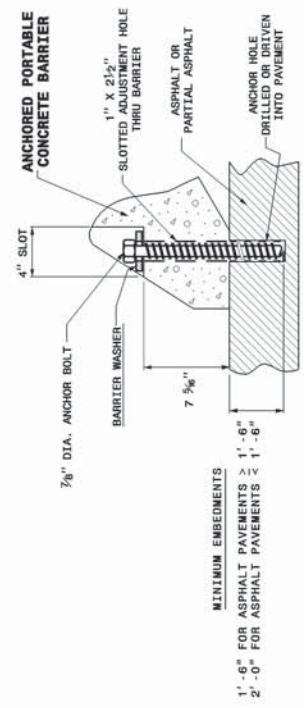
THRU-THE-DECK ANCHOR METHOD

BRIDGE DECKS
METHOD TO BE USED ON OLD BRIDGE DECKS
ONLY AT TIMES WHEN SPECIFIED IN THE PLANS,
OR WHEN DIRECTED BY THE ENGINEER.



ANCHOR BOLT METHOD

BITUMINOUS PAVEMENTS



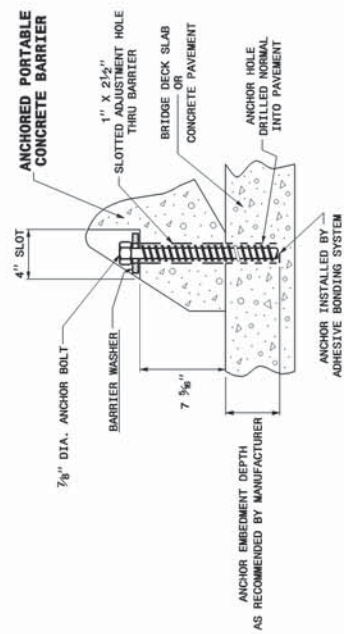
NOTE: EMBEDMENT DEPTHS ARE TYPICAL FOR MOST APPLICATIONS. HOWEVER, DUE TO VARYING ASPHALT CONDITIONS, THEY MAY NOT BE ADEQUATE FOR ALL CASES.

GENERAL NOTES

- EACH 10 FT. SECTION OF BARRIER REQUIRES 2 ANCHOR ASSEMBLIES WHEN INSTALLED ON CONCRETE, AND 4 ANCHOR ASSEMBLIES WHEN INSTALLED ON ASPHALT.
- EXPANSION ANCHORS WILL NOT BE PERMITTED FOR USE ON BRIDGE DECKS.
- DO NOT DRILL HOLES INTO PRESTRESSED CONCRETE BRIDGE DECK PANELS.
- USE ASTM A325 HIGH STRENGTH GALVANIZED ANCHOR BOLTS.
- DRILL ANCHOR HOLES IN CONCRETE WITH A PNEUMATIC DRILL.
- FOR BARRIER SECTIONS THAT EXTEND ACROSS CONCRETE JOINTS, DO NOT ANCHOR ON BOTH SIDES OF THE JOINT, OMIT THE ANCHOR CLOSEST TO THE JOINT.
- TIGHTEN ANCHORS "SNUG TIGHT". TURN THREADED RODS AT LEAST 1 FULL OF THREADS EXTENDING ABOVE THE NUT. DO NOT PROTRUDE THE TOP OF THE ANCHOR ABOVE THE SIDE OF THE BARRIER.
- COAT ANCHORS USED WITH THE ADHESIVE BONDING ANCHORING SYSTEM WITH A DEBONDING AGENT SO THE ANCHORS CAN BE EASILY REMOVED. DO NOT REDUCE THE STRENGTH OF THE ANCHOR SYSTEM WITH THE DEBONDING AGENT.
- ONCE REMOVED, COMPLETELY FILL ANCHOR HOLES WITH AN APPROVED, NON-SHRINK, NON-METALLIC GROUT, OR AS DIRECTED BY THE ENGINEER.

ADHESIVE BONDING SYSTEM ANCHOR METHOD

BRIDGE DECKS AND PORTLAND CEMENT CONCRETE PAVEMENTS



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 NCHRP Report 350 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 NCHRP Report 350 TL-2 crash test requirements may be used on the turnpike and local roadways with posted speeds of 40 MPH or less and as noted on the plans. The Contractor shall provide the Resident with documentation of the proposed work zone crash cushion's NCHRP Report 350 Crash Test Results prior to installation at the jobsite.

527.05 Basis of Payment

Payment will be made under:

<u>Pay Item</u>		<u>Pay Unit</u>
527.342	Work Zone Crash Cushions – TL-2	Unit

SECTION 602

PIPE LINING

(Flowable Concrete Fill)

602.01 Description

This work shall consist of providing and placing flowable concrete fill at the locations designated on the Plans.

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 |
| ▪ 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” |

602.03 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 110 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

602.04 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.

602.05 Batching

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

602.06 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.

602.07 Cold Weather Placement

The following amended requirements of Standard Specification Section 502, Structural Concrete, Subsection 502.08, Cold Weather Concrete, will apply.

The Cold Weather Temperature Table does not apply to flowable concrete fill. The minimum concrete temperature as placed shall be 40°F. No housing framework or heating will be required when placed under approved cold weather conditions.

602.08 Forms and Containment Berms

When necessary to contain flowable concrete fill within a defined area, berms shall be constructed of compacted granular material.

602.09 Placing Flowable Concrete Fill

Flowable concrete fill shall not be placed until forms and/or containment berms have been checked and approved. Flowable concrete fill shall not be placed under water. The method and sequence of placing flowable concrete fill shall be approved by the Resident before any flowable concrete fill is placed. A technical representative from the flowable concrete fill supplier shall be present during the initial placement.

All flowable concrete fill shall be placed before it has taken its initial set. Flowable concrete fill shall be placed in such a manner as to avoid separation and segregation of the mix. Consolidation, tamping, and vibration is not required or allowed.

Flowable concrete fill shall be discharged directly from the truck into the space to be filled. The drop height of the flowable concrete fill shall be as low as practicable. Flowable concrete fill shall not flow down the vertical face of a trench causing erosion of the trench face. Finishing and curing of flowable concrete fill is not required.

Flowable concrete fill placed will not be opened to traffic or covered with structural concrete or pavement for a minimum of 24-hours.

602.10 Method of Measurement

Flowable Concrete Fill satisfactorily placed and accepted will be measured by the cubic yard, in accordance with the pay limits established, if such limits have been established. If the Contractor elects to omit forms or berms, then any excavation or Flowable Concrete Fill placed beyond the pay limits as indicated on the Plans will not be paid for, but shall be at the Contractor's own expense.

602.11 Basis of Payment

The accepted work done under 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 forms, berms, granular material, pumping, dewatering and necessary incidentals.

Payment will be made under:

Pay Item

Pay Unit

602.30 Flowable Concrete Fill

Cubic Yard

SPECIAL PROVISION

SECTION 603

PIPE CULVERTS AND STORMDRAINS

(High Density Polyethylene Pipe)

603.1 Description

The following paragraphs are added:

This work shall consist of furnishing and installing High Density Polyethylene Pipe (HDPE) at the locations as shown on the Plans or as approved by the Resident.

603.2 Materials

The following paragraphs are added:

HDPE pipe shall be Polypipe EHMW PE3408, Class 150 manufactured by Polypipe Industries, Inc. or approved equal.

603.06 Jointing Culverts

The following paragraphs are added:

Fabrication of the HDPE pipe flanged fittings shall be by the heat fusion method.

603.11 Method of Measurement

The following paragraphs are added:

The HDPE pipe shall be measured by the linear foot installed, complete in place and accepted.

603.12 Basis of Payment

The following paragraphs are added:

HDPE will be paid for at the Contract unit price per linear foot. This payment shall include all material, labor and incidentals necessary to complete the work.

Payment will be made under:

Pay Item

603.152 16 Inch HDPE Pipe

Pay Unit

Linear Foot

SPECIAL PROVISION

SECTION 606

GUARDRAIL

(Bridge Transition- Type III (Modified))

606.01 Description

The following sentence is added:

This work shall consist of furnishing and installing double faced Type III guardrail bridge attachments at bridge Permanent Concrete Barrier Type I Transitions on bridges over the turnpike.

The following Subsection is added:

606.071 Guardrail Attachments at Bridges

Bridge transition - Type III shall be used at bridge Permanent Concrete Barrier Type I locations.

606.08 Method of Measurement

The following sentence is added:

Guardrail attachment will be measured by each unit of the type specified, installed and accepted.

606.09 Basis of Payment

The following paragraphs are added:

Bridge Transition - Type III will be paid for at the Contract unit price each complete 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 following: furnishing and installing guardrail, one terminal connector, including terminal connector anchorage and all other detailed accessories; furnishing and installing all required posts, rails, offset brackets, back-up plates, nuts, bolts, washers, and all other items necessary to make for a complete installation as shown on the Plans or as approved by the Resident.

Payment will be made under:

Pay Item

Pay Unit

606.1724 Bridge Transition - Type III (Modified)

Each

SPECIAL PROVISIONS

SECTION 606

GUARDRAIL

(Terminal End - Remove and Stack)

606.01 Description

The following paragraphs are added:

This work shall also include removing existing terminal ends, when designated, transporting and stacking them at the Crosby Maintenance Area, Mile 46 Southbound.

In locations where new guardrail is being installed on the departure side, terminal ends are required as end treatments. These terminal ends shall be provided from the ones designated under this item to be stacked. Installation of these terminal ends shall also be included under this item.

606.08 Method of Measurement

The following sentence is added:

Remove and Stack Terminal End will be measured for payment per each unit removed.

606.09 Basis of Payment

The following paragraphs are added:

The accepted quantity of Terminal Ends Removed and Stacked will be paid for at the Contract unit price each satisfactorily removed and stacked. This price shall be full compensation for removing all rails, posts, offset brackets, nuts, bolts, washers, hardware, all labor, transportation and all other incidentals necessary to complete the work. No additional compensation will be made for furnishing terminal ends from the stacked location and installing them on the departure side of the new guardrail, but shall be incidental to the Remove and Stack Terminal End item.

Payment will be made under:

<u>Pay Item</u>	<u>Pay Unit</u>
606.2652	Terminal End - Remove and Stack Each

SPECIAL PROVISION

SECTION 606

GUARDRAIL

(Reflectorized Beam Guardrail Delineator)

606.01 Description

The following paragraphs are added:

Reflectorized beam guardrail delineators shall be installed on existing guardrail to remain in place, guardrail noted to be removed, modified and reset (single and/or double rail) or new guardrail, at the locations noted on Maintenance of Traffic plans or as approved by the Resident. The delineators shall be installed prior to traffic being shifted closer to the identified guardrail run. The color for the reflective sheeting shall be silver (white) when installed on the outside shoulder and yellow when installed on the inside shoulder.

Reflectorized beam guardrail delineators shall be mounted as follows:

1. Delineators on guardrail adjacent to a shifted detour should be spaced every other guardrail post and located at the bolt in the valley of the guardrail beam.
2. On existing steel bridge rail, the delineators shall be mechanically attached towards the top, every 10 feet, and bottom, every 20 feet. Delineators shall also be mechanically attached in a similar pattern to concrete endposts that are 10 feet or longer.
3. If more than 25% of delineators in any 50 feet of guardrail, bridge rail, or endposts fall off for any reason, the Contractor will be responsible for reinstalling all delineators in that run at that their own cost.
4. In no instance shall delineators be installed on guardrail which deviates substantially from the alignment (horizontal or vertical) of the roadway or which is located more than eight feet from the edge of pavement.

Exceptions and/or modifications will only be made with the approval of the Resident.

Contractor is required to submit installation method for review and approval to the Resident.

606.08 Method of Measurement

The following paragraph is added:

Reflectorized Beam Guardrail Delineators will be measured by each unit of the kind specified and installed. Maintenance and replacement of delineators will not be measured separately for payment unless otherwise approved by the Resident.

606.09 Basis of Payment

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

Reflectorized Beam Guardrail Delineators will be paid for at the Contract unit price each, complete in place, which price shall be full payment for furnishing and installing all components and for all incidentals necessary to complete the installation.

Payment will be made under:

Pay Item

Pay Unit

606.352 Reflectorized Beam Guardrail Delineator

Each

SPECIAL PROVISION

SECTION 606

GUARDRAIL

(Delineator Post)
(Remove and Reset Delineator Post)

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 on reset posts shall be removed and replaced with new reflectorized delineator panels as required by the Resident.

Existing and reset delineator posts shall be located as follows:

Outside Shoulder:

- One at guardrail trailing ends (green delineator).
- Two at guardrail approach ends (red delineators at face end and first angle point, FLEAT red on traffic side).
- One at guardrail attachments to endposts (white delineator).

Median:

- One at guardrail trailing ends (green delineator).
- Two at guardrail approach ends (red delineators at face end and first angle point, CAT or FLEAT MT red on both sides).
- One at guardrail attachments to endposts (yellow delineator).

Other Locations:

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

Delineator posts shall be bolted to the back of the first wood post in the FLEAT 350's, CAT systems and FLEAT MT systems.

606.02 Materials

The following paragraphs are added:

Non-guardrail guardrail delineator posts shall conform to Subsection 606.02.

Guardrail delineator posts for the approach ends of 350 compliant end treatments shall be fabricated by Davidson Traffic Control Devices. The post shall be the color gray and a product of the Flexi-Guide 500 Series. The delineator shall be bolted to the top of the first post with two 4 inch 5/16 galvanized lag screws with flat washers.

The demountable reflectorized delineator panel shall meet the requirements of Subsection 719.06. Delineator panel shall be rectangles measuring 8" x 3".

606.03 Posts

The following paragraphs are added:

The installation of delineator posts shall conform to Subsection 606.03 for guardrail delineator posts.

The top of delineator posts associated with guardrail shall be installed 5'-0" (60") above edge of pavement elevation. White delineator posts for mile delineation shall be 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 post shall be mounted on breakaway supports. The bottom of the sign shall be five feet from 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 installed and accepted. Delineator Posts Removed and Reset will be measured by each unit satisfactorily reset.

Mile Marker post shall be measured for payment as Delineator Post.

606.09 Basis of Payment

The following sentences are added:

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

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

Payment will be made under:

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

SPECIAL PROVISION

SECTION 606

GUARDRAIL

(Guardrail – Remove, Modify and Reset)

606.01 Description

The following paragraphs are added:

This work shall consist of removing existing guardrail elements, component parts and hardware modifying and resetting.

New non-wood offset blocks conforming to NCHRP 350 Test Level 3 shall be installed on all guardrail being reset. The existing steel offset brackets and backup plates shall become the property of the Contractor.

The following Subsection is added:

606.021 General

The modified guardrail shall be installed in accordance with the applicable provisions of the Standard Specifications.

The materials removed shall be utilized in the reset guardrail locations with the following exceptions:

- Existing guardrail posts found to be unfit for reuse, in the opinion of the Resident, prior to or upon pulling;
- Existing steel backup plates when present;
- Existing steel offset brackets shall be replaced with non-wood offset blocks; and,
- Existing W-beam rail elements damaged by traffic and unfit for reuse, in the opinion of the Resident.

This work shall include all modifications to the existing guardrail system that may be necessary to install new non-wood offset blocks including, but not necessarily limited to, the drilling of new holes in the existing posts and cleaning and painting holes with a cold-applied zinc-rich paint. The completed guardrail assembly shall conform to NCHRP 350 Test Level 3.

Existing guardrail components removed, but not reset because of damage, shall become the property of the Contractor. Any materials lost or damaged by the Contractor's operations shall be replaced at no additional cost to the Authority.

Earth around each reset post shall be raked and compacted with a minimum 8 pound hand tamper or an approved device. Holes created due to resetting a post shall be filled with a similar surrounding material and compacted.

606.08 Method of Measurement

The following paragraphs are added:

Guardrail – Remove, Modify and Reset will be measured on a linear foot basis, from center-of-post to center-of-post, for the amount of rail satisfactorily reset.

Steel posts to replace damaged posts shall come from the stockpile of guardrail components to be disposed of, from this Contract and will not be measured separately for payment. If, in the opinion of the Resident, there are no suitable steel posts in the stockpile then steel posts will be measured for payment.

W-beam rail elements to replace damaged rail elements shall come from the stockpile of guardrail to be disposed from this Contract and will not be measured separately for payment. If, in the opinion of the Resident, there are no suitable W-beam rail elements in the stockpile then W-beam rail elements will be measured for payment.

606.09 Basis of Payment

The following paragraphs are added:

The accepted quantity of Guardrail - Remove, Modify and Reset will be paid for at the Contract unit price bid per linear foot. Such payment shall be full compensation for removing, modifying, and resetting guardrail, drilling holes in existing posts, and all equipment, labor and incidentals necessary to complete the work including any necessary modifications to the existing posts.

Furnishing and installing non-wood offset blocks will not be measured separately for payment, but shall be incidental to Item 606.3605, Guardrail - Remove, Modify and Reset, Single Rail, or Item 606.3606, Guardrail - Remove, Modify and Reset, Double Rail.

New steel posts, when measured for payment, will be paid for under Item 606.48, Single Galvanized Steel Post.

New W-beam rail components, when measured for payment, will be paid for under Item 606.178, Guardrail Beam.

Payment will be made under:

Pay Item

Pay Unit

606.3605	Guardrail - Remove, Modify and Reset, Single Rail	Linear Foot
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SPECIAL PROVISION

SECTION 606

GUARDRAIL

(Guardrail - Remove and Dispose)

606.01 Description

The following paragraph is added:

This work shall consist of removing, stockpiling and disposing of existing single and double guardrail elements, component parts and hardware unsuitable for replacement as approved by the Resident. At the completion of the Contract, any unused 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 disposal 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 removal will be paid for at the Contract unit price bid, 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.

Stockpiling existing rail elements and posts will not be measured separately for payment, but shall be incidental to Item 606.3631.

Payment will be made under:

Pay Item

Pay Unit

606.3631 Guardrail - Remove and Dispose

Linear Foot

SPECIAL PROVISION

SECTION 606

GUARDRAIL

(Guardrail 350 FLEAT Terminal)

606.01 Description

The following sentences are added:

This work shall also consist of furnishing and installing a Guardrail 350 FLEAT (Flared Energy Absorbing Terminal) as manufactured by Road Systems, Inc., 1507 East 4th Street, Big Spring, Texas 79720, (915) 263-2435, and retroreflective adhesive sheeting in accordance with these Specifications 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:

The retroreflective sheeting shall meet the requirements of Subsection 719.01, Reflective Sheeting – Minimum ASTM, Type VII.

The following Subsections are added:

606.03 Posts

Wood offset blocks shall be toe-nailed to the wood post to prevent the blocks from moving.

606.041 Reflective Sheeting

The color for the reflective sheeting shall be silver (white) when installed on the outside shoulder.

606.08 Method of Measurement

The second paragraph is amended by the addition of: “Guardrail 350 FLEAT Terminal” after the words “breakaway cable terminal”.

606.09 Basis of Payment

The second paragraph is amended by the addition of: “and Guardrail 350 FLEAT Terminal” after the words “breakaway cable terminal”.

The retroreflective sheeting will not be measured separately for payment, but shall be incidental to the Guardrail 350 FLEAT Terminal item.

Payment will be made under:

Pay Item

Pay Unit

606.80

Guardrail 350 FLEAT Terminal

Each

SPECIAL PROVISION

SECTION 606

GUARDRAIL

(Terminal End - Anchored End)
(Terminal End – Anchored End, Thrie Beam)

606.1 Description

The following sentence is added:

This work shall also consist of furnishing and installing Terminal End – Anchored End, and Terminal End – Anchored End, Thrie Beam end treatments in accordance with these Specifications, the AASHTO-AGC-ARBTA Joint Committee Task Force 13 Report: A Guide to Standardized Highway Barrier Hardware, dated May 1995; and in reasonably close conformity with the lines and grades as shown on the Plans or as approved by the Resident.

606.2 Materials

The following sentences are added:

The guardrail elements shall be per the Components' List found on Sheet No. 2 of 2 of Drawing SEW02a – Trailing End Terminal – Foundation Tube Option in the Task Force 13 Report noted above and/or as noted in the Contract Documents.

The following Subsection is added:

606.042 Terminal End - Anchored End

Installation of the Terminal End – Anchored End shall be in strict accordance with the AASHTO-AGC-ARBTA Joint Committee Task Force 13 Report and the Details on Sheet No. 1 of 2 of Drawing SEW02a – Trailing End Terminal – Foundation Tube Option.

606.8 Method of Measurement

The second paragraph is amended by the addition of: “, Terminal End - Anchored End,” and “Terminal End – Anchored End, Thrie Beam”, after the words “breakaway cable terminal”.

606.9 Basis of Payment

The second paragraph is amended by the addition of: “, Terminal End - Anchored End,” and “Terminal End – Anchored End, Thrie Beam”, after the words “breakaway cable terminal”.

Payment will be made under:

Pay Item

Pay Unit

606.278	Terminal End - Anchored End	Each
606.279	Terminal End – Anchored End, Thrie Beam	Each

SPECIAL PROVISION

SECTION 609

CURBING

(Curbing Remove and Stack)

609.01 Description

The following sentence is added:

The work shall consist of removing the granite curb, transporting, unloading, and stacking the granite curb at the Crosby Maintenance Area Mile 46 Southbound.

609.09 Method of Measurement

The following paragraph is added:

The curb shall be measured by the linear foot along the face of the curb prior to its removal. Curbing damaged or broken by the Contractor prior to stacking at the Maintenance Area will be deducted from the in place measurement.

609.10 Basis of Payment

The following paragraphs are added:

The accepted quantity of Curbing Removed and Stacked will be paid for at the Contract unit price per linear foot. This price shall include all labor, equipment, materials and all incidentals necessary to complete the work and will be full compensation for removing, loading, transporting, unloading, and stacking the curb.

Payment will be made under:

Pay Item

Pay Unit

609.441 Curbing Remove and Stack

Linear Foot

SPECIAL PROVISION

SECTION 619

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”.

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 upstation and downstation 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.

619.04 Applying Mulch

The third paragraph is deleted and replaced with the following:

Newly disturbed earth and ditches shall be mulched or otherwise stabilized by the end of each work day and maintained on a daily basis as described in Subsection 105.8.1.11 (b) in the Special Provisions. The Contractor is responsible for applying temporary mulch as necessary, in accordance with the latest edition of the BMP's, to minimize soil erosion prior to the application of the final slope treatment.

Temporary mulch applied during the winter months of November 1st through April 15th shall be applied at twice the standard temporary stabilization rate or 150 lbs. per 1,000 square feet or three tons/acre. Mulch shall not be spread on top of snow and shall be anchored with mulch netting on slopes steeper than eight percent unless erosion control blankets or erosion control mix is being used on the slopes.

The Contractor shall review his construction operations and staging to determine how much temporary mulching is required.

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

The following paragraphs are added:

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

Pay Unit

619.1202 Temporary Mulch

Lump Sum

SPECIAL PROVISION

SECTION 620

GEOTEXTILES

(Cellular Confinement System)

620.01 Description

The following sentence is added:

This work shall also include designing, furnishing and installing a proprietary cellular confinement system on slopes steeper than 2H:1V at the locations shown on the plan or designated by the Resident.

The cellular confinement system shall consist of a four (4) inch deep (minimum) geocell material which may be expanded to form a three dimensional cellular confinement system which resembles the appearance of a large honeycomb. This geocell material shall be anchored to the slope, filled with loam and seed and covered with temporary erosion control blanket to form a stable slope protection system.

The work shall also include having the manufacturer provide a qualified field representative on site at the start of construction to ensure the cellular confinement system is installed in accordance with the Contract Documents.

620.02 Materials

The following paragraph is added:

Slope stabilization geotextile shall be GEOWEB - GW30V Cellular Confinement System as manufactured by Presto Geosystems, PO Box 2399, Appleton, Wisconsin 54912 2399. Toll Free (800) 548 3424. Phone (920) 738 1328. Fax (920) 738 1222. E Mail info@prestogeo.com. Website www.prestogeo.com or approved equal.

Stake anchors shall be #4 reinforcing steel (minimum), 24" long (minimum) with molded, high-strength polyethylene end caps installed on the exposed rebar ends.

Keys shall be constructed of polyethylene and provide a high strength connection to connect the cellular confinement system together at each interleaf and end to end connection.

Infill material shall be loam meeting the requirements of Section 615 with a Soil Conservation Service texture of loam, sandy loam or silty loam. Topsoil shall be neither excessively acidic nor alkaline; and shall be free of any foreign material. Clays and silts are not acceptable infill material.

The Contractor shall submit shop drawings and installation instructions for review by the Resident.

620.03 Placement

The following paragraphs are added:

Prepare subgrade and install cellular confinement system in accordance with Manufacturer's recommendations.

Excavate or fill foundation soils so top of installed cellular confinement system is flush with or slightly lower than adjacent terrain or final grade as indicated on the drawings or as directed by the Engineer.

Install the cellular confinement system in accordance with the approved shop drawings and the manufacturer's published recommendations. The stake anchors and keys shall be installed in a grid pattern provided by the manufacturer and approved by the Resident.

Place specified infill in expanded cells with suitable material handling equipment. Limit the drop height to a maximum of 3 feet (1 m) to avoid damage or displacement of the cell walls. Fill the cellular confinement system sections from the crest of the slope to toe or in accordance with Engineer's direction. Evenly spread infill and tamp into place.

Fill the anchorage trench with the specified material and compact as required by the Contract Documents.

Seed, and install erosion control fabric, secured per the Manufacturer's instructions, immediately after placement of the loam fill materials.

620.05 Protection of Fabric

The following paragraphs are added:

The manufacturer's recommendation for cellular containment system installation, staking, and placement of loam shall be strictly followed so the cellular containment system is not damaged. The operation of construction vehicles over the installed cellular containment system will not be permitted.

620.07 Method of Measurement

The quantity of cellular containment system will be measured by the number of square yards of surface area satisfactorily covered and accepted.

Common excavation and fill materials to obtain subgrade for the cellular containment system will be measured for payment under their respective pay items. Proper preparation of the subgrade to accept the cellular containment system will not be measured separately but shall be incidental to Item 620.625 Cellular Confinement System.

Loam, seed, and temporary erosion control blanket will be measured for payment under their individual pay items. No additional compensation will be allowed for any additional labor, material or equipment required to place these materials in the cellular containment system in accordance with the manufacturer's recommendation.

620.08 Basis of Payment

Pay Item

Pay Unit

620.625 Cellular Confinement System

Square Yard

SPECIAL PROVISION

SECTION 620

GEOTEXTILES

(HDPE Geomembrane)

620.01 Description

The following sentence is added:

This work shall include installation of HDPE geomembrane as shown on the Plans or as approved by the Resident.

620.02 Materials

The following paragraph is added:

HDPE geomembrane shall be Poly-Flex 20 mil High Density Polyethylene (HDPE) as manufactured by Poly-Flex, Inc., 2000 W. Marshall Drive, Grand Prairie, TX 75051, (972) 647-4374, Fax (972) 988-8331, or an approved equal.

620.03 Placement

The following paragraphs are added:

HDPE geomembrane shall be placed within the limits shown on the Plans. A surface slope shall be provided in the underlying leveling sand away from structures and toward the sides of the embankments.

HDPE geomembrane deployment shall proceed only when ambient temperatures are between 32°F to 104°F. Geomembrane shall not be placed during precipitation or moisture of any type (e.g., fog, rain, dew), or in the presence of excessive winds, as determined by the Resident or Geotechnical Consultant. Observation of temperature, humidity, precipitation and wind should be noted to ensure that the weather conditions are acceptable prior to HDPE geomembrane placement.

620.04 Overlap and Seams

The following paragraphs are added:

Approved seaming processes are hot shoe fusion and extrusion welding. On side slopes, seams shall be oriented in the general direction of maximum slope, (i.e., oriented down, not across the slope). In corners and odd-shaped geometric locations, the number of field seams shall be minimized. Seams shall be aligned with the least possible number of wrinkles and “fishmouths”. If a fishmouth or wrinkle is found, it shall be relieved and cap-stripped.

Geomembrane panels must have a finished minimum overlap of four inches for hot shoe fusion welding and three inches for extrusion welding.

Cleaning solvents may not be used unless the product is approved by the liner manufacturer.

Field test seams may be conducted on the liner in accordance with the manufacturer's recommendations to verify that seaming conditions are satisfactory.

620.07 Method of Measurement

The words, "HDPE Geomembrane" shall be added after the word "geotextiles" in the first sentence of the first paragraph.

620.08 Basis of Payment

The words, "HDPE Geomembrane" shall be added after the word "geotextiles" in the first sentence of the first paragraph.

Payment will be made under:

Pay Item

620.70

HDPE Geomembrane

Pay Unit

Square Yard

SPECIAL PROVISION

SECTION 626

FOUNDATIONS, CONDUIT AND JUNCTION BOXES FOR HIGHWAY SIGNING, LIGHTING AND SIGNALS

(30-Inch Diameter, Greater Than 8-ft Long, and All 36-Inch and 42-Inch Diameter Foundations)

All work and materials shall conform to the Contract Drawings and the provisions of the State of Maine Department of Transportation Standard Specifications, Revision December 2002, SECTION 626, with the following modifications:

626.021 Miscellaneous Material

Add the following:

Reinforcing Steel

Section 503.02

626.022 Equipment List and Drawings

Replace in its entirety with the following:

A. Submittals

All submittals shall be in electronic PDF format, and all documents in each PDF shall be legible. All submittals shall be prepared jointly by the Contractor and any subcontractors that will be performing the work.

The Resident will evaluate submittals for conformance with the Plans, Specifications, and Special Provisions, and provide acceptance and/or comments within 5 working days of receipt.

Work shall not begin until all the required submittals have been approved in writing by the Resident. All procedural approvals given by the Resident will be subject to trial in the field and shall not relieve the Contractor of the responsibility to satisfactorily complete the work.

1. Construction Experience Submittal

Prior to the start of shaft construction, the Contractor shall electronically submit a project reference list to the Resident for approval verifying the successful completion by the Contractor of at least three separate foundation projects with shafts of diameters and depths similar to or larger than those shown in the Plans, and ground conditions similar to those identified in the Contract. A brief description of each listed project shall be provided along with the name and current phone number of the project owner or the owner's Contractor.

Prior to the start of shaft construction, the Contractor shall electronically submit a list identifying the on-site supervisors and drill rig operators potentially assigned to the project to the Resident for approval. The list

shall contain a brief description of each individual's experience in shaft excavation operations and placement of assembled steel reinforcing bar cages and concrete in shafts. The individual experience lists shall be limited to a single page for each supervisor or operator.

- i. On-site supervisors shall have a minimum 2 years of experience in supervising construction of shaft foundations of similar size (diameter and depth) and scope to those shown in the Plans, and similar geotechnical conditions to those described in the boring logs and summary of geotechnical conditions. Work experience shall be direct supervisory responsibility for the on-site shaft construction operations. Project management level positions indirectly supervising on-site shaft construction operations is not acceptable for this experience requirement.
- ii. Drill rig operators shall have a minimum of 1 year experience in construction of shaft foundations.

The Resident will approve or reject the Contractor's qualifications and field personnel within 5 working days after receipt of the submission. Work shall not be started on any shaft until the Contractor's qualifications and field personnel are approved by the Resident. The Resident may suspend the shaft construction if the Contractor substitutes unapproved personnel. The Contractor shall be fully liable for the additional costs resulting from the suspension of work, and no adjustments in contract time resulting from the suspension of work will be allowed.

2. Shaft Installation Narrative Submittal

The Contractor shall electronically submit a shaft installation narrative for approval by the Resident. In preparing the narrative, the Contractor shall reference the available subsurface data provided in the test boring logs and laboratory testing results attached in the Appendices of this document, as well as foundation requirements and any foundation-specific information as provided on the plans. Unless another foundation type is specified on the plans, foundations shall consist of cast-in-place reinforced concrete drilled shafts.

This narrative shall provide at least the following information:

- i. Proposed overall construction operation sequence.
- ii. Description, size, and capacities of proposed equipment, including but not limited to, cranes, drills, auger, bailing buckets, final cleaning equipment, and drilling unit. The narrative shall describe why the equipment was selected, and describe equipment suitability to the anticipated site conditions and work methods. The narrative shall include a project history of the drilling equipment demonstrating the successful use of the equipment on shafts of equal or greater size in similar soil conditions. The narrative shall also include details of shaft excavation and cleanout methods.

- iii. Details of the method(s) to be used to ensure shaft stability (i.e., prevention of caving, bottom heave, using temporary casing, or other means) during excavation (including pauses and stoppages during excavation) and concrete placement. If permanent casings are required, casing dimensions and detailed procedures for installation shall be provided.
- iv. Description of the method used to fill or eliminate all voids below the top of shaft between the plan shaft diameter and excavated shaft diameter, when permanent casing is specified.
- v. Details of concrete placement, including proposed operational procedures for pumping methods, and a sample uniform yield form to be used by the Contractor for plotting the approximate volume of concrete placed versus the depth of shaft for all shaft concrete placement (except concrete placement in the dry).
- vi. When shafts are constructed in water, the submittal shall include seal thickness calculations, seal placement procedure, and descriptions of provisions for casing shoring dewatering and flooding.
- vii. Description and details of the storage and disposal plan for excavated material.
- viii. Reinforcing steel shop drawings, details of reinforcement placement, including bracing, centering, and lifting methods, and the method to ensure the reinforcing cage position is maintained during construction, including use of bar boots and/or rebar cage base plates.

The reinforcing steel assembly and installation plan shall include:

- a. Procedure and sequence of steel reinforcing bar cage assembly.
- b. The tie pattern, tie types, and tie wire gages for all ties on permanent reinforcing and temporary bracing.
- c. Number and location of primary handling steel reinforcing bars used during lifting operations.
- d. Details and orientation of all internal cross-bracing, including a description of connections to the steel reinforcing bar cage.
- e. Description of how temporary bracing is to be removed.
- f. Location of support points during transportation.
- g. Cage weight and location of the center of gravity.
- h. Number and location of pick points used for lifting for installation and for transport (if assembled off-site).

The Resident will evaluate the shaft installation narrative for conformance with the Plans, Specifications, and Special Provisions, within the review time specified in Section 626.022.A.

626.034 Concrete Foundations

Replace in its entirety with the following:

A. Shaft Construction Tolerances

Shafts shall be constructed so that the center at the top of the shaft is within a horizontal tolerance equal to 1-inch.

Shafts shall be within 1.5 percent of plumb. During drilling or excavation of the shaft, the Contractor shall make frequent checks on the plumbness, alignment, and dimensions of the shaft. Any deviation exceeding the allowable tolerances shall be corrected with a procedure approved by the Resident.

Shaft steel reinforcing bar placement tolerances shall conform to Section 506 – Reinforcing Steel.

B. Shaft Excavation

Shafts shall be excavated to the required depth as shown in the Plans. Shaft excavation operations shall conform to this Section and the shaft installation narrative as approved by the Resident.

Shaft excavation shall not be started until the Contractor has received approval from the Resident for the reinforcing steel centralizers required when the casing is to be pulled during concrete placement.

1. Conduct of Shaft Excavation Operations

Once the excavation operation has been started, the excavation shall be conducted in a continuous operation until the excavation of the shaft is completed, except for pauses and stops as noted, using approved equipment capable of excavating through the type of material expected.

Pauses, defined as momentary interruptions of the excavation operation, will be allowed only for casing splicing, tooling changes, and removal of obstructions. Shaft excavation operation interruptions not conforming to this definition shall be considered stops. Stops for fully cased excavations shall not exceed 24 hours duration.

For stops exceeding the time durations specified above, the Contractor shall stabilize the excavation using the following method:

- i. For cased excavation, backfill the hole with flowable fill in accordance with Section 502. The Contractor shall backfill the hole to a minimum of 5 feet above the bottom of casing (temporary or permanent).

During stops, the Contractor shall stabilize the shaft excavation to prevent bottom heave, caving, head loss, and loss of ground. The Contractor bears full responsibility for selection and execution of the

method(s) of stabilizing and maintaining the shaft excavation. Shaft stabilization shall conform to the shaft installation narrative in accordance with Section 626.022.A.2.iii.

2. Temporary and Permanent Shaft Casing

The Contractor shall furnish and install required temporary and permanent shaft casings as shown in the Plans and as specified in the Special Provisions.

3. General Shaft Casing Requirements

Shaft casing shall be watertight and clean prior to placement in the excavation.

The inside diameter of the casing shall not be less than the specified diameter of the shaft. The outside diameter of the casing shall not be greater than the specified diameter of the shaft plus 6 inches, except as otherwise noted for shafts 5 feet or less in diameter.

4. Permanent Shaft Casing

Permanent casing is defined as casing designed as part of the shaft structure and installed to remain in place after construction is complete. All permanent casing shall be of ample strength to resist damage and deformation from transportation and handling, installation stresses, and all pressures and forces acting on the casing. Where the minimum thickness of permanent casing is specified in the Plans, it is specified to satisfy structural design requirements only. The Contractor shall increase the casing thickness as necessary to satisfy the requirements of this Section.

5. Temporary Shaft Casing

Temporary casing is defined as casing installed to facilitate shaft construction only, which is not designed as part of the shaft structure, and which shall be completely removed after shaft construction is complete unless otherwise shown in the Plans. All temporary casing shall be of ample strength to resist damage and deformation from transportation and handling, installation and extraction stresses, and all pressures and forces acting on the casing. The casing shall be capable of being removed without deforming and causing damage to the completed shaft and without disturbing the surrounding soil.

To maintain stable excavations and to facilitate construction, the Contractor shall furnish and install temporary casing in addition to the required casing specified in the Special Provisions. The Contractor shall provide temporary casing at the site in sufficient quantities to meet the needs of the anticipated construction method.

6. Permanent Slip Casing

Permanent slip casing is defined as casing installed vertically inside the drilled hole, after removal of the temporary casing and prior to pouring the exposed length of shaft, and wet-set into the shaft concrete a minimum of 2 feet below grade or to greater depth as needed to enhance stability. The casing diameter requirements of Section 626.034.B.3 do not apply to

permanent slip casing, but the inside diameter of the permanent slip casing shall provide the steel reinforcing bar clearance specified in Section 626.034.D.1.

7. Conduct of Shaft Casing Installation and Removal and Shaft Excavation Operations

The Contractor shall conduct casing installation and removal operations and shaft excavation operations such that the adjacent soil outside the casing and shaft excavation for the full height of the shaft is not disturbed. Disturbed soil is defined as soil whose geotechnical properties have been changed from those of the original in situ soil, and whose altered condition adversely affects the structural integrity of the shaft foundation.

8. Bottom of Shaft Excavation

The Contractor shall use appropriate means such as a cleanout bucket or air lift to clean the bottom of the excavation of all shafts. No more than 2 inches of loose or disturbed material shall be present at the bottom of the shaft just prior to placing concrete.

The excavated shaft shall be inspected and approved by the Resident with consultation with the Geotechnical Engineer prior to proceeding with construction. The bottom of the excavated shaft shall be sounded with a tape with a heavy weight attached to the end of the tape, or other means acceptable to the Resident to determine that the shaft bottom meets the requirements in the Contract.

9. Shaft Obstructions

When obstructions are encountered, the Contractor shall notify the Resident promptly. An obstruction is defined as a specific object (including, but not limited to, boulders, logs, and manmade objects) encountered during the shaft excavation operation which prevents or hinders the advance of the shaft excavation. When efforts to advance past the obstruction to the design shaft tip elevation result in the rate of advance of the shaft drilling equipment being significantly reduced relative to the rate of advance for the portion of the shaft excavation in the geological unit that contains the obstruction, then the Contractor shall remove, break up, or push aside the obstruction. The method of dealing with such obstructions, and the continuation of excavation shall be as proposed by the Contractor and approved by the Resident.

10. Voids Between Permanent Casing and Shaft Excavation

When permanent casing is specified, excavation shall allow its installation within the specified outside diameter of the shaft. All void space occurring between the casing and shaft excavation shall be filled with concrete or excavatable flowable fill, in accordance with the shaft installation narrative specified in Section 626.022.A.2.iv, and as approved by the Resident.

11. Maintenance of a Stable Shaft Excavation

The Contractor shall demonstrate to the satisfaction of the Resident that stable conditions are being maintained. If the Resident determines that stable conditions are not being maintained, the Contractor shall immediately take action to stabilize the shaft. The Contractor shall submit a revised shaft installation narrative that addresses the problem and prevents future instability. The Contractor shall not continue with shaft construction until the damage that has already occurred is repaired in accordance with the specifications, and until receiving the Resident's approval of the revised shaft installation narrative.

The use of slurry is not allowed.

C. Assembly and Placement of Reinforcing Steel

1. Steel Reinforcing Bar Cage Assembly

The reinforcing cage shall be rigidly braced to retain its configuration during handling and construction. Individual or loose bars will not be permitted. The Contractor shall show bracing and any extra reinforcing steel required for fabrication of the cage on the shop drawings. Shaft reinforcing bar cages shall be supported on a continuous surface to the extent possible. All rigging connections shall be located at primary handling bars, as identified in the reinforcing steel assembly and installation plan as approved by the Resident. Internal bracing is required at each support and lift point.

The reinforcement shall be carefully positioned and securely fastened to provide the minimum clearances listed below, and to ensure no displacement of the reinforcing steel bars occurs during placement of the concrete. The steel reinforcing bars shall be securely held in position throughout the concrete placement operation.

2. Steel Reinforcing Bar Cage Centralizers

The Contractor shall submit details of the proposed reinforcing cage centralizers along with the shop drawings. The reinforcing steel centralizers at each longitudinal space plane shall be placed at least at the quarter points around the circumference of the steel reinforcing bar cage, and at a maximum longitudinal spacing of either 2.5 times the shaft diameter or 20 feet, whichever is less.

D. Placing Concrete

1. Concrete Cover Over Steel Reinforcing Bars

Steel reinforcing bars shall be placed as shown in the Plans with minimum concrete cover as shown below:

Shaft Diameter (feet)	Minimum Concrete Cover Except at Permanent Slip Casing (inches)	Minimum Concrete Cover at Permanent Slip Casing (inches)
Less than or equal to 3	3	1½
Greater than 3 and less than 4	4	1½
Greater than or equal to 4 and less than 5	4	2
5 or larger	6	3

2. Concrete Class for Shaft Concrete

Concrete for drilled shafts and spread footings shall be Class A in accordance with Section 502 - Structural Concrete.

3. Concrete Placement Requirements

Concrete for drilled shafts shall be placed as soon after excavation as practicable to prevent debris from collecting in the excavated area. The Contractor shall provide temporary dewatering of excavations for foundations as needed, such that 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.

Before placing concrete, the required elbows of entrance conduits, reinforcing steel and anchor bolts shall be carefully positioned. The anchor bolt size, spacing, and the bolt circle diameter shall be as shown on the plans and field verified by the Contractor at the existing foundation locations. The Contractor shall construct an anchor bolt template from the existing conditions at each foundation prior to casting in anchor bolts at the proposed foundations. These templates shall be used in properly locating the anchor bolts to accept the existing sign truss column base plates. Anchor bolts shall be 1½ inch diameter in accordance with Section 503 and shall project between 2½ and 3 inches above the top of the foundation. At least two threads on each anchor bolt shall project beyond the outside of the nuts holding the plumbed pole.

Conduit placement penetrating the side of the foundation concrete below grade shall be by one of the following methods:

- i. Contractor shall install the vertical conduit and elbow with a block out along the edge of the rebar cage, excavate to the block out below grade as required after concrete has cured, cut a hole in the permanent slip casing to remove the block out, and splice the conduit and grout the void as required.

- ii. Contractor shall provide compacted fill as required to raise grade at the foundation location to form the exposed length of concrete foundation in lieu of providing a permanent slip casing above grade. The conduit including the elbow and side penetration below grade shall be placed during the placement of the concrete in the top portion of the drilled shaft.
- iii. Contractor shall submit alternative conduit placement methods to the Resident for review and approval.

Concrete placement shall commence immediately after completion of excavation by the Contractor and inspection by the Resident.

Immediately prior to commencing concrete placement, the shaft excavation shall conform to Section 626.034.B. Concrete placement shall continue in one operation to the top of the shaft, or as shown in the Plans. The Contractor shall place concrete in the dry.

During concrete placement, the Contractor shall monitor, and minimize, the difference in the level of concrete inside and outside of the steel reinforcing bar cage. The Contractor shall conduct concrete placement operations to maintain the differential concrete head as 1-foot maximum.

If water is not present, the concrete shall be deposited through the center of the reinforcement cage by a method that prevents segregation of aggregates and splashing of concrete on the reinforcement cage. The concrete shall be placed such that the free-fall is vertical down the center of the shaft without hitting the sides, the steel reinforcing bars, or the steel reinforcing bar cage bracing.

iv. Concrete Vibration Requirements

When placing concrete in the dry, only the top 5 feet of concrete shall be vibrated, in accordance with Section 502. If a temporary casing is used, it shall be removed before vibration. This requirement may be waived if a temporary casing is used and removed with a vibratory hammer during the concrete placement operation. Vibration of concrete does not affect the maximum slump allowed for the concrete class specified.

v. Protection of Fresh and Curing Concrete From Vibration

The Contractor's construction operation in the vicinity of a shaft excavation with freshly placed concrete and curing concrete shall avoid operations that generate potentially damaging vibration of the freshly placed concrete.

E. Casing Removal

1. Concrete Head Requirements During Temporary Casing Removal

As the temporary casing is withdrawn, the Contractor shall maintain the concrete inside the casing at a level sufficient to balance the hydrostatic pressure outside the casing and at least 2 feet above the bottom of the casing.

2. Removing Portions of Permanent Casing Above the Top of Shaft

Tops of permanent casings for the shafts shall be removed to the top of the shaft.

3. Requirements for Leaving Temporary Casing in Place

The Contractor shall completely remove all temporary casings, except as noted. The Contractor may leave some or all of the temporary casing in place provided all the following conditions are satisfied:

- i. The Contractor shall submit the following information in writing to the Resident:
 - a. The Contractor shall completely describe the portion of the temporary casing to remain.
 - b. The Contractor shall specify the reason(s) for leaving the portion of the temporary casing in place.
 - c. The Contractor shall submit structural calculations, using the design specifications and design criteria specified in the Plans, indicating that leaving the temporary casing in place is compatible with the structure as designed in the Plans.
- ii. The Contractor shall have received the Resident's written approval of the submitted request to leave the temporary casing in place.

F. Contractor's Investigation and Remedial Action Plan

For all shafts determined to be unacceptable, the Contractor shall submit a plan for further investigation or remedial action to the Resident for approval. All modifications to the dimensions of the shafts, as shown in the Plans, required by the investigation and remedial action plan shall be supported by calculations and working drawings as specified in Section 626. All investigation and remedial correction procedures and designs shall be submitted to the Resident for approval. The Contractor shall not begin repair operations until receiving the Resident's approval of the investigation and remedial action plan.

G. Cored Holes

At the Resident's request, the Contractor shall drill a corehole in any questionable quality shaft (as determined by observation of the Resident) to explore the shaft condition.

Prior to beginning coring, the Contractor shall submit the method and equipment used to drill and remove cores from shaft concrete to the Resident and receive the Resident's written approval. The coring method and equipment shall provide for complete core recovery and shall minimize abrasion and erosion of the core.

If a defect is confirmed, the Contractor shall pay for all coring costs. If no defect is encountered, the Maine Turnpike Authority will pay for all coring and grouting of the core hole. Materials and Work necessary, including Engineering analysis and redesign, to effect corrections for shaft defects shall be furnished to the Resident's satisfaction at no additional cost to the Maine Turnpike Authority.

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. Drilled shaft depths shall be increased as directed by the Geotechnical Engineer to account for the unsuitable material.

H. Shaft Completion

All foundations shall be warranted against leaning and corrosion for two years after the project is completed. If the lean is greater than 2 degrees from normal or the foundation is spalling within the first two years, the Contractor shall replace the foundation at no extra cost.

The finished ground at each foundation shall be graded as shown on the plans. If required, approved backfill material shall be added to grade the slopes as specified. There will be no additional compensation for furnishing, placing and compacting material flush around the foundation. In all cases, the surface area around the foundations shall be graded to drain away from the foundation and loamed and seeded in accordance with the requirements of Section 615 and Section 618.

The concrete portion of the foundations exposed to view shall have a troweled finish. A drainage groove shall be formed in the horizontal surface of the foundation. The top of the concrete foundation shall be horizontal.

When the anchor bolt template is removed, the threads of the anchor bolts shall be greased and protected with a 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.

626.4 Method of Measurement

Modify the first paragraph as follows:

30-inch dia. greater than of 8 feet long, and all 36-inch and 42-inch dia. Foundations will be measured by the theoretical cubic yard volume of foundation based upon approved lengths.

626.5 Basis of Payment

The following paragraphs are added:

The accepted volume of foundations will be paid for at the contract unit price per cubic yard. This payment shall include: drilling/excavation, disposing of spoils, temporary casing, permanent slip casing, dewatering, structural concrete, anchor bolts, reinforcing steel, conduit

within the foundation and extending 12 inches from the foundation, and all incidentals necessary to complete the work.

Payment will be made under:

<u>Pay Item</u>	<u>Pay Unit</u>
626.331 30-inch dia., greater than 8-feet long, and all 36-inch and 42-inch dia. Foundations	Cubic yard

SPECIAL PROVISION

SECTION 627

PAVEMENT MARKINGS

(Temporary Pavement Markings - 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.

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.

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 inch 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 manufacturer.

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 will be made under:

Pay Item

Pay Unit

627.73 Temporary 6 Inch Pavement Marking Tape

Linear Foot

SPECIAL PROVISION

SECTION 627

PAVEMENT MARKINGS

(Temporary 6 Inch Black Pavement Marking Tape)

627.01 Description

The following paragraphs are added:

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

Temporary pavement marking black tape is scheduled for covering all conflicting existing pavement markings on I-195 westbound from Sta. 111+00 to Sta. 131+00.

627.02 Materials

The following paragraph is added:

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

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 black pavement marking tape for traffic maintenance during construction as shown on the Plans or as directed by the Resident. The tape shall be cut to the varying lengths necessary to cover the conflicting painted pavement marking.

Temporary pavement marking tape that 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 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 will be made under:

Pay Item

Pay Unit

627.731	Temporary 6 Inch Black Pavement Marking Tape	Linear Foot
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SPECIAL PROVISION

SECTION 631

EQUIPMENT RENTAL

631.02 General

The following sentences are added:

Air Compressor - including operator

Jackhammer - To be included under category of air tool.

Bucket truck - Approved one man, able to reach 30 feet height bucket truck with 10 feet lateral extension.

Scissor Lift - Hydraulic scissors lift with a minimum capacity of 3 workers.

Electrician - Licensed by State of Maine.

Electrician's Apprentice - Enrolled in an accredited program.

631.08 Basis of Payment

The following paragraphs are added:

Such related costs such as use of hand tools, meal and room expenses, benefits, insurance, retirement, travel time, overtime, overhead and profit will not be measured separately for payment, but shall be incidental to the unit price for the bid item.

Note: For extra materials required for miscellaneous work the general contractor shall be allowed 15% overhead and profit on the cost of materials and rental equipment (not covered by miscellaneous unit items). Rates for Subcontractor owned equipment required to perform miscellaneous work, not otherwise provided for in the Contract, shall be negotiated.

The general contractor will be allowed 10% overhead and profit on the subcontractor's cost of materials, and subcontractors rented equipment (not covered by miscellaneous unit items). The general contractor shall include his markup on the Subcontractor's labor in the Pay Items.

The labor hour bid items shall include labor and labor burdens, benefits, supervision, transportation, travel time and allowances, overnights, small tools and equipment, subcontractor overhead and profit, and general contractor overhead and profit. Time will be measured from the start of work to the stoppage of work at the project site; less the time taken for lunch. No deduction of time will be taken for the standard morning "coffee break".

Method of Measurement: as per section 631.07 of the Maine Department of Transportation Specifications, except that time will be measured to the nearest 1/2 hour.

Payment will be made under:

<u>Pay Item</u>		<u>Pay Unit</u>
631.10	Air Compressor (including operator)	Hour
631.50	Jackhammer (air tool including operator)	Hour
631.51	Bucket Truck	Hour
631.52	Scissor Lift	Hour
631.53	Electrician	Hour
631.54	Electrician's Apprentice	Hour

SPECIAL PROVISION

SECTION 634

HIGHWAY LIGHTING

(Service Pole with Cabinet and Controls)

Add to 634.01 Description

This work shall consist of furnishing and installing a wood utility pole, complete with cabinet and controls that will supply power to the relocated VMS controller cabinet, as shown on the plans.

Add Section 634.028 Service Pole Complete With Cabinet and Controller

The Service Pole with Cabinet and Controller installation shall be in accordance with Standard Detail 634(01) and circuited in accordance with Standard Detail 634(02) without provisions for lighting on the pole.

The service pole shall be installed in accordance with Section 643.04 and shall meet the material requirements of Section 720.10.

The meter and controls cabinet shall be in accordance with Section 715.11 Service Equipment.

The Contractor shall ensure all equipment is compatible with the relocated VMS controller cabinet.

The maximum size for main breaker shall be a 2-pole, 100-ampere, 240 volt, 1 phase, 3 wire service wired with #2 AWG, Contractor to confirm the size of Utility pole mounted transformer.

Replace Paragraph 2 of 634.08 Service

The system will be supplied with electrical power by the local power company. The type of service will be single phase, three wire, 120/240 volt, 60 hertz, alternating current. The power company will make all connections at the service pole. The Contractor shall notify the power company at least two weeks in advance of the time they intend to start construction at each of the sites and shall make all necessary arrangements with the power company for the required installation.

All meter mounting devices shall be installed so that the meters will be upright (plumb). They shall be installed with the top of the meter not less than 48 inches nor more than 60 inches from the floor to the final grade. Exceptions to this height requirement will be made where special permission has been given to install group or modular metering, overall metering enclosures, or pole-mounted meters. Level grade shall be maintained for a minimum of 3 feet in

front of the meter enclosure to provide a safe working space. In order to meet this requirement on uneven terrain, as an option, the Contractor may install a pressure-treated wood platform.

For any non-residential (industrial or commercial) self-contained meter socket the bypass requirements are single phase, 100 or 150 amp, single handle lever operated.

** The by-pass is particularly important for use during the Utility Company's normal business hours. Therefore, the following types of non-residential services (200A or less) are exempt from these by-pass requirements and the residential socket (non by-pass) may be utilized: Outdoor lighting (ball field, tennis court, etc.).

The Contractor shall meet all requirements and regulations of Utility Companies when installing equipment on their poles and for the service connection. It is the responsibility of the Contractor to contact the appropriate Utility to determine their specific requirements.

The Contractor shall be responsible for obtaining all permits, inspections, and ensuring all local installation requirements are met.

Add to 634.093 Basis of Payment

Service pole with cabinet and controller will be paid for at the respective Contract unit price per each, complete, operational, tested, and accepted in place, which prices shall include full compensation for all electrical components, mounting brackets, ground rods, ground wire and ground wire connections, enclosure, wiring, conduit, circuit breakers, load center, meter socket, control wiring, receptacle, device boxes, wire troughs, contactors, pull wire, locks, delivery of keys to Maine Turnpike Authority, wood utility pole, guy wire, and all labor, materials, equipment, and incidental costs required to complete the work, including all service coordination with the CMP and the Town of Arundel code official.

Payment will be made under:

Pay Item

Pay Unit

634.25 Service Pole Complete with Cabinet and Controls

Each

SPECIAL PROVISION

SECTION 643

TRAFFIC SIGNALS

(Lane Use Signal)

643.01 Description

This work shall consist of supply and installation of a new lane use signals (Non-Flashing). All equipment, installation of equipment and other incidental work shall conform to the latest applicable provisions of: NEC, MUTCD, NESC, NEMA, and the ITE Standards for traffic control equipment. All work shall be done to the satisfaction of the Resident. The meaning of specific terms shall be as defined in MUTCD, NESC, and the ITE Standards for traffic control equipment.

643.02 Materials

The new lane use signal heads shall be Trans-Tech DOT2424RG-175 or approved equal. See Appendix A for technical product details.

Canopy override switch will be provided by Transcore.

643.03 Installation

The new lane use signal housing and LED signal shall be installed and wired over the center of the new lane. New Pelco (or equal) mounting brackets may be needed and will be incidental to the installation of the new lane use signal. The contractor shall provide a 1 year warranty on all material and workmanship related to the installation of the new lane use signal.

643.04 Method of Measurement

New lane use signals will be measured by each unit, installed and accepted.

643.05 Basis of Payment

New Lane Use Signals will be paid for at the Contract unit price each which payment shall be full compensation for furnishing and installation of new lane use signals, and all other materials, labor, tools, equipment and incidentals necessary to complete the work.

Payment will be made under:

Pay Item

Pay Unit

643.712 Lane Use Signal

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 supporting overhead sign structure as specified herein and as shown on the Plans. The existing sign structure is located at Station 123+75± on westbound I-195 in Saco (MM 36.0) and shall be moved to Station 1360+66± on southbound I-95 in Arundel (MM 28.3). Photographs of the existing sign structure are included in this specification. This work includes the following:

- Disassembly of the existing overhead VMS and supporting structure, walkway, and controller cabinet at Exit 36 Saco;
- Removal of existing VMS concrete foundations below existing grade;
- Coordinating with utilities to remove all wire and cap existing underground conduit in Saco.
- Storage and transport of the VMS and supporting structure to proposed site in Arundel;
- Installation of the sign structure, VMS, 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 dissipaters, and grounding on the relocated sign structure and VMS.

The VMS and associated controls shall be fully operational within 3 weeks after the VMS erection at the Arundel site (MM 28.3).

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.

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 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 re-erecting 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 (if required) shall conform to ASTM A36 and shall be hot-dip galvanized in accordance with the requirements of Section 504 – Structural Steel.

645.71 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 foundation in the median to 1’-0” 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.

The Contractor shall ensure that all electric power has been severed at its source prior to disassembling the structure. Any underground wiring at the Saco site from the meter to the VMS shall be removed and disposed of at the Contractor's expense.

645.72 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). Conduit feeds to ground mounted cabinet foundation shall include two (2) 3"PVC for electrical power to cabinet with two (2) 3" conduits out for controls and power to VMS respectively. Embedded conduit stubs shall not be paid for separately, but are included in the ground mounted cabinet foundation item.

The Contractor shall provide a metal tracer wire and a 2" wide "buried cable" plastic warning tape located 12" below grade at all underground conduits.

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 634.09 – 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.

645.8 Method of Measurement

Removal, disassembly, and relocation of VMS and supporting structure will be measured by the lump sum.

645.9 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 all materials, equipment, labor and hardware necessary to remove, disassemble and relocate the VMS and support structure in accordance with the Specifications and details as shown on the Plans.

Payment shall also include removing existing concrete foundations to below grade, removing and relocating the existing controller cabinet, 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.

Construction of ground mounted cabinet foundation is not included with Pay Item 645.123, but paid for separately under Pay Item 626.38.

Lump sum payment shall include all electrical work and shall be full compensation for furnishing, installing, erecting, and testing: wiring in underground conduit, pole wiring, 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 dissipater and grounding system.

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>
645.123 Removal, Disassembly and Relocation of VMS and Supporting Structure	Lump Sum



TYPICAL TRUSS MEMBER TO VERTICAL SUPPORT MEMBER (2)U-BOLT CONNECTION



(2) GALVANIZED STEEL CONDUITS FROM VMS TO CONTROLLER CABINET



ELEVATION OF OVERHEAD VMS STRUCTURE EXIT 36 (SACO)



OVERHEAD SIGN STRUCTURE, WALKWAY PLATFORM, AND VMS SUPPORT



COLUMN CAP TO TRUSS CONNECTION WITH CONDUIT (SIDE SLOPE)



WALKWAY PLATFORM FOR VMS



CONDUIT FEED INTO BACK OF VMS. Z-CLIP CONNECTION SIGN TO VERTICAL SUPPORT



COLUMN CAP PLATE, CONDUIT RUNS FROM VMS TO INSIDE COLUMN (HAND HOLE AT BASE) AND OUT OF FOUNDATION BELOW GRADE TO CONTROLLER CABINET NEARBY

SPECIAL PROVISION

SECTION 645

HIGHWAY SIGNING

(Remove and Stack Sign)

(Remove and Reset Sign)

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 shall consist of removing the sign panels and wood or steel posts and resetting of the sign panels on new or existing wood or steel posts. 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 stacking existing sign panels and posts at the Sign Shop at Gray Maintenance at Mile Marker 63.3 and the excavations shall be backfilled and ground restored to the satisfaction of the Resident.

Any existing signs not shown on the Plans are to remain in their existing condition unless directed otherwise by the Resident.

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.

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 and stacking sign panels and supports at the location specified.

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 of existing wood or steel post, providing and installing a new wood post if necessary, disposing existing wood post if necessary, resetting the sign panels on the existing or new wood or steel 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.

Payment will be made under:

Pay Item

Pay Unit

645.105	Remove and Stack Sign
645.109	Remove and Reset Sign

Each
Each

SPECIAL PROVISION

SECTION 645

HIGHWAY SIGNING

(Remove and Reset Delineator)

645.01 Description

The following sentences are added:

This work shall also consist of removing and resetting existing delineator posts.

645.08 Method of Measurement

The following sentence is added:

Remove and Reset Delineator will be measured by each unit in place.

645.09 Basis of Payment

The following paragraph is added:

The accepted Removed and Reset Delineators will be paid for at the Contract unit price each. Such price shall be full compensation for delivering delineators to be reinstalled to a site designated by the resident, and all other incidentals necessary to complete the work. All delineators damaged by the Contractor shall be replaced with new delineators conforming to applicable specifications at no additional cost to the Authority.

Payment will be made under:

Pay Item

Pay Unit

645.303 Remove and Reset Delineator

Each

SPECIAL PROVISION

SECTION 645

HIGHWAY SIGNING

(Installation of Type I Signs)

645.01 Description

The following sentences are added:

The Authority shall supply proposed permanent ground mounted signs to the contractor. Proposed signs shall be located at the Sign Shop at Gray Maintenance at Mile Marker 63.3. The contractor shall install signs as specified in the MaineDOT Standard Specifications and Standard Details. Work shall include loading, transporting, storage and installation of the signs.

645.08 Method of Measurement

The following sentence is added:

Installation of Type I Signs shall be measured for payment by each unit installed. Such payment shall include loading, transporting, storage, and installation of the signs and new hardware as required to complete the sign installation.

645.09 Basis of Payment

The following paragraph is added:

Payment will be made under:

Pay Item

Pay Unit

645.403 Installation of Type I Signs

Each

SPECIAL PROVISION

SECTION 652

MAINTENANCE OF TRAFFIC

(General)

652.2.3 Flashing Arrow Board

Delete the existing 5 paragraphs and replace with the following: Flashing Arrow Panels (FAP) 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.

FAP 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. An FAP 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 an FAP 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.

FAP 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. FAP shall be at least 2.4 M x 1.2 M [96" x 48"] and finished in non-reflective black. The FAP shall be interpretable for a distance not less than 1.6 km [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 FAP 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 2.1 M [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

The eighth paragraph is deleted and replaced with Special Provision Section 652, Maintenance of Traffic (Portable Changeable Message Sign).

652.2.5 Safety Vests

This Subsection is amended by the addition of the following:

All jobsite personnel shall wear a safety vest labeled as ANSI 107-2004 standard performance for Class 3 risk exposures. This requirement also applies to truck drivers and equipment operators when out of an enclosed cab.

652.2.6 Signs

The use of temporary plaques to cover text or to change text will not be allowed. All signs shall have a uniform face.

652.6 Nightwork

Delete this section entirely and replace with the following:

“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 and at all work 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, as a subset of the Traffic Control Plan, a lighting plan at the Preconstruction Conference, 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, Inslope 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.

All workers shall wear safety apparel labeled as meeting the ANSI 107-2004 standard performance for Class 3 risk exposure.

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 Contractor shall furnish approved signs reading "Construction Vehicle - Keep Back" to be used on trucks hauling to the project when such signs are deemed necessary by the Resident. The signs shall be a minimum of 30 inches by 60 inches, Black and Orange, ASTM D 4956 - Type VII, Type VIII, or Type IX (prismatic).

All vehicles used on the project, including pickup trucks and personal vehicles, shall be equipped with amber flashing lights, visible from both front and rear, or by means of single, approved type, revolving, flashing or strobe lights mounted so as to be visible 360°. The vehicle flashing system shall be in continuous operation while the vehicle is on any part of the project.

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.”

652.63 Traffic Coordinator

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. Insure that all traffic control implements (signs, arrow boards, barrels, etc.) are on-site so the traffic program can be implemented effectively;
- c. Insure 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.

SPECIAL PROVISION

SECTION 652

MAINTENANCE 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:

Limerick Road Traffic Control Requirements

Two lane traffic shall be maintained on Limerick Road in Arundel at all times, as the Contractor's primary access to the VMS relocation site will be via the Maine Turnpike service access road from the mainline near MM28.3.

Maine Turnpike and I-195 Traffic Control Requirements (VMS Relocation)

Maintenance of traffic control details have been developed in the Plans for the disassembly, removal, relocation, and construction of the existing VMS, its supporting structure, and foundations. These traffic control details allow for shoulder or lane closures to perform work adjacent to the Maine Turnpike mainline in Arundel (MM 28.3) and on I-195 in Saco (MM 36.0) as indicated later in these specifications. Travel lanes may not be impeded by traffic control devices until the time frames specified for each activity below. Lane closures shall be removed if construction is not ongoing. Unattended lane closures are not allowed.

On the mainline Maine Turnpike in Arundel (MM 28.3), the following shall be allowed:

- Short-term single shoulder or lane closures at anytime with approval of the Resident.
- A longer term median lane closure with temporary concrete barrier for a maximum of seven (7) consecutive calendar days for the median foundation and guardrail construction. This closure is subject to Supplemental Liquidated Damages contained in Section 107.4.6. This lane closure shall not be permitted during the Memorial Day Weekend holiday period.
- Double lane closures shall only be allowed on Monday to Thursday between 8:00 p.m. and 6:00 a.m. and on Fridays between 10:00 p.m. and 6:00 a.m.
- As indicated later in these specifications, complete closure of traffic is permissible for certain operations that endanger the public safety. They are allowed between the hours of 10:00 p.m. and 5:00 a.m.

On I-195 in Saco (MM 36.0), the following shall be allowed:

- Short-term single lane closures in the immediate area of the existing VMS at anytime except between the hours of 5:00 a.m. and 9:00 a.m. daily. Lane closures at the toll plaza including the outside wide load lane shall not be permitted at any time.
- As indicated later in these specifications, complete closure of traffic is permissible for certain operations that endanger the public safety. They are allowed between the hours of

10:00 p.m. and 5:00 a.m.

I-195 Traffic Control Requirements (Lane Addition)

Maintenance of traffic control details have been developed in the Plans for the construction of an additional toll lane at the Saco Toll Plaza on I-195. These traffic control details allow for the long term right shoulder closure to perform work adjacent to Saco Toll Plaza. Travel lanes may not be impeded by traffic control devices until the time frames specified for each activity below. Temporary lane closures shall be removed if construction is not ongoing. Unattended lane closures are not allowed.

On I-195 in Saco (MM 36.0), the following shall be allowed:

- Phase 1 provides a long-term right shoulder closure with 11' minimum travel lanes and adjacent temporary concrete barrier. Short-term single lane closures in the immediate area of the existing VMS at anytime except between the hours of 5:00 a.m. and 9:00 a.m. daily. Refer to Temporary Toll Plaza Lane Closure for requirements with closing lanes at the toll plaza.
- Phase 2 continues to provide a long-term right shoulder closure with restricted Wide Loads. This Wide Load restriction shall have a maximum of seven (7) days. Contractor shall coordinate with Resident and provide a written request one (1) week in advance to the Resident.
- At the completion of Phase 2, contractor shall reset temporary concrete barrier behind proposed island if guardrail protecting the embankment has not been installed. Temporary barrier placed behind the island shall tie into existing barrier with 8:1 taper rates.

652.7 Method of Measurement

The following paragraph is added:

Traffic control devices required to complete the work will be measured for payment under their respective pay items. Installation, maintenance, and removal of traffic setups and the Contractor's dedicated traffic employee will not be measured separately for payment, but shall be incidental to Item 652.361, Maintenance of Traffic Control Devices.

SPECIAL PROVISION

SECTION 652

MAINTENANCE OF TRAFFIC

(Temporary Toll Plaza Lane Closures)

The following minimum requirements shall be maintained:

Plaza lanes shall remain available for opening at all times except when the Contractor is performing work in, adjacent to or directly over the plaza lanes. A plaza lane closure is required when danger to the traveling public or turnpike employees may exist. The potential of any material falling onto the roadway shall be considered a potential danger. This shall include, but not necessarily be limited to, demolition debris, water, tools, equipment and material.

A plaza lane closure will be required whenever men or equipment will be present in a plaza lane. The Authority may also require adjacent lanes to be closed to protect the traveling public or turnpike employees. Temporary plaza lane closures will only be allowed at the following times:

- single toll plaza lane may be closed from 9 AM to 3PM and from 7 PM to 5 AM
- two toll plaza lanes may be closed from 10 PM to 4 AM

These hours may be adjusted based on the traffic volume each day by the Resident. Plaza lane closures not completely removed by the ending time specified will be subject to a lane rental fee of \$100.00 per 10 minutes for every 10 minute increment beyond the specified ending time. Temporary plaza lane closures will not be allowed during periods of inclement weather as determined by the Authority. Temporary plaza lane closures may not be allowed on days or times when complete stoppages of traffic for other Authority projects are scheduled. The Authority reserves the right to order removal of approved plaza lane closures.

Requests for temporary traffic lane closures shall be submitted to the Resident for approval. The Resident is required to receive approval from the Maine Turnpike Authority's Director of Fare Collections for all plaza lane closures. The request shall be submitted to the Director of Fare Collections by the Resident at least one (1) working days prior to the day of the requested plaza lane closure. 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.

Some activities, which require plaza lane closures, will be considered favorably for night work. The Contractor shall submit a request in writing to the Resident. The approval of the request will be at the Resident's discretion and will not be unreasonably withheld.

Wide load lanes may be closed when wide loads are not permitted by the MTA. The wide load restrictions at the Saco Toll plaza shall not exceed fourteen (14) consecutive calendar days. The wide load lane closures must be scheduled two (2) weeks in advance, and occur outside of the various Holiday restrictions.

Work Directly Over Traffic

The Contractor shall not perform any of the following canopy extension work directly over lanes carrying traffic or within 15 feet of the centerline of an open plaza lane (20 feet of the centerline of the wide load lanes):

1. Welding, burning or grinding
2. Unbolting and removing structural steel
3. Erecting and bolting structural steel
4. Removing or erecting sign panels
5. Spray painting structural steel
6. Electrical work

Before the roadway is reopened, all materials shall be secured so they will not endanger traffic passing underneath or alongside.

Traffic Control and Plaza Safety

The Contractor shall plan his work accordingly to provide a safe working environment for turnpike employees and safe passage for turnpike patrons.

The following are the minimum Plaza Lane closure requirements for completing the work. The limits have been set to protect Turnpike patrons and Toll Attendants from potential harm during the prosecution of the work. The Contractor shall utilize this information in bidding the work. Drums and constructions signs will be paid under their respective pay items. Movement of drums and construction signs will be paid under the Maintenance of Traffic pay item.

The Contractor shall furnish, erect, maintain and relocate ten 10 inch by 14 inch (minimum dimensions) DANGER – Unauthorized Persons Keep Out, or DANGER – DO NOT ENTER signs, meeting OSHA specifications for size, color and legend, for installation on toll booths or drums, as directed by the Resident. The Contractor shall furnish and install red hazard safety tape between barrels and in cordoned off lane areas to identify the hazard areas for Turnpike patrons and Toll Attendants. The purchase, erection, maintenance, and relocation of the hazard signs and hazard safety tape shall be incidental to the mobilization pay item. When only Lane 4 is temporarily closed, the contractor shall provide a temporary walkway delineating employee access with drums and tape for access to the Lane 5 toll booth.

SPECIAL PROVISION

SECTION 652

MAINTENANCE OF TRAFFIC

(Temporary Mainline Lane Closures)
(Lane Closure Installation and Removal Procedures)
(Temporary Mainline Shoulder Closures)
(Work Requiring Complete Stoppages of Traffic)
(Short-Term or Work Hour Speed)

This Section outlines the minimum requirements that shall be maintained for working on, over, or adjacent to the Maine Turnpike roadway and I-195.

General

Three travel lanes in each direction (each direction being 36 feet wide excluding shoulder) in the widened portion of the turnpike (Mile 0.0 to mile 44.3) and on I-195 in Saco (MM 36.0) 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.

Temporary Lane Closures (I-95 and I-195)

A minimum width of 14 feet is required for all lane closures.

A lane closure is required when a danger to the traveling public may exist. The potential of any material falling onto the roadway shall be considered a potential danger. This shall include, but not necessarily be limited to, demolition debris, water, tools, equipment and materials.

A lane closure will be required whenever men or equipment will be present within four feet of a travel lane. Dump trucks shall be parked at least six (6) feet from the travel lane when being loaded. 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.

The lane closure setup may not begin until the beginning time specified. Lane closures that are setup early or that remain in place outside of the approved period shall be subject to a lane rental fee of \$500 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 the removal of a lane closure. Construction signs shall be installed immediately prior to the start of the lane closure and shall be promptly removed when no longer required. The installation and removal of a lane closure including signs, channelizing devices and arrow boards shall be a continuous operation. The Authority reserves the right to order removal of an approved lane 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 his 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 following is a partial list of activities requiring lane closures. Lane closures may be required for other activities as well:

- Loading of trucks within four feet of a travel lane.
- Overhead sign work directly over traffic or within six feet of a travel lane as measured from the painted pavement marking line or traffic control device:
- Preparation for VMS sign and supporting structure disassembly
- Removal of the existing VMS median foundation to below grade
- Installing VMS median foundation
- Installing median guardrail
- Pavement Marking installation by the Authority
- Closure of toll lanes

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.

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.

The Resident is required to receive approval from the Maine Turnpike Authority for all lane closures. Closures will not be allowed during inclement weather. The request shall be submitted to the Authority by the Resident at least two (2) working days prior to the day of the requested lane closure. All requests must be received by 12:00 p.m. 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.

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.

Temporary Mainline Shoulder Closures

Temporary mainline shoulder closures will only be allowed as outlined in Special Provision Section 652, Specific Project Maintenance of Traffic Requirements. Temporary shoulder closures are anticipated at locations where Contractor access to the mainline is required.

Temporary 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.

Work Requiring Complete Stoppages of Traffic

Complete stoppages of traffic will only be allowed outlined in Special Provision Section 652, Specific Project Maintenance of Traffic Requirements, or as approved by the Resident.

The following is a partial list of activities requiring complete stoppages of traffic. Complete stoppages of traffic may be required for other activities as well:

- Erection or removal of structural steel or bridge beams.
- Moving of heavy or slow equipment across or on the travel lanes (stoppage less than five minutes).
- Erection or removal of overhead signs or sign bridges.

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 Erection or Removal of Structural Steel and Overhead Sign Structures

The erection or removal of structural steel will only be allowed at times outlined in Section 652, Specific Project Maintenance or Traffic Requirements. 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 (northbound and southbound), in excess of the 25 minutes limit. Total penalty shall be deducted from the next pay estimate.

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. These signs shall be covered when not applicable.

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 heavy equipment across the travel lanes shall be considered a violation of the Maintenance of Traffic Requirements and is subject to the fines of \$500 per minute or portion thereof.

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.

Short-Term or Work Hour Speed

A short-term or work hour 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. The reduced speed zone shall be at least 1,500 feet long. 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 uncovered on a regular basis are not required to have the supplemental flags.

The reduced speed limit signs shall only be used during the following circumstances unless approved by the Resident:

- Workers are adjacent to traffic
- Travel lane is closed
- Outside shoulder is closed for 3,000 feet with concrete barrier

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

signs installed behind concrete barrier in the outside shoulder are required to be clearly visible to all drivers at all times.

SPECIAL PROVISION

SECTION 652

MAINTENANCE OF TRAFFIC

(Portable-Changeable Message Sign)

652.2.4 Other Devices

The eighth paragraph is deleted and replaced with the following:

Portable-Changeable Message Signs (PCMS) will be furnished by the Contractor and shall be Ver-Mac PCMS-1210 or an approved equal. 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 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.

652.7 Method of Measurement

The following sentence is added:

Portable-Changeable Message Sign(s) will be measured for payment by each unit furnished, installed and maintained.

652.8 Basis of Payment

The following paragraphs are added:

The accepted quantity of PCMS 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.

Payment will be made under:

Pay Item

Pay Unit

652.41 Portable-Changeable Message Sign

Each

SPECIAL PROVISION

SECTION 652

MAINTENANCE OF TRAFFIC

(Truck Mounted Attenuator)

652.1 Description

The following sentence is added:

The Contractor shall furnish, operate and maintain a truck and truck mounted attenuator.

652.2.1 Truck Mounted Attenuator

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.
- A mounted revolving amber light or amber strobe light 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.

652.3.7 Operations

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.

652.7 Method of Measurement

The following sentences are added:

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.

652.8.2 Basis of Payment

The following paragraphs are added:

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 unit price noted in the proposal sheet is fixed by the Maine Turnpike Authority and may not be altered. Altering of the unit price will be a non-curable bid defect.

Payment will be made under:

Pay Item

Pay Unit

652.45 Truck Mounted Attenuator

Calendar Day

SPECIAL PROVISION

SECTION 655

ELECTRICAL WORK

655.01 Description

All work shall be governed by the Standard Specifications except for that work which applies to those sections of the Standard Specifications which are amended by the following modifications, additions and deletions.

Specifically, for the electrical work (in addition to standards specified in individual work sections), the following standards are imposed, as applicable to the work in each instance:

- NEC, National Electrical Code (NFPA No. 70)
- NFPA No. 101, Life Safety Code
- ANSI C 2, National Electrical Safety Code
- ANSI C 73, Dimensions of Attachment Plugs and Receptacles
- NECA standards for installation
- NEMA standards for materials and products
- UL, Underwriters Laboratories

The Contractor will warranty the material supplied by them and their workmanship for a minimum of 1 year.

655.02 General Provisions

RELATED DOCUMENTS

General provisions of this Contract, including General Provisions and Special Provisions, apply to work of this section.

SUMMARY

This section specifies several categories of provisions for electrical work, including:

1. Certain adaptive expansions of requirements specified in the Special Provisions.
2. General performance requirements within the electrical systems as a whole.
3. General work to be performed as electrical work, because of its close association.

SUMMARY OF ELECTRICAL WORK

General Outline: The facilities and systems of the electrical work can be described (but not by way of limitation) as follows:

1. Installation of electrical control and power distribution systems, including the electrical connections to new equipment.
2. Installation of toll revenue collection systems hardware.
3. Installation of temporary and interim provisions.

Permits and Fees: This work shall include the procurement of and payment for any and all permits and fees required for the performance of the electrical work including those that may be required from local utilities for services.

COORDINATION OF ELECTRICAL WORK

Refer to Part II, Special Provisions for general coordination requirements applicable to the entire work. It is recognized that the Contract documents are often diagrammatic in showing certain physical relationships, which shall be established within the electrical work, and in its interface with other work including utilities and mechanical work, and that such establishment is the exclusive responsibility of the Contractor.

Arrange electrical work in a neat, well organized manner with conduit and similar services running parallel with primary lines of the building construction, and with a minimum of 7'0" overhead clearance where physical limitations permit.

Locate operating and control equipment properly and in accordance with the NEC, to provide easy access, and arrange entire electrical work with adequate access for operation and maintenance.

Coordination of Options and Substitutions: Where the Contract documents permit the selection from several product options, and where it becomes necessary to authorize a substitution, the contractor shall not proceed with purchases until coordination of all interface requirements has been checked and satisfactorily established. Substitutions are subject to approval by MTA or designated representative per the requirements of the Contract documents.

SUBMITTALS FOR ELECTRICAL WORK

For electrical work, submittals are required for each category of items listed below.

- Shop Drawings, Product Data, Certifications, Test Reports, Warranties, Guarantees, Installation Drawings,
- Installation Drawings shall be modified and submitted to reflect any changes during installation of electrical equipment.
- As Built installation drawings shall be submitted by the contractor for conduit in Booth, Lane and Pit with offset distances and depth.

The Contractor, prior to forwarding shop drawings and product data to the Resident, shall check all conditions, make all corrections and sign and date each set. No shop drawings will be reviewed by the Resident without the signature of the Contractor, which shall signify that he has checked the submittals.

PRODUCTS, ELECTRICAL WORK

Refer to Divisions 600 and 700 of the Standard Specifications for general requirements on products, materials and equipment. The following provisions expand or modify the requirements as applicable to electrical work:

Compatibility: Provide products, which are compatible with other products of the electrical work and with other work requiring interface with the electrical work, including electrical connections and control devices. For exposed electrical work, coordinate colors and finishes with other work.

FLOOR AND WALL PENETRATIONS

Where electrical materials penetrate walls or floors that are a part of a fire separation or assembly, the opening shall be effectively sealed to maintain separation integrity. Openings shall be closed using General Electric RTV850 Silicone RTV Foam, or approved equal to form a fire rated, water-tight seal, and installation with automatic mixing only. The penetration seal materials shall pass ASTM E 814 (UL 1479) Standard Method of Fire Tests for Through Penetration Fire Stops up to the required fire resistance.

Where conduits penetrate a wall, floor or ceiling that is part of a weatherproof barrier, a non-shrink weatherproof type grout and or sika 1A caulking shall be used, in accordance with manufacturer's installation instructions.

All work, materials, labor to fireproof or waterproof conduit penetrations shall be incidental to the various pay items

EXCAVATING FOR ELECTRICAL WORK

The work of this article is defined to include whatever excavating and back-filling is necessary to install the electrical work. Coordinate the work with other excavating and back-filling in the same area, including de-watering; flood protection provisions, and other temporary facilities. Coordinate the work with other work in the same area, including other underground services (existing and new), paving, and concrete work. Coordinate with weather conditions and provide temporary facilities needed for protection and proper performance of installations, excavating and back-filling.

General Standards: Except as otherwise required, comply with the applicable provisions of Divisions 600 and 700 of the Standard Specifications for information related to electrical-work excavating and back-filling. Refer instances of uncertain applicability to the Resident for resolution before proceeding.

ELECTRICAL WORK CLOSEOUT

Construction Equipment: After completion of the performance testing and the Authority's performance testing, remove Contractor's tools, test facilities, construction equipment and similar devices and materials used in execution of the work but not incorporated in the work.

ELECTRICAL SYSTEM TEST

The Contractor shall submit certification of the adequacy of each power and/or communications circuit for the following sub-systems, where applicable:

- Lane Controller (LC) System
- Automatic Vehicle Identification (AVI) System
- Digital Video Audit System (DVAS) System
- Traffic Control Pedestal (TCP)
- Canopy Override Switch (COS)
- Manual Lane Terminal (MLT)
- Receipt Printer (RP)
- Lane Use signal
- Outlets

Verification of the electrical system should be done by turning on/off assigned circuit breakers prior to attachment of equipment to validate panel schedule and that proper voltage is present at termination.

COMMUNICATIONS SYSTEMS

Provide outlets, wireways, device plates, etc., in conformance with the applicable sections of this specification, as may be required.

Wireways shall be in accordance with "Wireways" part of the Technical Specifications and NEC and the following special conditions:

- Minimum size shall be 1" unless otherwise noted.
- No more than two standard factory 90-degree bends per 100' or three 90 degree 24" radius bends and as to adhere to minimum manufacturers bend radius's on data cables.

655.03 Electrical Wireways

RELATED DOCUMENTS

General provisions of the Contract, including General Provisions and Special provisions, apply to work of this section.

SUMMARY

The requirements of this section apply to electrical wireway work specified elsewhere in these Specifications.

The types of electrical wireways required for the project may include the following:

- Electrical metallic tubing (Dry building interior use only).
- Flexible metal conduit (Dry building interior use only).
- Intermediate metal conduit.
- Liquid-tight flexible metal conduit.
- Rigid metal conduit (All exposed exterior conduit).
- Rigid nonmetallic conduit.
- Surface metal wireways.
- Surface nonmetallic wireways.

QUALITY ASSURANCE

Manufacturers: Firms regularly engaged in manufacture of electrical wireways of types and capacities required, whose products have been in satisfactory use in similar service for not less than three years.

Contractor: A firm with at least three years of successful installation experience on projects with electrical wiring installation work similar to that required for the project. Under this definition, Contractor can also be a subcontractor to the General Contractor for the Project.

NEMA Compliance: Comply with applicable portions of National Electrical Manufacturers Association standards pertaining to nonmetallic duct and fittings for underground installation.

UL Labels: Provide electrical wireways, which have been listed and labeled by Underwriters Laboratories.

NEC Compliance: Comply with National Electrical Code (NFPA No. 70) as applicable to construction and installation of electrical wireways.

PRODUCT DELIVERY, STORAGE AND HANDLING

Provide color-coded end-cap thread protectors on exposed threads of threaded metal conduit. Handle conduit and tubing carefully to prevent bending and end-damage and to avoid scoring finish. Store pipe and tubing inside and protect from weather. When necessary to store outdoors, elevate well above grade and enclose with durable, watertight wrapping.

MATERIALS AND COMPONENTS

For each electrical wireway system required, provide a complete assembly of conduit or tubing with fittings including, but not necessarily limited to, connectors, nipples, couplings, elbows, expansion fittings, supports, and other components and accessories as needed to form a complete system of type required.

Metal Conduit, Tubing and Fittings: Provide metal conduit, tubing and fittings of type, grade, size and weight (wall thickness) required for each service. Where type and grade are not indicated, provide proper selection determined to fulfill wiring requirements, and comply with National Electrical Code for electrical wireways.

Rigid Steel Conduit: FS WW-C-581 and ANSI C80.1.

Intermediate Steel Conduit: FS WW-C-581 and ANSI C80.1.

EMT- Electrical Metallic Tubing: FS WW-C-563A, ANSI C80.3 and UL 797. Installation shall comply with NEC Article 348. Provide high quality, hot dip galvanized, electrical metallic tubing conduit and fittings of type, size and weight (wall thickness) required for each application. EMT shall only be used in enclosed areas that are not subject to possible collision or interference. Where type and grade are not indicated, provide proper selection determined to fulfill wiring requirements, and comply with National Electrical Code. Rain-tight compression type connectors shall be used in all cases. Set-screw type conduit connections or fittings shall not be used.

Galvanized Rigid Metal Conduit Fittings: FS W-F-408, Type and Classes as required.

Liquid-tight Flexible Metal Conduit: Provide liquid-tight flexible metal conduit comprised of single strip, continuous, flexible interlocked, double-wrapped steel, galvanized inside and outside; forming smooth internal wiring channel; with liquid-tight jacket of flexible polyvinyl chloride (PVC).

Liquid-tight Flexible Metal Conduit Fittings: FS W-F-406, Type as required.

Nonmetallic Conduit and Fittings (PVC): Provide nonmetallic conduit and fittings of type, size and weight (wall thickness) required for each service. Where type and grade are not indicated, provide proper selection determined to fulfill wiring requirements, and comply with National Electrical Code for electrical wireways, and with type selected in accordance with applicable standards.

Surface Mounted Metallic Wireways: Provide wireways for surface mounting as required. Wireways shall be of rectangular cross section of size as required by the National Electrical Code (NFPA No. 70) for conductor fill. Wireways shall be of a design to accommodate wiring devices required. Finish shall be galvanized.

Conduit and Tubing and Wireway Accessories: Provide conduit, tubing and wireway accessories including straps, hangers, angles expansion and deflection fittings as recommended by conduit, tubing and wireway manufacturers.

Mounting strut materials and hardware: Provide corrosion-resistant hot-dip galvanized strut members and stainless steel hardware for all equipment and cabinet mounting applications.

INSTALLATION

Install conduit and tubing products as required, in accordance with manufacturer's written instructions, applicable requirements of NEC and National Electrical Contractors Association's "Standard of Installation", and in accordance with recognized industry practices to ensure that products serve intended function.

Complete the installation of electrical wireways before starting installation of cables within wireways.

Where conduit is installed in earth, it shall be Polyvinyl Chloride (PVC), Schedule-80 (min.) conduit (unless otherwise noted).

PVC conduit shall be used in concrete slabs on grade. Metallic conduit is not permitted in the concrete slabs or in substitution of any PVC conduit locations specified on the Plans without specific authorization by MTA.

Wherever possible, install horizontal wireway runs above water and steam piping.

Install surface metal wireways and accessories as required on elevations. Carefully coordinate with interior finishes and furnishings.

At any point where a conduit crosses an expansion joint, or where movement between adjacent sections of conduit can be expected, bronze or alloy expansion fittings shall be installed equal to Type AX as made by the O.Z. Electrical Manufacturing Co., Inc., or equivalent by Hope or Spring City unless such locations are within conduit specified as non-metallic. Such locations shall be handled with a non-metallic equivalent or as specified in Plans.

655.04 Wires and Connectors

RELATED DOCUMENTS

The general provisions of the Contract, including General Provisions and Special Provisions, apply to the work specified in this section.

SUMMARY

The requirements of this section apply to the wire work specified elsewhere in these specifications.

The applications for wire and connectors required on the project may include the following:

- Power distribution circuitry.
- Lighting circuitry.
- Appliance and equipment circuitry.

QUALITY ASSURANCE

Manufacturers: Firms regularly engaged in the manufacture of electrical products of the types and ratings required, whose products have been in satisfactory use in similar service for not less than 3 years.

Contractor: A firm with at least three (3) years of successful installation experience on projects with electrical wiring installation work similar to that required for the project. Under this definition, Contractor can also be a subcontractor to the general contractor for the project.

NEC Compliance: Comply with National Electrical Code (NFPA 70) as applicable to construction and installation of electrical cable, wire and connectors.

UL Labels: Provide electrical cable, wire and connectors, which have been listed and labeled by Underwriters Laboratories.

NEMA/ICEA Compliance: Comply with National Electrical Manufacturers Association/Insulated Power Cable Authorities Association Standards publications pertaining to materials, construction and testing wire cable, where applicable.

PRODUCT DELIVERY, STORAGE AND HANDLING

Provide factory-wrapped water-proof flexible barrier material for covering wire and cable on wood reels, where applicable; and weather resistant fiberboard containers for factory-packaging of cable, wire and connectors, to protect against physical damage in transit. Do not install damaged cable, wire or connectors; remove from project site.

Store wire and connectors in factory-installed coverings in a clean, dry indoor space which provides protection against the weather.

MANUFACTURERS

Provide products produced by one of the following or approved equal (for each type of cable, wire and connectors):

Cable and Wire:

- Anaconda Wire and Cable Co.
- Belden Corp.
- General Cable Corp.
- Phelps Dodge Cable and Wire Co.
- Wire and Cable Dept., General Electric Co.
- Rome Cable Corp.

Connectors:

- AMP Inc.
- Burndy Corp.
- Minnesota Mining and Mfg. Co.
- OZ/Gedney Co.
- Thomas & Betts Co.

WIRE AND CONNECTORS

Except as otherwise required, provide wire and connectors of manufacturer's standard materials, as required by published product information; designed and constructed as recommended by the manufacturer, and as required for the installation.

Wire:

Provide factory-fabricated wire of the size, rating, material and type as required for each service. Where not indicated, provide proper selection as determined by Installer to comply with installation requirements and with NEC standards. Select from only the following types, materials, conductor configurations, insulations, and coverings for 120/240 Volt circuits:

UL Type: THW. (Sizes #6 AWG wire and larger)

UL Type: THHW. (Sizes up to #8 AWG wire)

UL Type: USE. (Underground installation)

Material: Copper.

Conductors: (AWG wire 20 to AWG wire 16).

Note: All low voltage signal conductors (including CAT5e and CAT6 data cables) shall be stranded. Conductors for underground, below grade, or in conduit to lane devices shall be OSP grade, gel filled. Interior building communications cables may be plenum rated for interior wall or cable tray applications.

Concentric-lay-stranded (standard flexibility) (AWG wire 14 and larger).

Interconnection for data communication shall be performed with cables that shall be submitted for approval. The general cable types are designated on the Plans/ Specifications. Minimum bend radius should meet the requirements of the manufacturer and the requirements of the system.

Wire shall be color-coded as noted in the wiring schedules provided in the Plans.

Where tray cables are used to connect to the various lane and canopy signals, they shall be classified as suitable for wet locations (E.g.: Alpha 7106 rather than 7506).

Connections between the reversible lanes may also be made with tray cables that are classified as suitable for wet locations.

Lead-in cables to extend loop detectors shall be IMSA Type 50-2. Loop lead-in cables shall be manufactured with a size of #16 AWG.

Klik-Its (Power & Tel Enterprise Part #C8820) or approved equivalent shall be used at all loopwire splice locations.

Home run cables preferably should not be shielded. The use of shielded cable is acceptable provided neither end is grounded.

All cable labeling shall be coordinated with the requirements of the SI.

INSTALLATION

Install electrical wire and connectors as required, in accordance with the manufacturer's written instructions, the applicable requirements of NEC and the National Electrical Contractors Association's "Standard of Installation", and in accordance with recognized industry practices to ensure that products serve the intended functions.

Coordinate cable and wire installation work with electrical wireway and equipment installation work, as necessary for proper interface.

All wire and cable shall be in first class condition when they are installed. Lo-leak lubricants manufactured for the purpose of a pulling lubricant may be used when necessary.

All wires shall be continuous from outlet and there shall be no unnecessary slack in the conductors.

Install splices and taps which have equivalent-or-better mechanical strength and insulation as the conductor.

Use splice and tap connectors, which are compatible with the conductor material.

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.

655.05 Electrical Boxes and Fittings

RELATED DOCUMENTS

The general provisions of the Contract, including General Provisions and Special Provisions, apply to the work specified in this section.

SUMMARY

The types of electrical boxes and fittings required for the project may include the following:

- Cabinet for lane controller (LC) – Provided by TransCore
- Outlet boxes
- Junction boxes
- Pull boxes
- Floor boxes
- Conduit bodies
- Bushings
- Locknuts

QUALITY ASSURANCE

Manufacturers: Firms regularly engaged in the manufacture of electrical units of types and sizes required, whose products have been in satisfactory use in similar service for not less than three years.

Contractor: A firm with at least three years of successful installation experience on projects with electrical installation work similar to that required for the project. Under this definition, Contractor can also be a subcontractor to the general contractor for the project.

NEC Compliance: Comply with National Electrical Code (NFPA 70) as applicable to construction and installation of electrical boxes and fittings.

U.L. Labels: Provide boxes and fittings, which have been listed and labeled by Underwriter's Laboratories.

NEMA Compliance: Comply with National Electrical Manufacturers Association standards as applicable to nonmetallic fittings for underground installation.

NECA Standard: Comply with applicable portions of the National Electrical Contractors Association's "Standard of Installation".

MANUFACTURERS

Provide products produced by one of the following or approved equal (for each type of box and fitting):

Equipment Cabinet:

- Hammond Manufacturing (provided by SI)

Interior Outlet Boxes:

- Appleton Electric Co.
- Arrow Conduit and Fittings Corp.
- National Electric Products Co.
- OZ/Gedney Co.
- Steel City, Midland-Ross Corp.

Junction and Pull Boxes:

- Arrow-Hart, Inc.
- General Electric Co.
- OZ/Gedney Co.
- Square D Co.

Conduit Bodies:

- Appleton Electric Co.
- Crouse-Hinds Co.
- Killark Electric Mfg. Co.
- Pyle-National Co.

Bushings, Knockout Closures and Locknuts:

- Allen-Stevens Conduit Fittings Corp.
- Allied Metal Stamping, Inc.
- Appleton Electric Co.
- Carr Co.
- Racco, Inc.
- Steel City, Midland-Ross Corp.
- Thomas and Betts Co., Inc.

MATERIALS

LC cabinet shall be provided by the MTA's Toll System Integrator (SI) and installed by the contractor. The following information is provided to assist the Contractor with planning for the associated conduit and wiring work. The LC cabinet shall have dimensions of:

Height 24"

Width 24"

Depth 14"

FABRICATED MATERIALS

Interior Outlet Boxes: Provide galvanized steel interior outlet wiring boxes, of the type, shape and size, including depth of box, to suit each respective location and installation; constructed with stamped knockouts in back and sides, and with threaded holes with screws for securing box covers or wiring devices.

Interior Outlet Box Accessories: Provide outlet box accessories as required for each installation, including mounting brackets, wallboard hangers, extension rings, fixture studs, cable clamps and metal straps for supporting outlet boxes, compatible with outlet boxes being used and

meeting requirements of individual wiring situations. Choice of accessories is Installer's option. All covers for outlet boxes to be stainless steel.

Junction and Pull Boxes: Provide galvanized sheet steel junction and pull boxes, with screw-on covers; of the type shape and size, to suit each respective location and installation; with welded seams and equipped with stainless steel nuts, bolts, screws and washers.

Conduit Bodies: Provide galvanized cast-metal conduit bodies, of the type, shape and size, to suit each respective location and installation, constructed with threaded conduit ends, removable cover, and corrosion-resistant screws.

Bushings, Knockout Closures and Locknuts: Provide corrosion-resistant punched-steel box knockout closures, conduit locknuts and malleable iron conduit bushings of the type and size to suit each respective use and installation.

Mounting strut materials and hardware: Provide corrosion-resistant hot dipped galvanized members and stainless steel hardware for all equipment mounting applications. Where strut material is exposed to the weather, and less than 10 feet off the ground, struts shall be stainless steel. When any galvanized strut member or hardware is cut or the galvanizing is compromised, the affected area shall be wire brushed and cleaned to bare metal and the area shall be given two coats of cold galvanizing (following application instructions).

INSTALLATION OF BOXES AND FITTINGS

Install all equipment cabinets in compliance with NEC requirements, in accordance with the manufacturer's written instructions and with recognized industry practices to ensure that the boxes and fittings serve the intended purposes. Contractor shall coordinate all associated conduit, wiring and related work with the Resident and SI to confirm appropriate placement in coordination with LC cabinet installation by the SI after completion of this work. Given the installation of the LC cabinet will likely take place well after the completion of this Contract, the Contractor shall work with the Resident to determine adequate protection of completed work at completion of Contract.

Install electrical boxes and fittings in compliance with NEC requirements, in accordance with the manufacturer's written instructions and with recognized industry practices to ensure that the boxes and fittings serve the intended purposes:

Provide weatherproof outlets for interior and exterior locations exposed to weather or moisture.

Provide knockout closures to cap unused knockout holes where blanks have been removed.

Locate boxes and conduit bodies to ensure accessibility of electrical wiring.

All boxes shall be rigidly secured in position unless otherwise directed

Where standard boxes are not suitable, provide boxes of special design to suit space and function.

655.06 Wiring Devices

RELATED DOCUMENTS

The general provisions of the Contract, including General Provisions and Special Provisions, apply to the work specified in this section.

SUMMARY

Wiring devices are defined as single discrete units of electrical distribution systems, which are intended to carry but not utilize electric energy.

The types of electrical wiring devices required for this project include the following:

- Receptacles
- Switches
- Wall plates
- Plugs
- Connectors
- Breakers
- Key Switch

QUALITY ASSURANCE

Manufacturers: Firms regularly engaged in manufacture of wiring devices, of types and ratings required, whose products have been in satisfactory use in similar service for not less than three years.

Contractor: A firm with at least two years of successful installation experience on projects with electrical installation work similar to that required for the project.

NEC Compliance: Comply with National Electrical Code (NFPA No. 70) as applicable to construction and installation of electrical wiring devices.

UL Labels: Provide electrical wiring devices, which have been tested, listed and labeled by Underwriters Laboratories.

NEMA Compliance: Comply with National Electrical Manufacturers Association standards for general- and specific-purpose wiring devices.

MANUFACTURERS

Provide products produced by one of the following:

- Arrow-Hart, Inc.
- Bell Electric Co.

- Bryant Electric Co.
- Crouse-Hinds Co.
- Cutler-Hammer, Inc.
- General Electric Co.
- Gould, Inc.
- Harvey Hubbell Inc.
- Pass and Seymour, Inc.
- Slater Electric, Inc.
- Square D Co.
- Hunt Electronics
- Lutron
- Intermatic
- Paragon

FABRICATED DEVICES

Provide factory-fabricated wiring devices, in type and electrical rating for the service required.

Receptacles: Comply with NEMA Standards. Pub. No. WD1 and as follows:

General-Duty Duplex: Provide duplex general-duty type, spec. grade, receptacles, 2-pole, 3-wire grounding, with green hexagonal equipment ground screw, ground terminals and poles internally connected to mounting yoke, 15-ampere, 125-volts, with metal plaster ears, screw terminal connectors, NEMA configuration 5-15R unless otherwise required.

Heavy-Duty Duplex: Provide duplex type, spec. grade, receptacles, 2-pole, 3-wire grounding, with green hexagonal equipment ground screw, 30-ampere, 125-volts, with metal plaster ears, screw terminal connectors, NEMA configuration L5-30R unless otherwise required.

Switches: Comply with NEMA Standards. Pub. No. WD1 and as follows:

Provide general-duty flush toggle switches, 20-ampere, 120/277 VAC, with mounting yoke insulated from mechanism, equipped with plaster ears, and side-wired screw terminals as follows:

Single pole switches

Double pole switches

Three Way switches

Four Way switches

Breakers: Breakers shall be 15 amp and compatible with existing panel circuits. All breakers necessary will be incidental to the contract pay items.

WIRING DEVICE ACCESSORIES

Wall Plates: Provide single switch and duplex outlet wall plates for wiring devices, with ganging and cutouts as required provide with metal screws for securing plates to devices, screw heads colored to match finish of plate, and wall plates possessing the following additional construction features:

Material and Finish: 0.04" thick, satin finished stainless steel.

INSTALLATION OF WIRING DEVICES

Install wiring devices where required, in accordance with manufacturer's written instructions, applicable requirements of NEC and National Electrical Contractors Association's "Standard of Installation", and in accordance with recognized industry practices to ensure that products serve intended function.

Delay installation of devices until wiring is completed.

Install receptacles and switches only in electrical boxes that are clean and free from excess building materials, debris, etc.

PROTECTION OF WALL PLATES AND RECEPTACLES

Upon installation of wall plates and receptacles, Contractor shall use caution regarding the use of convenience outlets. At time of completion, replace those items which have been damaged, including those burned and scored by faulty plugs.

TESTING

Test wiring devices to ensure electrical continuity of grounding connections, and after energizing circuitry, to demonstrate compliance with requirements.

655.07 Grounding

SUMMARY

Furnish labor and material to provide grounding facilities for the entire electrical installation as required by all inspecting and jurisdictional authorities as herein specified. The following are included, but not limited to, as items requiring grounding:

- Electrical service neutral conductor.
- Neutral conductor of all transformer secondaries.
- Conduits, boxes and other conductor enclosures. Neutral or identified conductor of interior wiring system.

- Distribution panels, power and lighting panel boards.
- Non-current - carrying parts of fixed equipment, such as transformers, motors, starters, control cabinets, disconnects, lighting fixtures, stand-by generator, etc.
- Metallic cabinets and auxiliary systems cabinets.

EQUIPMENT

Furnish and install all boxes and/or access plates required for installation and inspection of grounding connections to cold water piping system or other made electrodes.

Provide brass identifying tags on all ground clamps.

INSTALLATION

Ground connections made to metallic cold water piping system at such locations as will be readily available for inspection. Provide jumper connections around all meters and shut off devices.

Where cold water piping is not available for ground connections, use other available or made electrodes as described in NEC Sections 250-81 or 250-83.

Conduit Grounding: All grounding bushings within all enclosures, including equipment enclosures, shall be wired together and connected internally to the enclosure grounding lug or grounding bus with bare copper conductor. Grounding conductors sized in accordance with NEC shall be used with all grounding bushings.

Equipment Grounding: All electrical equipment shall be grounded. Most other equipment will be furnished with grounding pads or grounding lugs. All ground connections shall be cleaned immediately prior to connection. Contractor shall provide all grounding material required but not furnished with the equipment.

No grounding conductor shall be smaller than 12 AWG wire unless it is a part of an acceptable cable assembly.

655.08 Scope of Work/Item Description/Measurement and Payment

LANE CONTROLLER (LC) CABINET PREPARATION WORK

RELATED DOCUMENTS

- A. Examine Drawings, Contract Conditions all other Sections of the Specifications for requirements which affect work of this Section whether or not such work is specifically mentioned in this Section.
- B. Coordinate work with that of all other trades affecting, or affected by work of this Section. Cooperate with such trades to assure the steady progress of all Project work.

DESCRIPTION

The purpose of this section is to provide information related to the work required to prepare the location for the proposed lane controller (LC) cabinet to be installed by the Contractor. This section provides information on how the work by the Contractor will take the LC into consideration. All work shall be coordinated with the Resident and SI. The work consists of installing the conduits and wiring associated with the LC, and installing the new LC cabinet. Note the SI may request the quadplex be removed to allow direct clean power connection to breakers within the proposed LC installed by the SI.

Submittals

Five days prior to the removal of the LC cabinet, the Contractor will be required to submit 3 copies of a neat line sketch of the proposed lane controller cabinet location detailing existing and proposed conduit/wireway runs (calling out conduit/wireway sizes and the specific cables/wires in each conduit/wireway) to the LC, AVI, Sensor loops, TCP, DVAS, MLT, RP, Proximity Reader and COS (As shown in the Plans). Included with this sketch will be the Plaza Work checklist from Appendix B that the Contractor must complete, indicating what cables will be routed into the new LC, how much slack is present in each of these existing cables, whether or not existing cables will have to be removed and re-installed (with longer run) in order to reach the new LC, and any extra work that is required. The Resident/SI will have 3 working days to review the submittal. Work done for this submittal will be incidental to mobilization. After this submittal the exact location of the LC installation will be confirmed by the Resident and SI. Also to be confirmed by the Resident and SI will be the number, size and location of the conduits entering the LC cabinet, conduit/wireway layouts in pit and entering the pit, canopy and booth, islands, under slabs, etc.

Installation

The Contractor shall install all conduit/wireway and power, and data wires, associated with the proposed LC within the LC cabinet so as to be able to connect existing and proposed peripherals to the new LC at the time of installation by the SI.

The Contractor will be required to:

- a. terminate clean and dirty power into the LC cabinet or provide alternate termination as directed by the Resident and SI. Power termination requirements to be confirmed in the field;
- b. pull data/power from lane equipment into the LC cabinet with a 36" service loop for all data lines (including 120 volt data);
- c. label each wire coming into the LC cabinet with numbered tags as directed by the Resident and SI at the start of the project. Tags shall be neat, legible, waterproof, and approved by SI/ the Resident.

Note: Existing power wires to proposed lane controller to be spliced if necessary following NEC regulations. If any other existing cable will not reach the proposed LC, a new "Home Run" from the existing equipment to the LC will need to be pulled.

Prior to the start of work on the existing toll equipment or power and comms associated with the toll equipment, the Contractor shall coordinate with the MTA and SI for proper shut down

of toll equipment. SI will shut down the lane equipment prior to work, including LC and AVI systems. Contractor shall not commence with work associated with toll system components without MTA authorization after proper shutdown of equipment by SI. Upon authorization, the Contractor will disconnect all power connections to the existing LC and peripheral equipment as specified in the Plans. SI will then disconnect all communication cables to the existing LC and peripheral equipment as specified in the Plans. Contractor shall coordinate activities with SI. SI shall remove equipment within the existing LC cabinet prior to Contractor removal of the existing LC Cabinet. The Contractor will then pull all power and communication cables out, remove existing LC cabinet, and remove existing conduit as necessary install new conduit as necessary to the proposed LC location, and pull all existing cables to the proposed LC location including the existing AVI communications line (if existing length is adequate, otherwise replace per these specifications). The Contractor will terminate clean and dirty power into the LC cabinet. The SI will install all electronics in the cabinet and terminate all communications cables to the electronics for testing. After the Contractor completes all conduit and power connections, and pulls all existing and proposed communication cables to the new LC cabinet and associated equipment as specified in the plans, the Contractor is finished with the installation.

Measurement and payment for preparation work associated with the LC cabinet as shown on the Plan drawings and described herein will be per each item. Removal of the existing LC cabinet, installation of receptacles (if applicable), completion of all conduits and wiring associated with the cabinet shall be incidental.

Install power wires and data cables as required for the new LC and associated equipment as shown on the Plans will also be incidental. All new conduit/wireway installed will be paid under its appropriate pay item.

Payment will be made under:

<u>Pay Item</u>	<u>Pay Unit</u>
655.012 Installation of Cash Lane Controller Cabinet	Each

DVAS MOUNT INSTALLATION

The Contractor shall mount a Pelco EM2200 hook to the underside of the canopy to accept a Costar CHG3000S enclosure for the DVAS camera. The Pelco hook shall be supplied by the SI. The Contractor will be responsible for mounting the hook. Final location shall be approved by MTA. Any additional hardware required will be incidental to the pay item.

Installation of individual circuit breakers or key switches for each DVAS camera circuit shall also be incidental to this item. Each DVAS camera will be wired to individual dedicated circuit at Interchange 36. Key switches will be new for inline clean power of each DVAS.

Payment will be made under:

<u>Pay Item</u>	<u>Pay Unit</u>
655.02 DVAS Mount Installation	Each

INSTALLATION OF SENSOR LOOPS

Installation

Contractor shall sawcut concrete pavement slab as directed by the resident and according to Plans and detailed manufacturer's instructions provided prior to installation. Given the proprietary nature of the loop installation requirements, the manufacturer's instructions will only be provided to the awarded Contractor. Loop installation will involve multiple sawcuts within the limits indicated on the Plans and per manufacturer provided templates. Templates for loop cutting outlines shall be provided by the SI. No loop installation activities shall be done without SI representative on site. SI will also provide the required materials for sealing the loops including but not limited to the required loctite epoxy, pump and related injection equipment prior to contractor placing sensor loops. Contractor shall be responsible for obtaining and operation of required sawcutting equipment.

NOTE: All dust must be contained so that no silica reaches MTA employees or patrons. This may be accomplished by using wet saws, advanced air filter systems or by building an enclosure around the work area. The contractor shall provide the resident a 5-day notice prior to any sawcutting activities.

Basis of Payment

Payment to be made as lump sum for all associated Sensor loops shown on Plans. Sawcutting of pavement, installation of epoxy and loops will be incidental to item.

Payment will be made under:

<u>Pay Item</u>	<u>Pay Unit</u>
655.04 Installation of Sensor Loops	Lump Sum

INSTALLATION OF AVI ANTENNAS

The Contractor shall pick up AVI antennas and mounting equipment at the Maine Turnpike headquarters or a nearby maintenance yard as coordinated by the Resident. The Contractor shall install antennas and mounts in accordance with the manufacturer's instructions. Antenna wires shall be installed and looped, the Contractor or SI will terminate equipment wiring while the Contractor is onsite. If the vendor requires additional work during termination and testing the Contractor must be present to assist.

Basis of Payment

Measurement and payment for work associated with the installation of AVI antennas as shown on the Plan drawings and described herein will be per each item. The Contractor will not pay for the purchase of antennas or the AVI equipment vendor's presence to terminate and tune equipment.

Payment will be made under:

<u>Pay Item</u>	<u>Pay Unit</u>
655.05 Installation of AVI Antennas	Each

TRAFFIC CONTROL PEDESTAL (TCP) PREPARATION WORK

Measurement and payment for preparation work for the TCP as shown on the Plan drawings and described herein will be per each item. Preparation work shall include drilling and installing threaded rods with adhesive and protection of associated wiring for the TCP in advance of installation of the TCP by the SI. Contractor shall provide the following items or approved equals for the TCP anchorage system:

- 4 each - 1/2" x 6-1/2" Hilti HAS 304SS threaded rods, nuts (double nut), flat and lock washers.
- 4 each - Hilti HVU adhesive capsules.
- 4 each – 1/2" SS nuts and fender washers for shimming and leveling the pedestal base.

Steps involved for installation of threaded rods are as follows:

1. Using the Pedestal Base detail in Appendix A as a template, layout and drill four (4) 9/16" holes for the 1/2" threaded rods.
2. Using a compressor and wire brush blow gun, clean out the anchor holes.
3. Use the shop vacuum to clean up all of the concrete dust and metal shavings.
4. For all concrete island installations, install the four (4) 1/2" Hilti HAS 304SS threaded rods (using HVU adhesive capsules according to the manufacturer's instructions).

An acceptable alternate, where applicable, will be to cast the threaded rods in place where the TCP is located in an existing light curtain hole. The anchors will be longer to accommodate a cast in place base template and the needed retaining nuts to anchor the threaded rods to the template.

Final location of TCP and alignment of threaded rod pattern layout shall be confirmed by Resident and SI prior to threaded rod installation.

Payment will be made under:

<u>Pay Item</u>	<u>Pay Unit</u>
655.07 Traffic Control Pedestal Preparation Work	Each

AWG WIRE

This task shall include the providing and installation of the AWG wire, as described herein for clean and dirty power wiring, for grounding wires (where applicable) and other

locations called for in the Plans and Specifications. All wire installed in conduit must be burial grade, suitable for wet locations.

Basis of Payment

Measurement and payment for the installation of the AWG wire as described herein will be per foot, to the nearest 10 foot interval per run. It shall include the furnishing, installation, routing, termination, splices and connection of the wire per the wiring schedule.

Payment will be made under:

<u>Pay Item</u>	<u>Pay Unit</u>
655.11 #10 AWG Wire	Linear Foot
655.12 #12 AWG Wire	Linear Foot
655.13 #14 AWG Wire	Linear Foot

4 pr/24 (CATEGORY 5e) CABLE

This task shall include the providing and installation of the Category 5e cable shown on the Plan drawings and described herein.

Cable: 4 pair, 24 AWG, Category 5e, twisted pair cable. Conductor material shall be bare copper, inner jacket material shall be PVC, cable shall be insulated and unshielded. Must be direct burial type suited for harsh conditions 4pr/24 category 5e cable, as approved.

Basis of Payment

Measurement and payment for the installation of the 4pr/24 category 5e cable will be by linear foot to the nearest 10 ft. interval. It shall include the furnishing, installation and routing of the cable per the wiring schedule.

Payment will be made under:

<u>Pay Item</u>	<u>Pay Unit</u>
655.14 4pr/24 (Category 5e) Cable	Linear Foot

FIBER OPTIC CABLE

This task shall include the providing and installation of 62.5/125 micron multimode fiber optic cable as shown on the Plan drawings and described herein. The following Specifications for the selection and installation of fiber-optic cable and associated hardware are intended to ensure a reliable and consistent fiber optic media infrastructure for the MTA. All fiber optic cable termination and the fiber optic patch panels will be provided by the Contractor

Cable: 6-Fiber multi-mode multi-mode Fi, 100 mbs, 62.5/125 Microns, Indoor/Outdoor Riser Rater, ST (Male) Connection, as approved

Specifications: Fiber installed must meet or exceed the following Specifications:

- Multimode fiber installed cable shall be 62.5/125micron core/cladding, enhanced grade, multimode, and graded index glass fiber. All materials in the cable shall be dielectric.
- Installed fiber must meet or exceed the following performance Specifications:

Wavelength (nm)	Max. Attn.(dB/Km)	Min. Bandwidth (Mhz*Km)
850	3.0	200
1,300	0.9	500

- Plenum rated cable shall be used for all interior installations. Plenum rated cable shall be:
 - Tight buffered 900 um
 - Mechanical strippable Teflon (for plenum applications)
 - EIA/TIA -598 color coding for fiber optic cable
 - Aramid yarn strength member
 - Capable of supporting a short-term tensile load of 400 lb. without stretching.
 - Capable of bend radii as small as 20 x outside cable diameter (under installation load) and 10 x outside cable diameter (long term load)
 - Capable of a minimum crush resistance of 850 lb./in.
- Corning and Berk-Tech fiber are currently recommended for installation. Cable from other manufacturers will be considered. All cable installed must be cleared by MTA prior to installation.

All cable is to be fully supported throughout its entire run.

At no time shall more than 400 pounds of tension be placed on any fiber cable while it is being pulled through tray or conduit. It is preferred that all fiber cable be pulled with hand power only. If power winches or mechanical advantage devices are used to pull cable, a tensionometer must be used to insure that maximum tension is not exceeded. Alternatively, a "mechanical fuse" rated at 350 pounds may be included in the linkage. Torsion shall be avoided by the use of a swivel at the cable end. While under tension, a minimum bend radius of 20 times the outside cable diameter will be maintained through the use of pulleys and sheaves where required. After pulling, no bend may have a radius, at rest, of less than 10 times the outside cable diameter.

Each cable is to be permanently labeled at each end with a unique cable number. In addition, labels shall be affixed to the cable at every transition of a vault, hand hole, riser closet, or major pull box.

Each fiber optic strand shall be labeled with a unique identifier at the ST coupler.

Fiber ends are to be terminated in ST-type connectors. No splices will be permitted. The cable shall be continuous run from LC to server room fiber switch location.

At each end of the cable, sufficient slack (15 - 30') shall be left to facilitate reasonable future relocation of the fiber switch or LC. Slack shall be mounted on walls or upper ladder racks.

Testing: Contractor shall test all long reels with an OTDR for length and transmission anomalies while on the reel prior to installation. It is suggested that each individual fiber in a cable regardless of length be tested with an OTDR for length and transmission anomalies while on the reel before installation.

All multimode fiber strands shall be tested end-to-end for bi-directional attenuation, 850 nm/1300 nm for multimode. Tests should be conducted in compliance with EIA/TIA-526-14 or OFSTP 14, Method B, according to the manufacturer's instructions for the test set being utilized.

Tests must ensure that the measured link loss for each strand does not exceed the "worst case" allowable loss defined as the sum of the connector loss (based on the number of mated connector pairs at the EIA/TIA-568 B maximum allowable loss of 0.75 dB per mated pair) and the optical loss (based on the performance standard above, 2.1.1 and 2.2.1).

After termination, each fiber shall be tested with an ODTR for length, transmission anomalies, and end-to-end attenuation. Results are to be recorded and supplied to MTA in the form of hard-copy printouts or photographs of screen traces.

After termination each terminated fiber is to be tested for end-to-end loss with a power meter/light source. As above, results are to be recorded and supplied to MTA.

The Contractor shall review all end faces of field terminated connectors with a fiber inspection scope following the final polish. Connector end faces with hackles, scratches, cracks, chips and or surface pitting shall be rejected and repolished or replaced if repolishing will not remove the end face surface defects. The recommended minimum viewing magnifications for connector ends are 100X for multimode fiber and 200X for single mode fiber.

Basis of Payment

Measurement and payment for the installation of the Fiber Optic cable will be by linear foot to the nearest 10 foot interval. It shall include the furnishing, installation, termination and routing of the cable per the wiring schedule.

Payment will be made under:

<u>Pay Item</u>	<u>Pay Unit</u>
655.16 Fiber Optic Cable – 6 Fiber	Linear Foot

IVIS HOMERUN LOOP CABLE (IMSA 50-2 #16)

This task shall include the providing and installation of the IVIS homerun loop cable (IMSA 50-2 #16) shown on the Plan drawings and described herein.

Cable: IMSA 50-2 #16 cable loop detector wire shall be as follows:

- Conductors: Solid or stranded tin copper
- Insulation: Polyethylene
- Conductor Configuration: Twisted pair
- Shield: Aluminum/Mylar tape
- Outer Jacket: Low-density polyethylene

Cable shall have two conductors, #16 AWG, 19 strand. Cable must be direct burial grade suitable for installation in the utility duct beneath the roadway, and any other locations shown on the Plan or described within the design documents. All loop sensor homerun cables shall have tape with length markings.

Basis of Payment

Measurement and payment for the installation of the IMSA 50-2 #16 cable will be by linear foot to the nearest 10 foot interval. It shall include the furnishing, installation and routing of the cable per the wiring schedule.

Payment will be made under:

<u>Pay Item</u>	<u>Pay Unit</u>
655.17 IVIS Homerun Loop Cable (IMSA 50-2 #16)	Linear Foot

PVC CONDUIT

This task shall include providing and the installation of PVC Conduit as shown on the Plan drawings and described herein. All conduit shall be installed per NEC specification. Connections to specialized fittings are to be compatible with adjoining conduit.

Joints shall be made in accordance with ASTM D 2855. Solvent cement shall meet the requirements of ASTM D 2564 with particular attention to matching the viscosity to the conduit size.

Joint adhesives shall be in accordance with ASTM D2517.

All conduit runs shall be watertight. Slope conduit to drain into junction boxes.

All empty conduits shall have a labeled pull string. Pull strings shall have length markings and should be used for long conduits over 50 feet or for all underground installations. Clean, plug and seal conduit ends after installation.

Basis of Payment

Measurement and payment for installing PVC Conduit as shown on the Plan drawings and described herein will be per linear foot of each type of underground or exposed conduit actually furnished, installed, and accepted at the Contract price per linear foot. It shall include the

furnishing, installing, supporting and connection of the conduit and all various hardware necessary for the installation. This price shall include the cost of hand digging, trenching, or plowing; furnishing and installing the conduit; furnishing special backfilling materials, pull string, fittings, groundings and bonding; test cleaning interiors of conduits and all materials, labor, equipment and incidentals necessary to complete the work.

Pay Items are as follows:

<u>Pay Item</u>		<u>Pay Unit</u>
655.203	1 1/2" Schedule 80 PVC Conduit	Linear Foot
655.2031	2" Schedule 80 PVC Conduit	Linear Foot
655.204	3" Schedule 80 PVC Conduit	Linear Foot

GALVANIZED RIGID METAL CONDUIT (RMC)

This task shall include providing and the installation of Galvanized RMC as shown on the Plan drawings and described herein. All fittings shall be threaded, or approved compression type (approved by the engineer and compatible with the conduit), so as to be waterproof. Conduit shall be installed and grounded per NEC regulations. All supports shall be hot dipped galvanized or stainless steel (approved by the engineer and compatible with the conduit).

Basis of Payment

Measurement and payment for furnishing and installing the Galvanized RMC as shown on the Plan drawings, where necessary, and described herein will be per linear foot actually furnished, installed, and accepted at the Contract price per linear foot. This price shall include the cost of: furnishing and installing the conduit; pull string, fittings, groundings and bonding; test cleaning interiors of conduits and all materials, labor, equipment and incidentals necessary to complete the work.

Payment will be made under:

<u>Pay Item</u>		<u>Pay Unit</u>
655.2071	2" Galvanized Rigid Metal Conduit	Linear Foot

LIQUID TIGHT METALLIC FLEXIBLE CONDUIT

This task shall include providing and the installation of Liquid Tight Metallic Flexible Conduit as shown on the Plan drawings and described herein. All conduit shall be watertight with flexible PVC coating over galvanized steel flex tubing. Conduit shall be installed and grounded per NEC regulations. All supports for shall be hot dipped galvanized or stainless steel. Connections shall be specialized fittings to be compatible with adjoining conduit and watertight.

Basis of Payment

Measurement and payment for installing the Liquid Tight Metallic Flexible Conduit as shown on the Plan drawings and described herein will be per linear foot actually furnished,

installed, and accepted at the Contract price per linear foot. This price shall include the cost of: furnishing and installing the conduit; pull string, fittings, groundings and bonding; test cleaning interiors of conduits and all materials, labor, equipment and incidentals necessary to complete the work.

Payment will be made under:

<u>Pay Item</u>	<u>Pay Unit</u>
655.2102 2" Liquid Tight Metallic Flexible Conduit	Linear Foot

INSTALLATION OF PULL BOXES

This task shall include providing and installing:

- The type D pull box as shown on the Plan drawings and detailed herein, or where used elsewhere.
 - Materials: 12" x 12" x 6" stainless steel, NEMA 4X.
 - Material: Unistrut – P3000 Hot-Dipped Galvanized (HG) with appropriate fasteners shall be used to secure Pull Boxes to anchorage points.

If equipment is to be installed at a later date insure adequate slack in the junction box for termination and additional 4" for possible re-termination. For pass through junction boxes no slack is required. For specific equipment the following guidelines apply:

- Sensor Loops: A single slack loop of 12" – 24" for convenience of splicing.
- DVAS: Slack loop to allow for distance to mounting location of camera plus an additional 3'.
- LC: 4' of slack at LC mounting location.

Basis of Payment

Measurement and payment for installing the pull boxes as shown on the Plan drawings and described herein will be per each item. It shall include the furnishing, installation, mounting of the box, and the drilling of holes into the box for conduits.

Payment will be made under:

<u>Pay Item</u>	<u>Pay Unit</u>
655.223 Type D Pull Box Outdoor Canopy	Each

KEY SWITCH

A key switch similar to existing key switches in use within the toll system shall be installed in line between clean power panel and power lead for each pair of VES cameras and each DVAS camera.

Basis of Payment

Work shall include furnishing all materials and hardware, and labor and equipment to install. All conduit and wires will be paid under separate pay items.

Payment will be made under:

Pay Item

Pay Unit

655.81 Key Switch

Each

SPECIAL PROVISION

SECTION 656

TEMPORARY SOIL EROSION AND WATER POLLUTION CONTROL

Section 656 of the Standard Specifications and the General Provisions is deleted in its entirety and replaced with the following:

656.01 Description

This work shall consist of providing temporary erosion and water pollution control during construction in accordance with these Specifications, standard details, Best Management Practices, or as otherwise directed.

All temporary erosion control devices shall be in place and approved by the Resident prior to any operations resulting in disturbed area. The Contractor is responsible for maintaining all erosion control measures in effective operating condition, including repairing and replacing damaged or missing erosion control material until areas are permanently stabilized. The Contractor shall maintain these devices in a clean and properly operating condition as described herein.

Prior to construction, the Contractor shall properly install sediment barriers (e.g., silt fence) at the edge of any downgradient disturbed area and adjacent to any drainage channels within disturbed areas. The Contractor shall maintain the sediment barriers until the disturbed area is permanently stabilized.

The Contractor is responsible for all temporary drainage and erosion control measures. The Contractor shall review his construction operations and staging to determine if additional erosion control measures are required. The Resident may also request additional erosion control measures. The cost for all erosion control devices necessary, due solely to the Contractor's construction operations and not shown on the Plans, shall be borne solely by the Contractor. The frequency of inspection of these devices by the Contractor and the Erosion Control Compliance Officer (ECCO) shall be weekly and before, during and immediately following a rainfall of greater than 1/2 inch in a 24-hour period.

656.02 Temporary Erosion and Sedimentation Control Devices - Materials

The Contractor shall install and maintain all temporary erosion and sedimentation control materials in accordance with the manufacturer's recommendations or the latest BMP's.

1. Baled hay shall be bales at approximately 14 by 18 by 30 inches, or an equivalent, securely tied to form a firm bale.
2. Flexible drainage pipe shall consist of collapsible neoprene pipe, a minimum of 12 inches in diameter or equal.

3. Silt Fence

- (a) Posts - Either hardwood posts or steel posts shall be used. Hardwood posts shall be straight, at least 18 inches longer than the height of the silt fence and at least one inch by one inch.

Staples shall be of No. 9 wire.

Steel posts shall be at least 18 inches longer than the height of the silt fence and have the means provided for fastening wire to the fence.

- (b) Wire Support Fence - If required, wire support fence shall be at least two inches higher than the height of the silt fence. Horizontal and vertical wires shall be spaced no more than six inches apart. The top and bottom wires shall be at least 10 gauge; all other wires at least 12 gauge.
- (c) Fabric - The woven geotextile fabric and components shall be made from polypropylene, polyester, polyimide or other chemically stable material and be resistant to ultraviolet radiation degradation for at least 12 months of installation. Silt retention capacity shall be no less than 75 percent. The fabric shall have a Mullen burst test of no less than 260 pounds per square inch with a maximum average sieve opening size of No. 20 to No. 60. Roll width of the fabric shall be no less than six inches wider than the height of the fence, except fabric for boom supported floating silt fence which shall be no less than two feet wider than the design width.
- (d) Flotation Devices – Boom supported floating silt fence shall consist of suitable, flexible plastic or synthetic rubber barrier supported on the top (or floated on the top using six inch “minimum” Styrofoam logs) and sides, and weighted or anchored on the bottom to form a continuous vertical barrier to contain within the designated area(s), silt and clay-size particles suspended or carried by water. The flotation boom and weighing devices for boom supported floating silt fence shall be sufficient to hold the fence in an approximately vertical position.

656.03 Temporary Erosion and Sedimentation Control Devices - General

Temporary Erosion Checks - Temporary erosion checks shall be constructed in ditches and at other locations designated. Checks shall be in accordance with the Standard Detail unless otherwise directed.

Baled hay shall be used in other areas as necessary to inhibit soil erosion.

During winter construction, November 1st through April 15th, all areas being constructed within 75 feet of a protected natural resource shall be protected with a double row of silt fence.

Sediment deposits behind haybales and silt fence shall be removed when the depth of sediment reaches 50 percent of the erosion control device height.

The Contractor is also required to have on-site, at all times, 25 percent additional Contract quantities of silt fence for use as backup devices.

656.04 Temporary Erosion and Sedimentation Control Devices – Construction Requirements

1. Erosion Control Filter Berm

The Contractor may opt to furnish and install an erosion control filter berm in lieu of silt fence. The erosion control filter berm shall be a water permeable windrow of a composted bark mix to remove suspended soil particles from water moving off the site. Erosion control filter berm shall be considered an erosion control device. The material and specific application shall be submitted to the Resident for approval.

The erosion control berm shall be placed uncompacted, in a windrow in locations approved by the Resident. The cross section of the berm shall be four feet wide at the base and 1-1/2 feet high at the center. The erosion control filter berm shall be removed when no longer required, as determined by the Resident, and shall be distributed over an adjacent area.

2. Temporary Berms

When designated, temporary barriers shall be constructed along the edge of the embankment. The barriers shall be of embankment earth material, gravel or sand as available and shaped approximately as shown in the Standard Details. The barriers shall be compacted with the wheels of construction equipment. When placed on pavement, the berms shall be constructed of asphalt grindings or other non-erodible soil material as approved by the Resident, and shaped as shown in the Standard Details.

At designated intervals, temporary slope drains shall be constructed with a crescent shaped barrier placed at each slope drain to direct the water into the inlet pipe.

3. Temporary Slope Drains

Collapsible pipe with corrugated metal pipe inlet shall be placed down the embankment slopes at designated locations and in accordance with the Best Management Practices.

At the outlet end of the drain, dumped stone shall be placed to prevent scoring unless otherwise directed.

4. Silt Fence

The silt fence shall be installed downhill of disturbed slopes as shown on the Plans or as approved. The Contractor shall have the option to provide a reinforced filter fabric or an un-reinforced filter fabric attached to a wire fence.

The fence posts shall be spaced as specified by the Resident, however, not to exceed a maximum of eight feet [2.5 m] apart when either type of silt fence is used and be driven a minimum of 18 inches [450 mm] into the ground.

The geotextile fabric shall be secured to the post or fence by suitable staples, tie wire or hog rings in such a manner as to prevent tearing and sagging of the fabric. The bottom flap of the geotextile fabric shall be entrenched into the ground a minimum depth of six inches [150 mm] to prevent water from flowing under the fence. The geotextile shall be spliced together only at support posts with a minimum six inches [150 mm] overlap and secure post connection which prevents leakage of silt. The top of the geotextile shall be installed with a reinforced top end section.

The Contractor shall maintain the silt fence in a functional condition at all times. All deficiencies shall be immediately corrected by the Contractor. The Contractor shall make a daily inspection of silt fences in areas where construction activity causes drainage runoff, to ensure that the silt fences are properly located for effectiveness. Where deficiencies exist, additional silt fences shall be installed as approved or otherwise directed.

Sediment deposits shall be removed when sediments reach 50 percent of the height of the device. All sediment deposits remaining in place after the device is no longer required shall be graded to conform to the existing ground, seeded and mulched immediately.

Geotextile fabric which has decomposed or has become ineffective and is still needed shall be replaced with material equal to the original design.

5. Boom Supported Floating Silt Fence

Prior to starting any work within the river, the Contractor shall furnish and install a boom supported floating silt fence to completely surround the work area as shown on the Plans or as approved by the Resident. The boom supported floating silt fence shall remain in place a minimum of 48-hours after the completion of the work. The Contractor shall then remove the boom supported floating silt fence from the river.

The silt fence fabric shall be securely attached to the flotation boom with a continuous weight placed the entire length of the fence to maintain the fence in a vertical submerged position from the surface of the water to the design depth.

Anchor's shall be placed at the ends of the fence, and intermediate locations if necessary, to hold the fence securely in place.

656.05 Temporary Erosion and Sedimentation Control Devices - Maintenance

The erosion control devices will be cleaned, repaired or replaced as necessary. All deficiencies shall be corrected immediately by the Contractor.

656.06 Temporary Erosion and Sedimentation Control Devices - Removing and Disposing

When disturbed areas have been permanently stabilized, temporary erosion control devices, including stone check dams, shall be removed. However, erosion control mix filter berms may be spread out, seeded and left to decompose. Areas disturbed during the removal of the erosion control devices shall be repaired and properly stabilized.

When removed, such devices may be reused in other locations provided they are in good condition and suitable to perform the erosion control for which they are intended. Reused devices, if approved, will be measured for payment.

656.07 Erosion Control Compliance Officer

The Contractor shall designate an Erosion Control Compliance Officer (CECCO) on this Project who shall be a “DEP Certified Contractor” or have had equivalent training approved by the Authority. The Contractor shall provide the Resident with the name of the CECCO and any phone numbers or pager numbers that can be used to contact the person in case of emergency.

Before commencing any work that could disturb soils or impact water quality, the CECCO must field review the Project with the Resident’s ECCO (RECCO).

656.08 Inspection and Recordkeeping

The CECCO shall accompany the RECCO in the inspection of all erosion control devices. An inspection log shall be maintained by the Resident for the duration of the Project. The log will include daily on-site precipitation and air temperature as well as the performance, failure and/or any corrective action for all erosion and sedimentation controls in place. The log will be updated at least weekly and after all significant storm runoff or flood events. The log shall be signed by the RECCO and the CECCO after each inspection.

Failure to comply with the erosion and sedimentation control requirements herein or as directed by the RECCO within 24-hours after the violation is noted in the inspection log, will result in the \$1,000 per day per violation penalty until the violation is corrected to the satisfaction of the Resident.

656.09 Method of Measurement

Baled hay will be measured for payment by the number of bales or bags satisfactorily placed.

Temporary berms and temporary slope drains will be measured for payment by the linear foot measured parallel with the flow line including the pipe inlet.

Temporary silt fence will be measured by the linear foot along the gradient of the fence, end post to end post.

Boom supported floating silt fence will be measured by the linear foot.

Erosion control filter berm shall be measured by the linear foot.

The quantity of additional haybales and silt fence material required herein will be measured for payment only when and if they are actually put to use as additional measures on the Project as approved by the Resident. Haybales and silt fence material used for maintenance or replacement of existing devices will not be measured for payment.

The removal of silt and other material from behind the erosion control devices will not be measured separately for payment, but shall be incidental to the Erosion Control items.

656.10 Basis of Payment

The accepted quantity of baled hay will be paid for at the Contract unit price each for each bale which price shall be full compensation for furnishing and placing the bales, for furnishing and driving the stakes for baled hay, for maintaining the bales, stakes, and for the removing and disposing of the bales, stakes when no longer needed.

The accepted quantity of temporary berms will be paid for at the Contract unit price per linear foot of berm which price shall be full compensation for furnishing, placing and compacting material, for maintaining and for removing the berm when no longer needed.

There will be no separate payment for excavation in the construction of temporary erosion control items under this Section and all necessary excavation shall be incidental to the work.

The accepted quantity of temporary silt fence and boom supported floating silt fence will be paid for at the Contract unit price per linear foot complete in place. Payment shall be full compensation for furnishing, installing, maintaining, anchoring, replacing deteriorated geotextile and clogged geotextile when required and for removing and disposing of the fence when no longer needed.

The accepted quantity of erosion control filter berm will be paid for at the Contract unit price per linear foot under Item 656.632, 30 Inch Temporary Silt Fence, which price shall be full compensation for furnishing, placing, maintaining, and removing the erosion control filter berm.

Cost of seeding and mulching the area after removal of the temporary silt fence will be paid for at the Contract unit prices for Item 618, Seeding, and Item 619, Mulch.

Payment will be made under:

<u>Pay Item</u>	<u>Pay Unit</u>
656.50 Baled Hay, in place	Each
656.60 Temporary Berms	Linear Foot
656.62 Temporary Slope Drains	Linear Foot
656.632 30 inch Temporary Silt Fence	Linear Foot

SPECIAL PROVISION

SECTION 669

BOLLARD

669.01 Description

This work shall consist of furnishing and installation of bollards in accordance with these Specifications, and in reasonably close conformity with the lines and grades shown on the Plans or as approved by the Resident.

669.02 Materials

The materials shall meet the following requirements:

- A. Bollards - Six (6) inch I.D. steel pipe, ASTM A 53, Grade B, Schedule 40, galvanized after fabrication in accordance with ASTM A 123.
- B. Concrete - shall be in accordance with Sections 502 for Class "A" Concrete (4000 psi).
- C. Galvanizing Repair Compound - High Zinc dust content compound complying with Military Specification MIL-P21035 (Ships).
- D. Asphalt - Base Emulsion - ASTM D 1187.
- E. HDPE plastic cover over the bollard as shown on the Plans.

669.03 General Construction Requirements

- A. Earthwork for bollards shall be in accordance with the applicable provisions of Section 206.
- B. Excavate pit for bollard foundation to depth shown on the Plans and place and compact gravel foundation to the depth indicated. Prior to setting bollards apply a heavy brush coat of approved asphalt - base emulsion to all surfaces to be embedded in concrete plus an additional one inch above the indicated top of concrete elevation.
- C. After the concrete has set, backfill and compact gravel borrow to top of concrete.
- D. Fill bollard with concrete until it extends slightly above the top of the bollard. Finish the exposed concrete to form a convex surface which overlaps the top edge of the bollard with a 1/4 inch lip so that surface water will drain off the top of the bollard.
- E. Clean entire exposed metal surface of bollard with hand tools (e.g., wire brushes) and paint manufacturers recommended solvent or detergent wash to remove all

foreign material which would impair adhesion of the paint. Rinse thoroughly with water and wipe dry with clean cloths. Allow surfaces to dry completely.

- F. Apply primer and two (2) top coats to the manufacturer's recommended dry film thickness, in strict accordance with the manufacturer's instructions and recommendations. Paint shall be allowed to thoroughly cure between coats.
- a. Prime Coat: Repair damaged galvanizing with ZRC Cold Galvanizing Compound or equal, and prime all galvanizing with Tnemec 32 - 1210 Tnemec - Grip.
 - b. Finish Coat: Two coats of Tnemec Series 2H Hi - Build Tnemec - Gloss Alkyd Enamel; 2.5 to 3.5 dry mils each coat (spray, brush or roller applied).

669.04 Method of Measurement

Bollard will be measured by each unit, complete and accepted.

669.05 Basis of Payment

Bollard will be paid for at the Contract unit price each which payment shall be full compensation for the furnishing and installation of bollard, foundation, excavation and backfilling, concrete, paint, plastic cover, and all other materials, labor, tools, equipment and incidentals necessary to complete the work.

Payment will be made under:

<u>Pay Item</u>	<u>Pay Unit</u>
669.01 Bollard	Each

SPECIAL PROVISION

SECTION 800

BUILDING AND STRUCTURES

(Toll Gantry Installation)

800.51 Description

This work shall consist of the furnishing and installing materials and components to install a gantry (over Lane 5 and 6), as well as all other related electrical and communication facilities needed for the new toll system equipment that will be located within the toll booth or attached to the gantry as described in the Plan drawings and herein as required for the lane addition at Interchange 36 and new gantry over Lanes 5 and 6.

800.52 Construction Requirements

The work in this item generally includes, but is not limited to reconstruction of, or portions thereof, the following:

- a. Gantry: The contractor shall install a new gantry section over Lanes 5 and 6 of Interchange 36 as shown in the plan drawings and described within these specifications. The gantry installation shall include hot dipped galvanized (per Section 506) hollow structural steel sections fabricated in accordance with Section 504 similar to the existing gantry over the exiting lanes, all re-routed electrical and communication for the toll system, installation of a new overhead lane sign (provided by the MTA) with galvanized mounting hardware and LED flood light (1 - Dialight RS5N4KG 100 watt) with galvanized mounting hardware for illuminating the sign, and all material labor and equipment needed to provide the completed gantry. The Contractor shall submit an installation plan for approval that will describe in detail the installation process for the gantry.

All material associated with gantry installation is included in this item and is shown on the Plan drawings and described in this Special Provision. Electrical and communication items associated with the toll system will be paid for under the specific item.

800.53 Basis of Payment

Payment to be made as lump sum for gantry fabrication, supply, and installation required. All labor, materials and equipment required will be incidental to this item.

Payment will be made under:

<u>Pay Item</u>	<u>Pay Unit</u>
800.501 Toll Gantry Installation	Lump Sum

MAINE TURNPIKE AUTHORITY

SPECIFICATIONS

PART III – APPENDICES

MAINE TURNPIKE AUTHORITY

SPECIFICATIONS

APPENDIX A

LOGS OF SUBSURFACE EXPLORATIONS



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SOURCE: THIS MAP CONTAINS THE ESRI ARCOGIS ONLINE USA TOPOGRAPHIC MAP SERVICE, PUBLISHED DECEMBER 12, 2009 BY ESRI ARCOGIS SERVICES AND UPDATED AS NEEDED. THIS SERVICE USES UNIFORM NATIONALLY RECOGNIZED DATUM AND CARTOGRAPHY STANDARDS AND A VARIETY OF AVAILABLE SOURCES FROM SEVERAL DATA PROVIDERS

MAINE TURNPIKE
VMS BOARD RELOCATION
ARUNDEL, MAINE

PREPARED BY:
GZA GeoEnvironmental, Inc.
Engineers and Scientists
www.gza.com

PREPARED FOR:
STANTEC

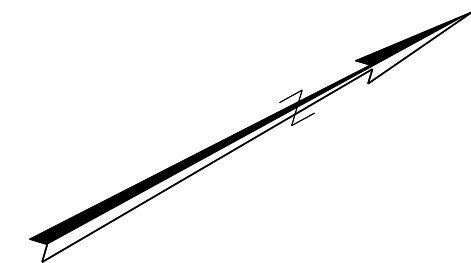
LOCUS PLAN

PROJ MGR: JRB	REVIEWED BY: CLS
DESIGNED BY: JRB	DRAWN BY: ADM
DATE: 10/07/2014	PROJECT NO. 09.0025863.00

CHECKED BY: RJM	FIGURE 1
SCALE: 1 in = 2,000 ft	
REVISION NO.	

Filename: ... \HIGHWAY\MSTA\VMS\003_Plan.dgn

1. BASE PLAN WAS DEVELOPED FROM ELECTRONIC PDF BASE PLAN PROVIDED BY STANTEC VIA EMAIL ON OCTOBER 6, 2014.
2. BORINGS GZ-1 AND GZ-2 WERE PERFORMED BY NEW ENGLAND BORING CONTRACTORS, OF HERMAN, MAINE DURING THE PERIOD FROM SEPTEMBER 24, 2014 THROUGH SEPTEMBER 25, 2014 AND WERE OBSERVED AND LOGGED BY GZA PERSONNEL.
3. BORING LOCATIONS AND ELEVATIONS WERE SURVEYED BY TITCOMB ASSOCIATES OF BATH MAINE.



STANTEC CONSULTING SERVICES INC.
482 PAYNE ROAD
SCARBOROUGH, ME 04074
TEL (207) 887-3448
FAX (207) 883-3376



FIGURE 2
EXPLORATION LOCATION PLAN
PROPOSED VMS SIGN RELOCATION
MAINE TURNPIKE
ARUNDEL, MAINE
OCTOBER 9, 2014

[illegible]

GZA TEMPLATE TEST BORING; 10/7/2014; 9:52:47 AM

[illegible]

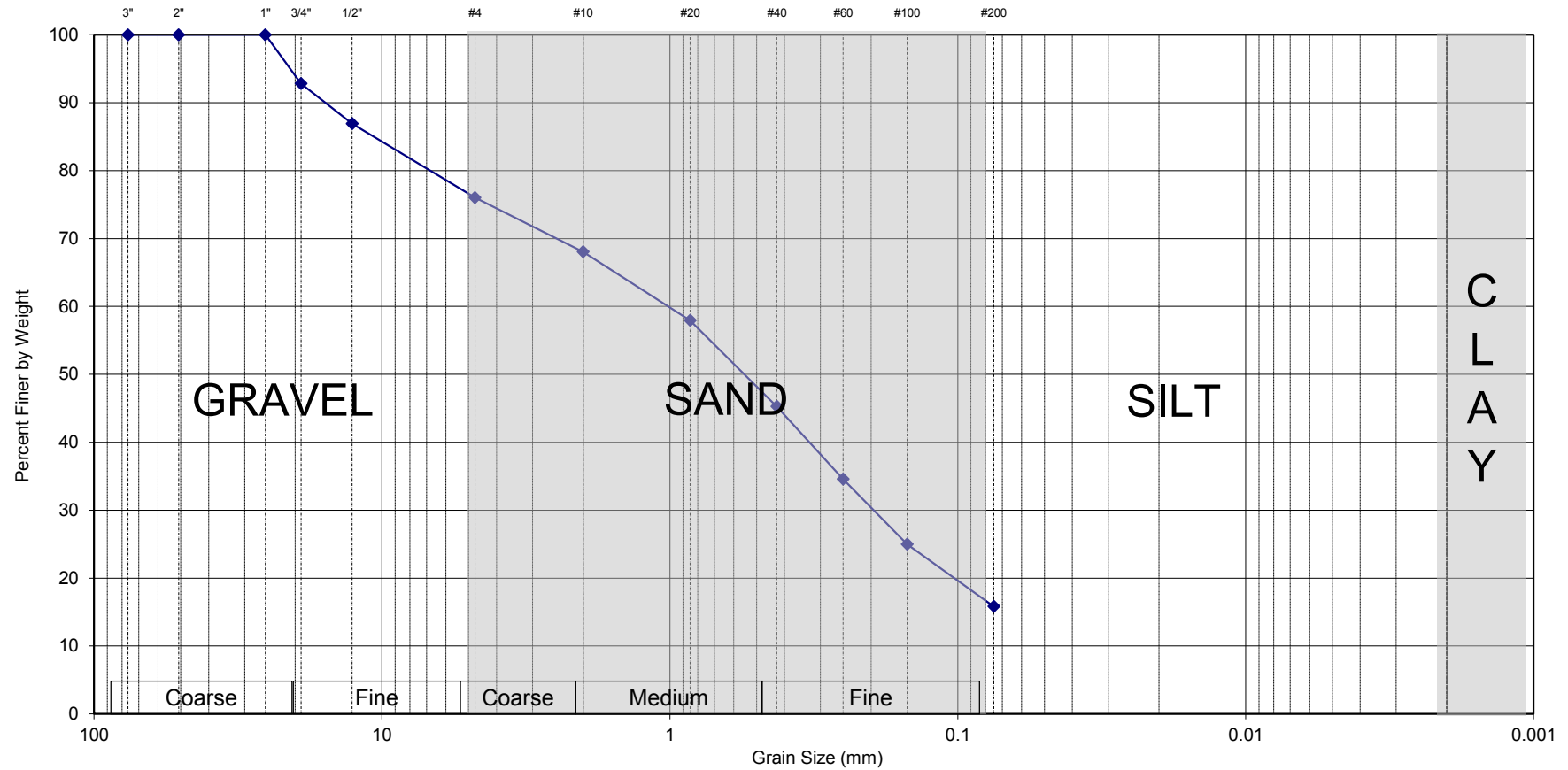
GZA TEMPLATE TEST BORING; 10/7/2014; 9:52:47 AM

[illegible]

GZA TEMPLATE TEST BORING; 10/7/2014; 9:52:49 AM

TEST BORING LOG														
GZA GeoEnvironmental, Inc. <i>Engineers and Scientists</i>					Stantec VMS Board Relocation Limerick Road Bridge Vicinity Arundel, Maine					EXPLORATION NO.: GZ-2 SHEET: 2 of 2 PROJECT NO: 09.0025863.00 REVIEWED BY: J. Baron				
Logged By: B. Cardali Drilling Co.: New England Boring Contractors Foreman: Brad Enos					Type of Rig: Truck Rig Model: B53 Drilling Method: SSA/Drive & Wash			Boring Location: See Plan Ground Surface Elev. (ft.): Final Boring Depth (ft.): 52 Date Start - Finish: 9/25/2014 - 9/25/2014			H. Datum: V. Datum:			
Hammer Type: Safety Hammer Hammer Weight (lb.): 140 Hammer Fall (in.): 30 Auger or Casing O.D./I.D Dia (in.): 3"					Sampler Type: SS Sampler O.D. (in.): 2.0 Sampler Length (in.): 24 Rock Core Size:			Groundwater Depth (ft.)						
								Date	Time	Water Depth	Stab. Time			
								9/24/14	1140	19	15 min.			
Depth (ft)	Casing Blows/ Core Rate	Sample No.	Depth (ft.)	Pen. (in)	Rec. (in)	Blows (per 6 in.)	SPT Value	Sample Description and Identification (Modified Burmister Procedure)	Remark	Field Test Data	Depth (ft.)	Stratum Description	Elev. (ft.)	
35		S-11	30.0- 32.0	24	19	25 30 42 76	72	S-11: Dense, gray, fine to medium SAND and Silt, trace Gravel, moist. (SM)						
		S-12	35.0- 37.0	24	20	20 15 16 22	31	S-12: Dense, gray, fine to medium SAND and Silt, trace Gravel, moist. (SM)						
40		S-13	40.0- 42.0	24	21	14 13 14 23	27	S-13: Medium dense, gray, fine to medium SAND and Silt, trace Gravel, moist. (SM)						
45		S-14	45.0- 47.0	24	13	20 34 31 32	65	S-14: Dense, gray, fine to medium SAND and Silt, trace Gravel, moist. (SM)						
50		S-15	50.0- 52.0	24	20	21 15 25 42	40	S-15: Dense, gray, fine to medium SAND and Silt, trace Gravel, moist. (SM)						
55								End of exploration at 52 feet.						
60														
REMARKS														
See Log Key for explanation of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.											Exploration No.: GZ-2			

U.S. STANDARD SIEVE AND HYDROMETER



Gravel
24.0%

Sand
60.2%

Fines
15.8%

Lab #	Exploration	Sample	Depth	Description	WC	LL	PL	PI
1	GZ-1	S-1	0-2'	Brown f-c Sand, some f-c Gravel, little Silt (SM)	12.3			

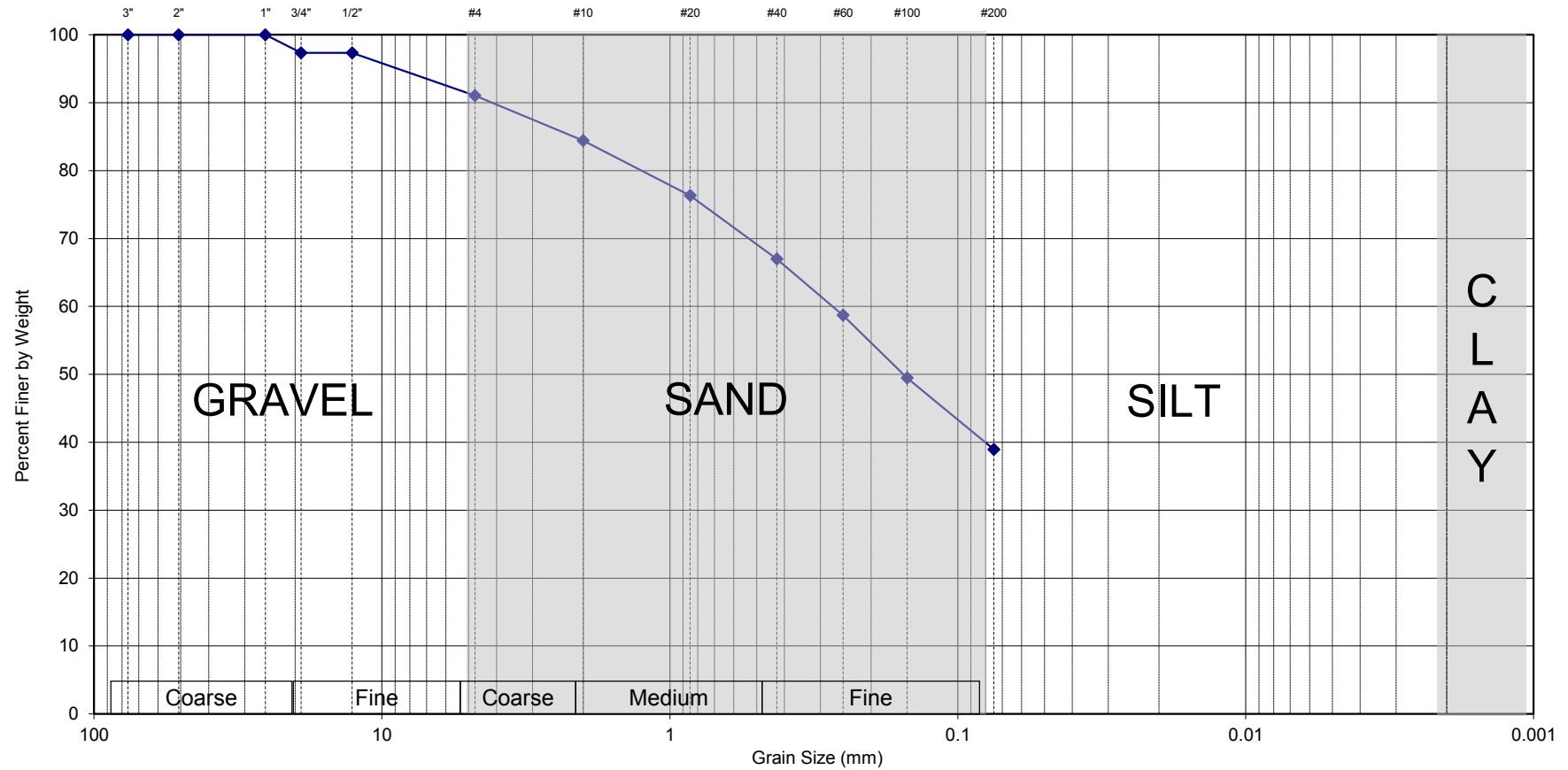
Sieve Size	% Passing
3/4"	92.8
1/2"	86.9
#4	76.0
#10	68.0
#20	57.9
#40	45.3
#60	34.6
#100	25.0
#200	15.8



195 Frances Ave., Cranston, RI 02910
401-467-6454

CTS-74-14-0003
VMS Board Relocation
Arundel, ME
GZA File # 09.0025863.00
Tested by: LM/MS Date: 10/2/14
Reviewed by: MBP Date: 10/6/14

U.S. STANDARD SIEVE AND HYDROMETER

Gravel
9.0%Sand
52.1%Fines
38.9%

Lab #	Exploration	Sample	Depth	Description	WC	LL	PL	PI
4	GZ-1	S-4	6-8'	Brown f-c Sand and SILT, trace Gravel (SM)	9.7			

Sieve Size	% Passing
3/4"	97.3
1/2"	97.3
#4	91.0
#10	84.4
#20	76.3
#40	67.0
#60	58.7
#100	49.5
#200	38.9

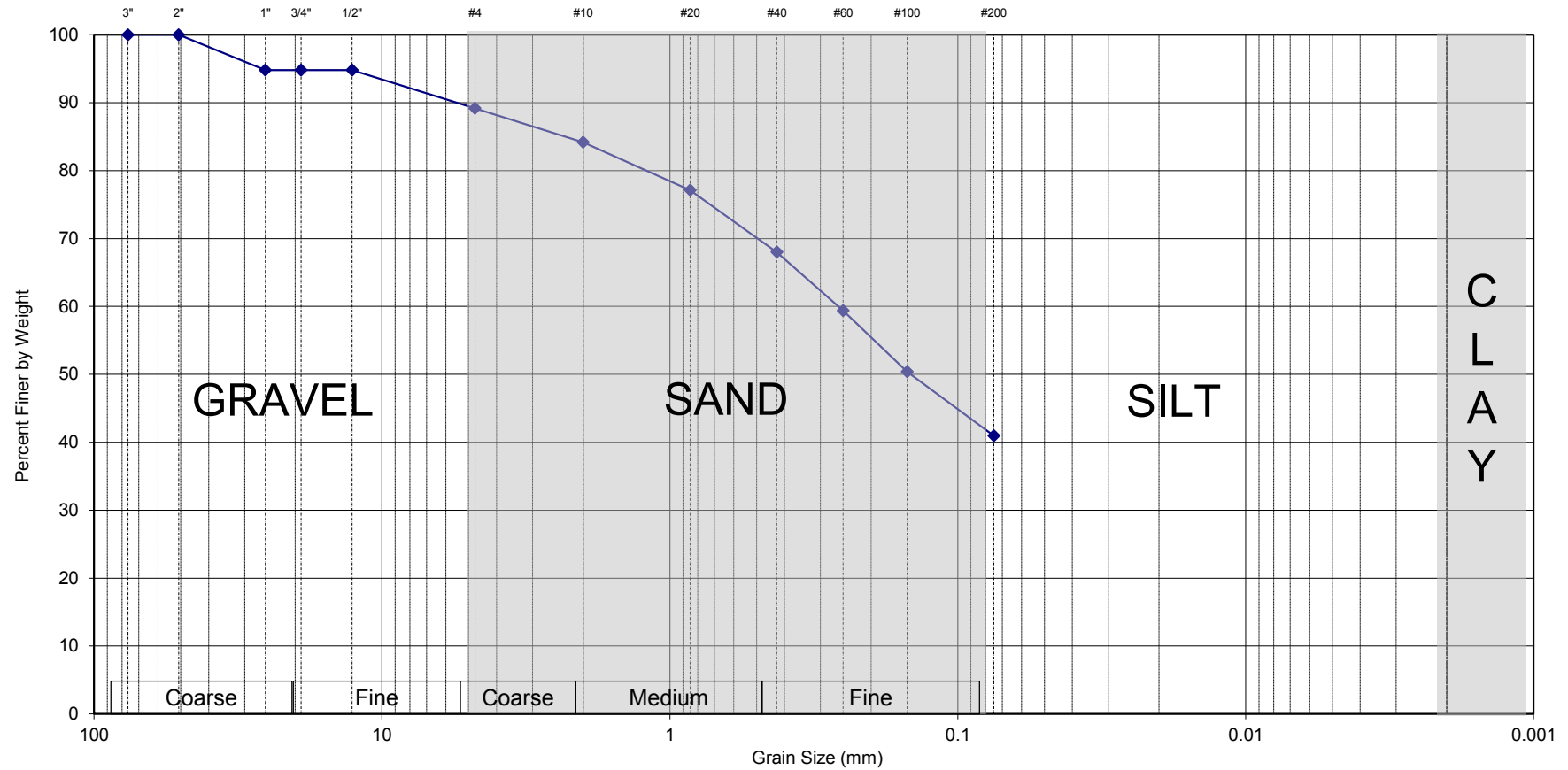
THIELSCH
ENGINEERING

 195 Frances Ave., Cranston, RI 02910
 401-467-6454

 CTS-74-14-0003
 VMS Board Relocation
 Arundel, ME
 GZA File # 09.0025863.00

 Tested by: LM/MS Date: 10/2/14
 Reviewed by: MBP Date: 10/6/14

U.S. STANDARD SIEVE AND HYDROMETER



Gravel
10.8%

Sand
48.2%

Fines
41.0%

Lab #	Exploration	Sample	Depth	Description	WC	LL	PL	PI
7	GZ-1	S-7	12-14'	Brown f-c Sand and SILT, little f-c Gravel (SM)	9.1			

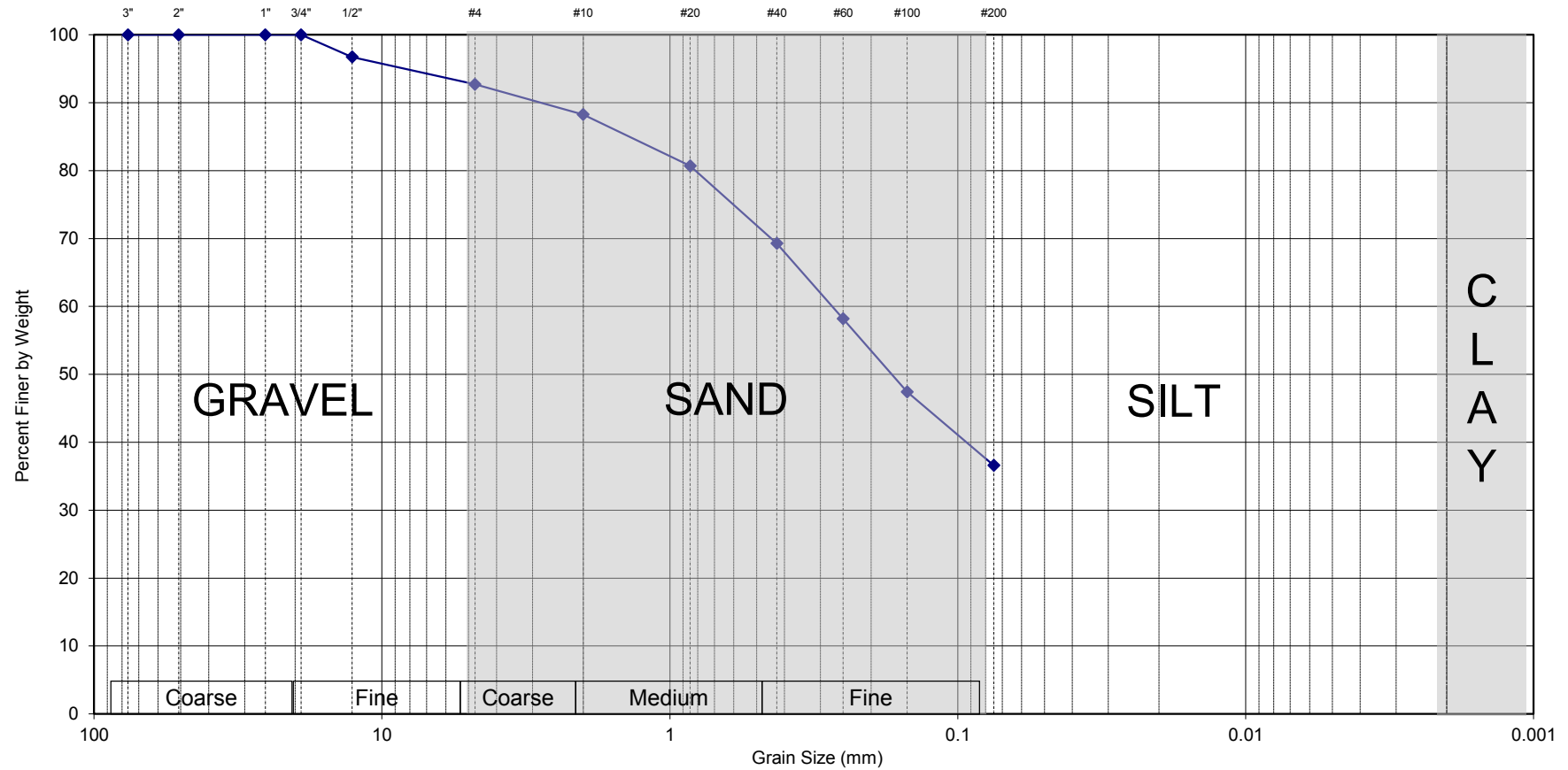
Sieve Size	% Passing
3/4"	94.8
1/2"	94.8
#4	89.2
#10	84.2
#20	77.1
#40	68.0
#60	59.4
#100	50.4
#200	41.0

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CTS-74-14-0003
VMS Board Relocation
Arundel, ME
GZA File # 09.0025863.00
Tested by: LM/MS Date: 10/2/14
Reviewed by: MBP Date: 10/6/14

U.S. STANDARD SIEVE AND HYDROMETER



Gravel
7.3%

Sand
56.1%

Fines
36.6%

Lab #	Exploration	Sample	Depth	Description	WC	LL	PL	PI
8	GZ-2	S-2	2-4'	Gray-brown f-m Sand and SILT, trace Gravel (SM)	8.6			

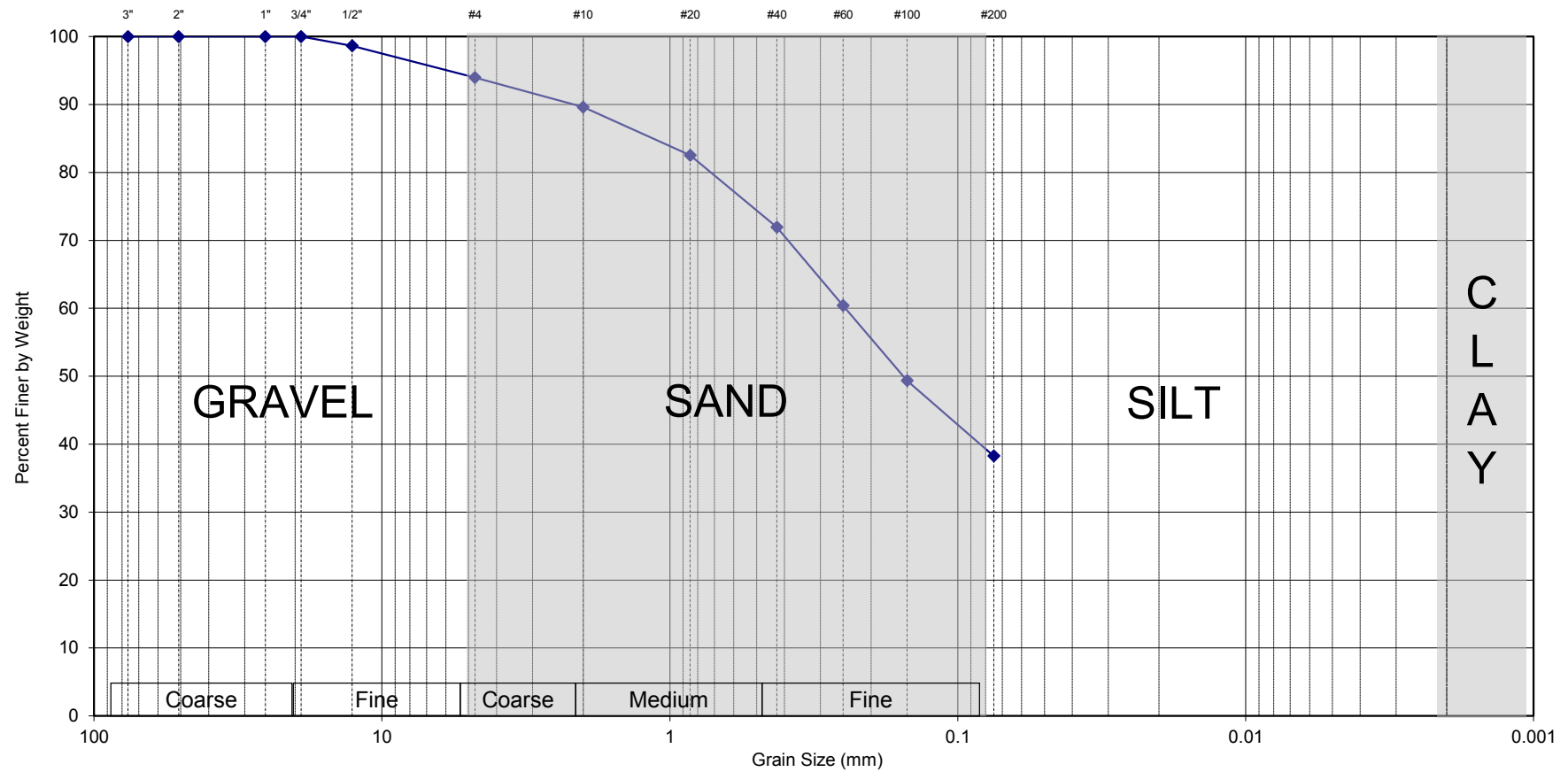
Sieve Size	% Passing
3/4"	100.0
1/2"	96.7
#4	92.7
#10	88.2
#20	80.7
#40	69.3
#60	58.2
#100	47.4
#200	36.6



195 Frances Ave., Cranston, RI 02910
401-467-6454

CTS-74-14-0003
VMS Board Relocation
Arundel, ME
GZA File # 09.0025863.00
Tested by: LM/MS Date: 10/3/14
Reviewed by: MBP Date: 10/6/14

U.S. STANDARD SIEVE AND HYDROMETER



Gravel
6.0%

Sand
55.7%

Fines
38.2%

Lab #	Exploration	Sample	Depth	Description	WC	LL	PL	PI
9	GZ-2	S-4	6-8'	Gray-brown f-m Sand and SILT, trace Gravel (SM)	8.2			

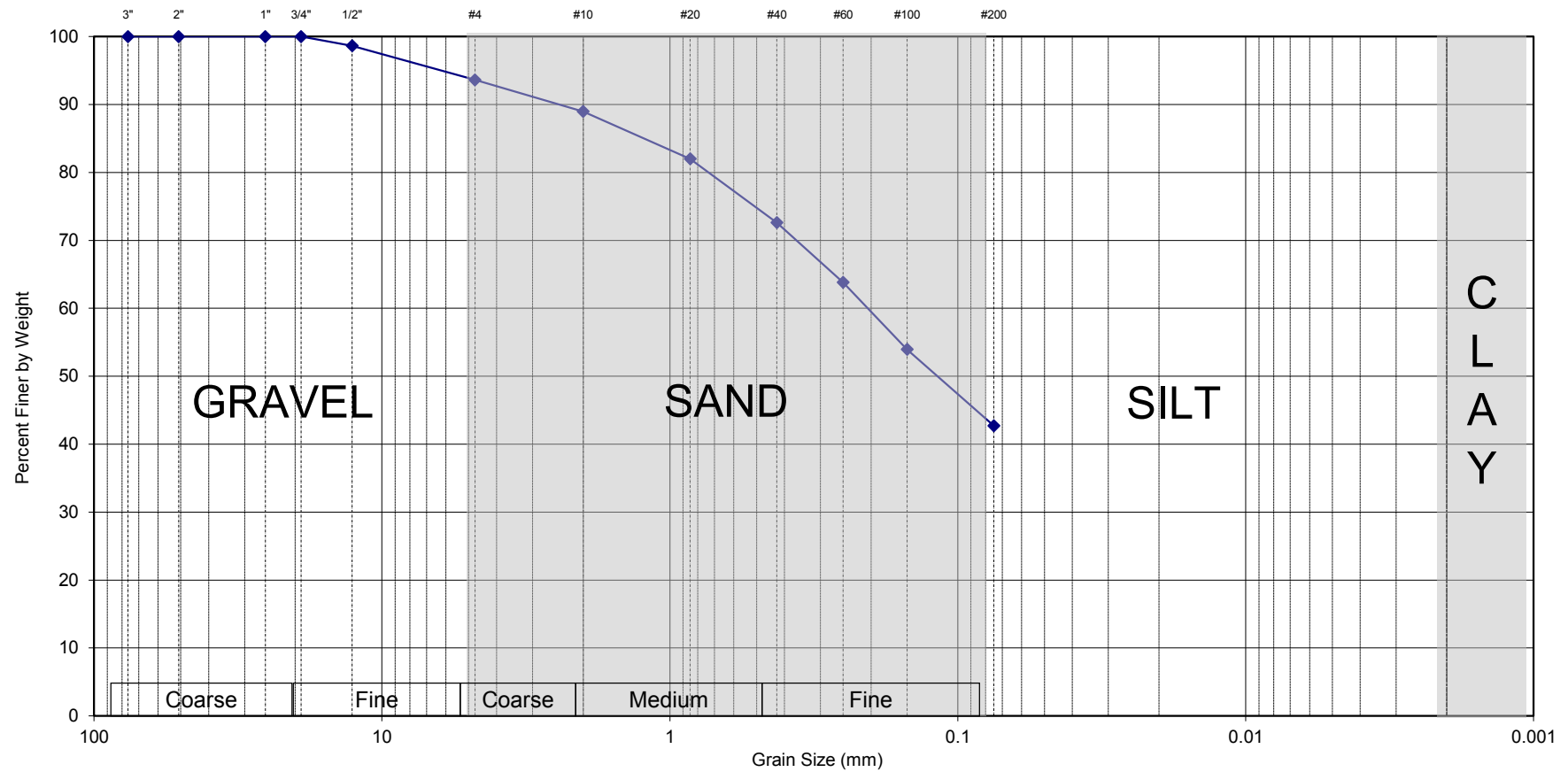
Sieve Size	% Passing
3/4"	100.0
1/2"	98.6
#4	94.0
#10	89.6
#20	82.5
#40	71.9
#60	60.4
#100	49.3
#200	38.2



195 Frances Ave., Cranston, RI 02910
401-467-6454

CTS-74-14-0003
VMS Board Relocation
Arundel, ME
GZA File # 09.0025863.00
Tested by: LM/MS Date: 10/3/14
Reviewed by: MBP Date: 10/6/14

U.S. STANDARD SIEVE AND HYDROMETER



Gravel
6.4%

Sand
50.9%

Fines
42.7%

Lab #	Exploration	Sample	Depth	Description	WC	LL	PL	PI
11	GZ-2	S-6	10-11.7'	Gray-brown f-m Sand and SILT, trace Gravel (SM)	8.0			

Sieve Size	% Passing
3/4"	100.0
1/2"	98.6
#4	93.6
#10	89.0
#20	82.0
#40	72.6
#60	63.8
#100	53.9
#200	42.7

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195 Frances Ave., Cranston, RI 02910
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CTS-74-14-0003
VMS Board Relocation
Arundel, ME
GZA File # 09.0025863.00
Tested by: LM/MS Date: 10/3/14
Reviewed by: MBP Date: 10/6/14

QUANTITY ITEMS AND UNITS			
ITEM NO.	DESCRIPTION	QUANTITY	UNIT
202.195	REMOVING EXISTING BRIDGE (SEE NOTE A)	1	LS
203.25	GRANULAR BORROW	180	CY
203.29	SELECTED GRANULAR MATERIAL	36	CY
206.082	STRUCTURAL EARTH EXCAVATION - MAJOR STRUCTURES **	800	CY
206.10	STRUCTURAL EARTH EXCAVATION - PIERS	215	CY
403.13	DENSE GRADED BITUMINOUS PAVEMENT FOR BRIDGES	160	TON
501.2141	STEEL H-BEAM PILES 53 LBS/FT (SUPPLIED BY AUTHORITY)	12,600	LF
501.231	LOADING TEST (2 EA)	1	LS
502.21	STRUCTURAL CONCRETE ABUTMENTS & RETAINING WALLS	815	CY
502.231	STRUCTURAL CONCRETE PIERS	180	CY
502.261	STRUCTURAL CONCRETE ROADWAY AND PARAPETS ON STEEL BRIDGES (436 CY)*	1	LS
502.311	STRUCTURAL CONCRETE APPROACH SLAB (24 CY)*	1	LS
501.90	PILE TIPS	145	EA
503.12	REINFORCING STEEL, FABRICATED & DELIVERED	67,200	LB.
503.13	REINFORCING STEEL, PLACING	67,200	LB.
503.14	EPOXY COATED REINFORCING STEEL, FABRICATED & DELIVERED	152,200	LB.
503.15	EPOXY COATED REINFORCING STEEL, PLACING	152,200	LB.
504.7021	STRUCTURAL STEEL FABRICATED & DELIVERED, WELDED (18,850 LBS, A36, 321,750 LBS. A572)*	1	LS
504.711	STRUCTURAL STEEL ERECTION (340,600 LBS.)*	1	LS
505.091	STUD WELDED SHEAR CONNECTORS (2,430 EACH)*	1	LS
506.301	SHOP COATING OF STRUCTURAL STEEL	1	LS
506.311	FIELD REPAIR OF DAMAGED COATING	1	LS
507.091	ALUMINUM BRIDGE RAILING, 1 BAR	273	LF
507.092	ALUMINUM BRIDGE RAILING, 2 BAR	273	LF
508.131	MEMBRANE WATERPROOFING (950 SY)	1	LS
511.09	TEMPORARY EARTH SUPPORT SYSTEM	1	LS
512.08	FRENCH DRAIN	211	LF
513.09	SLOPE PROTECTION - PORTLAND CEMENT CONCRETE	360	SY
514.06	CURING BOX FOR CONCRETE CYLINDERS	1	EA
515.20	PROTECTIVE COATING FOR CONCRETE SURFACES	1090	SY
520.21	EXPANSIVE DEVICE - GLAND SEAL	2	EA
523.103	POT BEARING	15	EA
524.40	PROTECTIVE SHIELD	708	SY
607.18	CHAIN LINK FENCE, 9FT.-2 INCH	267	LF
609.132	VERTICAL BRIDGE CURB TYPE 1B	267	LF
609.15	SLOPED BRIDGE CURB	280	LF

- * - QUANTITIES FOR ESTIMATING PURPOSES ONLY.
 ** - EXCAVATION QUANTITY BASED ON EXISTING GROUND ELEVATIONS.

NOTE A


THE FOLLOWING QUANTITIES WERE TAKEN FROM THE CONSTRUCTION DRAWINGS FOR THE INITIAL CONSTRUCTION AND ARE NOT GUARANTEED:
 SUPERSTRUCTURE CONCRETE 130 CY
 SUBSTRUCTURE CONCRETE 530 CY
 STRUCTURAL STEEL 158,000 LBS

INDEX OF DRAWINGS	
SHEET NO	TITLE
LR-S1	GENERAL PLAN AND ELEVATION
LR-S2	INDEX AND QUANTITY ITEMS
LR-S3	BORING PLAN AND LOGS
LR-S4	BORING LOGS
LR-S5	BORING LOGS
LR-S6	BORING LOGS
LR-S7	ELEVATION VIEWS
LR-S8	FOOTING PLAN SOUTH ABUTMENT
LR-S9	SOUTH ABUTMENT PLAN & ELEV.
LR-S10	SOUTH ABUTMENT MAIN STEM REINFORCING
LR-S11	SOUTH ABUTMENT DETAILS
LR-S12	FOOTING PLAN NORTH ABUTMENT
LR-S13	NORTH ABUTMENT PLAN & ELEV.
LR-S14	NORTH ABUTMENT MAIN STEM REINFORCING
LR-S15	NORTH ABUTMENT DETAILS
LR-S16	WINGWALL DETAILS
LR-S17	ABUTMENT END POST DETAILS I
LR-S18	ABUTMENT END POST DETAILS II
LR-S19	PIER
LR-S20	PIER DETAILS
LR-S21	FRAMING PLAN
LR-S22	STRUCTURAL STEEL DETAILS
LR-S23	SLAB PLAN AND DETAILS
LR-S24	TYPICAL SECTION
LR-S25	PARAPET DETAILS
LR-S26	SCUPPER DETAILS
LR-S27	EXPANSION JOINT DETAILS
LR-S28	SLOPE PROTECTION
LR-S29	MISCELLANEOUS DETAILS
LR-S30	BEARING DETAILS
LR-S31	FENCE DETAILS I
LR-S32	FENCE DETAILS II
LR-S33	RAILING DETAILS-1 BAR
LR-S34	RAILING DETAILS-2 BAR
LR-S35	REINFORCING SCHEDULE I
LR-S36	REINFORCING SCHEDULE II
LR-S37	REINFORCING SCHEDULE III
LR-S38	REINFORCING SCHEDULE IV

STANDARD DETAIL SHEETS	
SHEET NO	TITLE
BD 112-89	DIAPHRAGMS & CROSSFRAMES
BD 201-89	2-BAR CONCRETE END POST
BD 302-89	EXPANSION DEVICE - GLAND SEAL
BD 501-89	SUBSTRUCTURE DETAILS
BD 521-89	SUPERSTRUCTURE DETAILS

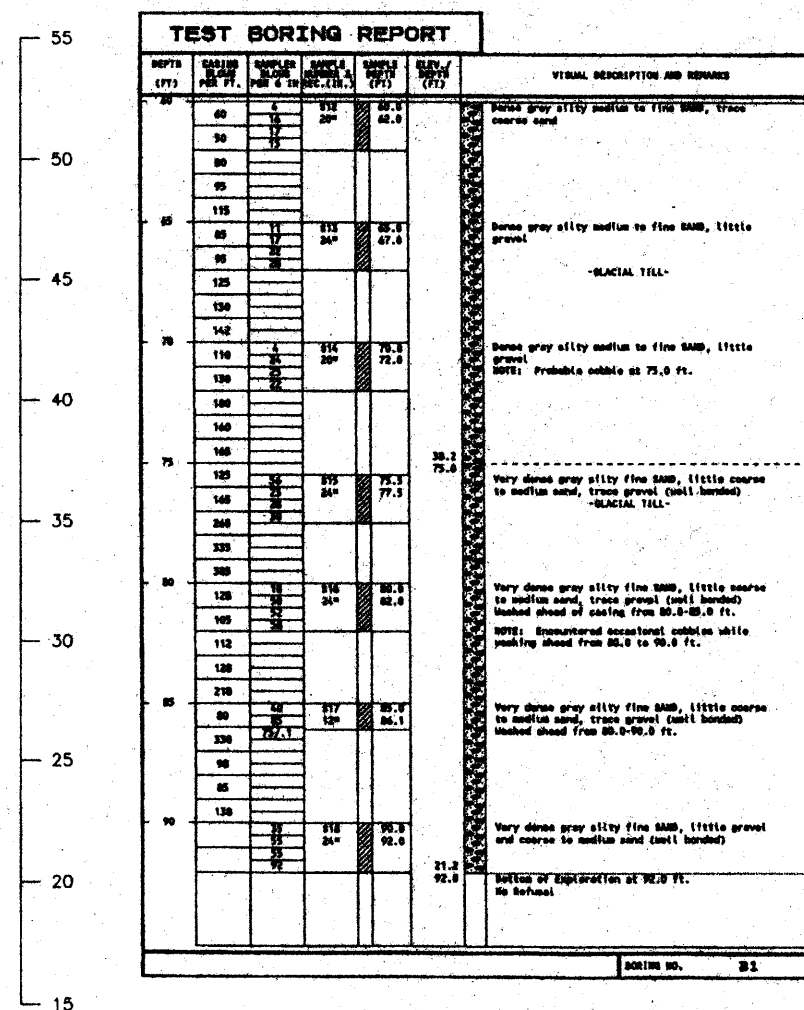
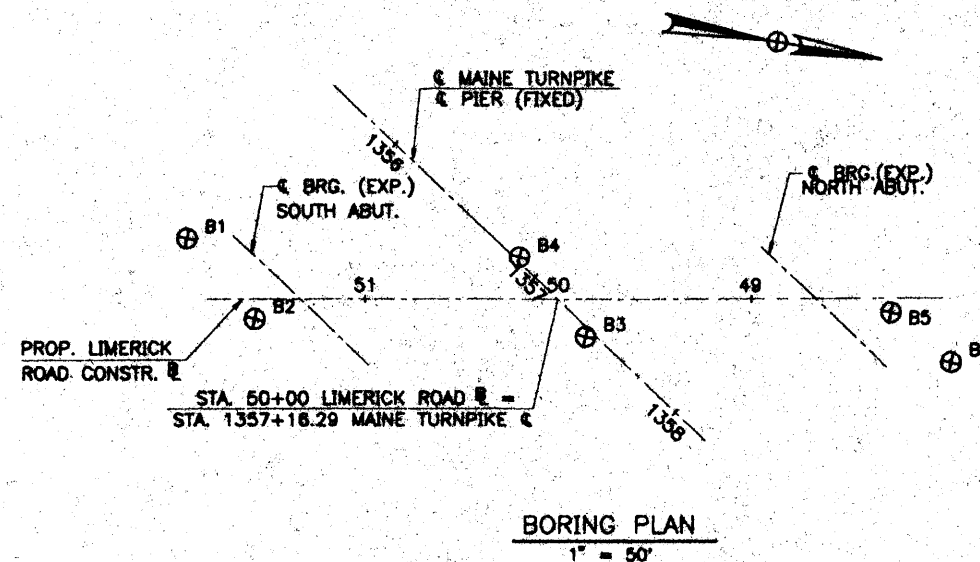
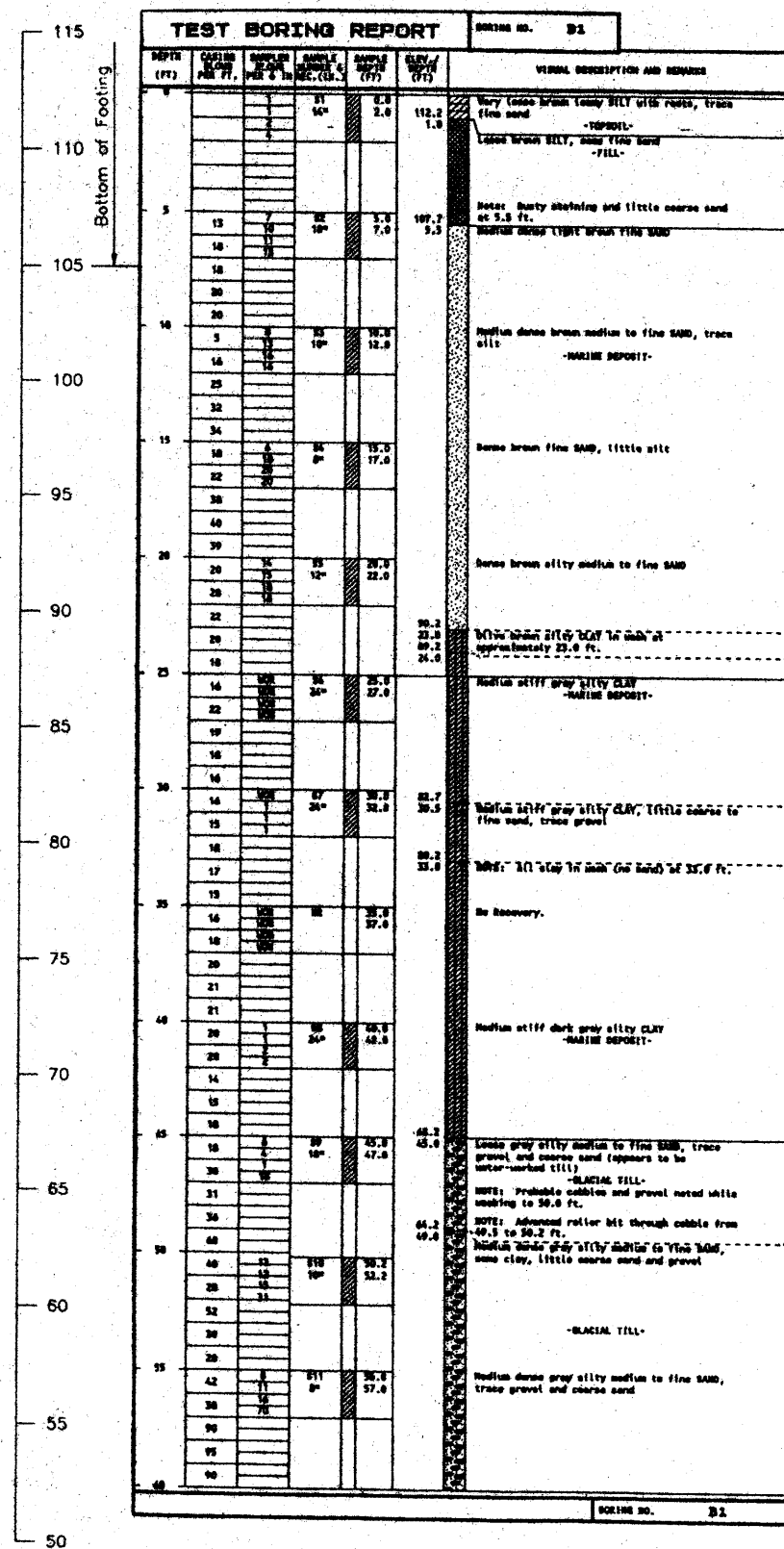
No.	Revision	By	Date	In Charge Of	REL
		Designed	RHW	3/95	
		Drawn	RHW	3/95	
		Checked	JOL	3/95	

Maine
Main



Contract 95.4

Ground Elev. 113.2



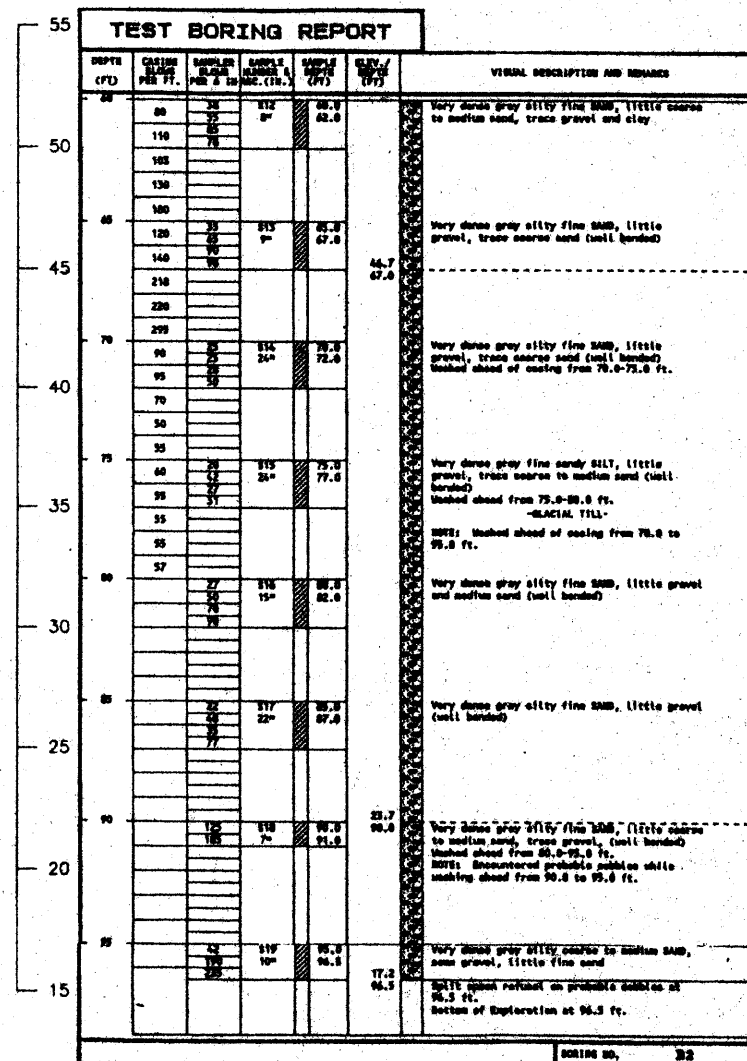
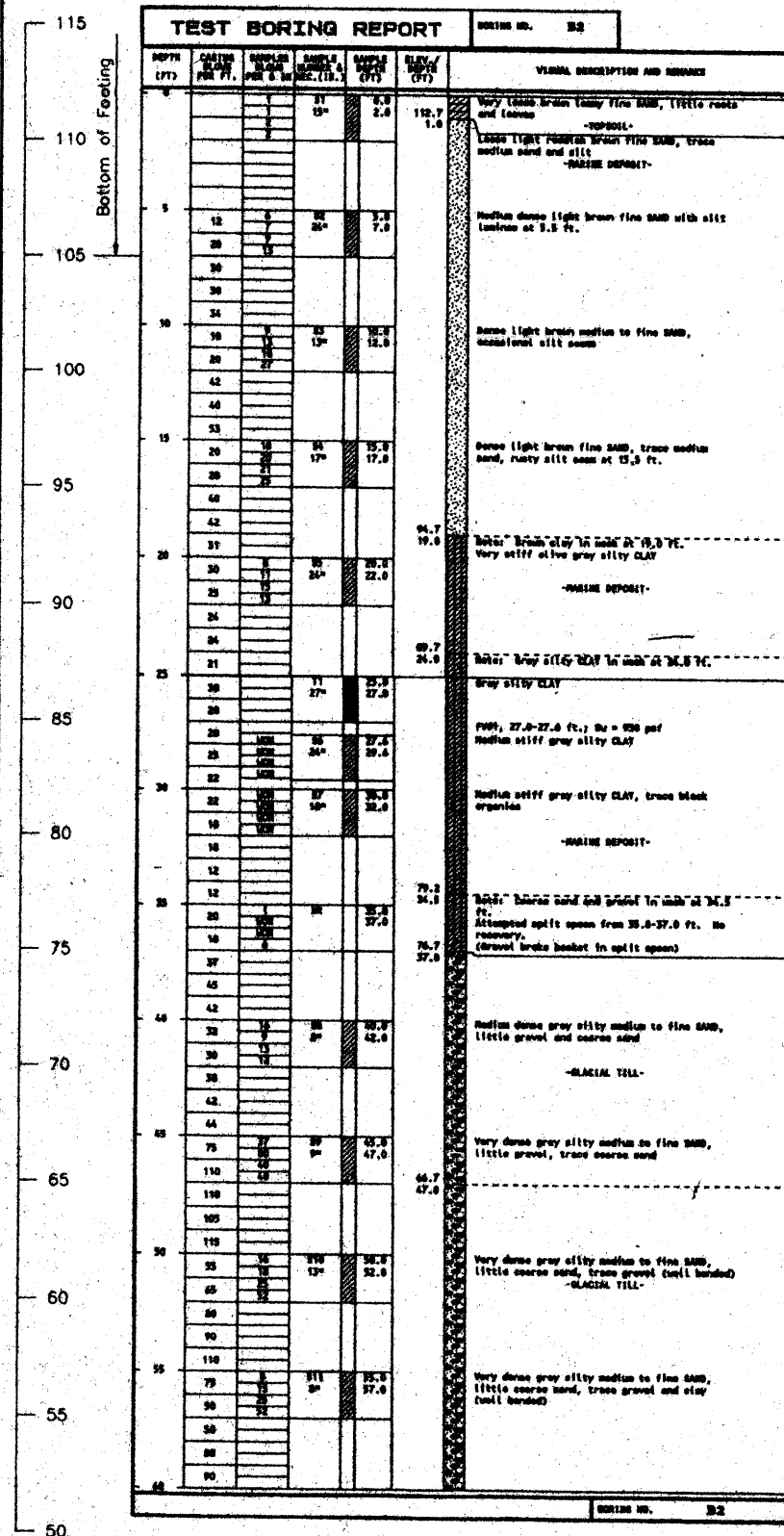
1. SOIL AND ROCK (WHERE ENCOUNTERED) CLASSIFICATION, PROF AND DESCRIPTIONS ARE BASED ON ENGINEERING INTERPRETATION AVAILABLE SUBSURFACE INFORMATION BY THE MAINE TURNPIKE AUTHORITY AND MAY NOT NECESSARILY REFLECT ACTUAL VARIATION IN SUBSURFACE CONDITIONS THAT MAY BE ENCOUNTERED BETWEEN INDIVIDUAL BORING OR SAMPLE LOCATIONS.
2. OBSERVED WATER LEVELS AND/OR WATER CONDITIONS INDICATED AS RECORDED AT THE TIME OF EXPLORATION AND MAY VARY WITH TO THE PREVAILING RAINFALL, METHODS OF EXPLORATION AND FACTORS.
3. SOUND ENGINEERING JUDGEMENT WAS EXERCISED IN PREPARING SUBSURFACE INFORMATION PRESENTED HEREIN. ANALYSIS AND INTERPRETATION OF SUBSURFACE DATA WAS PERFORMED AND FOR AUTHORITY DESIGN AND ESTIMATE PURPOSES ONLY. PRESENCE OF THE INFORMATION OF THE PLANS OR ELSEWHERE IS FOR THE PURPOSE OF PROVIDING INTENDED USERS WITH ACCESS TO THE DATA AVAILABLE TO THE AUTHORITY. THE SUBSURFACE INFORMATION IS PRESENTED IN GOOD FAITH AND IS NOT INTENDED AS A BASIS FOR PERSONAL INVESTIGATION, INDEPENDENT INTERPRETATIONS, INDEPENDENT ANALYSIS OR JUDGEMENT BY THE CONTRACTOR.
4. THE SUBSURFACE EXPLORATIONS SHOWN HEREIN WERE MADE DEC. 19, 1994 AND JAN. 10, 1995 BY THE MAINE TURNPIKE

1. BORINGS ARE TAKEN FOR THE PURPOSE OF DESIGN, AND SHK OF BORING POINTS ONLY, BUT DO NOT NECESSARILY SHOW THE MATERIALS TO BE ENCOUNTERED DURING CONSTRUCTION.
2. MEAN SEA LEVEL DATUM (NGVD 1929) IS USED THROUGHOUT.
3. ALL BORINGS TAKEN BY MAINE TEST BORINGS, INC.

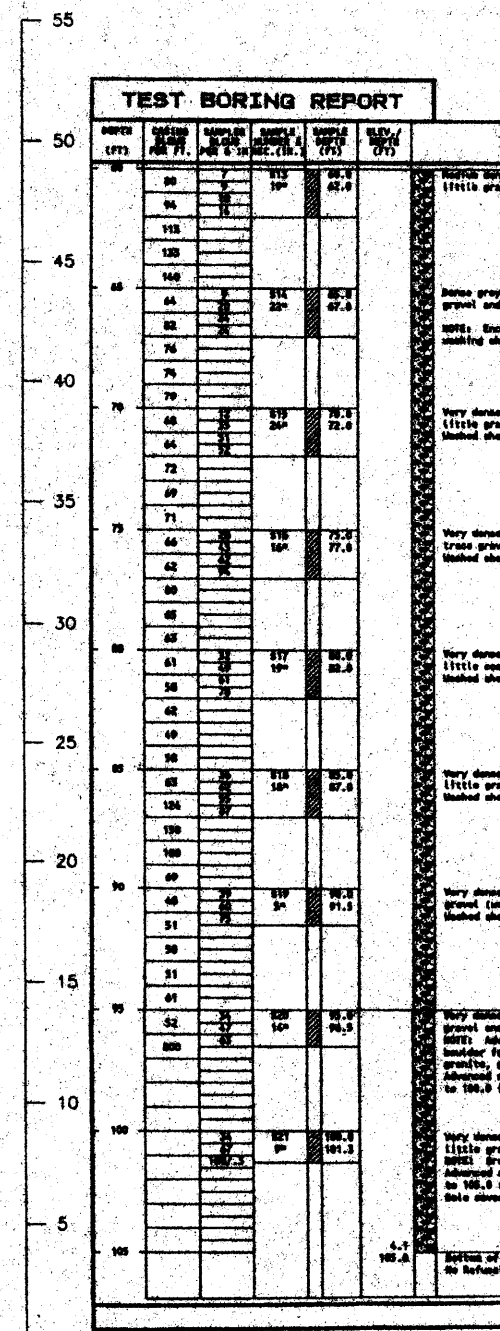
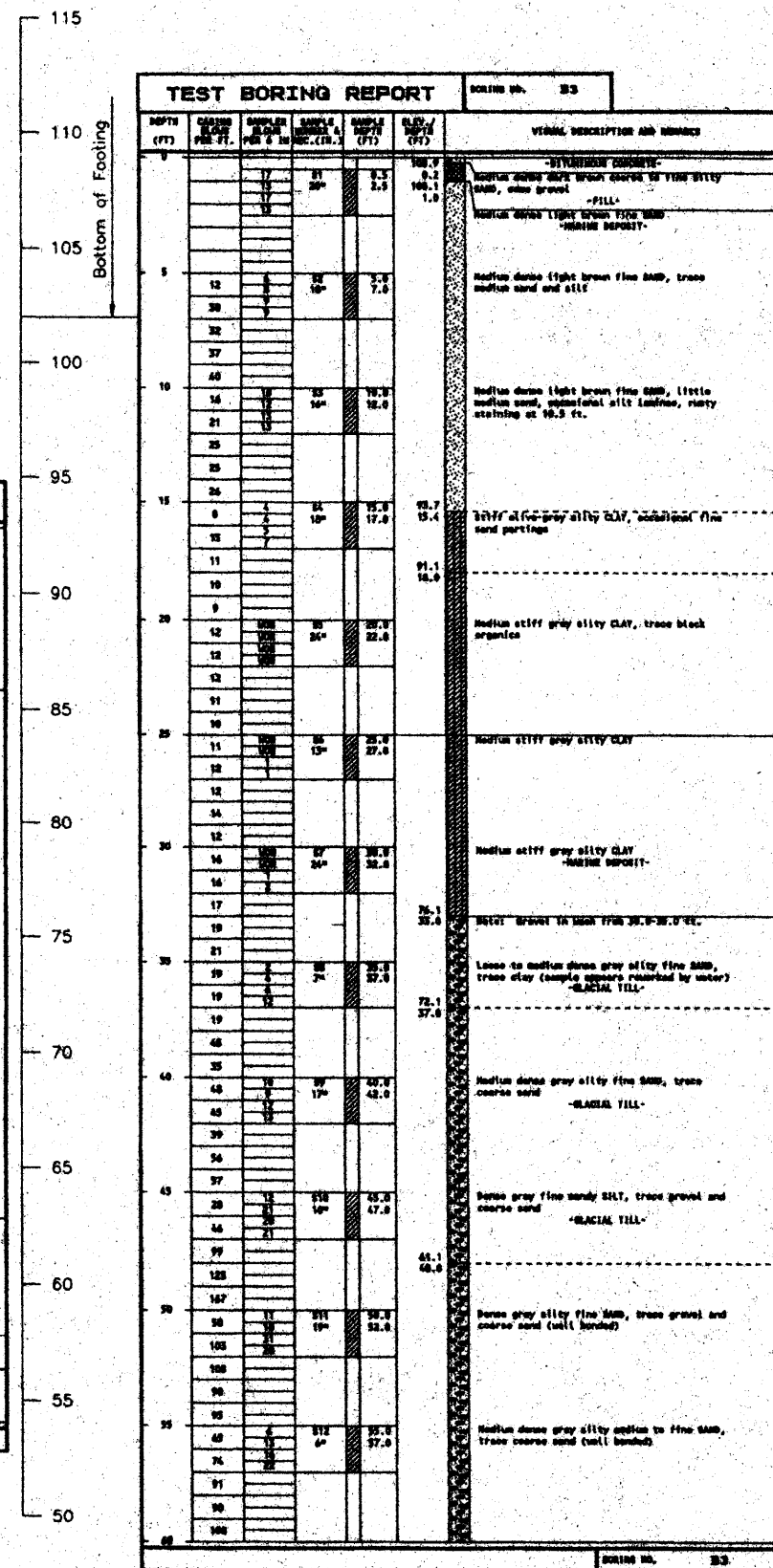
BORING LOCATIONS		
BORING NO.	STATION	OFFSET
B1	1355+56	110' RT.
B2	1356+10	118' RT.
B3	1357+40	4' RT.
B4	1358+87	2' LT.
B5	1358+46	114' LT.
B6	1358+86	117' LT.

						By	Date
					Designed	RHW	3/9
					Drawn	RHW	3/9
					Checked	JOL	3/9
No.	Revision	By	Date	In Charge Of			

Ground Elev. 113.7



Ground Elev. 109.1



Main
Main



HNTB

Contract 95.4

1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2588, 2589, 2590, 2591, 2592, 2593, 2594, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2609, 2610, 2611, 2612, 2613, 2614, 2615, 2616, 2617, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2625, 2626, 2627, 2628, 2629, 2630, 2631, 2632, 2633, 2634, 2635, 2636, 2637, 2638, 2639, 2640, 2641, 2642, 2643, 2644, 2645, 2646, 2647, 2648, 2649, 2650, 2651, 2652, 2653, 2654, 2655, 2656, 2657, 2658, 2659, 2660, 2661, 2662, 2663, 2664, 2665, 2666, 2667, 2668, 2669, 2670, 2671, 2672, 2673, 2674, 2675, 2676, 2677, 2678, 2679, 2680, 26

B-4

Ground Elev. 108.0

TEST BORING REPORT

BORING NO. B-4

DEPTH (FT)	LOG NO.	LOG PAGE	LOG DATE	LOG TIME	LOG BY	LOG REMARKS
115						
110						
105						
100						
95						
90						
85						
80						
75						
70						
65						
60						
55						
50						

TEST BORING REPORT

DEPTH (FT)	LOG NO.	LOG PAGE	LOG DATE	LOG TIME	LOG BY	LOG REMARKS
55						
50						
45						
40						
35						
30						
25						
20						
15						
10						
5						
0						
-5						
-10						
-15						

B-5

Ground Elev. 108.9

TEST BORING REPORT

BORING NO. B-5

DEPTH (FT)	LOG NO.	LOG PAGE	LOG DATE	LOG TIME	LOG BY	LOG REMARKS
115						
110						
105						
100						
95						
90						
85						
80						
75						
70						
65						
60						
55						
50						

TEST BORING REPORT

DEPTH (FT)	LOG NO.	LOG PAGE	LOG DATE	LOG TIME	LOG BY	LOG REMARKS
55						
50						
45						
40						
35						
30						
25						
20						
15						
10						
5						
0						

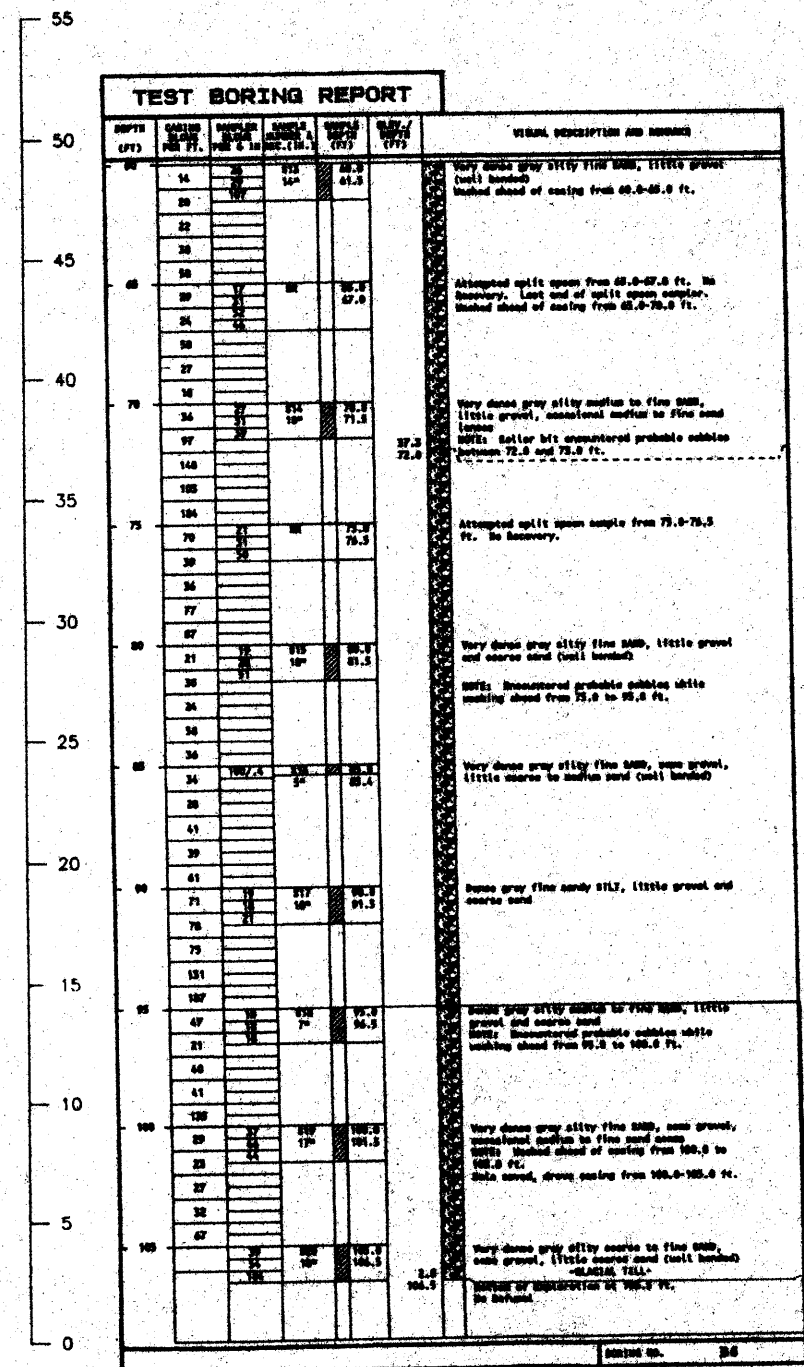
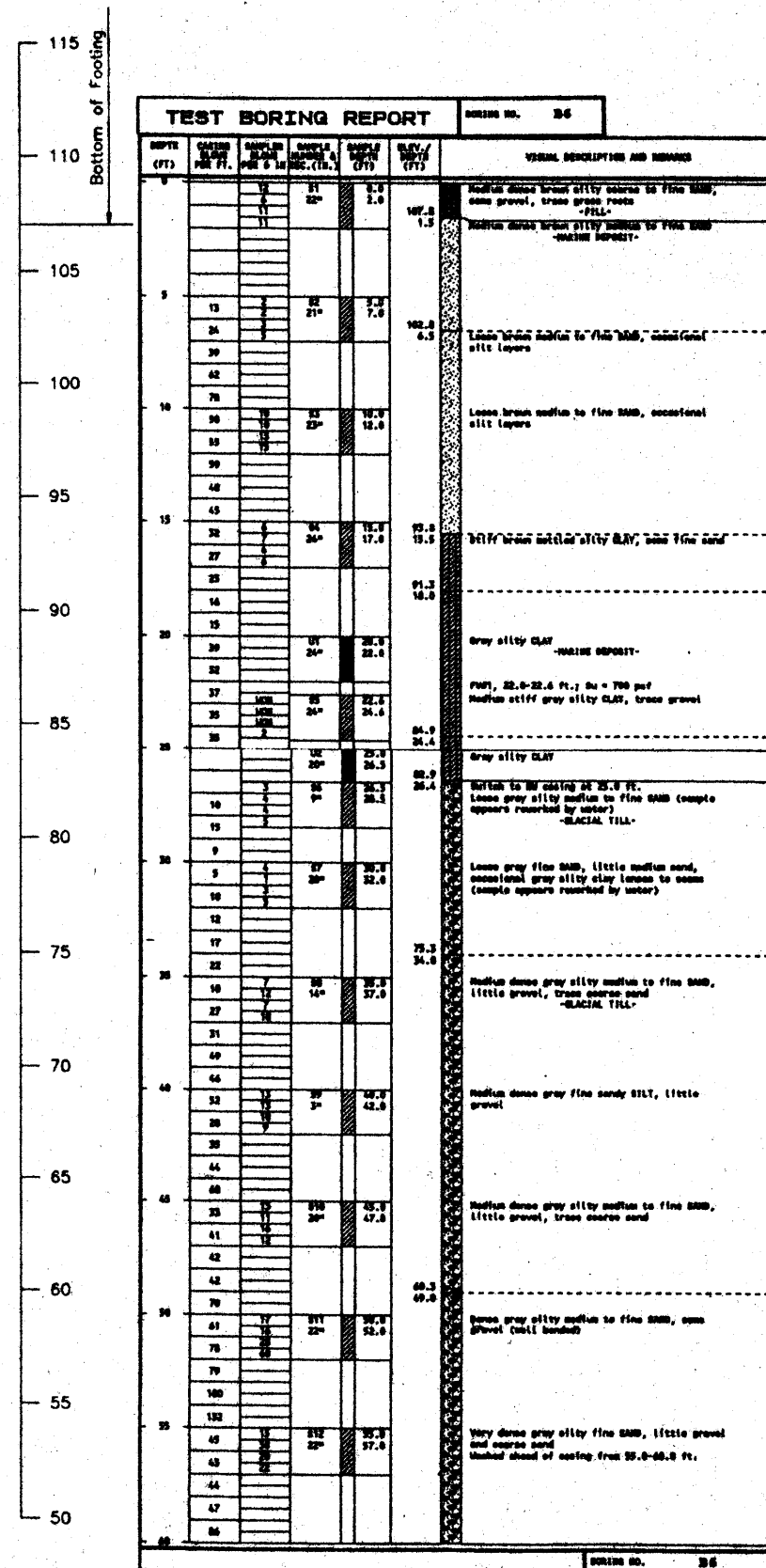
Maine
Maine

MaineDOT

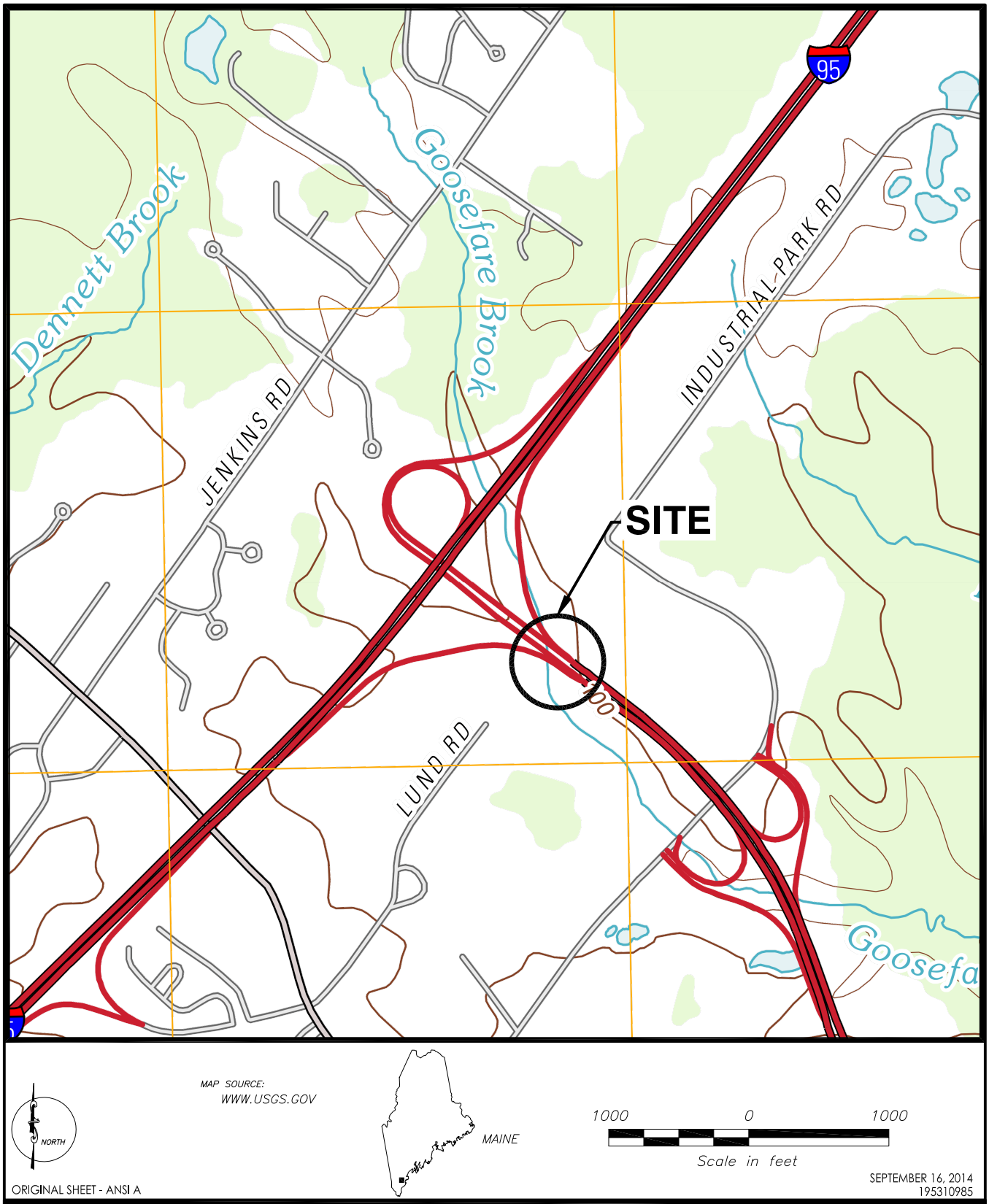
Contract 95.4

By	Date
Designed	REV 3/96
Drawn	REV 3/96
Checked	JUL 3/96
By	Date
In Charge Of	

B-6
Ground Elev. 109.3



Z:\Sacco Toll Booth\Sacco Toll Booth Figure 1 Figure 2.dwg



Stantec Consulting Services Inc.
5 Dartmouth Drive, Suite 101
Auburn NH 03032 U.S.A.
Tel. 603.669.8672

Client/Project

MAINE TURNPIKE AUTHORITY
INTERCHANGE 36, SACCO TOLL PLAZA
SACO, MAINE

Figure No.

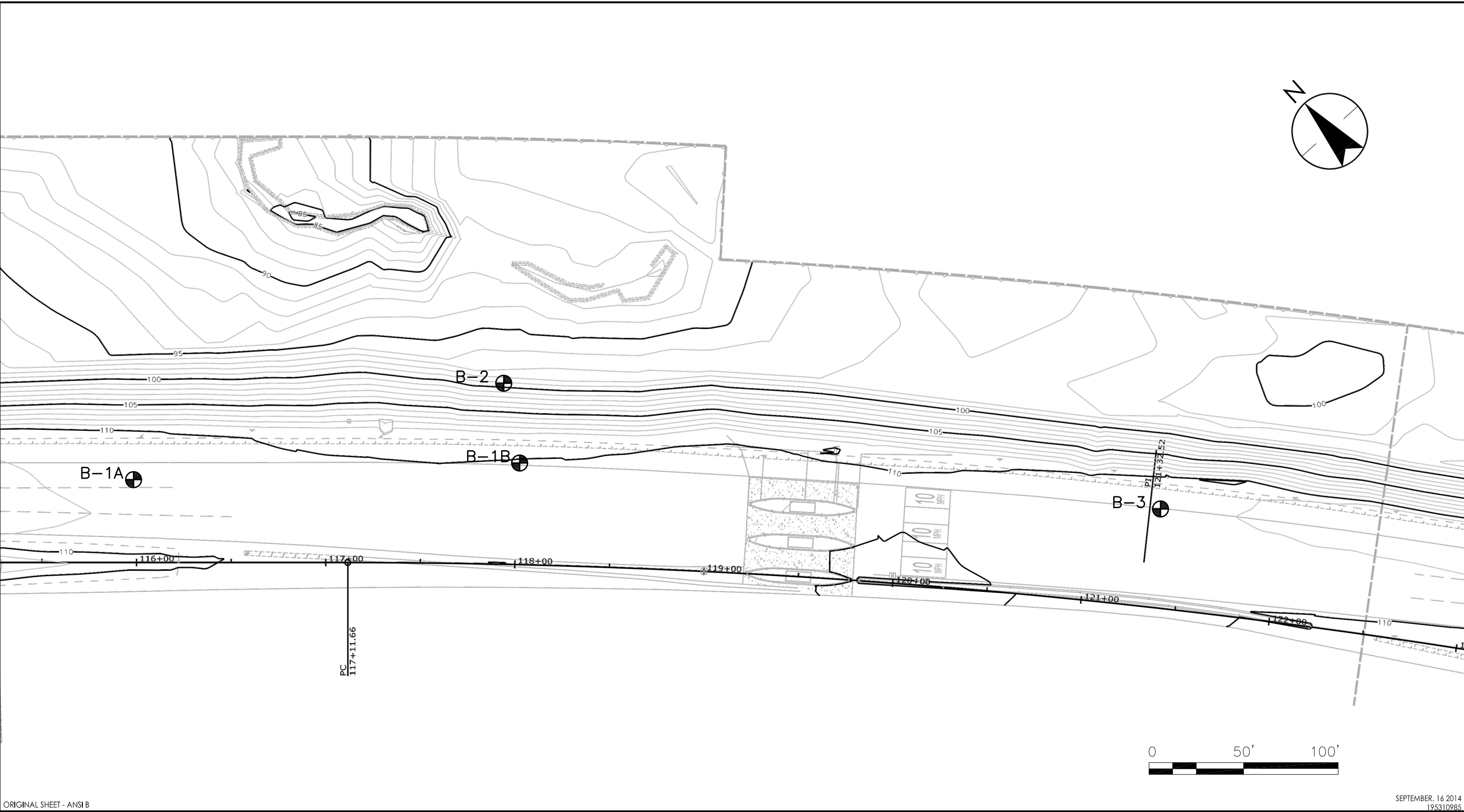
1.0

Title

SITE LOCATION MAP

SEPTEMBER 16, 2014
195310985

Z:\Sacco Toll Booth\Saco Toll Booth Figure 1 Figure 2.dwg
2014/09/16 10:11 AM By: Gradeski, Andrew



ORIGINAL SHEET - ANSI B

SEPTEMBER, 16 2014
195310985



Stantec Consulting Services Inc.
5 Dartmouth Drive, Suite 101
Auburn NH 03032 U.S.A.
Tel. 603.669.8672

Legend

B-1A  = BORE HOLE LOCATION

Notes

1. TEST BORINGS WERE DRILLED BY NEW ENGLAND BORING OF DERRY, NH DURING THE PERIOD FROM AUGUST 18 THROUGH AUGUST 20, 2014 UNDER THE DIRECTION OF STANTEC PERSONNEL
2. BORING LOCATIONS WERE DETERMINED BY STANTEC PERSONNEL BY TAPING FROM EXISTING STRUCTURES

Client/Project

MAINE TURNPIKE AUTHORITY
INTERCHANGE 36, SACO TOLL PLAZA
SACO, MAINE

Figure No.

2.0

Title

BORING LOCATION PLAN



BOREHOLE LOG

B-1B

CLIENT Maine Turnpike AuthorityPROJECT No. 195310985LOCATION Interchange 36, Saco Toll Plaza Lane Addition, Saco, MaineEXPLORATION No. B-1BEXPLORATION DATE 8/18/2014 to 8/19/2014 WATER LEVEL 19.8 ft - 8/19, 22.5 ft - 8/20

DATUM _____

DEPTH (ft)	ELEVATION (ft)	MATERIAL DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES					PID Reading (PPM)	Undrained Shear Strength - tsf			
					TYPE	NUMBER	RECOVERY	SPT blows / 6"	SPT N-Value		1	2	3	4
0	110.0							in.			Water Content & Atterberg Limits			
	109.8	Pavement - 3 inches									W _p W W _L			
	109.5	Dense, brown, coarse to fine SAND, little gravel, trace silt, (dry)			SS	1	16	11 18 24 19	42		Dynamic Penetration Test, blows/foot ★			
	107.5	S-2A: Dense, brown, coarse to fine SAND, little gravel, trace silt, (moist)			SS	2	18	19 20 27 50	47		Standard Penetration Test, blows/foot ●			
	107.0	S-2B: Medium to fine SAND, trace silt (moist)									10	20	30	40
	106.0	S-2C: Grey, medium to fine SAND and silt									50	60	70	80
	105.5	-FILL-									90			
5														
	101.0	Medium dense, brown, medium to fine SAND, little silt (moist)			SS	3	14	6 6 18 20	24					
10	99.0													
	96.0	Very dense, grey to brown, fine SAND, little silt (moist/wet)			SS	4	16	21 25 38 45	63					
15	94.0	-FILL-												
	91.0	Very dense, brown, fine SAND, trace silt (wet)						18 26						
20														

Driller: New England Boring Contractors; Supervisor: Trey Dykstra/David Chapman
 Rig Type: Truck Mobile B-53
 Hammer Type: 140# Safety 30" drop, 2" Split Spoon, 4" Casing

△ Unconfined Compression Test
 □ Field Vane Test ■ Remolded
 ✕ Pocket Penetrometer / Torvane
 Continued Next Page

CLIENT Maine Turnpike Authority
 LOCATION Interchange 36, Saco Toll Plaza Lane Addition, Saco, Maine
 EXPLORATION DATE 8/18/2014 to 8/19/2014 WATER LEVEL 19.8 ft - 8/19, 22.5 ft - 8/20

PROJECT No. 195310985
 EXPLORATION No. B-1B
 DATUM _____

DEPTH (ft)	ELEVATION (ft)	MATERIAL DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES					PID Reading (PPM)	Undrained Shear Strength - tsf																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
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BOREHOLE LOG

B-1B

CLIENT Maine Turnpike AuthorityPROJECT No. 195310985LOCATION Interchange 36, Saco Toll Plaza Lane Addition, Saco, MaineEXPLORATION No. B-1BEXPLORATION DATE 8/18/2014 to 8/19/2014 WATER LEVEL 19.8 ft - 8/19, 22.5 ft - 8/20

DATUM _____

DEPTH (ft)	ELEVATION (ft)	MATERIAL DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES					PID Reading (PPM)	Undrained Shear Strength - tsf																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
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40	69.0	Very soft, olive grey, silty CLAY (wet) TV = 2.0 - 2.5 tsf -CLAY DEPOSIT-			SS	8	24	WOH/6"																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	



BOREHOLE LOG

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CLIENT Maine Turnpike AuthorityPROJECT No. 195310985LOCATION Interchange 36, Saco Toll Plaza Lane Addition, Saco, MaineEXPLORATION No. B-1BEXPLORATION DATE 8/18/2014 to 8/19/2014WATER LEVEL 19.8 ft - 8/19, 22.5 ft - 8/20

DATUM _____

DEPTH (ft)	ELEVATION (ft)	MATERIAL DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES					PID Reading (PPM)	Undrained Shear Strength - tsf																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
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Driller: New England Boring Contractors; Supervisor: Trey Dykstra/David Chapman
 Rig Type: Truck Mobile B-53
 Hammer Type: 140# Safety 30" drop, 2" Split Spoon, 4" Casing

△ Unconfined Compression Test
 □ Field Vane Test ■ Remolded
 ✕ Pocket Penetrometer / Torvane
 Continued Next Page



BOREHOLE LOG

B-1B

CLIENT Maine Turnpike AuthorityPROJECT No. 195310985LOCATION Interchange 36, Saco Toll Plaza Lane Addition, Saco, MaineEXPLORATION No. B-1BEXPLORATION DATE 8/18/2014 to 8/19/2014 WATER LEVEL 19.8 ft - 8/19, 22.5 ft - 8/20

DATUM _____

DEPTH (ft)	ELEVATION (ft)	MATERIAL DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES					PID Reading (PPM)	Undrained Shear Strength - tsf								
					TYPE	NUMBER	RECOVERY	SPT blows / 6"	SPT N-Value		1	2	3	4					
80								in.			Water Content & Atterberg Limits W_p W W_L Dynamic Penetration Test, blows/foot ★ Standard Penetration Test, blows/foot ●								
85	26.0	Very soft, grey silty CLAY (wet) TV = 0.5 tsf			SS	16	24	WOR/24"			10	20	30	40	50	60	70	80	90
	24.0	-CLAY DEPOSIT-																	
95	16.0	Very soft, grey silty CLAY (wet) TV = 0.5 tsf			SS	17	24	WOR/24"											
	14.0																		
100																			

Driller: New England Boring Contractors; Supervisor: Trey Dykstra/David Chapman
 Rig Type: Truck Mobile B-53
 Hammer Type: 140# Safety 30" drop, 2" Split Spoon, 4" Casing

△ Unconfined Compression Test
 □ Field Vane Test ■ Remolded
 ✕ Pocket Penetrometer / Torvane
 Continued Next Page

CLIENT **Maine Turnpike Authority**

PROJECT No. 195310985

LOCATION Interchange 36, Saco Toll Plaza Lane Addition, Saco, Maine

EXPLORATION No. B-1B

EXPLORATION DATE 8/18/2014 to 8/19/2014 WATER LEVEL 19.8 ft - 8/19, 22.5 ft - 8/20

DATUM _____

DEPTH (ft)	ELEVATION (ft)	MATERIAL DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES					PID Reading (PPM)	Undrained Shear Strength - tsf										
					TYPE	NUMBER	RECOVERY	SPT blows / 6"	SPT N-Value		1	2	3	4							
											Water Content & Atterberg Limits W _P W W _L										
											Dynamic Penetration Test, blows/foot ★										
											Standard Penetration Test, blows/foot ●										
											10	20	30	40	50	60	70	80	90		
-100-							in.														
	6.0	Very soft, grey silty CLAY (wet) TV = 0.5 tsf																			
-105-	4.0	-CLAY DEPOSIT-			SS	18	24 WOR/24"														
-110-																					
	-4.0	Very soft, grey silty CLAY (wet) TV = 0.5 tsf																			
-115-					SS	19	24 WOR/24"														
	-6.0																				
-120-																					
Driller: New England Boring Contractors; Supervisor: Trey Dykstra/David Chapman Rig Type: Truck Mobile B-53 Hammer Type: 140# Safety 30" drop, 2" Split Spoon, 4" Casing											△ Unconfined Compression Test □ Field Vane Test ■ Remolded ✕ Pocket Penetrometer / Torvane Continued Next Page										

CLIENT Maine Turnpike Authority

PROJECT No. 195310985

LOCATION Interchange 36, Saco Toll Plaza Lane Addition, Saco, Maine

EXPLORATION No. B-2

EXPLORATION DATE 8/18/2014 to 8/18/2014

WATER LEVEL 7 ft

DATUM _____

DEPTH (ft)	ELEVATION (ft)	MATERIAL DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES					PID Reading (PPM)	Undrained Shear Strength - tsf																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
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Driller: New England Boring Contractors; Supervisor: David Chapman
Rig Type: Track-mounted Mobile B-53
Hammer Type: 140# Safety 30" drop, 2" Split Spoon, 4" Casing

△ Unconfined Compression Test
□ Field Vane Test ■ Remolded
✕ Pocket Penetrometer / Torvane
Continued Next Page

CLIENT Maine Turnpike Authority

PROJECT No. 195310985

LOCATION Interchange 36, Saco Toll Plaza Lane Addition, Saco, Maine

EXPLORATION No. B-3

EXPLORATION DATE 8/19/2014 to 8/20/2014

WATER LEVEL 23 ft

DATUM _____

DEPTH (ft)	ELEVATION (ft)	MATERIAL DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES					PID Reading (PPM)	Undrained Shear Strength - tsf																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
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CLIENT Maine Turnpike Authority
 LOCATION Interchange 36, Saco Toll Plaza Lane Addition, Saco, Maine
 EXPLORATION DATE 8/19/2014 to 8/20/2014 WATER LEVEL 23 ft

PROJECT No. 195310985
 EXPLORATION No. B-3
 DATUM _____

DEPTH (ft)	ELEVATION (ft)	MATERIAL DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES					PID Reading (PPM)	Undrained Shear Strength - tsf			
					TYPE	NUMBER	RECOVERY	SPT blows / 6"	SPT N-Value		1	2	3	4
								in.			Water Content & Atterberg Limits W_p W W_L Dynamic Penetration Test, blows/foot ★ Standard Penetration Test, blows/foot ●			
20											10	20	30	40
	89.5				SS	5	24	6	11					
								7						
	86.5													
		Very soft, pale olive silty CLAY (wet) TV = 1.0 tsf												
25					SS	6	6	1/12"						
	84.5							WOH/12"						
		-CLAY DEPOSIT-												
	81.5													
		S-7A: Very soft, greenish grey, silty CLAY (wet) TV = 0.5 tsf												
30	80.5				SS	7	12	3	8					
		S-7B: 4" layer of greenish gray, fine SAND, some silt (wet)						5						
	79.5							1						
	76.5													
		Pushed Shelby Tube from 34 to 36 feet.												
35					U	1	23							
	74.5													
	71.5													
		Very soft, dark green gray, silty CLAY (wet) TV = 0.5-1.0 tsf												
40														

Driller: New England Boring Contractors; Supervisor: David Chapman
 Rig Type: Truck Mobile B-53
 Hammer Type: 140# Safety 30" drop, 2" Split Spoon, 4" Casing

△ Unconfined Compression Test
 □ Field Vane Test ■ Remolded
 ✕ Pocket Penetrometer / Torvane
 Continued Next Page

CLIENT Maine Turnpike Authority

PROJECT No. 195310985

LOCATION Interchange 36, Saco Toll Plaza Lane Addition, Saco, Maine

EXPLORATION No. B-3

EXPLORATION DATE 8/19/2014 to 8/20/2014 WATER LEVEL 23 ft

DATUM _____

DEPTH (ft)	ELEVATION (ft)	MATERIAL DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES					PID Reading (PPM)	Undrained Shear Strength - tsf																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
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Driller: New England Boring Contractors; Supervisor: David Chapman
 Rig Type: Truck Mobile B-53
 Hammer Type: 140# Safety 30" drop, 2" Split Spoon, 4" Casing

△ Unconfined Compression Test
 □ Field Vane Test ■ Remolded
 ✕ Pocket Penetrometer / Torvane
 Continued Next Page

CLIENT Maine Turnpike Authority

PROJECT No. 195310985

LOCATION Interchange 36, Saco Toll Plaza Lane Addition, Saco, Maine

EXPLORATION No. B-3

EXPLORATION DATE 8/19/2014 to 8/20/2014

WATER LEVEL 23 ft

DATUM _____

DEPTH (ft)	ELEVATION (ft)	MATERIAL DESCRIPTION	STRATA PLOT	WATER LEVEL	SAMPLES					PID Reading (PPM)	Undrained Shear Strength - tsf																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
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Driller: New England Boring Contractors; Supervisor: David Chapman
 Rig Type: Truck Mobile B-53
 Hammer Type: 140# Safety 30" drop, 2" Split Spoon, 4" Casing

△ Unconfined Compression Test
 □ Field Vane Test ■ Remolded
 ✕ Pocket Penetrometer / Torvane



Client:	Stantec Consulting Services		
Project:	Saco Toll Plaza		
Location:	Saco, ME	Project No:	GTX-302234
Boring ID:	---	Sample Type:	---
Sample ID:	---	Test Date:	09/02/14
Depth :	---	Test Id:	306412
		Tested By:	jek
		Checked By:	jdt

Moisture Content of Soil and Rock - ASTM D2216

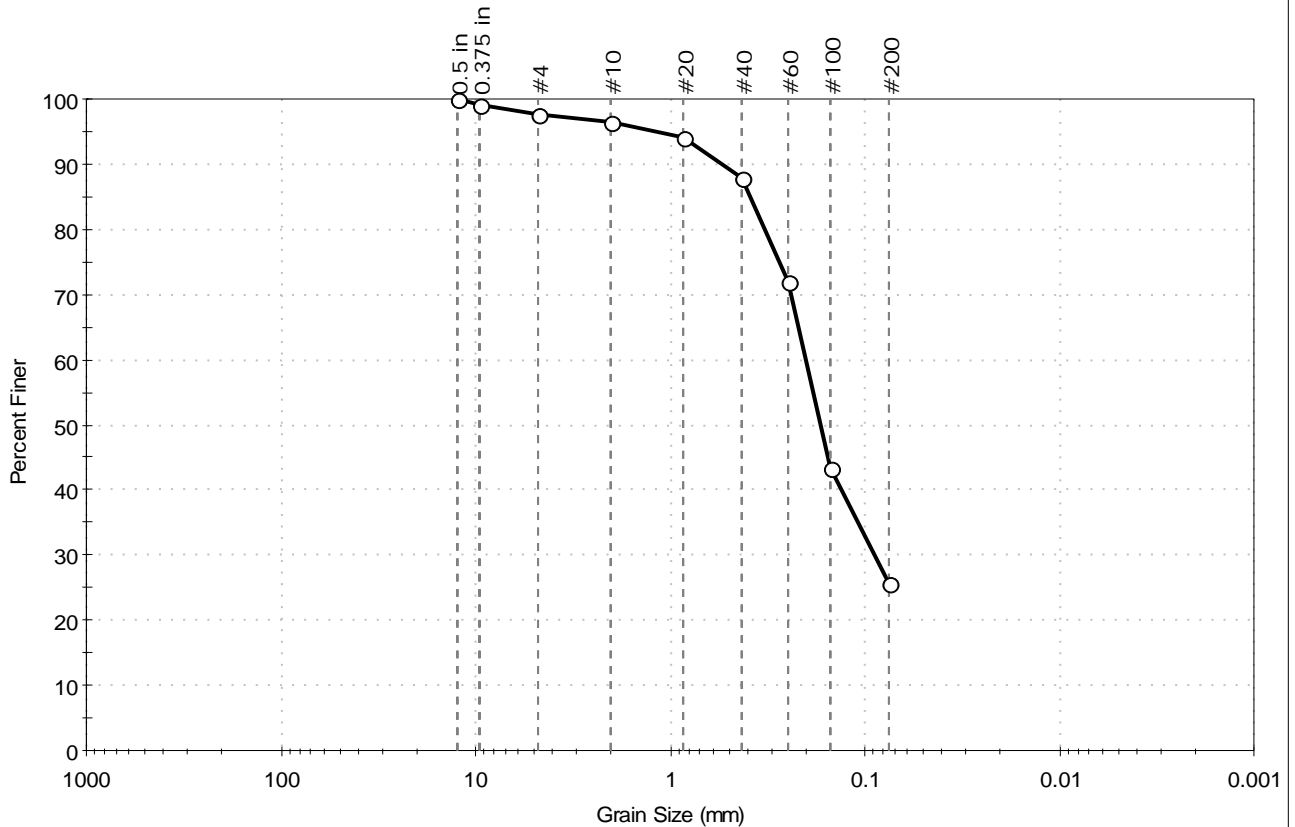
Boring ID	Sample ID	Depth	Description	Moisture Content, %
B-1B	S- 3	9-11 ft	Moist, olive brown silty sand	10.0
B-1B	S- 4	14-16 ft	Moist, olive silty sand	14.3
B-3	S- 3	9-11 ft	Moist, olive silty sand	13.2
B-3	S- 4	14-16 ft	Moist, olive sandy clay	22.1

Notes: Temperature of Drying : 110° Celsius



Client: Stantec Consulting Services	Project No: GTX-302234
Project: Saco Toll Plaza	
Location: Saco, ME	
Boring ID: B-1B	Sample Type: jar
Sample ID: S-3	Test Date: 09/02/14
Depth: 9-11 ft	Test Id: 306407
Test Comment: ---	Tested By: jbr
Sample Description: Moist, olive brown silty sand	Checked By: jdt
Sample Comment: ---	

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
---	2.3	72.2	25.5

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.5 in	12.50	100		
0.375 in	9.50	99		
#4	4.75	98		
#10	2.00	96		
#20	0.85	94		
#40	0.42	88		
#60	0.25	72		
#100	0.15	43		
#200	0.075	26		

Coefficients	
D ₈₅ = 0.3855 mm	D ₃₀ = 0.0892 mm
D ₆₀ = 0.2015 mm	D ₁₅ = N/A
D ₅₀ = 0.1686 mm	D ₁₀ = N/A
C _u = N/A	C _c = N/A

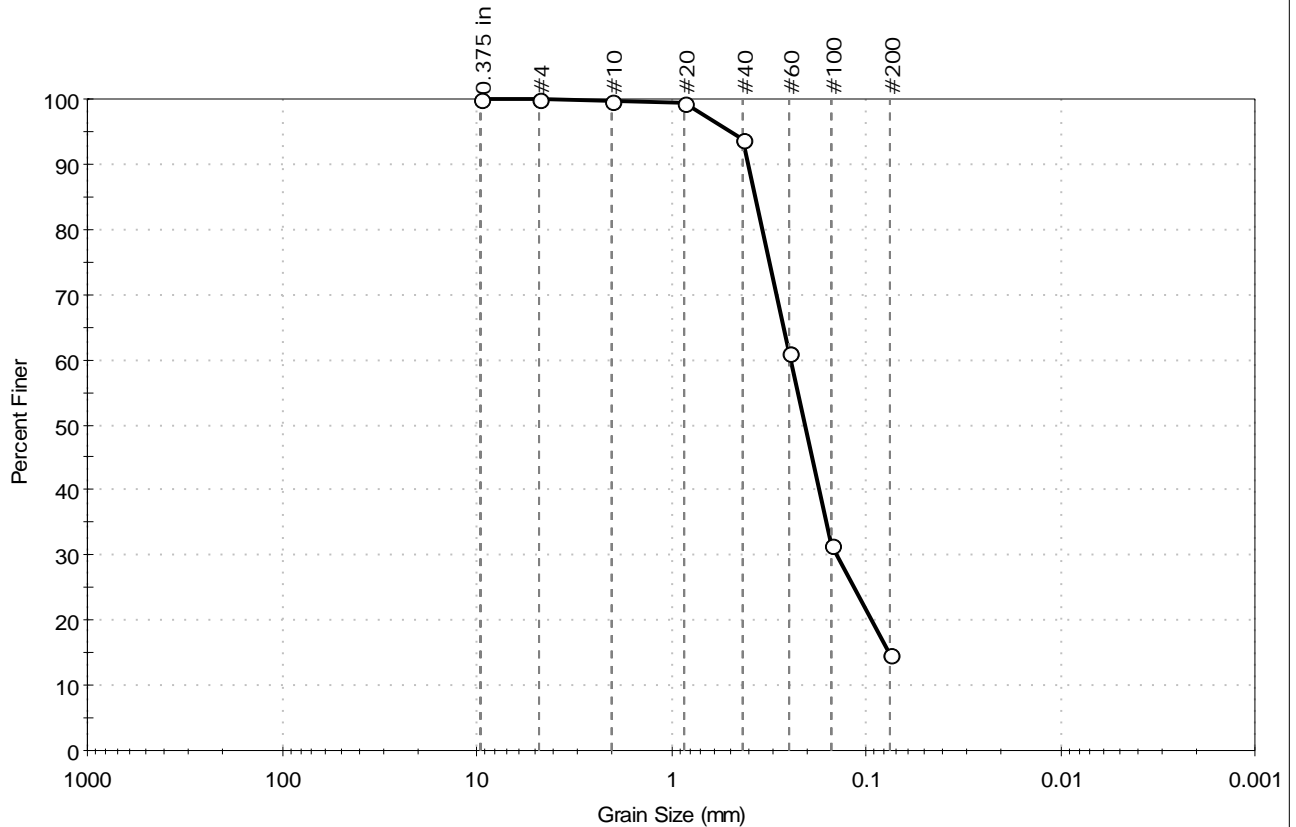
Classification	
ASTM	N/A
AASHTO	Silty Gravel and Sand (A-2-4 (0))

Sample/Test Description
Sand/Gravel Particle Shape : ---
Sand/Gravel Hardness : ---



Client: Stantec Consulting Services	Project No: GTX-302234
Project: Saco Toll Plaza	
Location: Saco, ME	
Boring ID: B-1B	Sample Type: jar
Sample ID: S-4	Test Date: 09/03/14
Depth: 14-16 ft	Test Id: 306408
Test Comment: ---	Tested By: jbr
Sample Description: Moist, olive silty sand	Checked By: jdt
Sample Comment: ---	

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
---	0.1	85.2	14.7

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.375 in	9.50	100		
#4	4.75	100		
#10	2.00	100		
#20	0.85	99		
#40	0.42	94		
#60	0.25	61		
#100	0.15	31		
#200	0.075	15		

Coefficients

D ₈₅ = 0.3687 mm	D ₃₀ = 0.1411 mm
D ₆₀ = 0.2457 mm	D ₁₅ = 0.0758 mm
D ₅₀ = 0.2067 mm	D ₁₀ = 0.0617 mm
C _u = 3.982	C _c = 1.313

Classification

ASTM N/A

AASHTO Silty Gravel and Sand (A-2-4 (0))

Sample/Test Description

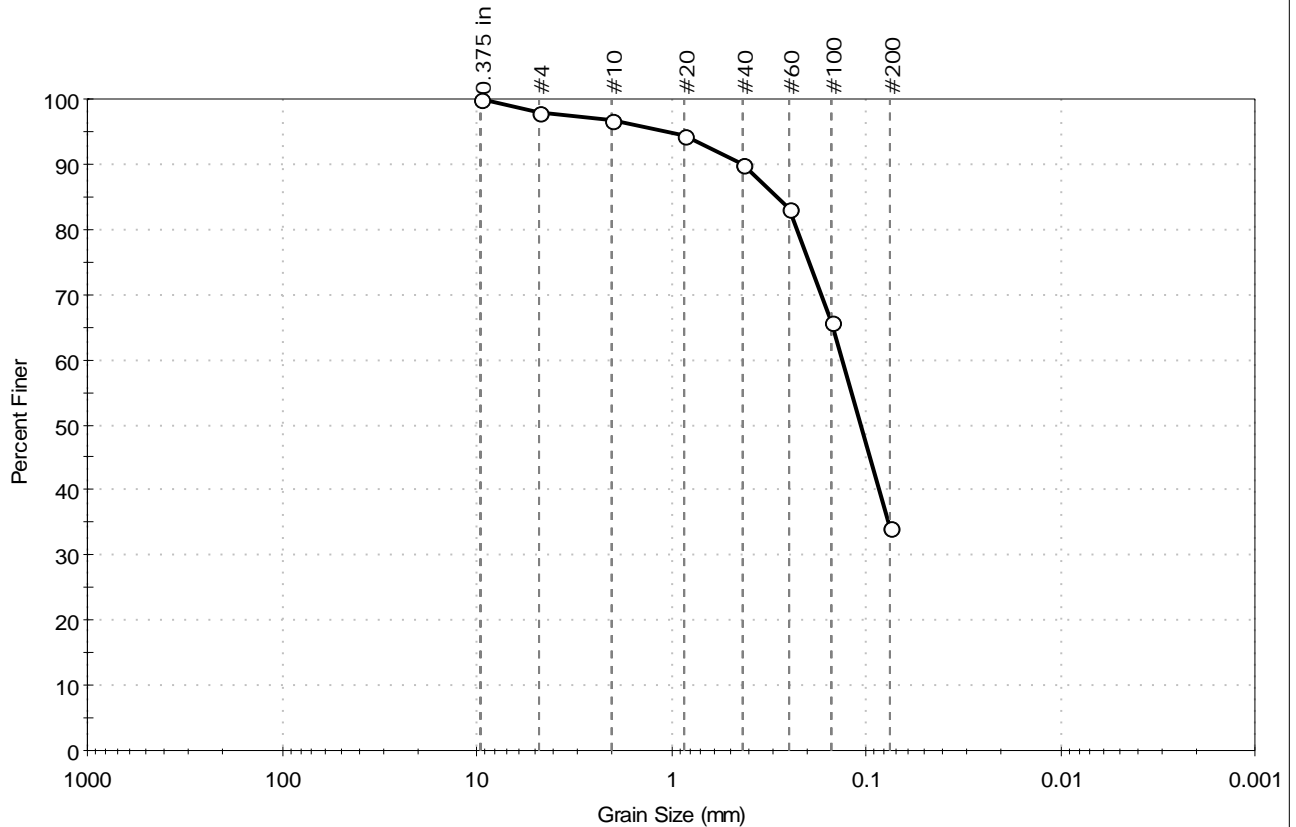
Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness : ---



Client: Stantec Consulting Services	Project No: GTX-302234
Project: Saco Toll Plaza	
Location: Saco, ME	
Boring ID: B-3	Sample Type: jar
Sample ID: S-3	Test Date: 09/03/14
Depth: 9-11 ft	Test Id: 306568
Test Comment: ---	Tested By: jbr
Sample Description: Moist, olive silty sand	Checked By: jdt
Sample Comment: ---	

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
---	2.0	63.7	34.3

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.375 in	9.50	100		
#4	4.75	98		
#10	2.00	97		
#20	0.85	94		
#40	0.42	90		
#60	0.25	83		
#100	0.15	66		
#200	0.075	34		

Coefficients

D ₈₅ = 0.2879 mm	D ₃₀ = N/A
D ₆₀ = 0.1324 mm	D ₁₅ = N/A
D ₅₀ = 0.1062 mm	D ₁₀ = N/A
C _u = N/A	C _c = N/A

Classification

ASTM N/A

AASHTO Silty Gravel and Sand (A-2-4 (0))

Sample/Test Description

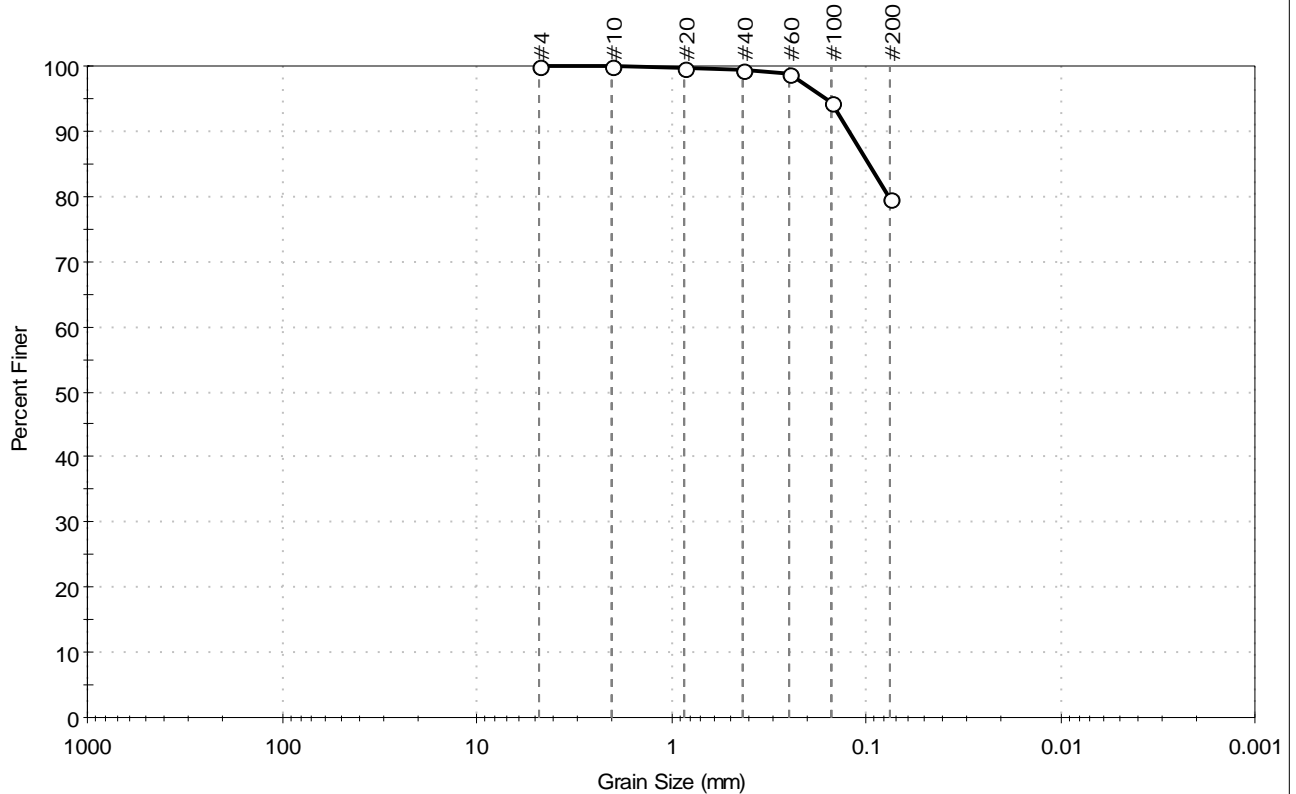
Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness : ---



Client:	Stantec Consulting Services	Project No:	GTX-302234
Project:	Saco Toll Plaza	Tested By:	jbr
Location:	Saco, ME	Checked By:	jdt
Boring ID:	B-3	Sample Type:	jar
Sample ID:	S-4	Test Date:	09/03/14
Depth :	14-16 ft	Test Id:	306569
Test Comment:	---		
Sample Description:	Moist, olive sandy clay		
Sample Comment:	---		

Particle Size Analysis - ASTM D422



% Cobble	% Gravel	% Sand	% Silt & Clay Size
---	0.0	20.4	79.6

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
#4	4.75	100		
#10	2.00	100		
#20	0.85	100		
#40	0.42	99		
#60	0.25	99		
#100	0.15	94		
#200	0.075	80		

Coefficients

D ₈₅ = 0.0965 mm	D ₃₀ = N/A
D ₆₀ = N/A	D ₁₅ = N/A
D ₅₀ = N/A	D ₁₀ = N/A
C _u = N/A	C _c = N/A

Classification

ASTM N/A

AASHTO Silty Soils (A-4 (0))

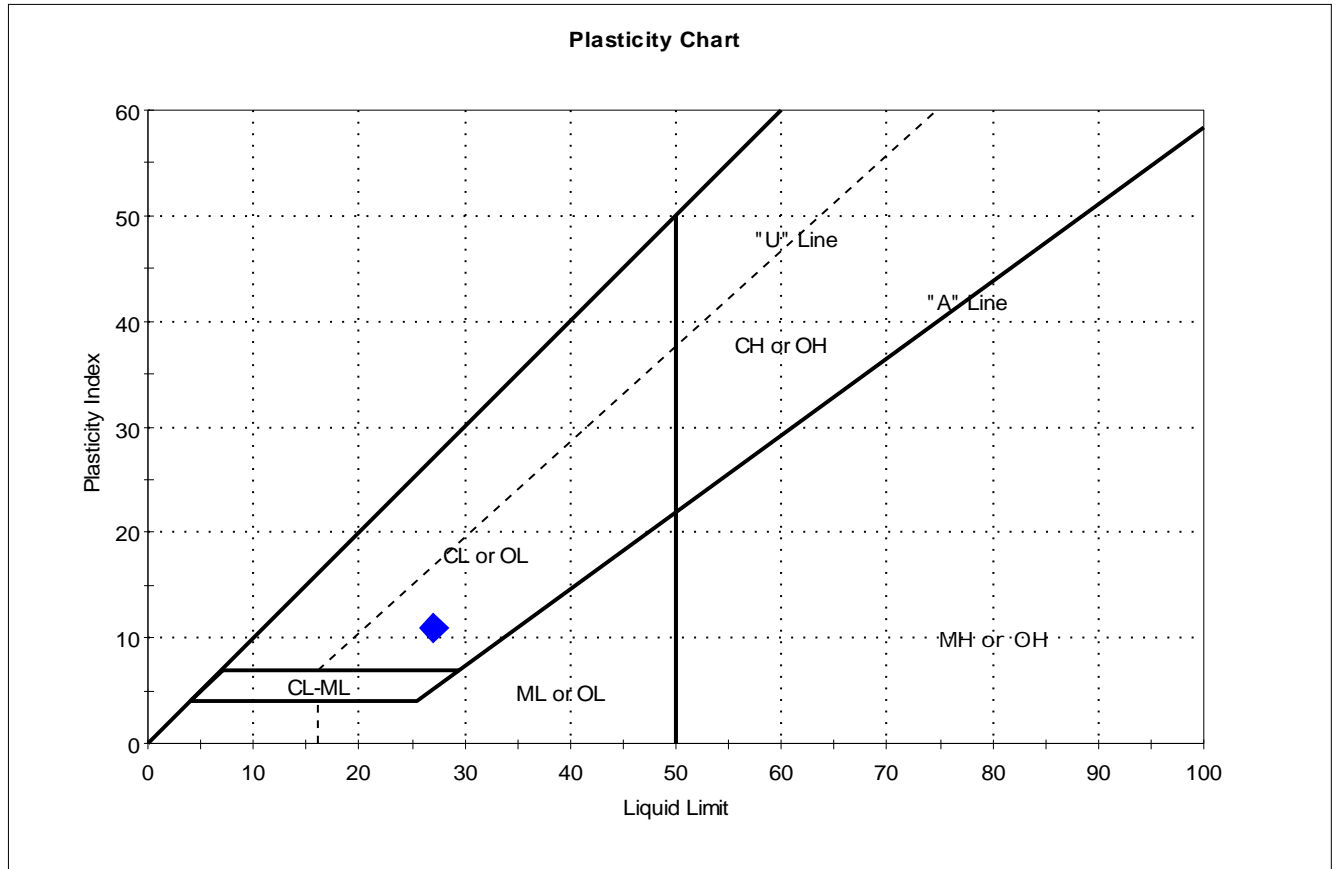
Sample/Test Description

Sand/Gravel Particle Shape : ---

Sand/Gravel Hardness : ---

Client:	Stantec Consulting Services	Project No:	GTX-302234
Project:	Saco Toll Plaza	Tested By:	cam
Location:	Saco, ME	Checked By:	jdt
Boring ID:	B-1B	Sample Type:	tube
Sample ID:	U-1	Test Date:	08/29/14
Depth :	34-36 ft	Test Id:	306403
Test Comment:	---		
Sample Description:	Wet, olive gray clay		
Sample Comment:	---		

Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
◆	U-1	B-1B	34-36 ft	31	27	16	11	1.4	

Sample Prepared using the WET method

Dry Strength: HIGH

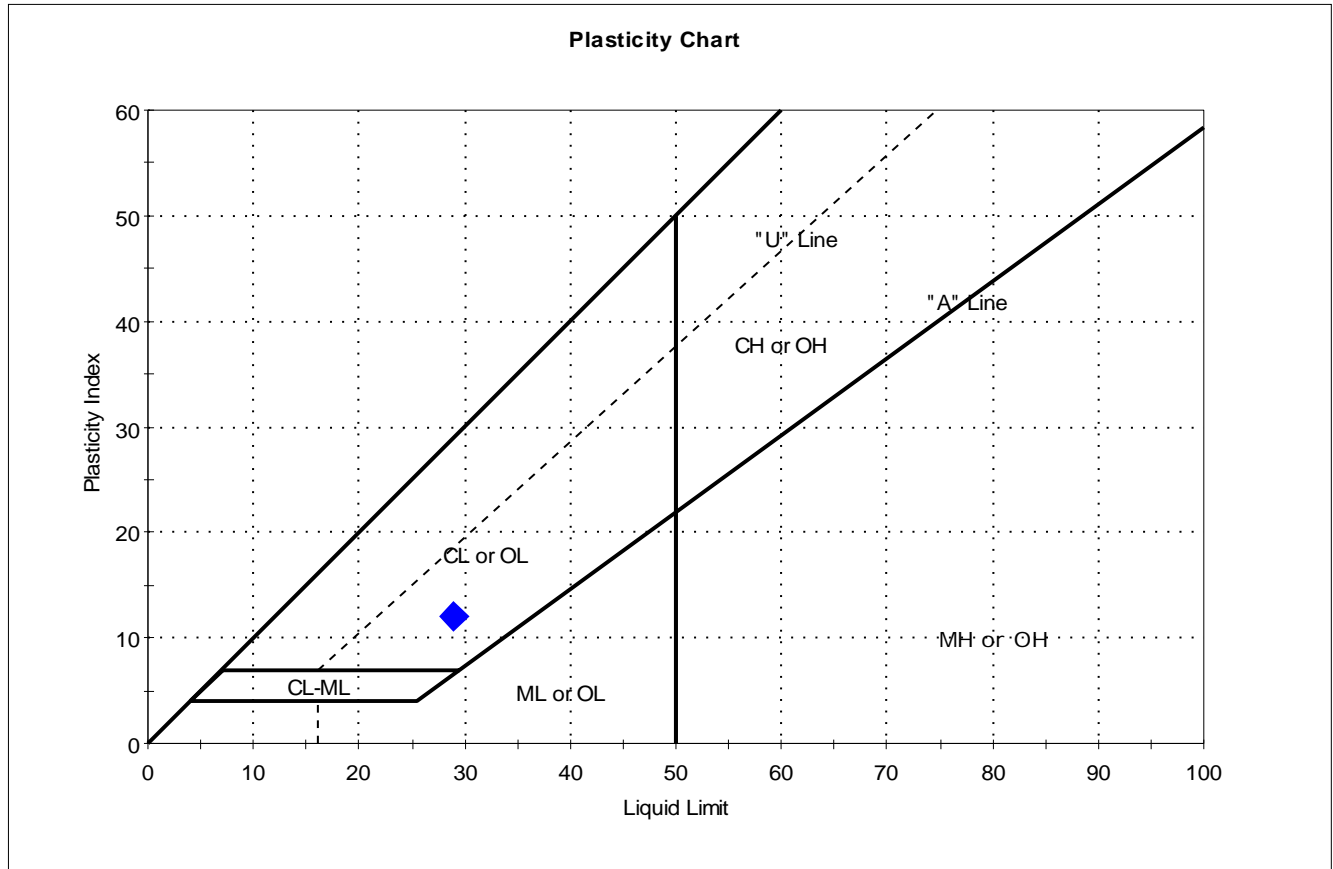
Dilatancy: SLOW

Toughness: LOW



Client:	Stantec Consulting Services	Project No:	GTX-302234
Project:	Saco Toll Plaza	Tested By:	cam
Location:	Saco, ME	Checked By:	jdt
Boring ID:	B-2	Sample Type:	tube
Sample ID:	U-1	Test Date:	09/02/14
Depth :	30-32 ft	Test Id:	306404
Test Comment:	---		
Sample Description:	Moist, olive gray clay		
Sample Comment:	---		

Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
◆	U-1	B-2	30-32 ft	30	29	17	12	1.1	

Sample Prepared using the WET method

Dry Strength: VERY HIGH

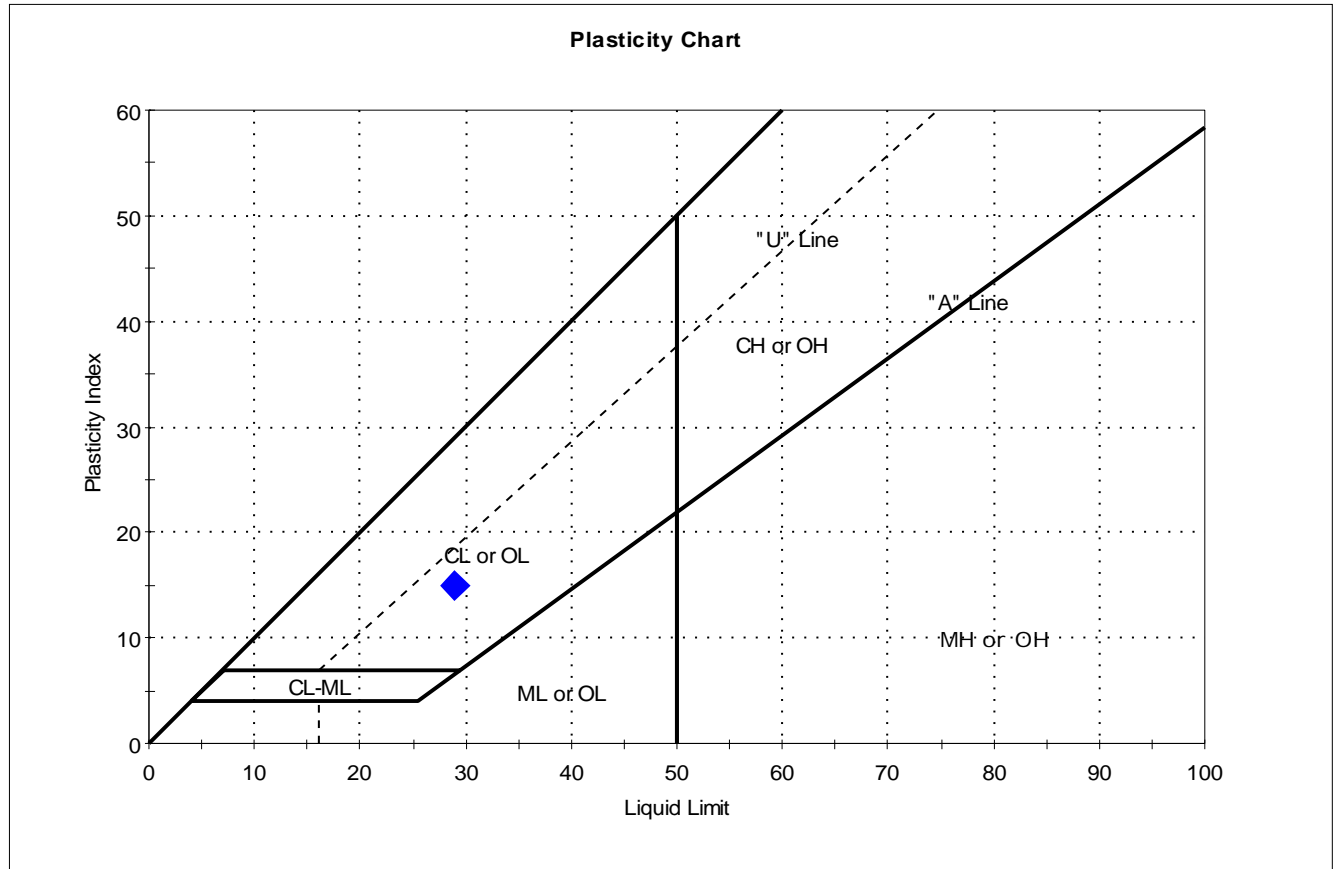
Dilatancy: SLOW

Toughness: LOW



Client:	Stantec Consulting Services	Project No:	GTX-302234
Project:	Saco Toll Plaza	Tested By:	cam
Location:	Saco, ME	Checked By:	jdt
Boring ID:	B-3	Sample Type:	tube
Sample ID:	U-1	Test Date:	09/02/14
Depth :	34-36 ft	Test Id:	306566
Test Comment:	---		
Sample Description:	Wet, olive gray clay		
Sample Comment:	---		

Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
◆	U-1	B-3	34-36 ft	34	29	14	15	1.3	

Sample Prepared using the WET method

Dry Strength: VERY HIGH

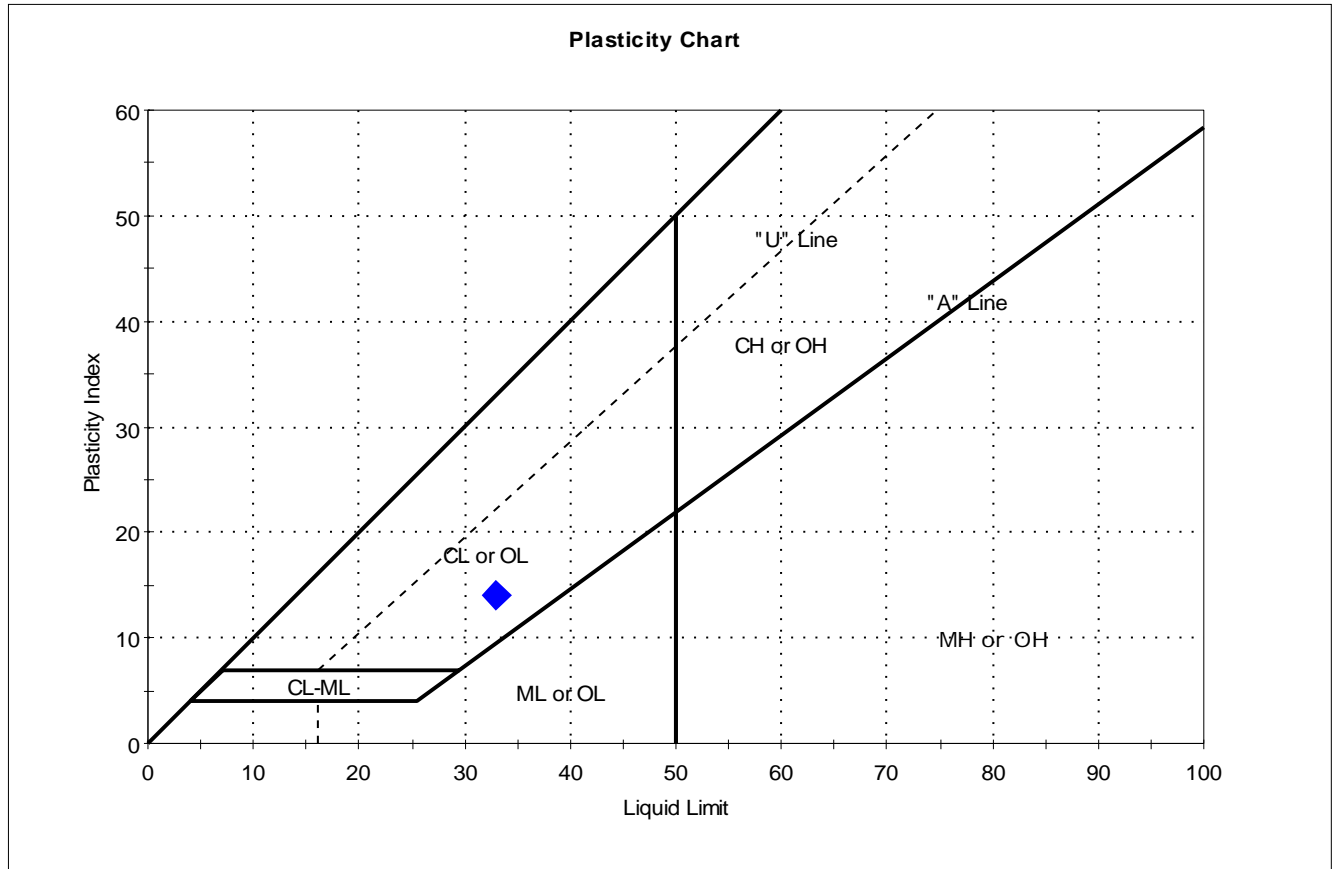
Dilatancy: SLOW

Toughness: LOW



Client:	Stantec Consulting Services	Project No:	GTX-302234
Project:	Saco Toll Plaza	Tested By:	cam
Location:	Saco, ME	Checked By:	jdt
Boring ID:	B-3	Sample Type:	tube
Sample ID:	U-2	Test Date:	09/02/14
Depth :	49.5-51.5 ft	Test Id:	306567
Test Comment:	---		
Sample Description:	Wet, olive gray clay		
Sample Comment:	---		

Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content, %	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
◆	U-2	B-3	49.5-51.5 ft	42	33	19	14	1.6	

Sample Prepared using the WET method

Dry Strength: VERY HIGH

Dilatancy: SLOW

Toughness: LOW



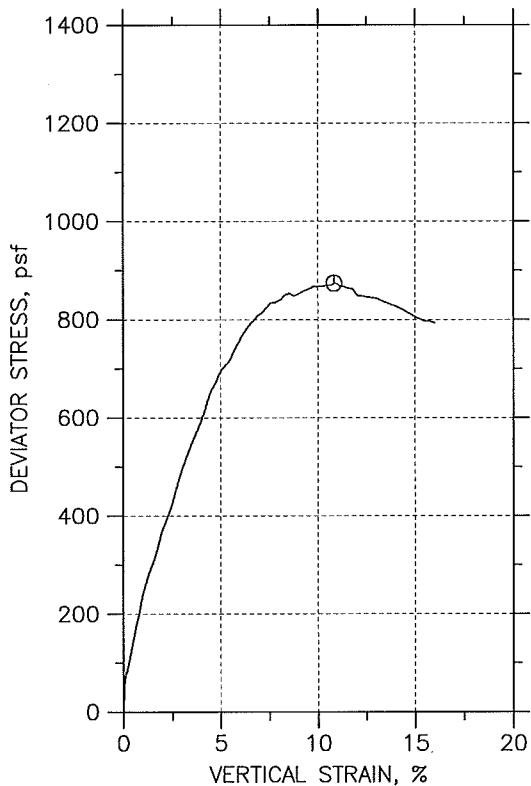
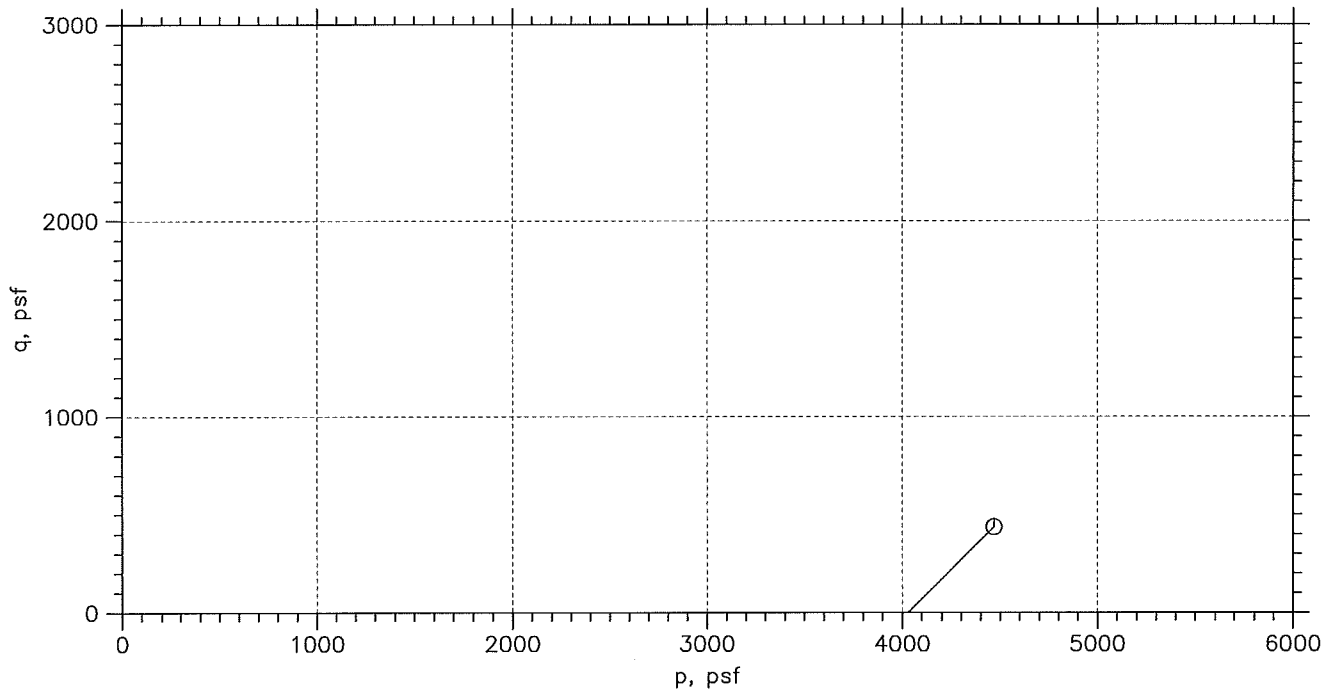
Client:	Stantec Consulting Services			
Project Name:	Saco Toll Plaza			
Project Location:	Saco, ME			
GTX #:	302234	Tested By:	md	
Test Date:	08/26/14	Checked By:	jdt	

Tube Handling with
Moisture Content (ASTM D2216), Density of Soil (ASTM D7263),
Hand-Held Torvane, and Visual Description





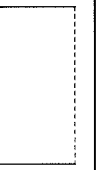
Boring ID	Sample ID	Depth, ft	Section	Visual Description	Bulk Density, lb/ft ³	Moisture Content, %	Dry Density, lb/ft ³	Hand Held Torvane Readings, tsf		
								1	2	3 Average
B-1B	U-1	34-36	Top	Wet, olive gray clay	129	21.7	106	0.16	0.17	0.16
			Middle	Wet, olive gray clay	123	28.0	96.4	0.19	0.18	0.19
			Bottom	Wet, olive gray clay	127	25.1	101	0.20	0.18	0.19
B-2	U-1	30-32	Top	Moist, olive gray clay	123	30.0	94.2	0.28	0.25	0.27
			Middle	Moist, olive gray clay	121	28.3	94.6	0.26	0.27	0.30
			Bottom	Moist, olive gray clay	134	27.8	105	0.24	0.25	0.25
B-3	U-1	34-36	Top	Wet, olive gray clay	117	24.6	94.3	0.09	0.10	0.10
			Middle	Wet, olive gray clay	114	32.0	86.5	0.15	0.15	0.15
			Bottom	Wet, olive gray clay	115	40.9	81.9	0.19	0.19	0.17
B-3	U-2	49.5-51.5	Top	Wet, olive gray clay	109	39.6	77.9	0.19	0.19	0.18
			Middle	Wet, olive gray clay	112	41.6	79.1	0.17	0.17	0.18
			Bottom	Wet, olive gray clay	113	40.8	80.2	0.16	0.15	0.15

Notes: Density determined on undisturbed tube sample provided to GeoTesting Express in a Shelby tubes
 Moisture content determined by ASTM D2216 at 110° C

UNCONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D2850

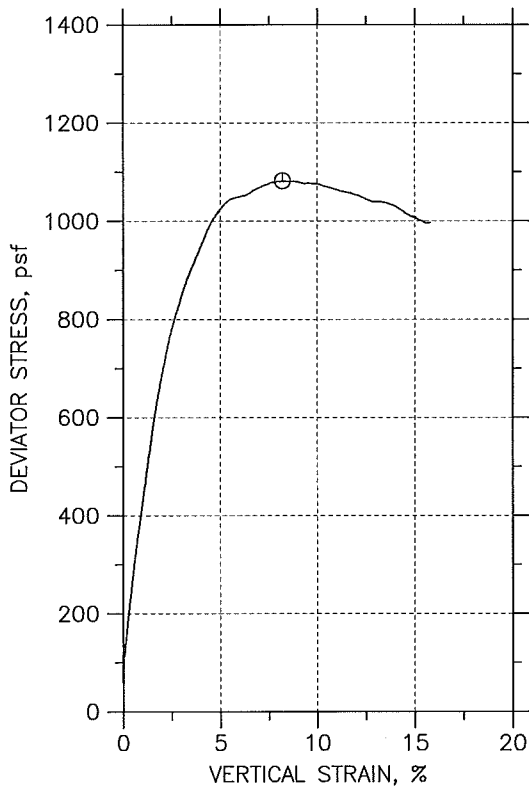
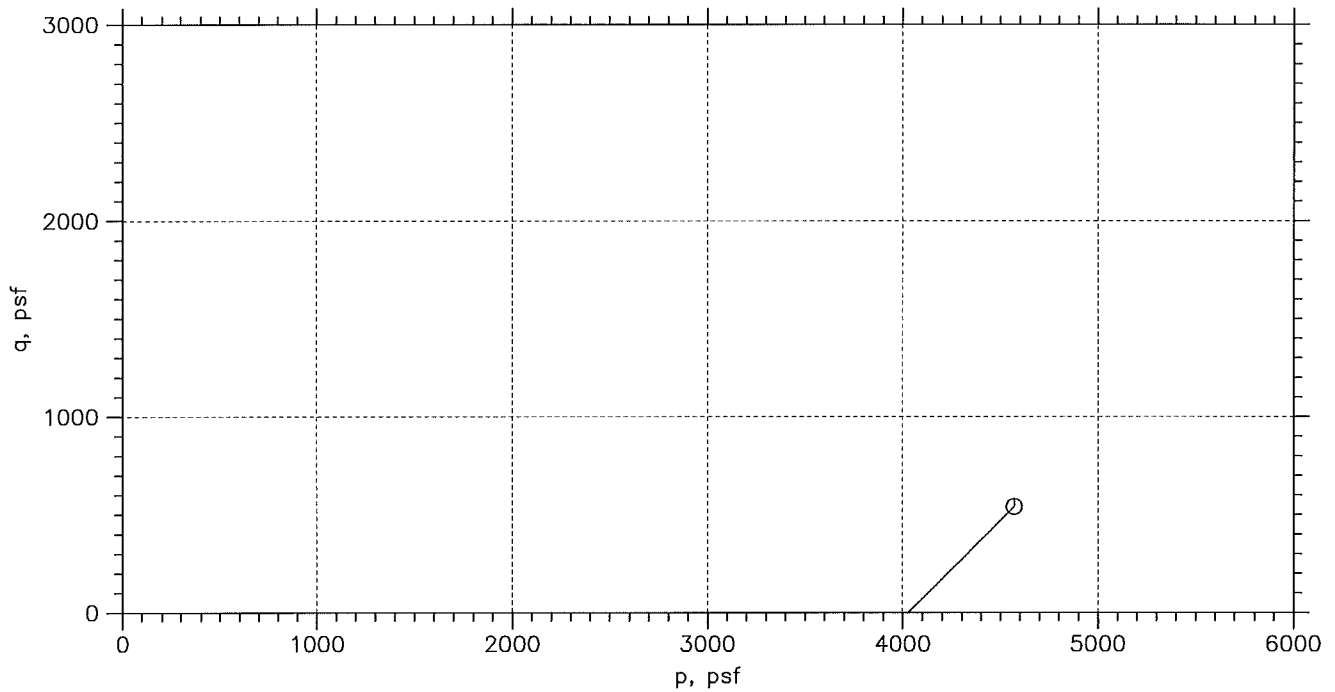


Symbol	⊕			
Sample No.	U-1			
Test No.	UU-1			
Depth	34-36 ft			
Tested by	md			
Test Date	08/26/14			
Checked by	jdt			
Check Date				
Diameter, in	2.87			
Height, in	6			
Water Content, %	28.0			
Dry Density, pcf	96.61			
Saturation, %	96.9			
Void Ratio	0.809			
Confining Stress, psf	4030			
Undrained Strength, psf	437			
Max. Dev. Stress, psf	873.9			
Strain at Failure, %	10.8			
Strain Rate, %/min	1			
Estimated Specific Gravity	2.8			
Liquid Limit	27			
Plastic Limit	16			
Plasticity Index	11			



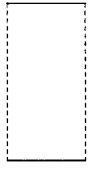

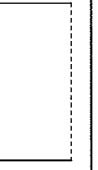
	Project: Saco Toll Plaza	   
	Location: Saco, ME	
	Project No.: GTX-302234	
	Boring No.: B-1B	
	Sample Type: intact	
	Description: Wet, olive gray clay	
Remarks: System S		

Phase calculations based on start and end of test.

UNCONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D2850

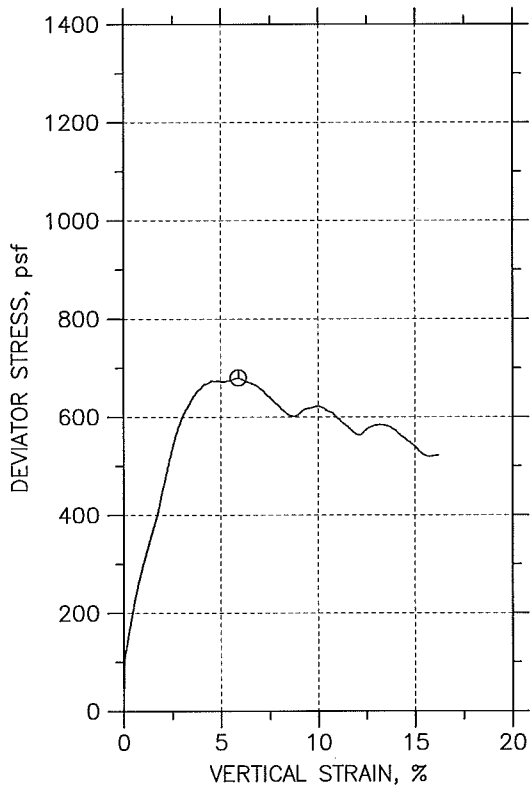
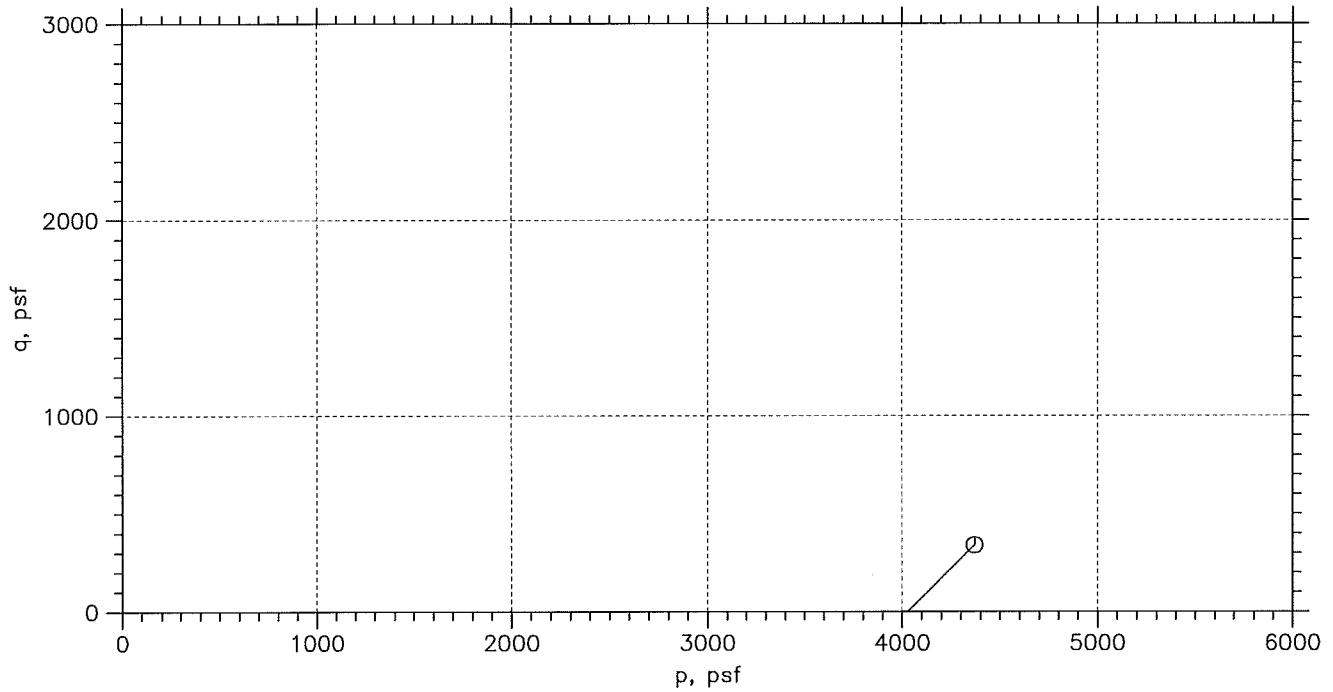


Symbol	⊙			
Sample No.	U-1			
Test No.	UU-2			
Depth	30-32 ft			
Tested by	md			
Test Date	08/27/14			
Checked by	jdt			
Check Date				
Diameter, in	2.87			
Height, in	6.08			
Water Content, %	28.3			
Dry Density, pcf	94.76			
Saturation, %	93.7			
Void Ratio	0.845			
Confining Stress, psf	4030			
Undrained Strength, psf	541.2			
Max. Dev. Stress, psf	1082			
Strain at Failure, %	8.2			
Strain Rate, %/min	1			
Estimated Specific Gravity	2.8			
Liquid Limit	29			
Plastic Limit	17			
Plasticity Index	12			



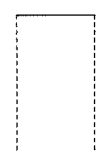


	Project: Saco Toll Plaza	   
	Location: Saco, ME	
	Project No.: GTX-302234	
	Boring No.: B-2	
	Sample Type: intact	
	Description: Moist, olive gray clay	
Remarks: System W		

Phase calculations based on start and end of test.

UNCONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D2850

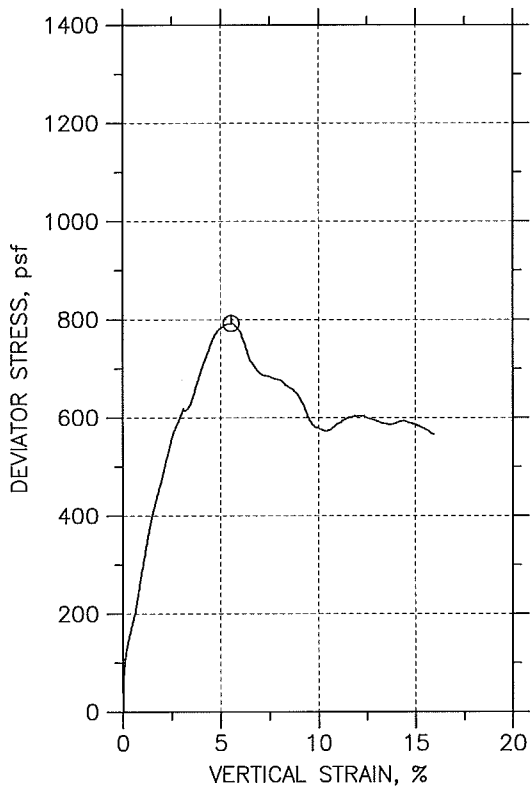
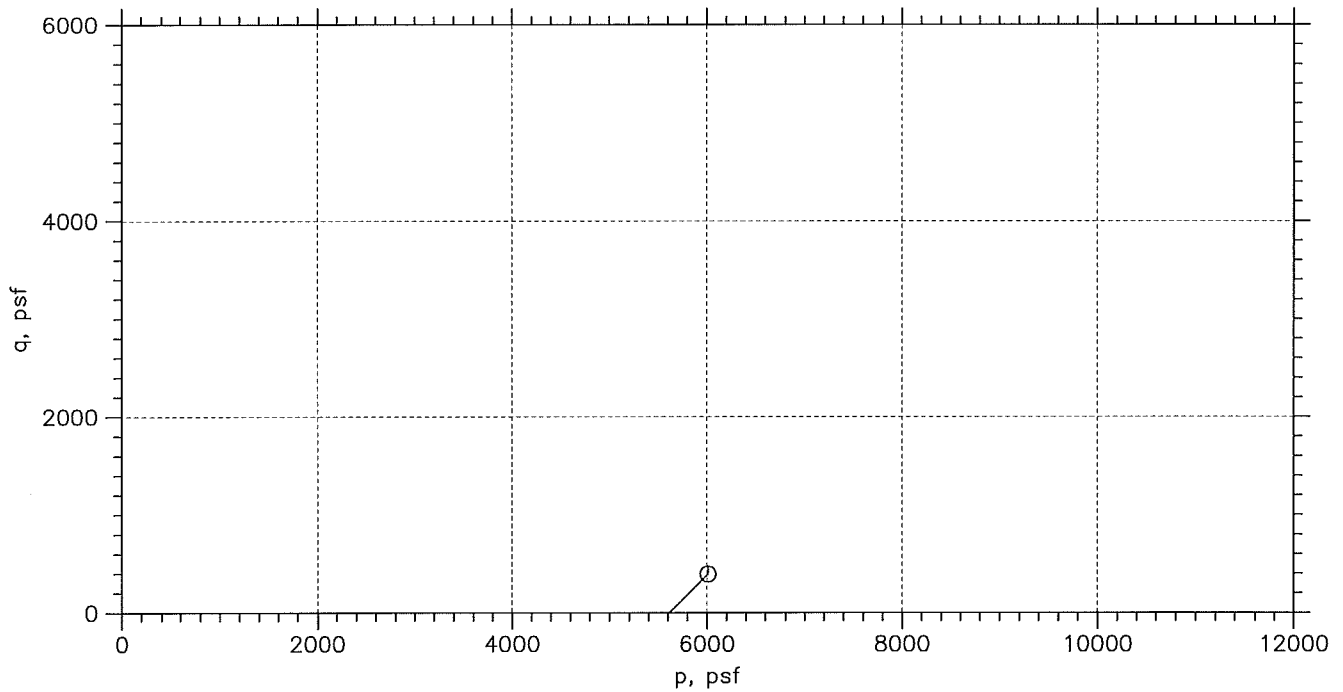


Symbol	⊙			
Sample No.	U-1			
Test No.	UU-4			
Depth	34-36ft			
Tested by	md			
Test Date	08/27/14			
Checked by	jdt			
Check Date				
Diameter, in	2.88			
Height, in	5.95			
Water Content, %	38.8			
Dry Density, pcf	83.28			
Saturation, %	98.8			
Void Ratio	1.1			
Confining Stress, psf	4030			
Undrained Strength, psf	339.9			
Max. Dev. Stress, psf	679.8			
Strain at Failure, %	5.87			
Strain Rate, %/min	1			
Estimated Specific Gravity	2.8			
Liquid Limit	29			
Plastic Limit	14			
Plasticity Index	15			


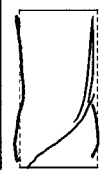
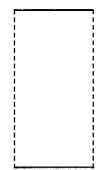

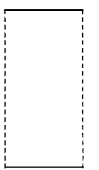
	Project: Saco Toll Plaza				
	Location: Saco, ME				
	Project No.: GTX-302234				
	Boring No.: B-3				
	Sample Type: intact				
	Description: Wet, olive gray clay				
	Remarks: System W				

Phase calculations based on start and end of test.

UNCONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D2850



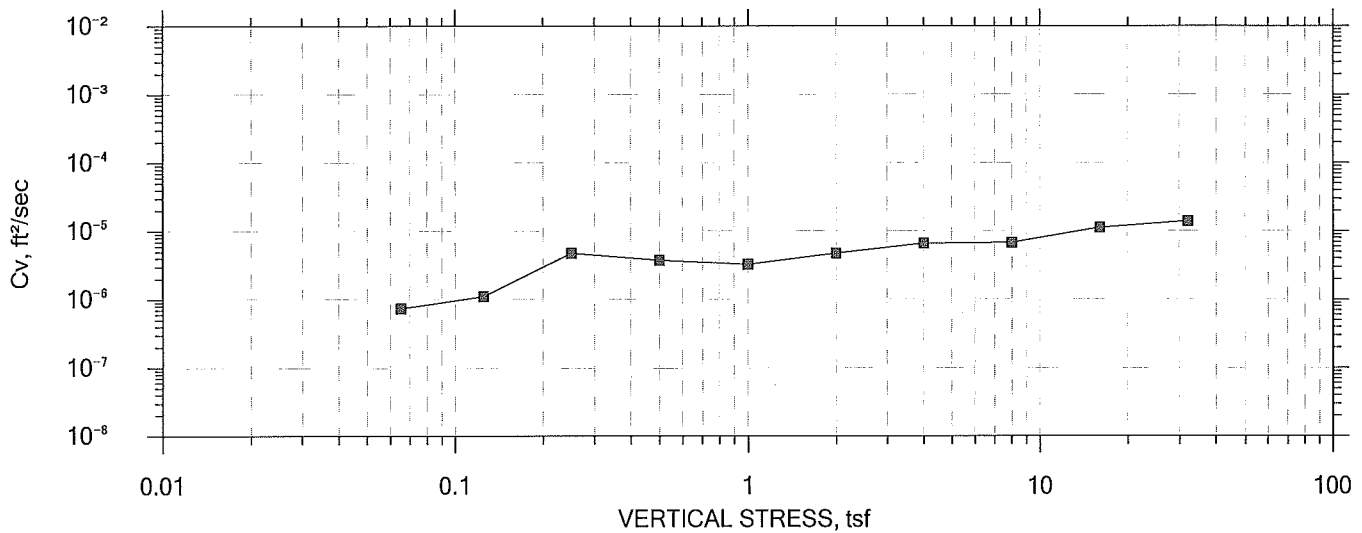
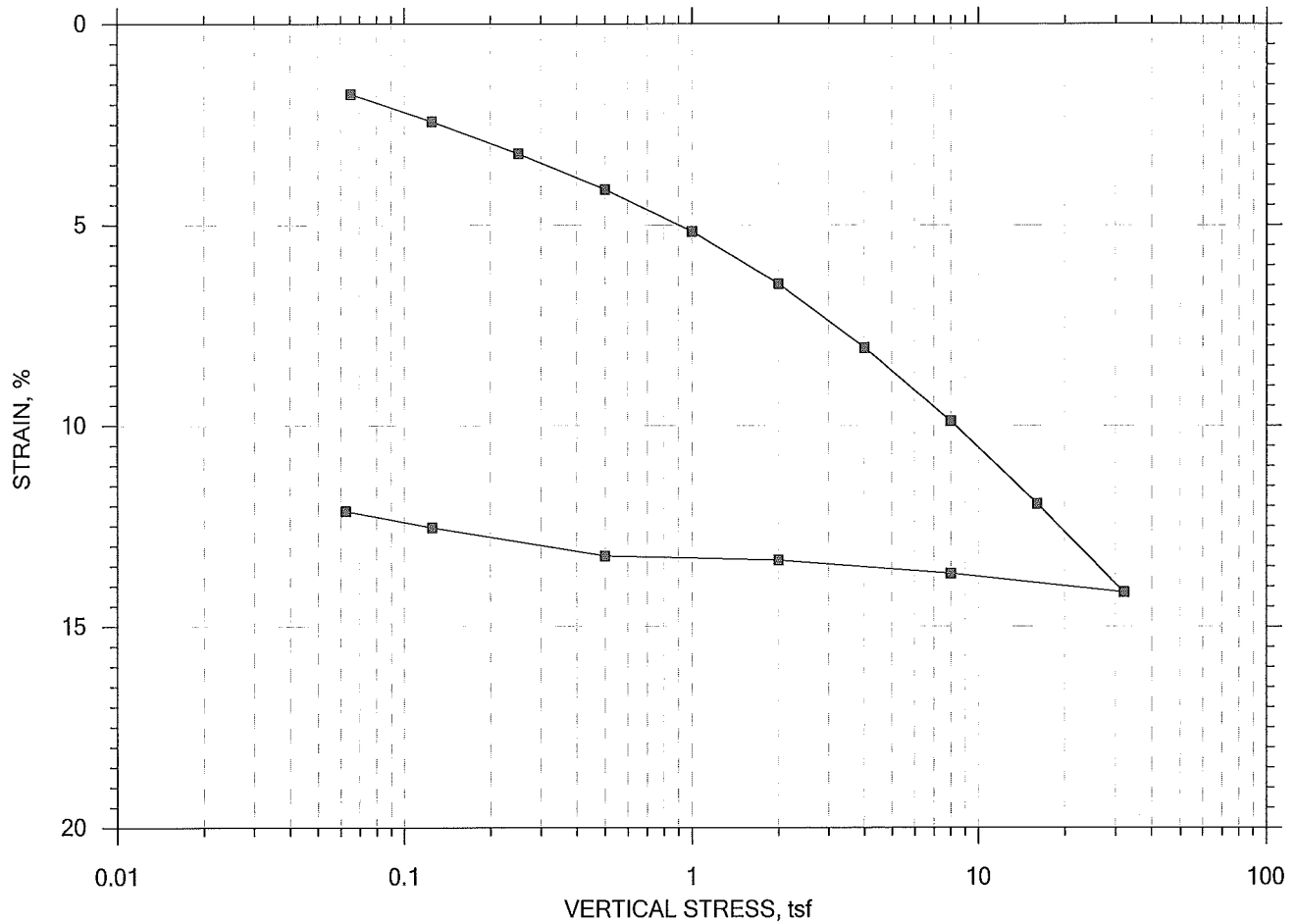
Symbol	⊙			
Sample No.	U-2			
Test No.	UU-3			
Depth	49.5-51.5			
Tested by	md			
Test Date	08/27/14			
Checked by	jdt			
Check Date				
Diameter, in	2.87			
Height, in	6.11			
Water Content, %	40.8			
Dry Density, pcf	80.36			
Saturation, %	97.2			
Void Ratio	1.18			
Confining Stress, psf	5615			
Undrained Strength, psf	396			
Max. Dev. Stress, psf	791.9			
Strain at Failure, %	5.53			
Strain Rate, %/min	1			
Estimated Specific Gravity	2.8			
Liquid Limit	33			
Plastic Limit	19			
Plasticity Index	14			


	Project: Saco Toll Plaza				
	Location: Saco, ME				
	Project No.: GTX-302234				
	Boring No.: B-3				
	Sample Type: intact				
	Description: Wet, olive gray clay				
	Remarks: System W				

Phase calculations based on start and end of test.

One-Dimensional Consolidation by ASTM D2435 - Method B

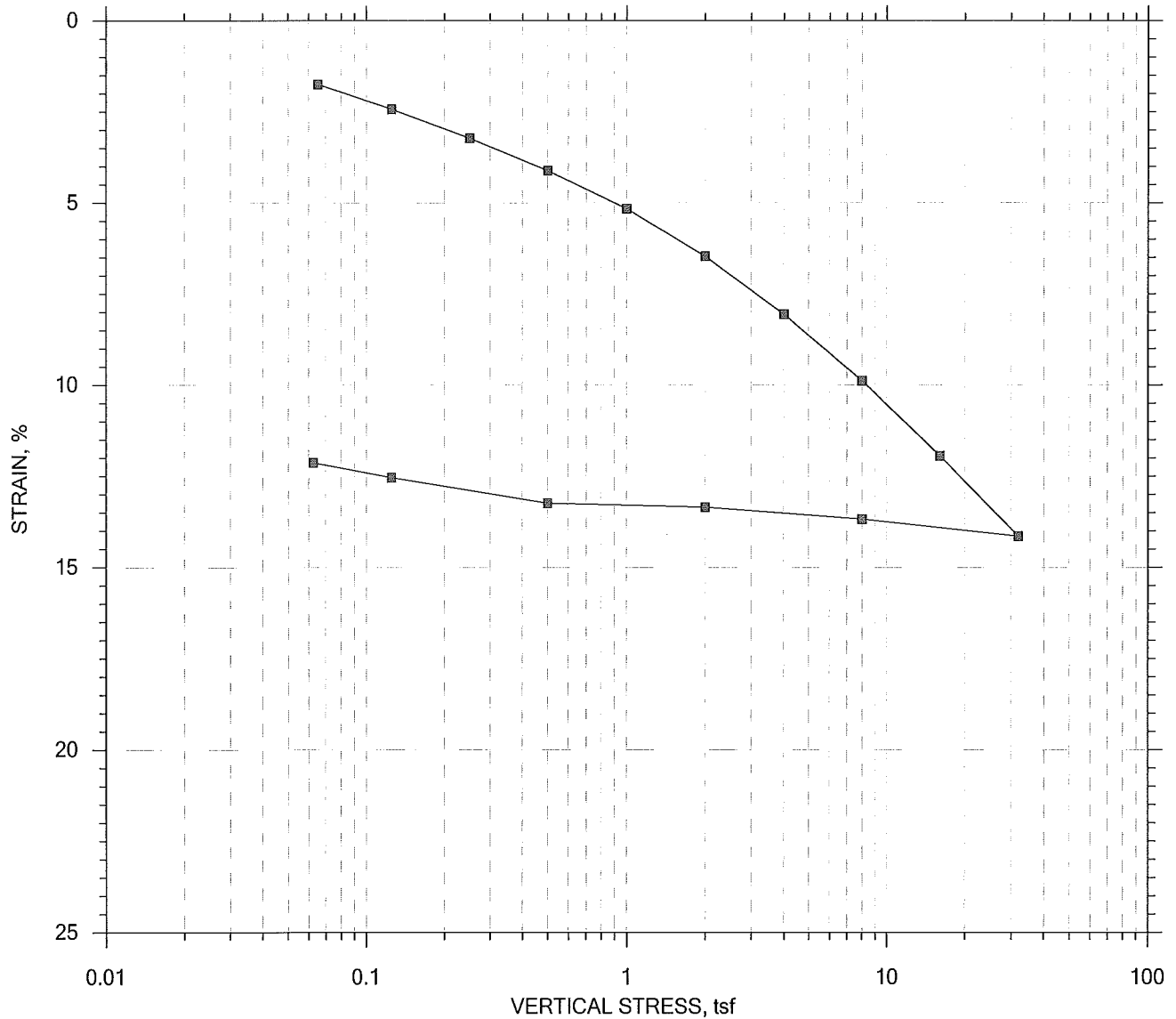
SUMMARY REPORT




	Project: Saco Toll Plaza	Location: Saco, ME	Project No.: GTX-302234
	Boring No.: B-1B	Tested By: md	Checked By: jdt
	Sample No.: U-1	Test Date: 08/28/14	Test No.: IP-8
	Depth: 34-36 ft	Sample Type: intact	Elevation: ---
	Description: Wet, olive gray clay		
	Remarks: System W, Swell Pressure = 0.0653 tsf		
	Displacement at End of Increment		

One-Dimensional Consolidation by ASTM D2435 - Method B

SUMMARY REPORT



				Before Test	After Test
Current Vertical Effective Stress: ---				22.22	16.52
Preconsolidation Stress: ---				105.6	119.99
Compression Ratio: ---				94.11	100.00
Diameter: 2.5 in		Height: 1 in		0.67	0.47
LL: 27	PL: 16	PI: 11	GS: 2.82		

	Project: Saco Toll Plaza	Location: Saco, ME	Project No.: GTX-302234
	Boring No.: B-1B	Tested By: md	Checked By: jdt
	Sample No.: U-1	Test Date: 08/28/14	Test No.: IP-8
	Depth: 34-36 ft	Sample Type: intact	Elevation: ---
	Description: Wet, olive gray clay		
	Remarks: System W, Swell Pressure = 0.0653 tsf		
	Displacement at End of Increment		

One-Dimensional Consolidation by ASTM D2435 - Method B

Project: Saco Toll Plaza
 Boring No.: B-1B
 Sample No.: U-1
 Test No.: IP-8

Location: Saco, ME
 Tested By: md
 Test Date: 08/28/14
 Sample Type: intact

Project No.: GTX-302234
 Checked By: jdt
 Depth: 34-36 ft
 Elevation: ---

Soil Description: Wet, olive gray clay
 Remarks: System W, Swell Pressure = 0.0653 tsf

Estimated Specific Gravity: 2.82
 Initial Void Ratio: 0.665
 Final Void Ratio: 0.465

Liquid Limit: 27
 Plastic Limit: 16
 Plasticity Index: 11

Specimen Diameter: 2.50 in
 Initial Height: 1.00 in
 Final Height: 0.88 in

	Before Consolidation		After Consolidation	
	Trimmings	Specimen+Ring	Specimen+Ring	Trimmings
Container ID	13932	RING		14842
Wt. Container + Wet Soil, gm	235.84	275.73	267.97	165.29
Wt. Container + Dry Soil, gm	195.32	245.49	245.49	143.05
Wt. Container, gm	8.2900	109.43	109.43	8.4300
Wt. Dry Soil, gm	187.03	136.06	136.06	134.62
Water Content, %	21.66	22.22	16.52	16.52
Void Ratio	---	0.665	0.465	---
Degree of Saturation, %	---	94.11	100.00	---
Dry Unit Weight, pcf	---	105.60	119.99	---

Note: Specific Gravity and Void Ratios are calculated assuming the degree of saturation equals 100% at the end of the test. Therefore, values may not represent actual values for the specimen.

One-Dimensional Consolidation by ASTM D2435 - Method B

Project: Saco Toll Plaza
 Boring No.: B-1B
 Sample No.: U-1
 Test No.: IP-8

Location: Saco, ME
 Tested By: md
 Test Date: 08/28/14
 Sample Type: intact

Project No.: GTX-302234
 Checked By: jdt
 Depth: 34-36 ft
 Elevation: ---

Soil Description: Wet, olive gray clay
 Remarks: System W, Swell Pressure = 0.0653 tsf

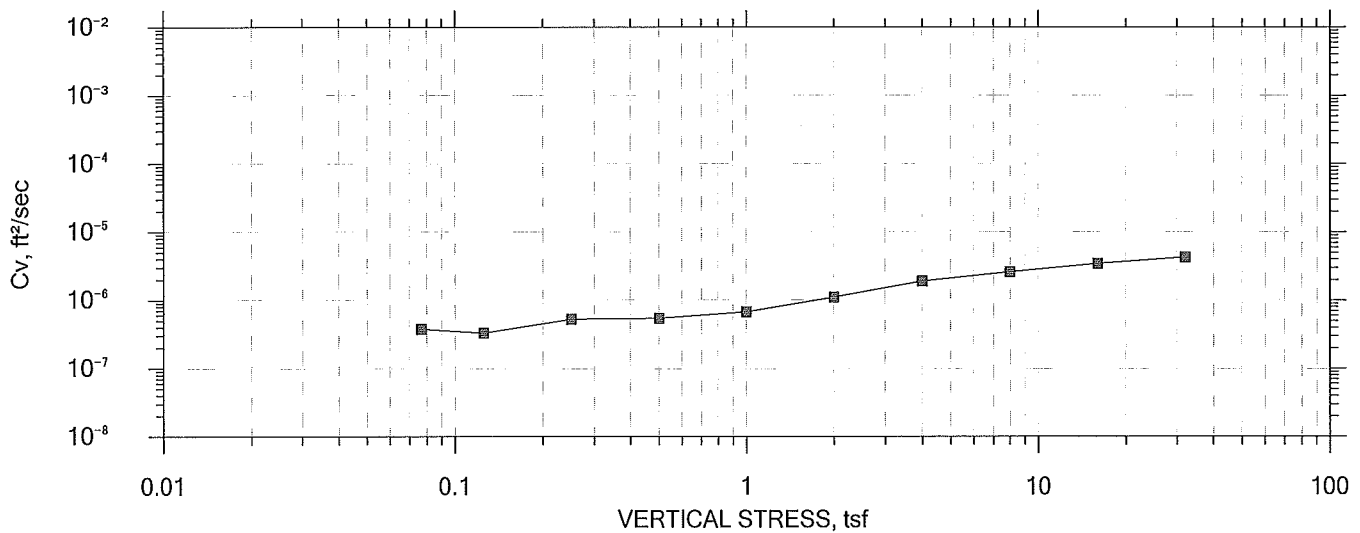
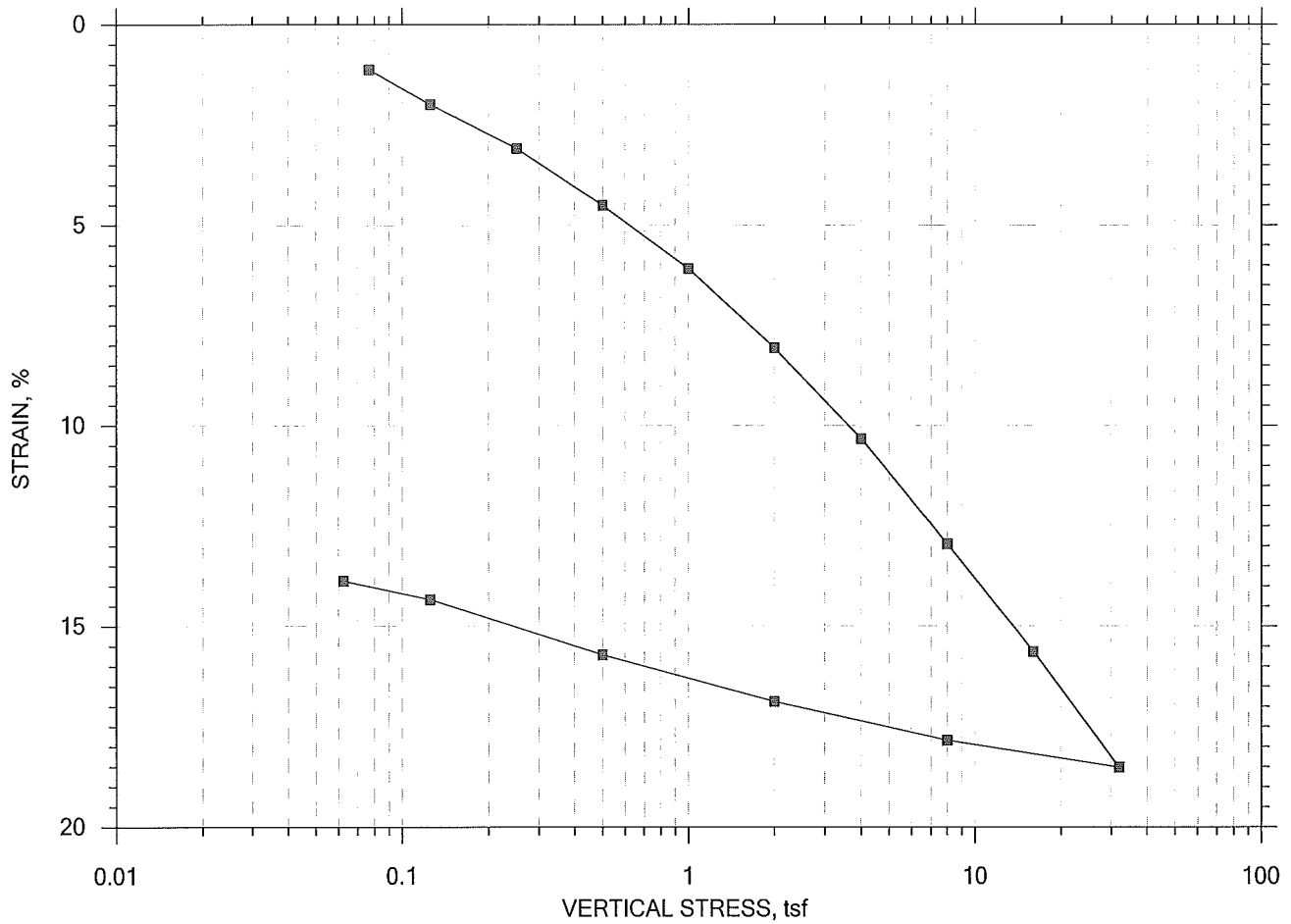
Displacement at End of Increment


	Applied Stress tsf	Final Displacement in	Void Ratio	Strain at End %	Sq.Rt T90 min	Cv ft ² /sec	Mv 1/tsf	k ft/day
1	0.0653	0.01746	0.636	1.75	31.759	7.59e-007	2.68e-001	5.48e-004
2	0.125	0.02430	0.625	2.43	22.286	1.06e-006	1.14e-001	3.26e-004
3	0.250	0.03219	0.612	3.22	6.351	3.65e-006	6.32e-002	6.22e-004
4	0.500	0.04111	0.597	4.11	5.402	4.22e-006	3.57e-002	4.06e-004
5	1.00	0.05163	0.579	5.16	6.320	3.53e-006	2.10e-002	2.00e-004
6	2.00	0.06462	0.558	6.46	6.058	3.59e-006	1.30e-002	1.26e-004
7	4.00	0.08055	0.531	8.06	3.696	5.71e-006	7.97e-003	1.23e-004
8	8.00	0.09882	0.501	9.88	3.369	6.03e-006	4.57e-003	7.43e-005
9	16.0	0.1194	0.466	11.9	2.358	8.26e-006	2.57e-003	5.72e-005
10	32.0	0.1414	0.430	14.1	2.216	8.37e-006	1.38e-003	3.11e-005
11	8.00	0.1368	0.437	13.7	0.502	3.62e-005	1.95e-004	1.90e-005
12	2.00	0.1334	0.443	13.3	2.193	8.37e-006	5.53e-004	1.25e-005
13	0.500	0.1324	0.445	13.2	25.003	7.38e-007	7.13e-004	1.42e-006
14	0.125	0.1253	0.456	12.5	10.020	1.86e-006	1.88e-002	9.43e-005
15	0.0625	0.1213	0.463	12.1	53.980	3.49e-007	6.50e-002	6.12e-005

	Applied Stress tsf	Final Displacement in	Void Ratio	Strain at End %	Log T50 min	Cv ft ² /sec	Mv 1/tsf	k ft/day	Ca %
1	0.0653	0.01746	0.636	1.75	0.000	0.00e+000	2.68e-001	0.00e+000	0.00e+000
2	0.125	0.02430	0.625	2.43	0.000	0.00e+000	1.14e-001	0.00e+000	0.00e+000
3	0.250	0.03219	0.612	3.22	1.073	5.02e-006	6.32e-002	8.55e-004	0.00e+000
4	0.500	0.04111	0.597	4.11	1.500	3.53e-006	3.57e-002	3.39e-004	0.00e+000
5	1.00	0.05163	0.579	5.16	1.666	3.11e-006	2.10e-002	1.77e-004	0.00e+000
6	2.00	0.06462	0.558	6.46	0.927	5.45e-006	1.30e-002	1.91e-004	0.00e+000
7	4.00	0.08055	0.531	8.06	0.730	6.72e-006	7.97e-003	1.44e-004	0.00e+000
8	8.00	0.09882	0.501	9.88	0.735	6.43e-006	4.57e-003	7.92e-005	0.00e+000
9	16.0	0.1194	0.466	11.9	0.347	1.30e-005	2.57e-003	9.03e-005	0.00e+000
10	32.0	0.1414	0.430	14.1	0.218	1.98e-005	1.38e-003	7.36e-005	0.00e+000
11	8.00	0.1368	0.437	13.7	0.000	0.00e+000	1.95e-004	0.00e+000	0.00e+000
12	2.00	0.1334	0.443	13.3	0.000	0.00e+000	5.53e-004	0.00e+000	0.00e+000
13	0.500	0.1324	0.445	13.2	0.000	0.00e+000	7.13e-004	0.00e+000	0.00e+000
14	0.125	0.1253	0.456	12.5	3.463	1.25e-006	1.88e-002	6.34e-005	0.00e+000
15	0.0625	0.1213	0.463	12.1	13.917	3.15e-007	6.50e-002	5.52e-005	0.00e+000

One-Dimensional Consolidation by ASTM D2435 - Method B

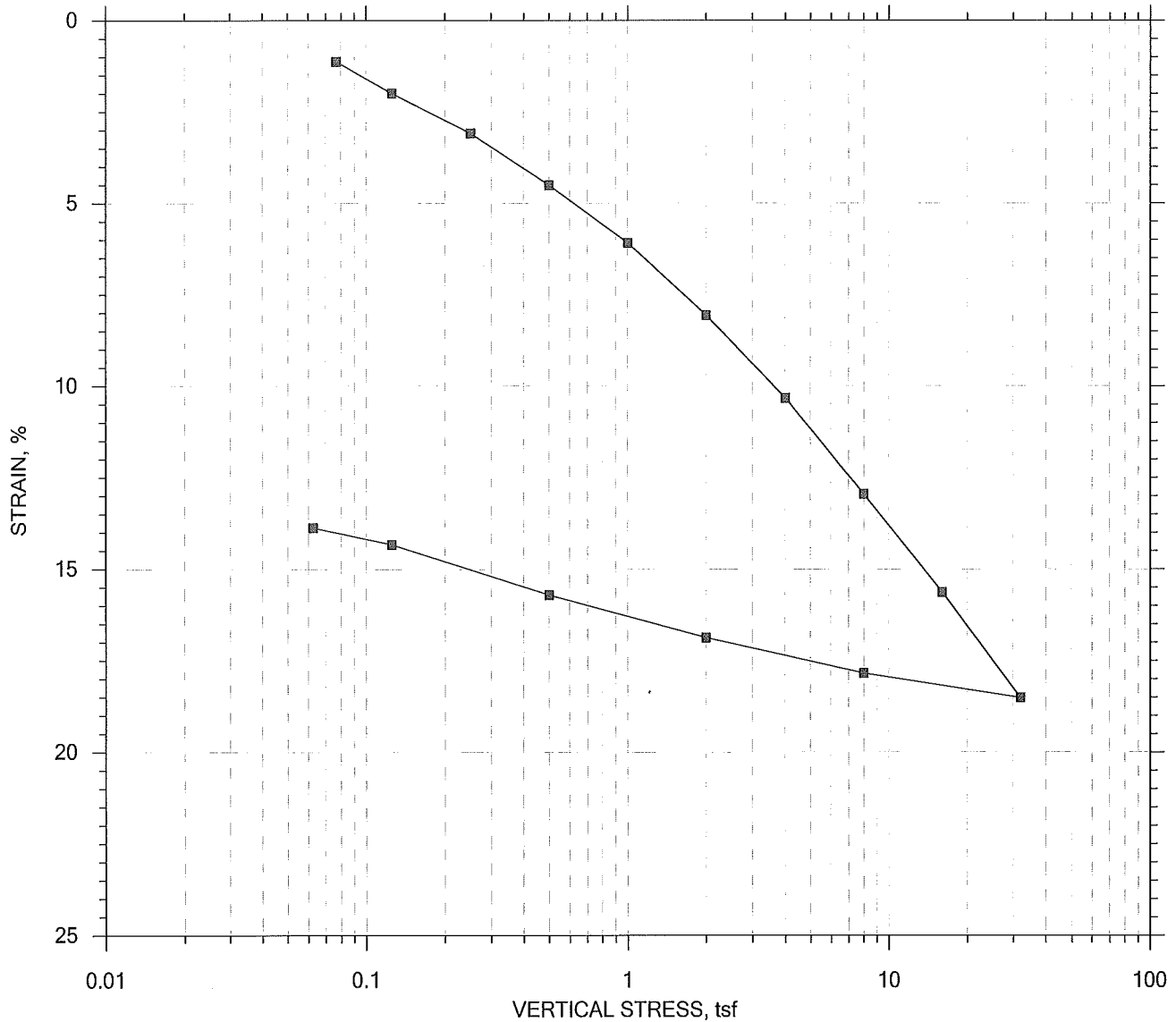
SUMMARY REPORT




	Project: Saco Toll Plaza	Location: Saco, ME	Project No.: GTX-302234
	Boring No.: B-2	Tested By: md	Checked By: jdt
	Sample No.: U-1	Test Date: 08/28/14	Test No.: IP-6
	Depth: 30-32 ft	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System Y, Swell Pressure = 0.0768 tsf		
	Displacement at End of Increment		

One-Dimensional Consolidation by ASTM D2435 - Method B

SUMMARY REPORT



				Before Test	After Test	
Current Vertical Effective Stress: ---				Water Content, %	32.51	21.85
Preconsolidation Stress: ---				Dry Unit Weight, pcf	92.148	109.7
Compression Ratio: ---				Saturation, %	99.43	100.00
Diameter: 2.5 in		Height: 1 in		Void Ratio	0.93	0.62
LL: 29	PL: 17	PI: 12	GS: 2.85			

	Project: Saco Toll Plaza	Location: Saco, ME	Project No.: GTX-302234
	Boring No.: B-2	Tested By: md	Checked By: jdt
	Sample No.: U-1	Test Date: 08/28/14	Test No.: IP-6
	Depth: 30-32 ft	Sample Type: intact	Elevation: ---
	Description: Moist, olive gray clay		
	Remarks: System Y, Swell Pressure = 0.0768 tsf		
	Displacement at End of Increment		

One-Dimensional Consolidation by ASTM D2435 - Method B

Project: Saco Toll Plaza
 Boring No.: B-2
 Sample No.: U-1
 Test No.: IP-6

Location: Saco, ME
 Tested By: md
 Test Date: 08/28/14
 Sample Type: intact

Project No.: GTX-302234
 Checked By: jdt
 Depth: 30-32 ft
 Elevation: ---

Soil Description: Moist, olive gray clay
 Remarks: System Y, Swell Pressure = 0.0768 tsf

Estimated Specific Gravity: 2.85
 Initial Void Ratio: 0.933
 Final Void Ratio: 0.623

Liquid Limit: 29
 Plastic Limit: 17
 Plasticity Index: 12

Specimen Diameter: 2.50 in
 Initial Height: 1.00 in
 Final Height: 0.84 in

	Before Consolidation		After Consolidation	
	Trimmings	Specimen+Ring	Specimen+Ring	Trimmings
Container ID	14752	RING		14932
Wt. Container + Wet Soil, gm	150.83	267.32	254.67	154.58
Wt. Container + Dry Soil, gm	118.29	228.72	228.72	128.33
Wt. Container, gm	8.2300	109.99	109.99	8.2000
Wt. Dry Soil, gm	110.06	118.73	118.73	120.13
Water Content, %	29.57	32.51	21.85	21.85
Void Ratio	---	0.933	0.623	---
Degree of Saturation, %	---	99.43	100.00	---
Dry Unit Weight, pcf	---	92.148	109.70	---

Note: Specific Gravity and Void Ratios are calculated assuming the degree of saturation equals 100% at the end of the test. Therefore, values may not represent actual values for the specimen.

One-Dimensional Consolidation by ASTM D2435 - Method B

Project: Saco Toll Plaza
 Boring No.: B-2
 Sample No.: U-1
 Test No.: IP-6

Location: Saco, ME
 Tested By: md
 Test Date: 08/28/14
 Sample Type: intact

Project No.: GTX-302234
 Checked By: jdt
 Depth: 30-32 ft
 Elevation: ---

Soil Description: Moist, olive gray clay
 Remarks: System Y, Swell Pressure = 0.0768 tsf

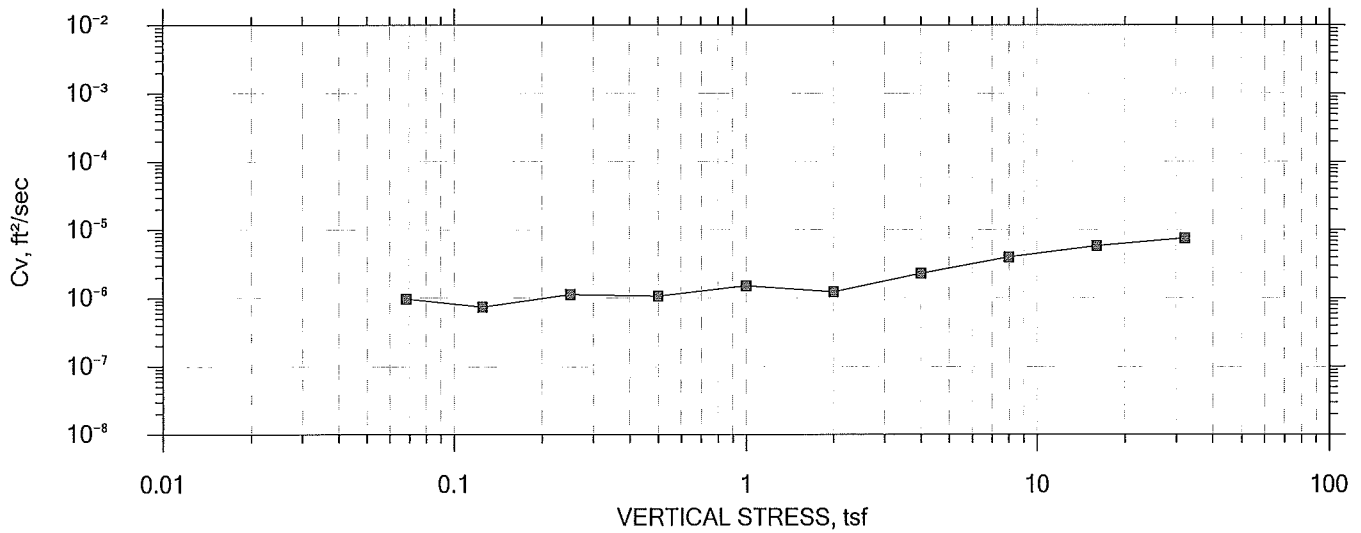
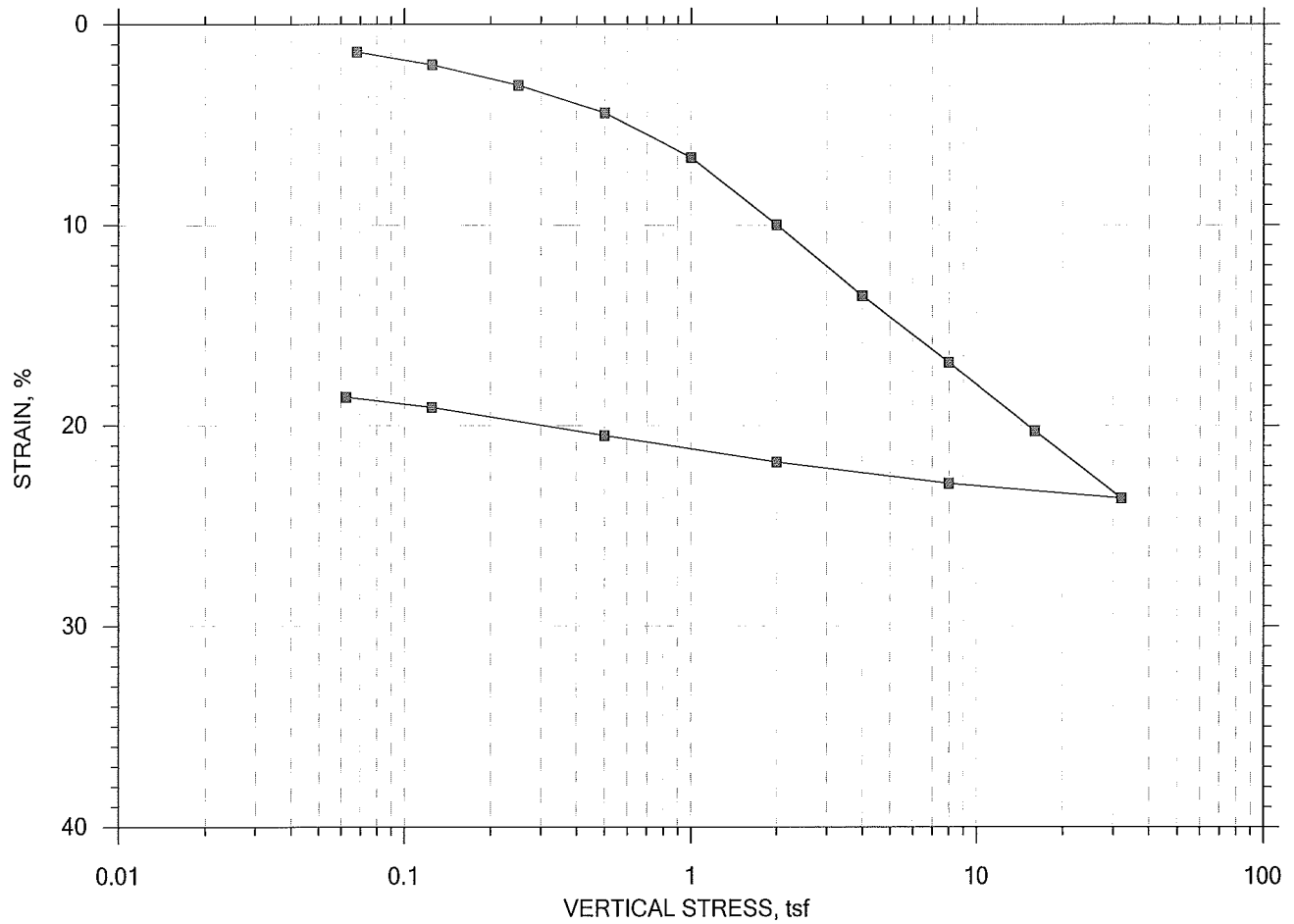
Displacement at End of Increment


	Applied Stress tsf	Final Displacement in	Void Ratio	Strain at End %	Sq.Rt T90 min	Cv ft ² /sec	Mv 1/tsf	k ft/day
1	0.0768	0.01120	0.911	1.12	55.257	4.39e-007	1.46e-001	1.73e-004
2	0.125	0.01990	0.894	1.99	68.396	3.48e-007	1.81e-001	1.69e-004
3	0.250	0.03084	0.873	3.08	36.804	6.33e-007	8.75e-002	1.49e-004
4	0.500	0.04501	0.846	4.50	41.826	5.43e-007	5.67e-002	8.30e-005
5	1.00	0.06081	0.815	6.08	35.979	6.12e-007	3.16e-002	5.21e-005
6	2.00	0.08058	0.777	8.06	16.544	1.28e-006	1.98e-002	6.83e-005
7	4.00	0.1033	0.733	10.3	9.860	2.05e-006	1.14e-002	6.28e-005
8	8.00	0.1295	0.682	12.9	6.341	3.02e-006	6.55e-003	5.34e-005
9	16.0	0.1563	0.631	15.6	4.732	3.81e-006	3.35e-003	3.44e-005
10	32.0	0.1851	0.575	18.5	3.348	5.04e-006	1.80e-003	2.45e-005
11	8.00	0.1784	0.588	17.8	1.172	1.40e-005	2.77e-004	1.05e-005
12	2.00	0.1687	0.607	16.9	3.744	4.48e-006	1.63e-003	1.96e-005
13	0.500	0.1570	0.629	15.7	20.238	8.50e-007	7.76e-003	1.78e-005
14	0.125	0.1434	0.655	14.3	47.201	3.75e-007	3.65e-002	3.70e-005
15	0.0625	0.1387	0.664	13.9	183.591	9.86e-008	7.43e-002	1.98e-005

	Applied Stress tsf	Final Displacement in	Void Ratio	Strain at End %	Log T50 min	Cv ft ² /sec	Mv 1/tsf	k ft/day	Ca %
1	0.0768	0.01120	0.911	1.12	0.000	0.00e+000	1.46e-001	0.00e+000	0.00e+000
2	0.125	0.01990	0.894	1.99	16.630	3.32e-007	1.81e-001	1.62e-004	0.00e+000
3	0.250	0.03084	0.873	3.08	10.780	5.02e-007	8.75e-002	1.19e-004	0.00e+000
4	0.500	0.04501	0.846	4.50	9.295	5.68e-007	5.67e-002	8.68e-005	0.00e+000
5	1.00	0.06081	0.815	6.08	7.236	7.07e-007	3.16e-002	6.02e-005	0.00e+000
6	2.00	0.08058	0.777	8.06	4.818	1.02e-006	1.98e-002	5.45e-005	0.00e+000
7	4.00	0.1033	0.733	10.3	2.618	1.80e-006	1.14e-002	5.50e-005	0.00e+000
8	8.00	0.1295	0.682	12.9	1.938	2.30e-006	6.55e-003	4.06e-005	0.00e+000
9	16.0	0.1563	0.631	15.6	1.330	3.15e-006	3.35e-003	2.84e-005	0.00e+000
10	32.0	0.1851	0.575	18.5	1.147	3.42e-006	1.80e-003	1.66e-005	0.00e+000
11	8.00	0.1784	0.588	17.8	0.237	1.61e-005	2.77e-004	1.20e-005	0.00e+000
12	2.00	0.1687	0.607	16.9	0.000	0.00e+000	1.63e-003	0.00e+000	0.00e+000
13	0.500	0.1570	0.629	15.7	5.934	6.73e-007	7.76e-003	1.41e-005	0.00e+000
14	0.125	0.1434	0.655	14.3	0.000	0.00e+000	3.65e-002	0.00e+000	0.00e+000
15	0.0625	0.1387	0.664	13.9	0.000	0.00e+000	7.43e-002	0.00e+000	0.00e+000

One-Dimensional Consolidation by ASTM D2435 - Method B

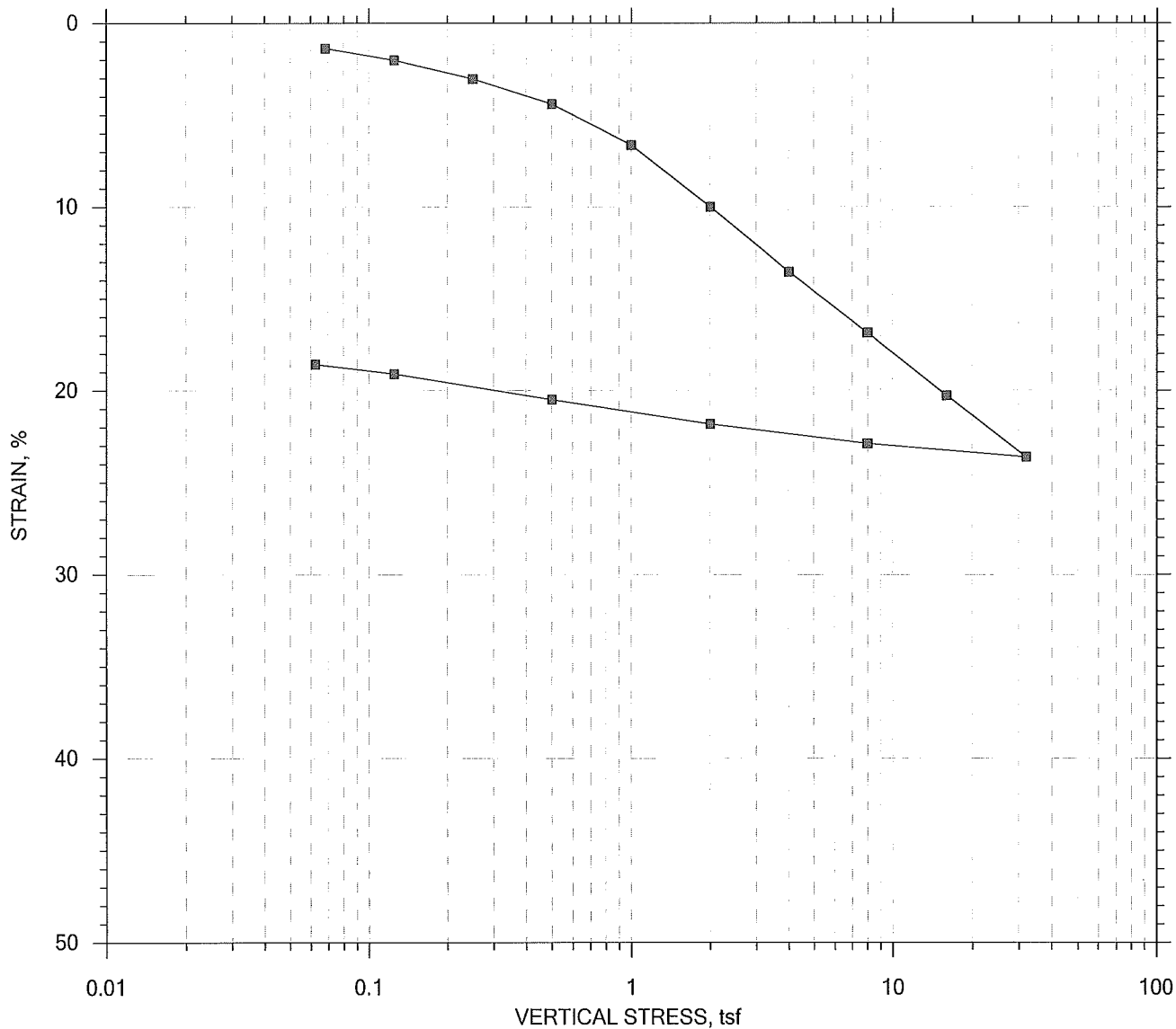
SUMMARY REPORT




	Project: Saco Toll Plaza	Location: Saco, ME	Project No.: GTX-302234
	Boring No.: B-3	Tested By: md	Checked By: jdt
	Sample No.: U-1	Test Date: 08/28/14	Test No.: IP-5
	Depth: 34-36 ft	Sample Type: intact	Elevation: ---
	Description: Wet, olive gray clay		
	Remarks: System T, Swell Pressure = 0.0683 tsf		
	Displacement at End of Increment		

One-Dimensional Consolidation by ASTM D2435 - Method B

SUMMARY REPORT



				Before Test	After Test
Current Vertical Effective Stress: ---				39.52	24.62
Preconsolidation Stress: ---				83.199	104
Compression Ratio: ---				99.72	100.00
Diameter: 2.5 in		Height: 1 in		1.12	0.70
LL: 29	PL: 14	PI: 15	GS: 2.82		

	Project: Saco Toll Plaza		Location: Saco, ME	Project No.: GTX-302234
	Boring No.: B-3		Tested By: md	Checked By: jdt
	Sample No.: U-1		Test Date: 08/28/14	Test No.: IP-5
	Depth: 34-36 ft		Sample Type: intact	Elevation: ---
	Description: Wet, olive gray clay			
	Remarks: System T, Swell Pressure = 0.0683 tsf			
	Displacement at End of Increment			

One-Dimensional Consolidation by ASTM D2435 - Method B

Project: Saco Toll Plaza
 Boring No.: B-3
 Sample No.: U-1
 Test No.: IP-5

Location: Saco, ME
 Tested By: md
 Test Date: 08/28/14
 Sample Type: intact

Project No.: GTX-302234
 Checked By: jdt
 Depth: 34-36 ft
 Elevation: ---

Soil Description: Wet, olive gray clay

Remarks: System T, Swell Pressure = 0.0683 tsf

Estimated Specific Gravity: 2.82
 Initial Void Ratio: 1.12
 Final Void Ratio: 0.695

Liquid Limit: 29
 Plastic Limit: 14
 Plasticity Index: 15

Specimen Diameter: 2.50 in
 Initial Height: 1.00 in
 Final Height: 0.80 in

	Before Consolidation		After Consolidation	
	Trimmings	Specimen+Ring	Specimen+Ring	Trimmings
Container ID	12736	RING		14797
Wt. Container + Wet Soil, gm	218.00	258.50	242.53	141.99
Wt. Container + Dry Soil, gm	163.27	216.13	216.13	115.53
Wt. Container, gm	8.4100	108.93	108.93	8.0700
Wt. Dry Soil, gm	154.86	107.20	107.20	107.46
Water Content, %	35.34	39.52	24.62	24.62
Void Ratio	---	1.12	0.695	---
Degree of Saturation, %	---	99.72	100.00	---
Dry Unit Weight, pcf	---	83.199	104.00	---

Note: Specific Gravity and Void Ratios are calculated assuming the degree of saturation equals 100% at the end of the test. Therefore, values may not represent actual values for the specimen.

One-Dimensional Consolidation by ASTM D2435 - Method B

Project: Saco Toll Plaza
 Boring No.: B-3
 Sample No.: U-1
 Test No.: IP-5

Location: Saco, ME
 Tested By: md
 Test Date: 08/28/14
 Sample Type: intact

Project No.: GTX-302234
 Checked By: jdt
 Depth: 34-36 ft
 Elevation: ---

Soil Description: Wet, olive gray clay
 Remarks: System T, Swell Pressure = 0.0683 tsf

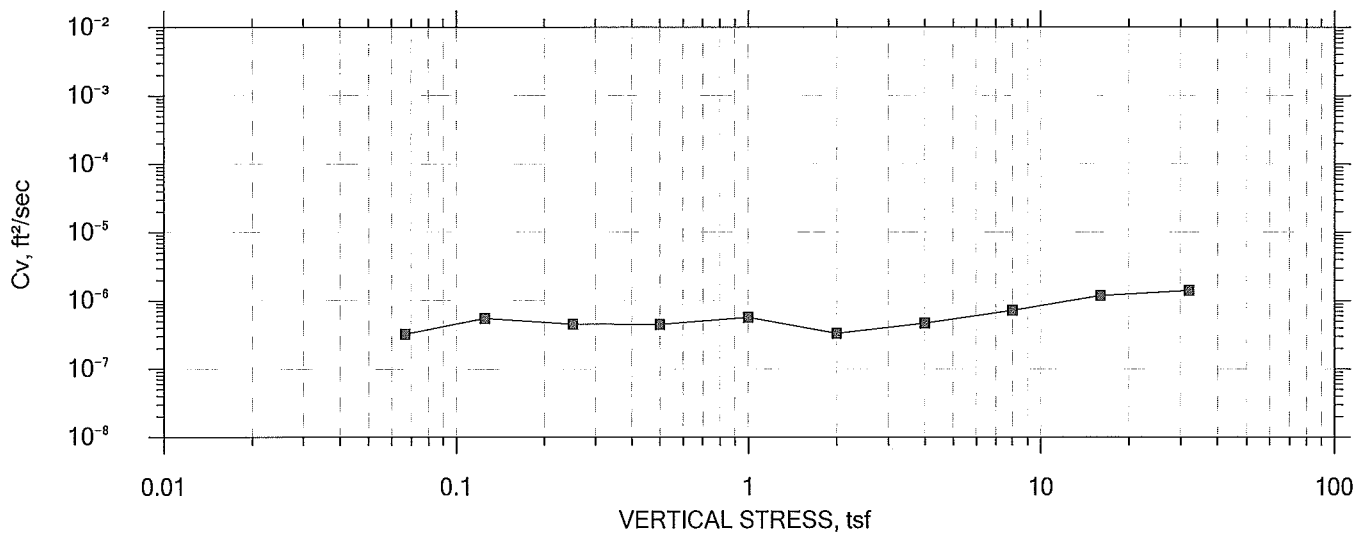
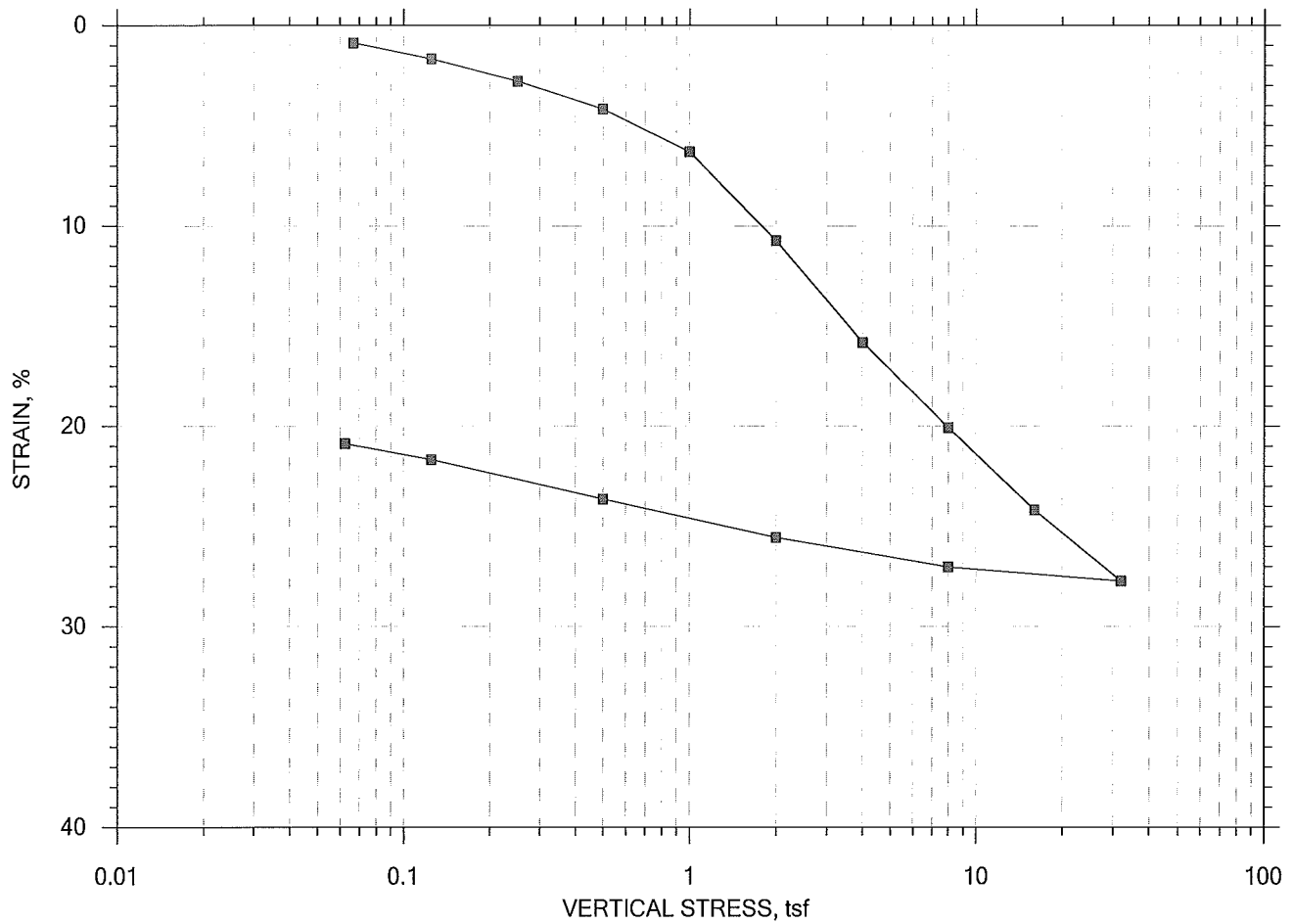
Displacement at End of Increment


	Applied Stress tsf	Final Displacement in	Void Ratio	Strain at End %	Sq.Rt T90 min	Cv ft ² /sec	Mv 1/tsf	k ft/day
1	0.0683	0.01365	1.09	1.36	20.055	1.21e-006	2.00e-001	6.50e-004
2	0.125	0.02015	1.08	2.01	36.397	6.52e-007	1.15e-001	2.02e-004
3	0.250	0.03030	1.06	3.03	24.941	9.35e-007	8.12e-002	2.05e-004
4	0.500	0.04392	1.03	4.39	21.818	1.04e-006	5.45e-002	1.53e-004
5	1.00	0.06631	0.979	6.63	15.358	1.43e-006	4.48e-002	1.72e-004
6	2.00	0.09993	0.908	9.99	17.258	1.20e-006	3.36e-002	1.08e-004
7	4.00	0.1354	0.832	13.5	9.460	2.02e-006	1.77e-002	9.67e-005
8	8.00	0.1685	0.762	16.9	4.470	3.95e-006	8.28e-003	8.81e-005
9	16.0	0.2028	0.690	20.3	2.784	5.85e-006	4.28e-003	6.74e-005
10	32.0	0.2362	0.619	23.6	2.474	6.04e-006	2.09e-003	3.40e-005
11	8.00	0.2288	0.634	22.9	0.812	1.78e-005	3.08e-004	1.48e-005
12	2.00	0.2182	0.657	21.8	1.678	8.82e-006	1.76e-003	4.20e-005
13	0.500	0.2049	0.685	20.5	12.448	1.23e-006	8.89e-003	2.94e-005
14	0.125	0.1909	0.715	19.1	49.565	3.19e-007	3.73e-002	3.20e-005
15	0.0625	0.1857	0.726	18.6	149.434	1.08e-007	8.26e-002	2.41e-005

	Applied Stress tsf	Final Displacement in	Void Ratio	Strain at End %	Log T50 min	Cv ft ² /sec	Mv 1/tsf	k ft/day	Ca %
1	0.0683	0.01365	1.09	1.36	6.620	8.49e-007	2.00e-001	4.58e-004	0.00e+000
2	0.125	0.02015	1.08	2.01	7.165	7.69e-007	1.15e-001	2.38e-004	0.00e+000
3	0.250	0.03030	1.06	3.03	0.000	0.00e+000	8.12e-002	0.00e+000	0.00e+000
4	0.500	0.04392	1.03	4.39	0.000	0.00e+000	5.45e-002	0.00e+000	0.00e+000
5	1.00	0.06631	0.979	6.63	3.417	1.49e-006	4.48e-002	1.80e-004	0.00e+000
6	2.00	0.09993	0.908	9.99	3.978	1.20e-006	3.36e-002	1.09e-004	0.00e+000
7	4.00	0.1354	0.832	13.5	1.862	2.38e-006	1.77e-002	1.14e-004	0.00e+000
8	8.00	0.1685	0.762	16.9	1.158	3.54e-006	8.28e-003	7.90e-005	0.00e+000
9	16.0	0.2028	0.690	20.3	0.728	5.19e-006	4.28e-003	5.99e-005	0.00e+000
10	32.0	0.2362	0.619	23.6	0.431	8.06e-006	2.09e-003	4.54e-005	0.00e+000
11	8.00	0.2288	0.634	22.9	0.000	0.00e+000	3.08e-004	0.00e+000	0.00e+000
12	2.00	0.2182	0.657	21.8	0.000	0.00e+000	1.76e-003	0.00e+000	0.00e+000
13	0.500	0.2049	0.685	20.5	3.090	1.15e-006	8.89e-003	2.75e-005	0.00e+000
14	0.125	0.1909	0.715	19.1	10.296	3.56e-007	3.73e-002	3.58e-005	0.00e+000
15	0.0625	0.1857	0.726	18.6	43.874	8.56e-008	8.26e-002	1.91e-005	0.00e+000

One-Dimensional Consolidation by ASTM D2435 - Method B

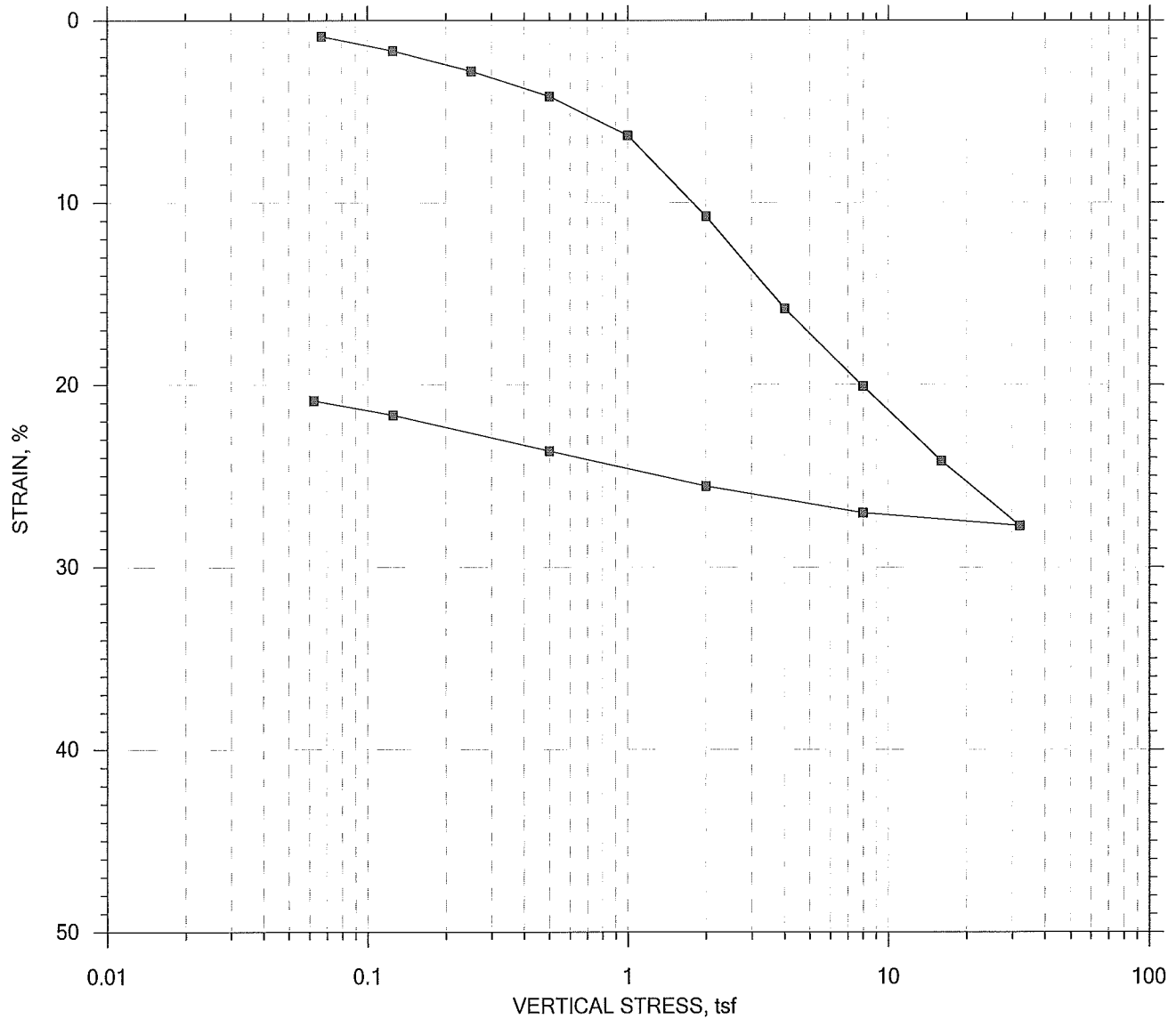
SUMMARY REPORT




	Project: Saco Toll Plaza	Location: Saco, ME	Project No.: GTX-302234
	Boring No.: B-3	Tested By: md	Checked By: jdt
	Sample No.: U-2	Test Date: 08/25/14	Test No.: IP-7
	Depth: 49.5-51.5 ft	Sample Type: intact	Elevation: ---
	Description: Wet, olive gray clay		
	Remarks: System X, Swell Pressure = 0.0668 tsf		
	Displacement at End of Increment		

One-Dimensional Consolidation by ASTM D2435 - Method B

SUMMARY REPORT



					Before Test	After Test
Current Vertical Effective Stress: ---				Water Content, %	46.27	30.35
Preconsolidation Stress: ---				Dry Unit Weight, pcf	75.71	94.638
Compression Ratio: ---				Saturation, %	98.78	100.00
Diameter: 2.5 in		Height: 1 in		Void Ratio	1.32	0.85
LL: 33	PL: 19	PI: 14	GS: 2.81			

	Project: Saco Toll Plaza	Location: Saco, ME	Project No.: GTX-302234
	Boring No.: B-3	Tested By: md	Checked By: jdt
	Sample No.: U-2	Test Date: 08/25/14	Test No.: IP-7
	Depth: 49.5-51.5 ft	Sample Type: intact	Elevation: ---
	Description: Wet, olive gray clay		
	Remarks: System X, Swell Pressure = 0.0668 tsf		
	Displacement at End of Increment		

One-Dimensional Consolidation by ASTM D2435 - Method B

Project: Saco Toll Plaza
Boring No.: B-3
Sample No.: U-2
Test No.: IP-7

Location: Saco, ME
Tested By: md
Test Date: 08/25/14
Sample Type: intact

Project No.: GTX-302234
Checked By: jdt
Depth: 49.5-51.5 ft
Elevation: ---

Soil Description: Wet, olive gray clay
Remarks: System X, Swell Pressure = 0.0668 tsf

Estimated Specific Gravity: 2.81
Initial Void Ratio: 1.32
Final Void Ratio: 0.852

Liquid Limit: 33
Plastic Limit: 19
Plasticity Index: 14

Specimen Diameter: 2.50 in
Initial Height: 1.00 in
Final Height: 0.80 in

	Before Consolidation		After Consolidation	
	Trimmings	Specimen+Ring	Specimen+Ring	Trimmings
Container ID	11000	RING		13432
Wt. Container + Wet Soil, gm	149.81	254.52	238.99	133.66
Wt. Container + Dry Soil, gm	106.99	209.38	209.38	104.45
Wt. Container, gm	7.6400	111.83	111.83	8.2000
Wt. Dry Soil, gm	99.350	97.554	97.554	96.250
Water Content, %	43.10	46.27	30.35	30.35
Void Ratio	---	1.32	0.852	---
Degree of Saturation, %	---	98.78	100.00	---
Dry Unit Weight, pcf	---	75.710	94.638	---

Note: Specific Gravity and Void Ratios are calculated assuming the degree of saturation equals 100% at the end of the test. Therefore, values may not represent actual values for the specimen.

One-Dimensional Consolidation by ASTM D2435 - Method B

Project: Saco Toll Plaza
 Boring No.: B-3
 Sample No.: U-2
 Test No.: IP-7

Location: Saco, ME
 Tested By: md
 Test Date: 08/25/14
 Sample Type: intact

Project No.: GTX-302234
 Checked By: jdt
 Depth: 49.5-51.5 ft
 Elevation: ---

Soil Description: Wet, olive gray clay
 Remarks: System X, Swell Pressure = 0.0668 tsf

Displacement at End of Increment

	Applied Stress tsf	Final Displacement in	Void Ratio	Strain at End %	Sq.Rt T90 min	Cv ft ² /sec	Mv 1/tsf	k ft/day
1	0.0668	0.008623	1.30	0.862	99.008	2.46e-007	1.29e-001	8.55e-005
2	0.125	0.01659	1.28	1.66	52.178	4.58e-007	1.37e-001	1.69e-004
3	0.250	0.02772	1.25	2.77	50.617	4.64e-007	8.91e-002	1.11e-004
4	0.500	0.04157	1.22	4.16	48.266	4.74e-007	5.54e-002	7.08e-005
5	1.00	0.06310	1.17	6.31	42.839	5.14e-007	4.31e-002	5.97e-005
6	2.00	0.1074	1.07	10.7	60.295	3.41e-007	4.43e-002	4.07e-005
7	4.00	0.1582	0.949	15.8	45.702	4.04e-007	2.54e-002	2.77e-005
8	8.00	0.2007	0.850	20.1	27.057	6.11e-007	1.06e-002	1.75e-005
9	16.0	0.2418	0.755	24.2	13.307	1.12e-006	5.13e-003	1.55e-005
10	32.0	0.2773	0.673	27.7	11.039	1.22e-006	2.22e-003	7.30e-006
11	8.00	0.2703	0.689	27.0	9.360	1.38e-006	2.93e-004	1.09e-006
12	2.00	0.2556	0.723	25.6	21.975	6.07e-007	2.45e-003	4.00e-006
13	0.500	0.2363	0.768	23.6	83.706	1.67e-007	1.29e-002	5.78e-006
14	0.125	0.2166	0.814	21.7	229.141	6.41e-008	5.25e-002	9.08e-006
15	0.0625	0.2086	0.832	20.9	227.355	6.69e-008	1.28e-001	2.30e-005

	Applied Stress tsf	Final Displacement in	Void Ratio	Strain at End %	Log T50 min	Cv ft ² /sec	Mv 1/tsf	k ft/day	Ca %
1	0.0668	0.008623	1.30	0.862	0.000	0.00e+000	1.29e-001	0.00e+000	0.00e+000
2	0.125	0.01659	1.28	1.66	7.948	6.99e-007	1.37e-001	2.58e-004	0.00e+000
3	0.250	0.02772	1.25	2.77	11.597	4.70e-007	8.91e-002	1.13e-004	0.00e+000
4	0.500	0.04157	1.22	4.16	12.288	4.32e-007	5.54e-002	6.46e-005	0.00e+000
5	1.00	0.06310	1.17	6.31	8.608	5.95e-007	4.31e-002	6.91e-005	0.00e+000
6	2.00	0.1074	1.07	10.7	14.900	3.20e-007	4.43e-002	3.83e-005	0.00e+000
7	4.00	0.1582	0.949	15.8	8.221	5.21e-007	2.54e-002	3.57e-005	0.00e+000
8	8.00	0.2007	0.850	20.1	4.774	8.04e-007	1.06e-002	2.30e-005	0.00e+000
9	16.0	0.2418	0.755	24.2	2.861	1.21e-006	5.13e-003	1.67e-005	0.00e+000
10	32.0	0.2773	0.673	27.7	2.066	1.51e-006	2.22e-003	9.06e-006	0.00e+000
11	8.00	0.2703	0.689	27.0	1.448	2.08e-006	2.93e-004	1.64e-006	0.00e+000
12	2.00	0.2556	0.723	25.6	0.000	0.00e+000	2.45e-003	0.00e+000	0.00e+000
13	0.500	0.2363	0.768	23.6	16.769	1.93e-007	1.29e-002	6.70e-006	0.00e+000
14	0.125	0.2166	0.814	21.7	0.000	0.00e+000	5.25e-002	0.00e+000	0.00e+000
15	0.0625	0.2086	0.832	20.9	0.000	0.00e+000	1.28e-001	0.00e+000	0.00e+000

MAINE TURNPIKE AUTHORITY

SPECIFICATIONS

APPENDIX B

EXISTING VMS PLANS

MAINE TURNPIKE AUTHORITY

MAINE TURNPIKE

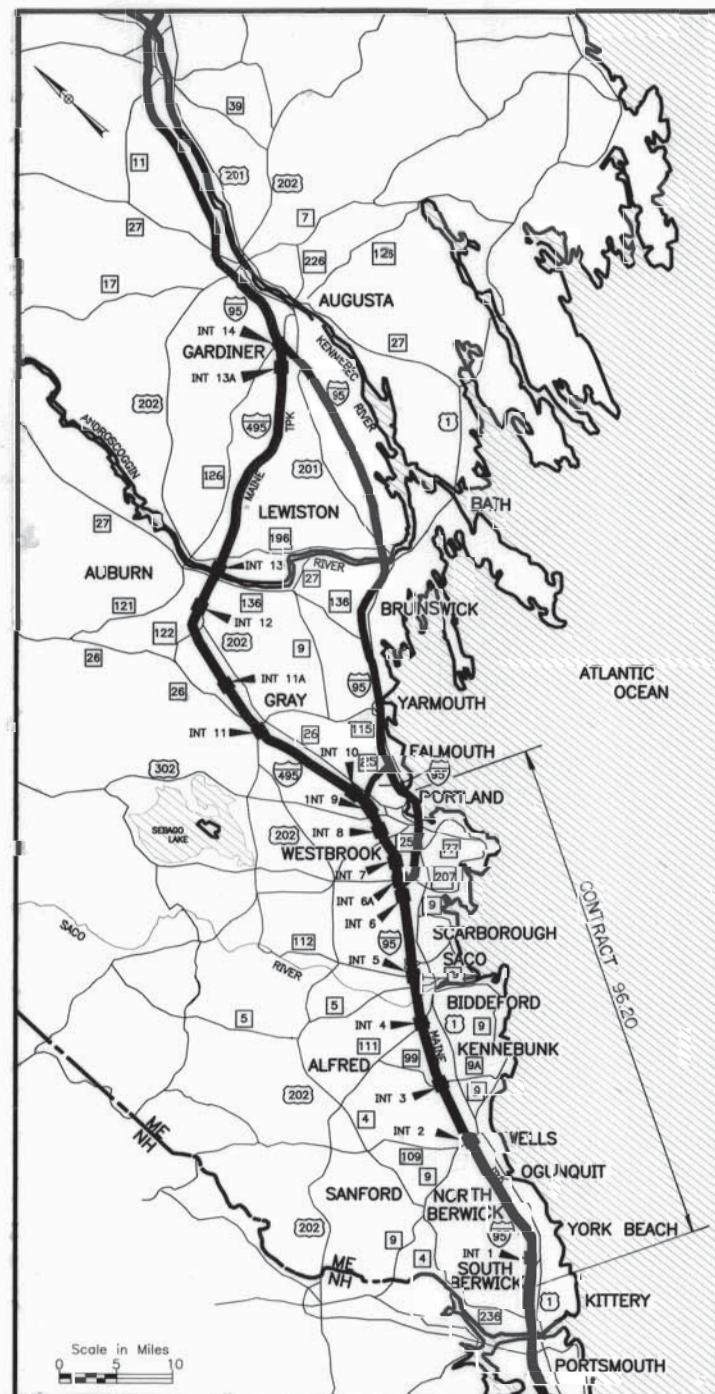


JULIAN R. COLES, CHAIRMAN
 DANIEL J. CALLAHAN, VICE CHAIRMAN
 DEBORAH H.S. CIANCHETTE, MEMBER
 PATRICK F. BUTLER, MEMBER
 JOHN G. MELROSE, MEMBER EX-OFFICIO
 PAUL E. VIOLETTE, EXECUTIVE DIRECTOR

CONTRACT No. 96.20

VARIABLE MESSAGE SIGN INSTALLATION

MM 4.7 - 51.2



LOCATION MAP

STATE OF MAINE
 DEPARTMENT OF TRANSPORTATION

COMMISSIONER _____ DATE _____
 BUREAU DIRECTOR AND CHIEF ENGINEER _____ DATE _____

HNTB HNTB CORPORATION
 ARCHITECTS ENGINEERS PLANNERS



Roland A. Lavallee
 ROLAND A. LAVALLEE, P.E.
 PROJECT MANAGER

1/23/77
 DATE

INDEX OF SHEETS

- | | |
|-------|---|
| 1 | TITLE SHEET |
| 2 | QUANTITY SHEET |
| 3 | STANDARD LEGEND / GENERAL NOTES |
| 4,5 | GENERAL LAYOUT SHEETS |
| 6-18 | VARIABLE MESSAGE SIGN LOCATION PLANS
(SHEET 15 IS OMITTED) |
| 19-21 | ELECTRIC DETAILS |
| 22-27 | REFERENCE DRAWINGS |
| 28,29 | STRUCTURE DETAILS |
| 30-35 | HIGHWAY DETAILS |
| 34 | TOTAL SHEETS |

APPROVED: _____
 MAINE TURNPIKE AUTHORITY

CHAIRMAN

EXECUTIVE DIRECTOR

DATE _____

STANDARD LEGEND

	Existing Guardrail Type 3b - Single Rail
	Existing Guardrail Type 3b - Double Rail
	PROPOSED GUARDRAIL TYPE 3B - SINGLE RAIL
	PROPOSED GUARDRAIL TYPE 3B - SINGLE RAIL, REMOVE AND RESET
	PROPOSED GUARDRAIL TYPE 3B - DOUBLE RAIL
	PROPOSED CRASH CUSHION ATTENUATING TERMINAL (C-A-T)
	PROPOSED MODIFIED ECCENTRIC LOADER TERMINAL (M.E.L.T.)
	PROPOSED LIMIT OF AGGREGATE BASE COURSE - CRUSHED
	Existing Sign
	PROPOSED VMS SIGN (OVERHEAD STRUCTURE, TYPE I)
	PROPOSED VMS SIGN (GROUND MOUNTED, TYPE II)
	PROPOSED RELOCATED SIGN
	FUTURE PROPOSED SIGN
	PROPOSED STRUCTURE FOOTING
	TEMPORARY SHEETING
	TOE OF SLOPE
	TEMPORARY SILT FENCE
	Existing Right of Way
	Existing Pipe (Type and Size as Noted)
	Existing Catch Basin
	Existing Utility Pole
	Existing Overhead Electric
	Existing Overhead Electric and Telephone
	Existing Underground Electric
	PROPOSED RIGID METALLIC CONDUIT - UNDERGROUND
	PROPOSED RIGID METALLIC CONDUIT - UNDER ROADWAY
	PROPOSED RIGID METALLIC CONDUIT - EXPOSED/ON STRUCTURE
	PRECAST CONCRETE JUNCTION BOX (18"x 36")
	TRAFFIC CABINET ON CONCRETE PAD FOUNDATION
	Existing Vegetation

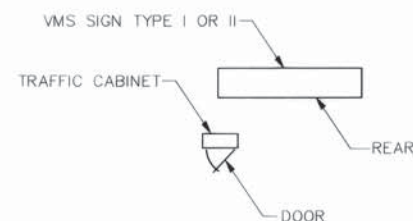
SIZE AND TYPE
AS SHOWN
ON PLANS

GENERAL NOTES

- EXISTING UTILITIES SHOWN ON THESE PLANS ARE NOT GUARANTEED TO BE ACCURATE NOR IS IT GUARANTEED THAT ALL UTILITIES ARE SHOWN. LOCATIONS SHALL BE VERIFIED BY THE CONTRACTOR. TEST PITS SHALL BE EXCAVATED AS NECESSARY AND ALL COSTS FOR THIS WORK SHALL BE INCLUDED IN THE LUMP SUM PRICE BID FOR THE ITEMS "VARIABLE MESSAGE GUIDE SIGN AND SUPPORTS."
- NO WORK SHALL BE STARTED UNTIL THE OWNERS OF THE VARIOUS UTILITIES ARE NOTIFIED BY THE CONTRACTOR. THE CONTRACTOR SHALL BE REQUIRED TO CALL DIG SAFE AT 1-800-322-4844, AND TARGET FOR PRIVATE UTILITIES, PRIOR TO THE START OF THE WORK.
- CONTRACTOR SHALL TAKE CARE SO AS NOT TO DAMAGE UNDERGROUND FACILITIES (ELECTRIC, GAS, STORM, ETC.) WHEN CONSTRUCTING FOOTINGS, DRIVING SHEETING, OR DRIVING GUARDRAIL POSTS. ANY DAMAGE DONE TO THE UTILITY SHALL BE REPAIRED TO THE SATISFACTION OF THE OWNER AT THE CONTRACTOR'S EXPENSE.
- CLEARING LIMITS SHALL BE 5' BEYOND AND PARALLEL TO THE CONSTRUCTION SLOPE LINES, INCLUDING OVERHANGING TREE LIMBS, UNLESS OTHERWISE INDICATED ON THE PLANS. ALL INDIVIDUAL TREE AND STUMP REMOVAL AS REQUIRED SHALL BE CONSIDERED INCIDENTAL TO THE WORK REQUIRED UNDER THIS CONTRACT.
- OVERHEAD SIGN STRUCTURES SHALL BE DELIVERED TO THE KENNEBUNK MAINTENANCE AREA. TRAFFIC CLOSINGS REQUIRED TO SET THE STRUCTURE ARE TO BE COORDINATED WITH THE TURNPIKE AND THE STATE POLICE.
- SEE STANDARD GUARDRAIL DETAILS FOR GRADING REQUIREMENTS IN AND AROUND PROPOSED GUARDRAIL.
- SEE SECTION 104.07 REGARDING REMOVAL AND DISPOSAL OF GUARDRAIL.
- TWO GUARDRAIL DELINEATOR POSTS WITH RED DELINEATORS SHALL BE INSTALLED AT EACH M.E.L.T. AND ONE GUARDRAIL DELINEATOR POST WITH RED DELINEATOR SHALL BE INSTALLED AT EACH TERMINAL END. COSTS FOR SAME SHALL BE INCLUDED IN THE UNIT PRICE BID FOR THE RESPECTIVE END TREATMENTS. SEE DETAILS FOR END TREATMENTS, PAY LIMITS, AND GRADING REQUIREMENTS.
- M.E.L.T. SHALL BE INSTALLED CONCURRENTLY WITH THE PLACEMENT OF EACH SECTION OF BEAM GUARDRAIL UNLESS OTHER TEMPORARY PROTECTION HAS BEEN AUTHORIZED.
- UPON APPROVAL OF THE ENGINEER, THE CONTRACTOR WILL BE PERMITTED TO WORK ON MORE THAN ONE LOCATION AT ONCE, AND/OR PROCEED TO ANOTHER LOCATION BEFORE THE CURRENT SITE IS COMPLETE. TRAFFIC PROTECTION SHALL REMAIN IN PLACE UNTIL PROPOSED GUARDRAIL IS CONSTRUCTED.
- SEE STANDARD DETAILS FOR TYPICAL MAINLINE SHOULDER CLOSINGS, INCLUDING PRECAST CONCRETE CONSTRUCTION BARRIER LAYOUT. SEE PLAN SHEETS FOR ALL OTHER LOCATIONS REQUIRING TRAFFIC PROTECTION.
- PRECAST CONCRETE BARRIER USED IN PROTECTING THE WORK ZONE SHALL BE CONTINUOUS AT ALL TIMES. IT IS THE CONTRACTORS RESPONSIBILITY TO ENSURE THAT THE CUSHIONS BE MAINTAINED AND PLACED CORRECTLY. ANY CUSHIONS THAT BECOME DAMAGED SHALL BE REPLACED UPON DISCOVERY AND ADDITIONAL PAYMENT WILL BE MADE AS DESCRIBED IN THE SPECIFICATIONS.
- THE CONTRACTOR SHALL BRING THE EMBANKMENT UP TO WITHIN 4" OF THE FINAL GRADE IN AREAS REQUIRING GRAVEL OR TOPSOIL AND SEEDING.
- UNLESS OTHERWISE NOTED, SEEDING METHOD No. 2 SHALL BE UTILIZED ON ALL NON-GUARDRAIL FORESLOPES FROM THE SHOULDER TO THE TOE OF FILL, AND SEEDING METHOD No. 3 ON ALL BACKSLOPES AND GUARDRAIL FORESLOPES.
- MULCH SHALL BE APPLIED IN AREAS SEEDED BY SEEDING METHODS No. 2 AND 3.
- WASTE MATERIALS SHALL BE DISPOSED OF OUTSIDE THE LIMITS OF THE TURNPIKE RIGHT-OF-WAY, IN ACCORDANCE WITH CHAPTER 404, DEPARTMENT OF ENVIRONMENTAL PROTECTION SOLID WASTE MANAGEMENT REGULATIONS.
- THE CONTRACTOR SHALL VERIFY LOCATION, ELEVATION, ETC. OF ALL FACILITIES AND UTILITIES THAT THE PROPOSED WORK WILL IMPACT AND SHALL REPORT ANY DISCREPANCIES TO THE ENGINEER.
- THE CONTRACTOR SHALL PROVIDE ADEQUATE BRACING AND SHORING OF ALL EXCAVATIONS IN ACCORDANCE WITH THE REQUIREMENTS OF GOVERNING CODES AND REGULATIONS. COSTS FOR THIS WORK IS TO BE CONSIDERED INCIDENTAL TO THE ITEM "VARIABLE MESSAGE GUIDE SIGN AND SUPPORTS."

ELECTRICAL NOTES

- ALL ELECTRICAL WORK NECESSARY FOR THE INSTALLATION OF THE VMS SIGNS, FROM THE TRAFFIC CABINET TO THE SIGN PANEL, SHALL BE INCLUDED IN THE LUMP SUM PRICE BID FOR THE ITEMS "VARIABLE MESSAGE GUIDE SIGN AND SUPPORTS." SEE THE SPECIFICATIONS FOR FURTHER DETAIL.
- CONDUITS RUNNING FROM THE TRAFFIC CABINET TO THE SIGN TERMINATION PANEL, SHALL BE INSTALLED ALONGSIDE OF THE SIGN SUPPORT STRUCTURE AND BRACED EVERY THREE FEET. PRIOR TO INSTALLATION, CONTRACTOR SHALL SUBMIT CONDUIT ROUTING LAYOUT TO THE ENGINEER FOR APPROVAL.
- ALL EXTENSIONS OF OVERHEAD FACILITIES (ELECTRIC AND TELEPHONE) REQUIRED FOR THE INSTALLATION OF THE VMS SIGNS, SHALL BE PERFORMED BY THE UTILITY COMPANY AND COORDINATED BY THE CONTRACTOR WITH THE TURNPIKE. THIS INCLUDES RELOCATION OF UTILITY POLES IF NECESSARY AND SHALL BE PERFORMED PRIOR TO THE CONTRACTOR'S WORK.
- GROUNDING OF SIGN STRUCTURES AND EQUIPMENT SHALL BE IN ACCORDANCE WITH THE APPLICABLE REQUIREMENTS OF ARTICLE 250 OF THE NATIONAL ELECTRIC CODE.
- ALL ELECTRICAL MATERIALS AND INSTALLATIONS SHALL CONFORM TO THE PLANS AND SPECIFICATIONS, UNLESS OTHERWISE APPROVED AND/OR DIRECTED BY THE ENGINEER.
- CONTRACTOR SHALL CLOSELY COORDINATE THE INSTALLATION AND WIRING CONNECTION FROM THE SIGN PANEL TO THE TRAFFIC CABINET WITH THE SIGN MANUFACTURER, DAKTRONICS, INC., BROOKINGS, SOUTH DAKOTA, 1-800-843-5843, AT EACH VMS SITE LOCATION.
- POSITION THE TRAFFIC CABINET SUCH THAT THE CABINET DOOR WILL OPEN AWAY FROM THE SIGN WHEN VIEWED FROM THE REAR OF THE SIGN. SEE SCHEMATIC SHOWN BELOW.



				By	Date
			Designed	RV	1/97
			Drawn	RV	1/97
			Checked	TM	1/97
Revision		By	Date	In Charge Of	



Maine Turnpike Authority Maine Turnpike	
	VARIABLE MESSAGE SIGN INSTALLATION GENERAL NOTES
	HOWARD NEEDLES TAMMEN & BERGENOFF, INC. ARCHITECTS ENGINEERS PLANNERS
Contract: 96.20	Sheet No. 3 of 35

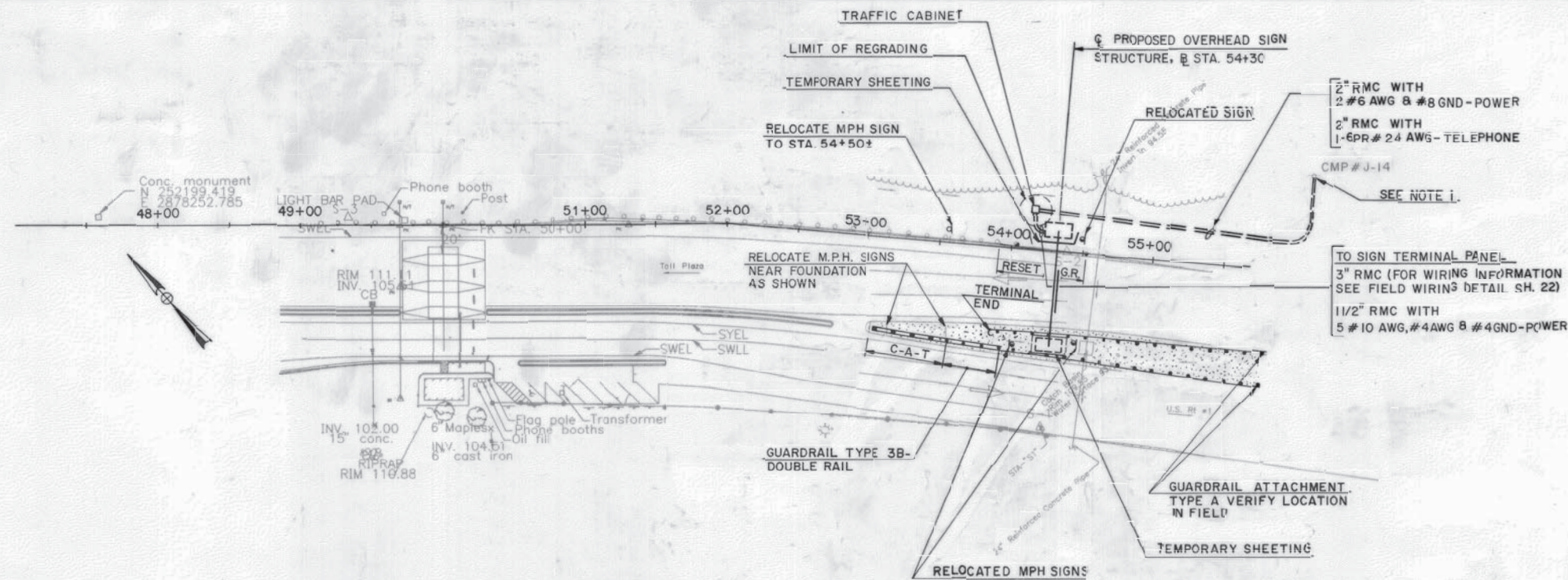


NOTE:
1. SEE SHEET NO. 6-18 FOR SITE LOCATION PLANS.

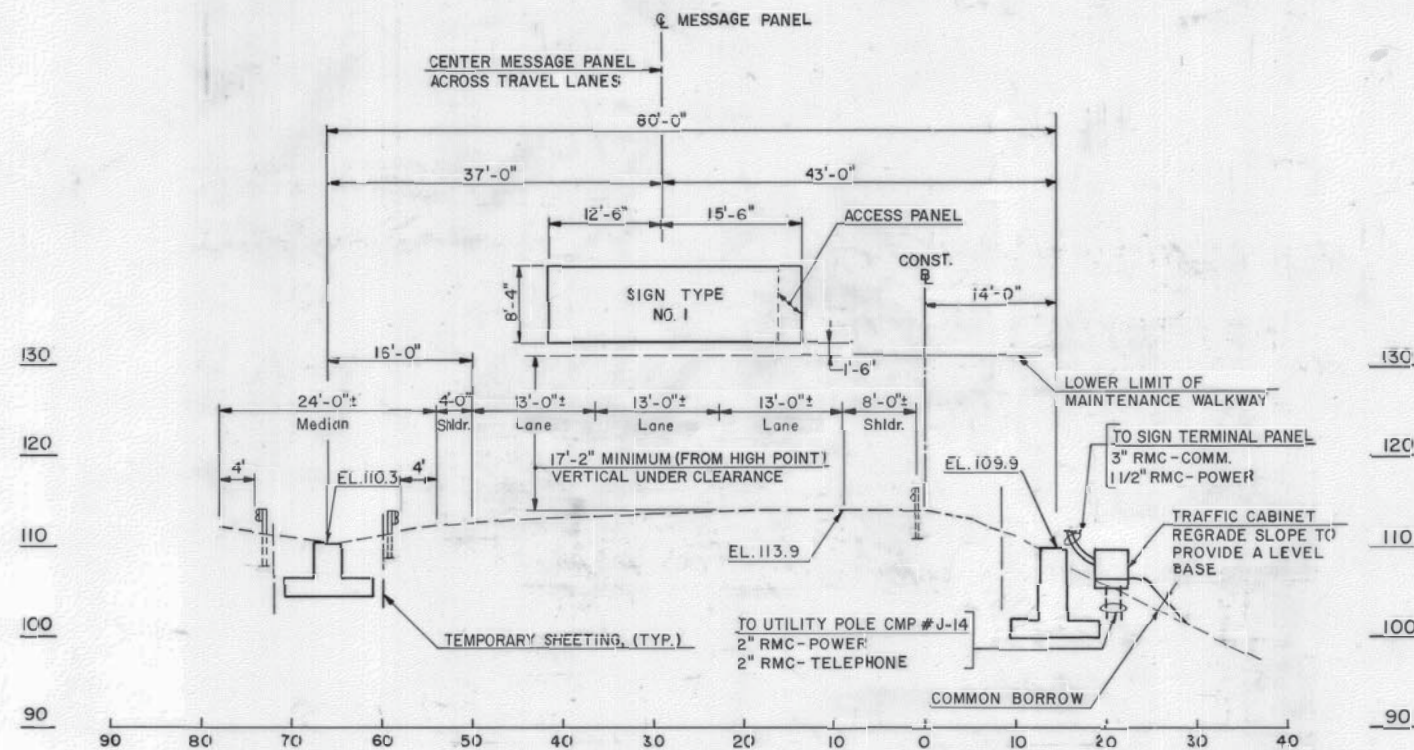


4				By	Date
3				Designed	RV 1/97
2				Drawn	RV 1/97
1				Checked	TM 1/97
Revision		By	Date	In Charge Of	

Maine Turnpike Authority Maine Turnpike	
	VARIABLE MESSAGE SIGN INSTALLATION GENERAL LAYOUT
 HOWARD NEEDLES TAMMEN & BERGENDOFF, INC. ARCHITECTS ENGINEERS PLANNERS	Contract: 96.20
	Sheet No. 4 of 35



PLAN VIEW
SCALE: 1" = 50'



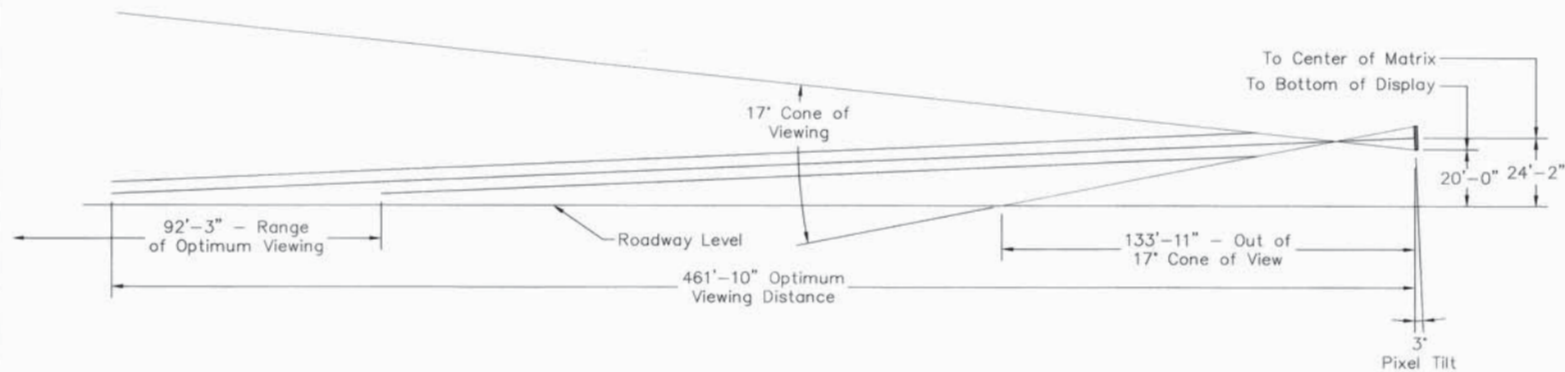
ELEVATION VIEW
STA. 54+30 N.B.
(LOOKING DOWN STATION)
SCALE: 1" = 10'

ELECTRICAL NOTES:

1. (a) UTILITY POWER COMPANY SHALL PROVIDE 120/240 V. SINGLE PHASE, 3 WIRE TRANSFORMER FOR 100 AMP SERVICE AT UTILITY POLE #J14
- (b) UTILITY TELEPHONE COMPANY SHALL PROVIDE TELEPHONE TERMINAL CABINET WITH PROVISION FOR TWO LINES (ONE SPARE) AT UTILITY POLE #J14. THIS TERMINATION SHALL PROVIDE 3002 TYPE LEASED TELEPHONE LINE SERVICE TO THE FIELD CONTROLLER.
2. FOR TRAFFIC CABINET PAD MOUNTED FOUNDATION DETAIL SEE SHEET NO. 6
3. FOR GENERAL NOTES SEE SHEET NO. 3

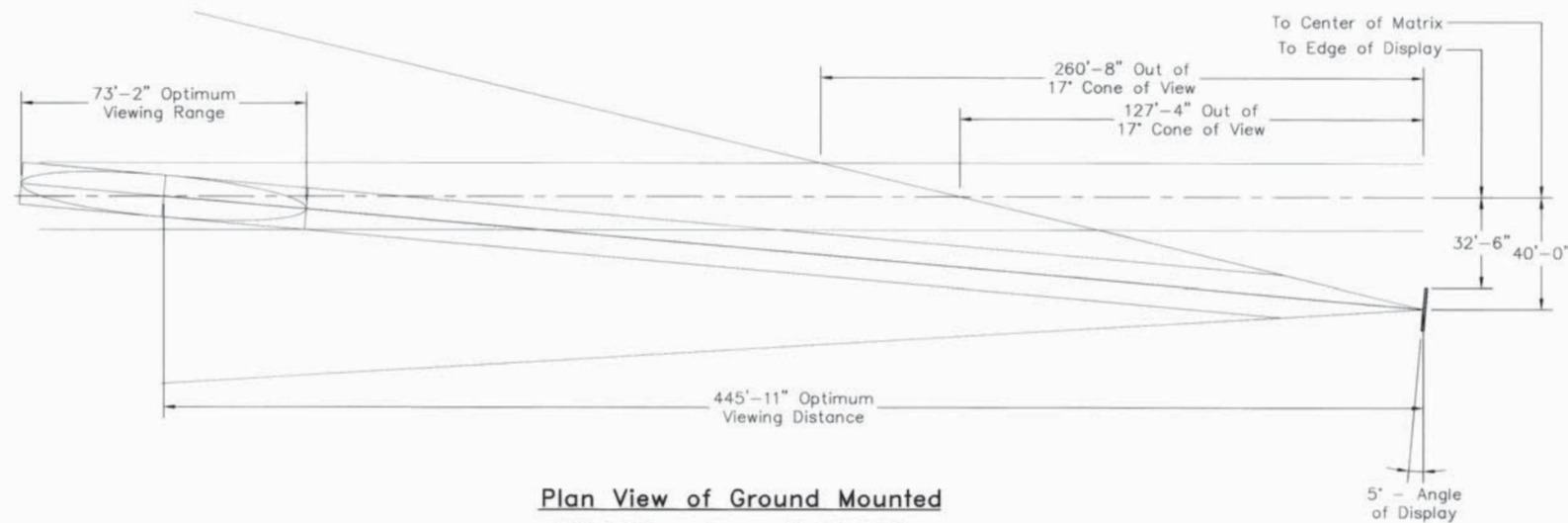
Maine Turnpike Authority Maine Turnpike	
VARIABLE MESSAGE SIGN INSTALLATION VMS SITE NO. 6 EXIT 5 I-195	
HOWARD NEEDLES TAMMEN & BERGENOFF, INC. ARCHITECTS ENGINEERS PLANNERS	
Contract:	Sheet No.
96.20	11 of 35

Revision	By	Date	In Charge
	Designed	R.V. 1/97	
	Drawn	V.E. 1/97	
	Checked	T.M.M. 1/97	



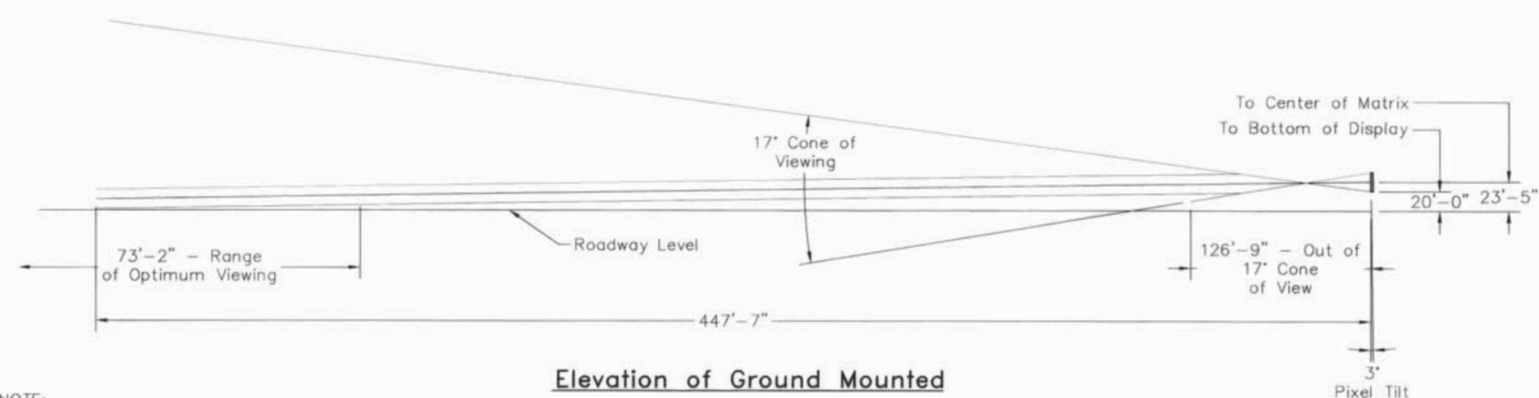
**Elevation of Overhead Mounted
VMS Sign Area of Visibility**

Typical for VMS Sites No. 1, 6, 7, 8, 12 & 13
(Not to scale)



**Plan View of Ground Mounted
VMS Sign Area of Visibility**

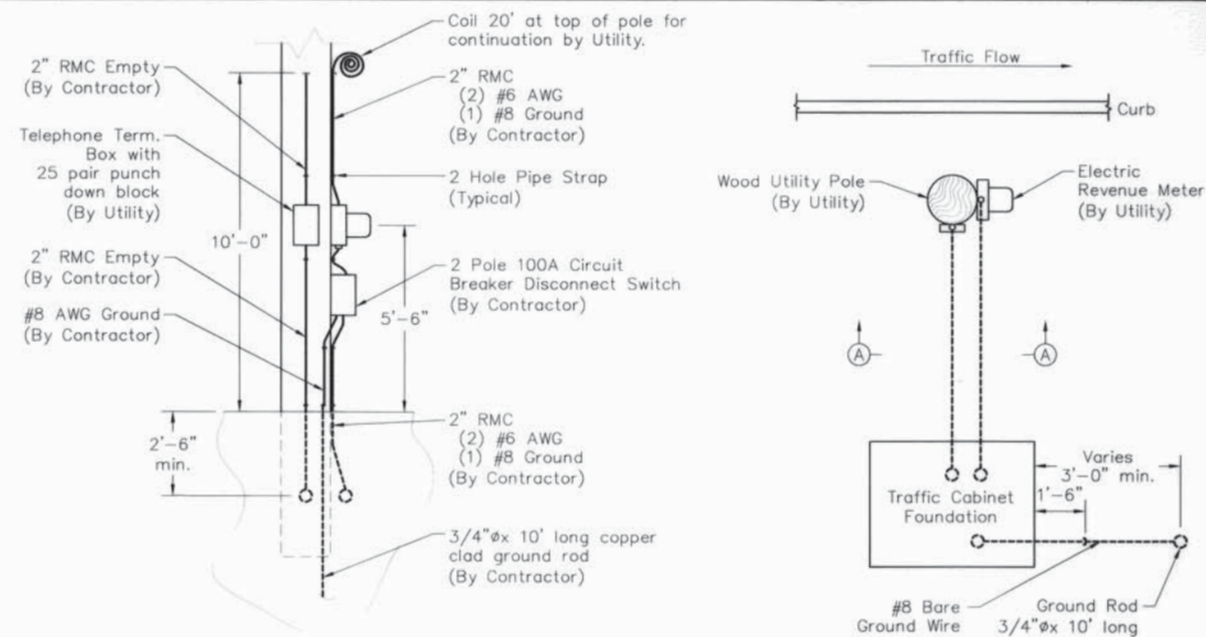
Typical for VMS Sites No. 2, 3, 4, 5, 9, & 11
(Not to scale)



**Elevation of Ground Mounted
VMS Sign Area of Visibility**

Typical for VMS Sites No. 2, 3, 4, 5, 9, & 11
(Not to scale)

NOTE:
Contractor shall be responsible for the correct orientation of the VMS sign. The cone of vision criteria for placement of the sign is diagrammatic. Contractor shall verify site condition and correct height of the Ground Mounted Sign. Calculation certifying that the optimum viewing of the sign is at a distance approximately 450 ft. must be submitted by the contractor, to the engineer for approval prior to installation of the sign.

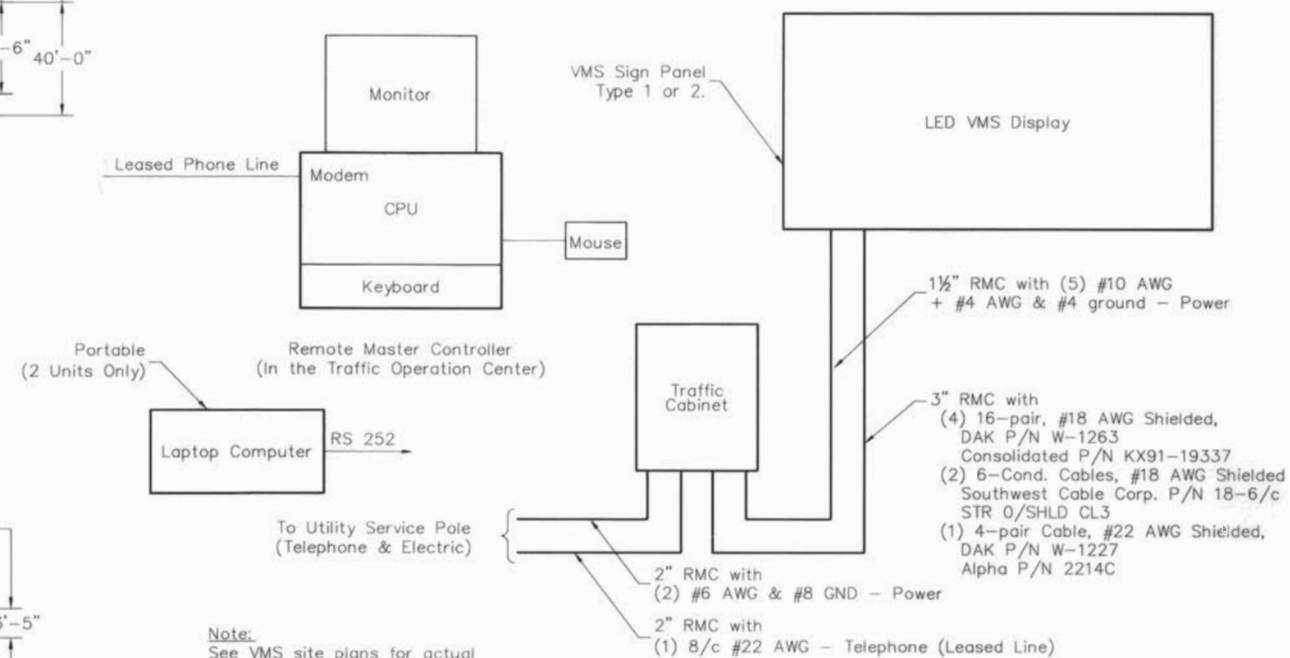


**Section A-A
(Not to Scale)**

Note:
See VMS site plans for actual size of service wire.

**Plan
(Not to Scale)**

**Utility Pole with Telephone and
Electrical Service - Detail**

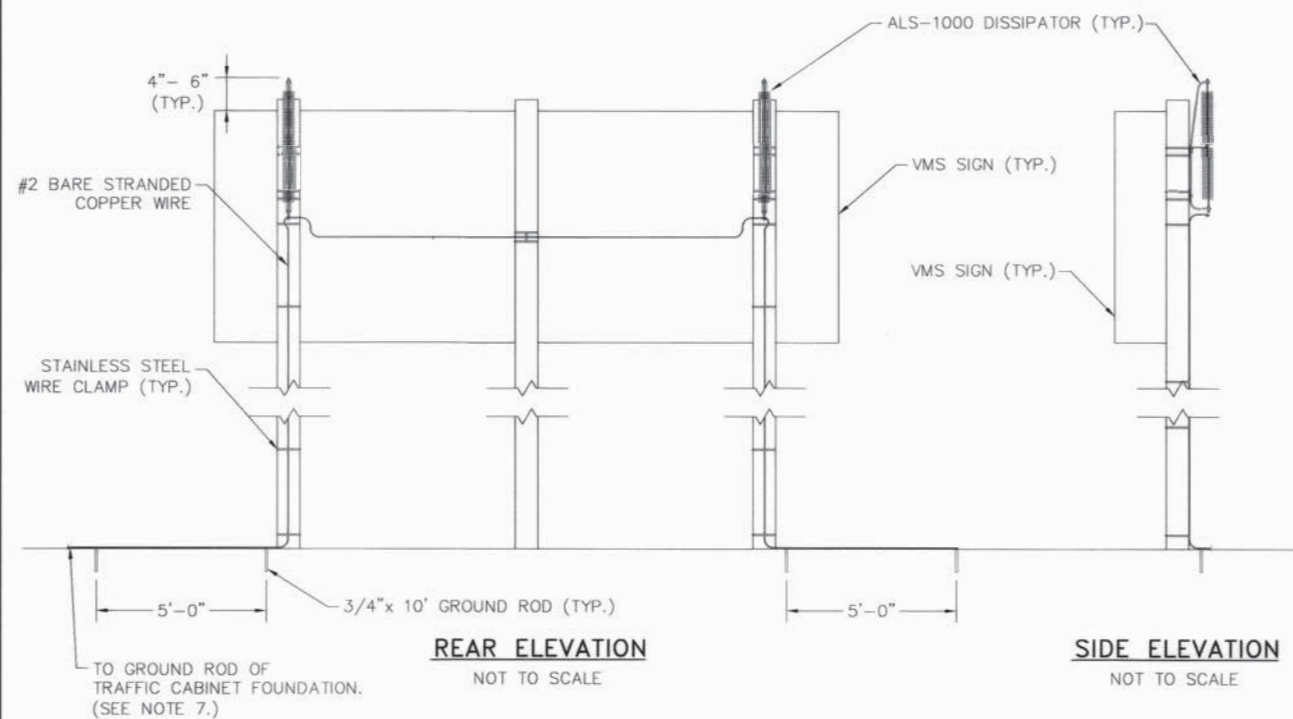


Note:
See VMS site plans for actual size of service wire.

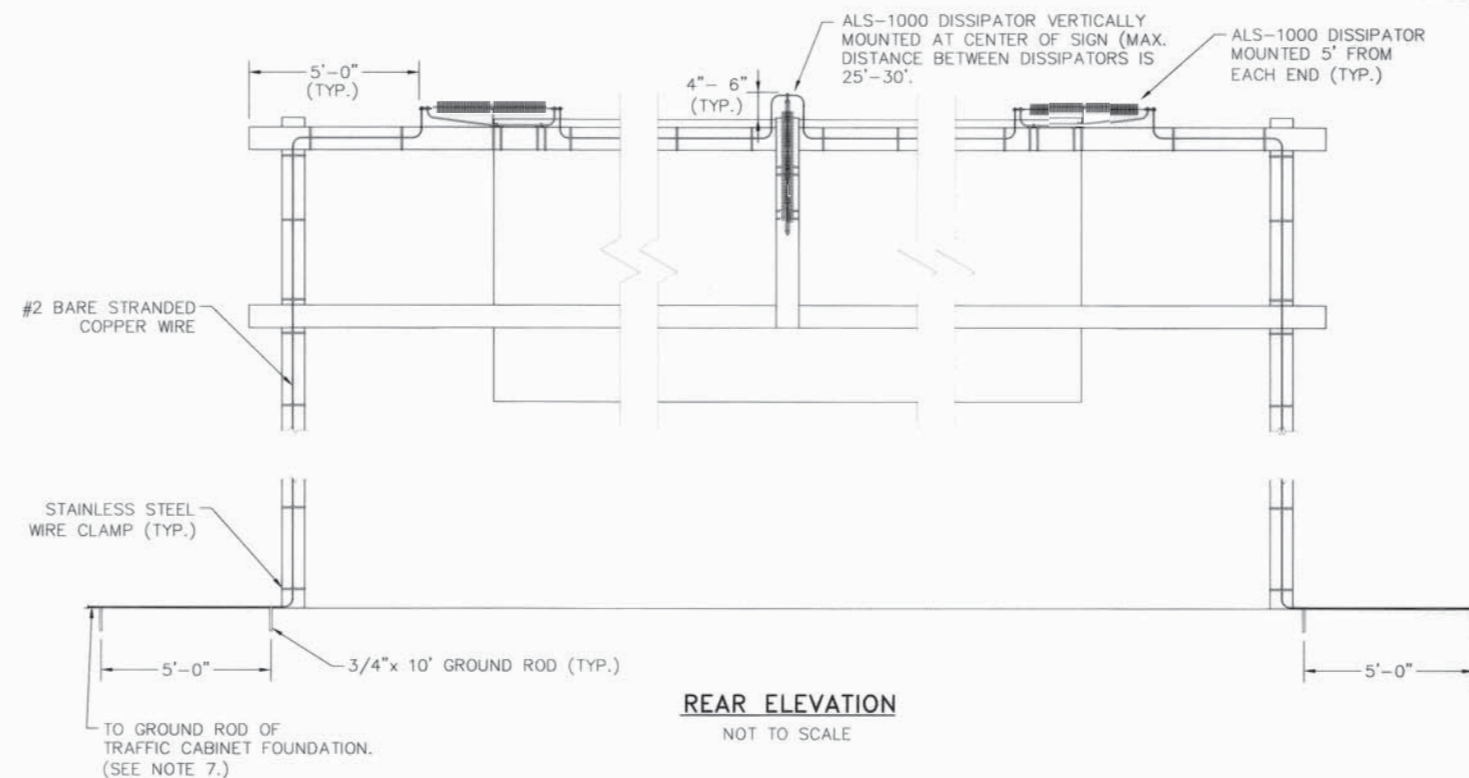
**VMS System Block Diagram
at Sites 1 Through 13**

Maine Turnpike Authority Maine Turnpike	
MISCELLANEOUS ELECTRICAL DETAILS	
Contract 96.20	Sheet No. 19 of 35

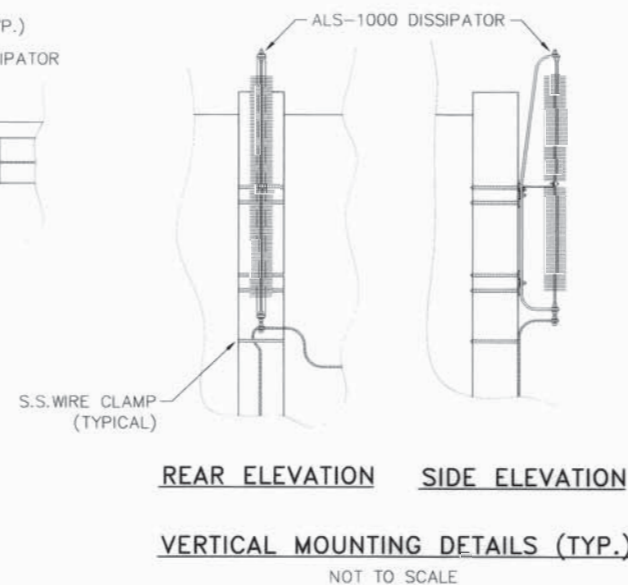
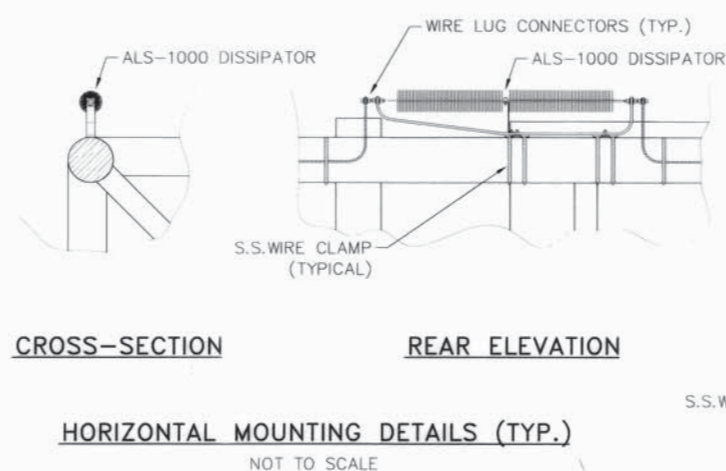
Revision	By	Date	In Charge Of
	Designed	FS 1/97	
	Drawn	MDC 1/97	
	Checked	FS 1/97	



GROUND MOUNTED VMS TYPE 2 INSTALLATION
Typical for VMS Sites No. 2, 3, 4, 5, 9, & 11



OVERHEAD SPAN MOUNTED VMS TYPE 1 INSTALLATION
Typical for VMS Sites No. 1, 6, 7, 8, 12 & 13

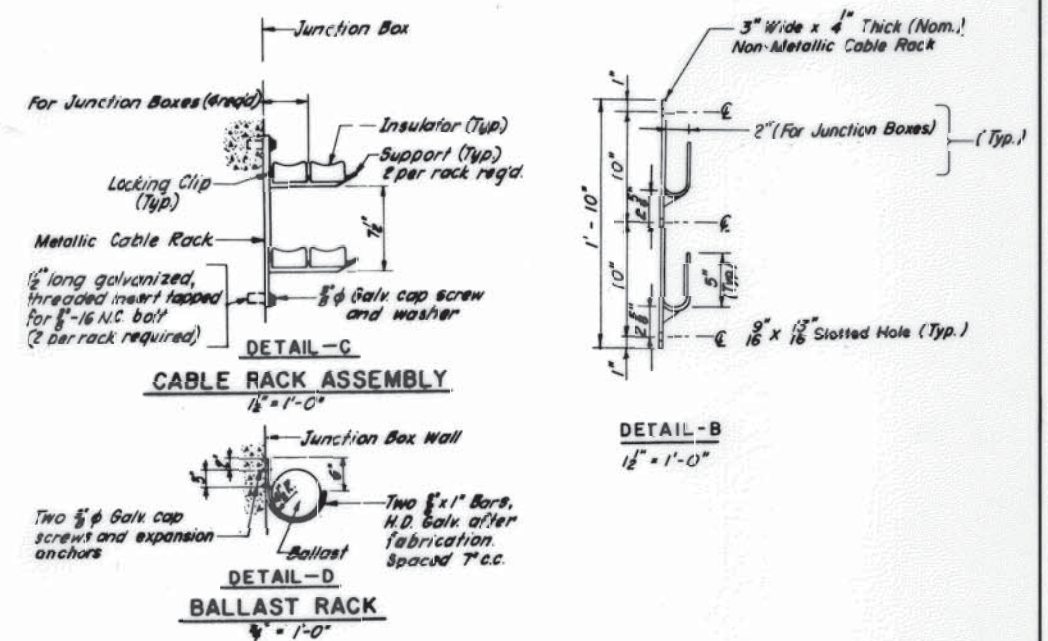


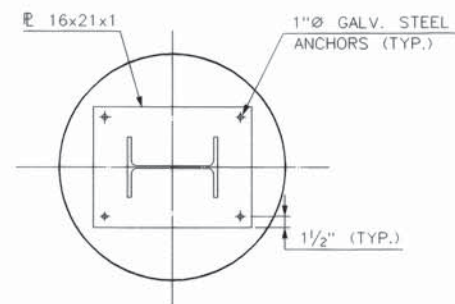
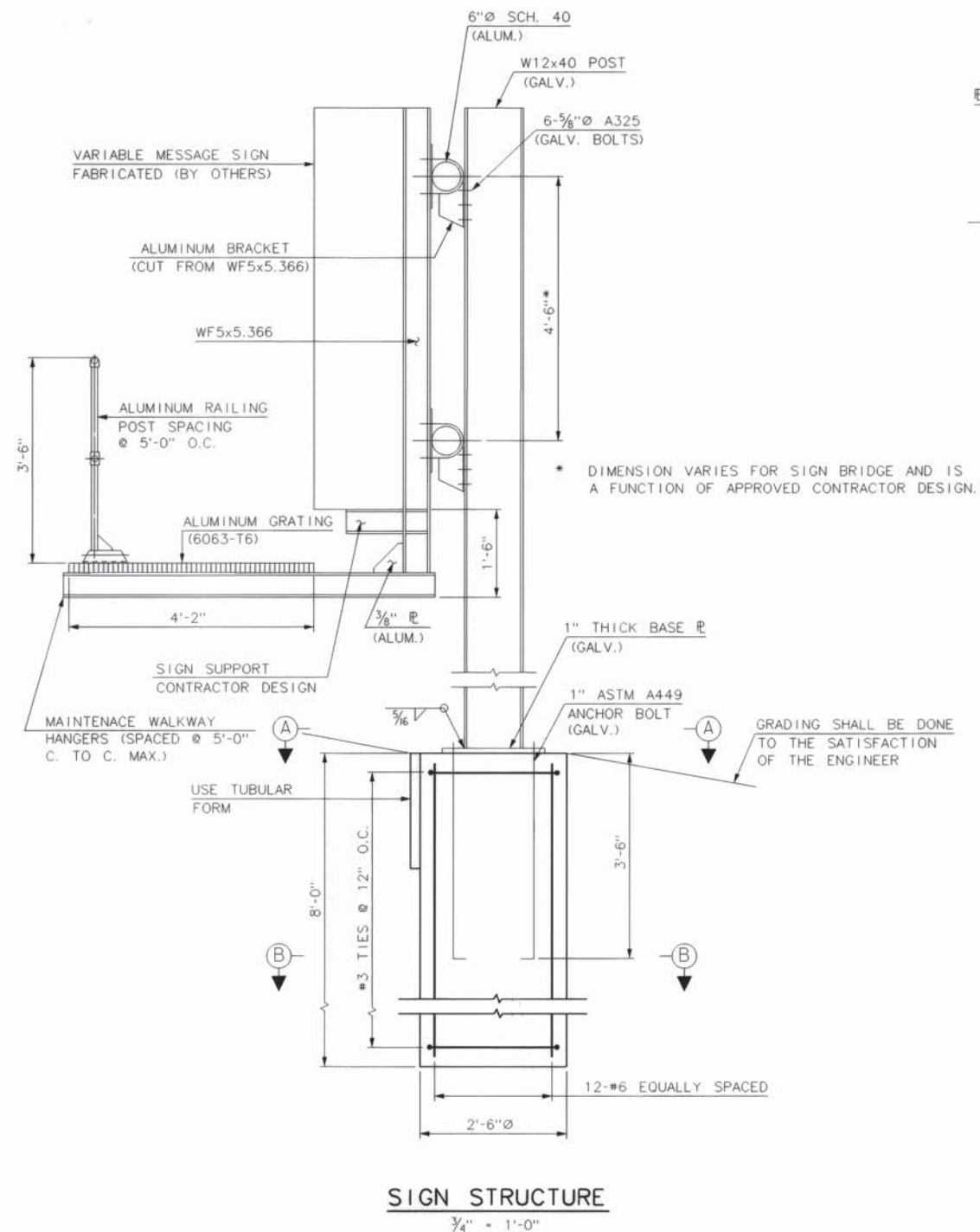
NOTES:

1. ALL DISSIPATORS SHALL BE TYPE ALS-1000 AS MANUFACTURED BY LPS (LIGHTNING PREVENTION SYSTEMS), OR APPROVED EQUAL.
2. CONTRACTOR SHALL INSTALL DISSIPATORS AS SHOWN ON DRAWING, PER MANUFACTURER GUIDELINES AND AS DIRECTED BY THE ENGINEER.
3. THE DISSIPATORS SHALL BE CONNECTED TO A #2 AWG BARE, STRANDED COPPER WIRE AS SHOWN ON PLANS, AS REQUIRED BY THE MANUFACTURER AND AS DIRECTED BY THE ENGINEER.
4. ALL GROUND WIRE CONNECTIONS SHALL BE BRAZED, HARD SOLDERED OR CADWELDED. THE CONNECTION AT THE WIRE LUG ON EACH OF THE DISSIPATORS SHALL BE VERY TIGHT, GREASED, WRAPPED WITH RUBBER TAPE, THEN WRAPPED GENEROUSLY WITH VINYL ELECTRICAL TAPE TO PROVIDE MAXIMUM WEATHERPROOFING.
5. STAINLESS STEEL WIRE CLAMPS SHALL BE INSTALLED AS NEEDED WITH 6 FT. MAX. BETWEEN EACH STRAP, ALONG THE #2 AWG CONNECTING WIRES. THE WIRE CLAMP SHALL BE PART NO. DWC-1 AS MANUFACTURED BY LPS OR APPROVED EQUAL.
6. ACTUAL DESIGN OF SIGN MOUNTING STRUCTURE MAY VARY FROM THAT SHOWN IN PLANS. ALS-1000 DISSIPATOR INSTALLATION DETAILS SHOWN IN PLANS AND RECOMMENDED BY MANUFACTURER SHALL STILL BE FOLLOWED IF PHYSICAL DESIGN OF MOUNTING STRUCTURE CHANGES.
7. CONTRACTOR SHALL TIE THE LIGHTNING PREVENTION SYSTEM'S GROUNDING WITH THE GROUNDING ROD OF THE TRAFFIC CABINET FOUNDATION.

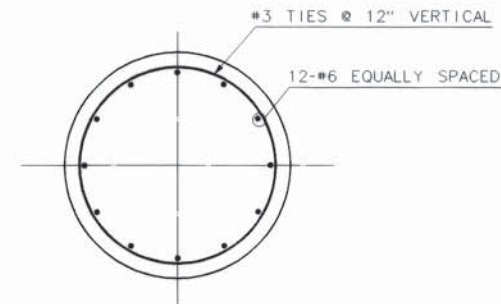
Maine Turnpike Authority	
Maine Turnpike	
	LIGHTNING PREVENTION SYSTEM DETAILS
	HOWARD NEEDLES TAMMEN & BERGENOFF, INC. ARCHITECTS ENGINEERS PLANNERS
Contract	Sheet No.
96.20	20 of 35

				By	Date
			Designed	FS	1/97
			Drawn	MDC	1/97
			Checked	FS	1/97
Revision		By	Date	In Charge Of	





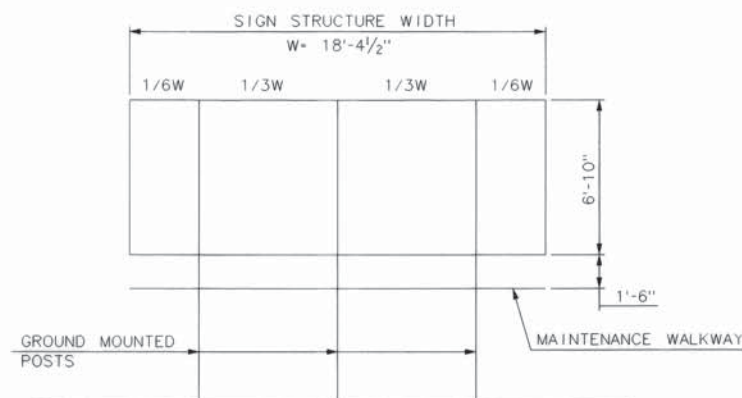
SECTION A-A
1" = 1'-0"



SECTION B-B
1" = 1'-0"

NOTES:
1. FOR WALKWAY DETAILS SEE SHEET 29.

SIGN I.D. NO.	SIGN SIZE		AREA FT ²	NO. OF SIGN SUPPORTS	H-BEAM SIZE	FOUNDATION SIZE	STATION
	WIDTH	HEIGHT					
VMS SITE NO. 2	18'-4 1/2"	6'-10"	125.56	3	W12x40	2'-6"Ø	9+25 WB
VMS SITE NO. 3A	18'-4 1/2"	6'-10"	125.56	3	W12x40	2'-6"Ø	11+80
VMS SITE NO. 3B	18'-4 1/2"	6'-10"	125.56	3	W12x40	2'-6"Ø	11+72
VMS SITE NO. 4	18'-4 1/2"	6'-10"	125.56	3	W12x40	2'-6"Ø	WEST KENNEBUNK RD
VMS SITE NO. 5	18'-4 1/2"	6'-10"	125.56	3	W12x40	2'-6"Ø	51+00
VMS SITE NO. 9	18'-4 1/2"	6'-10"	125.56	3	W12x40	2'-6"Ø	46+00
VMS SITE NO. 11	18'-4 1/2"	6'-10"	125.56	3	W12x40	2'-6"Ø	45+25 NB



ELEVATION
1/4" = 1'-0"

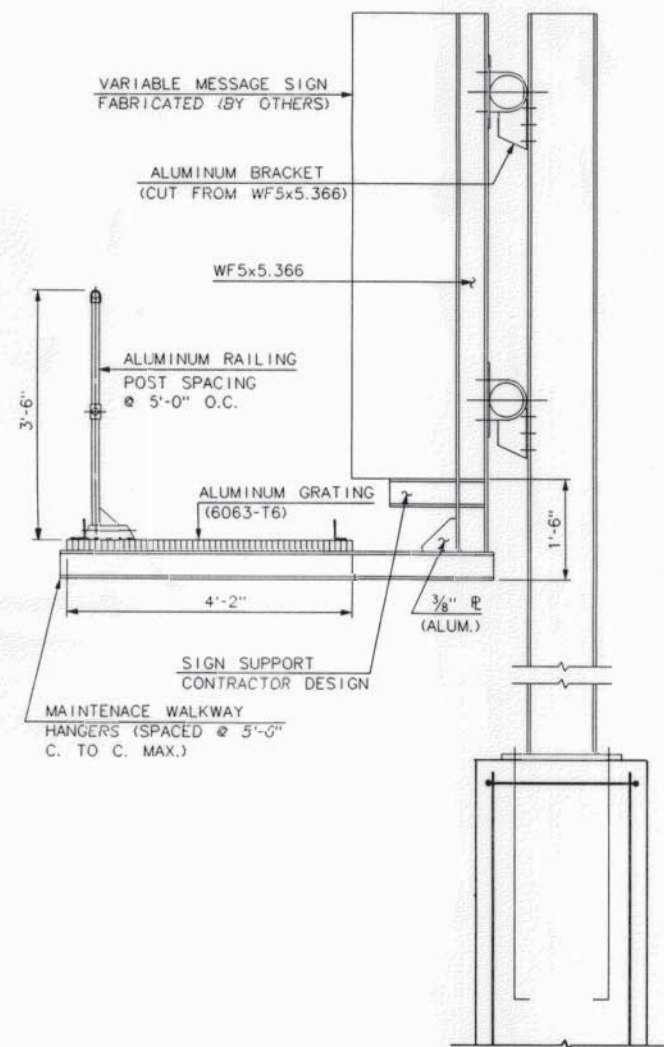
Maine Turnpike Authority
Maine Turnpike

"VMS" TYP 2 GROUND MOUNTED
SIGN STRUCTURE DETAILS
HOWARD NEEDLES TAMMEN & BERGENOFF, INC
ARCHITECTS ENGINEERS PLANNERS

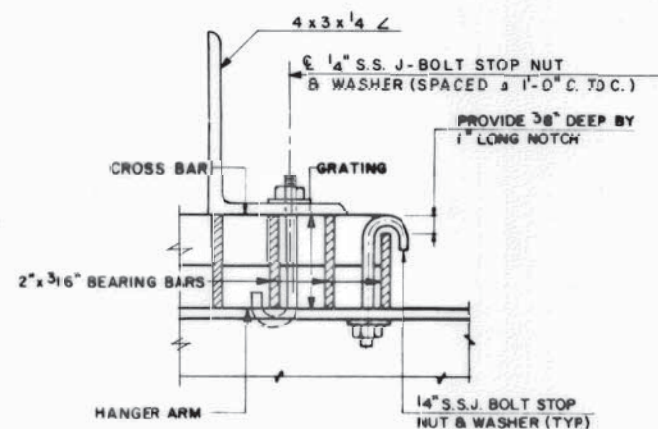
Contract
96.20

Sheet No.
28 of 35

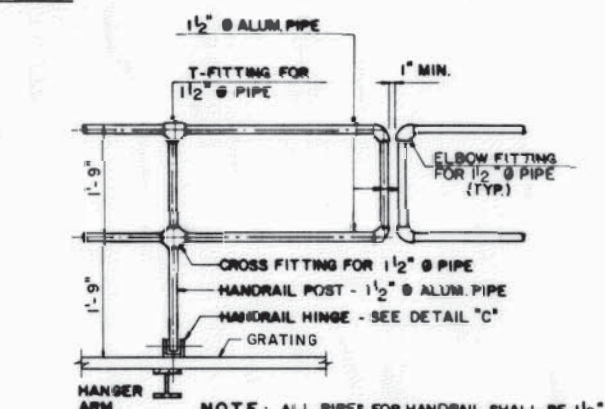
				By	Date
				Designed	BS 1/97
				Drawn	ARC 1/97
				Checked	RJM 1/97
No.	Revision	By	Date	In Charge Of	RAL



WALKWAY SECTION



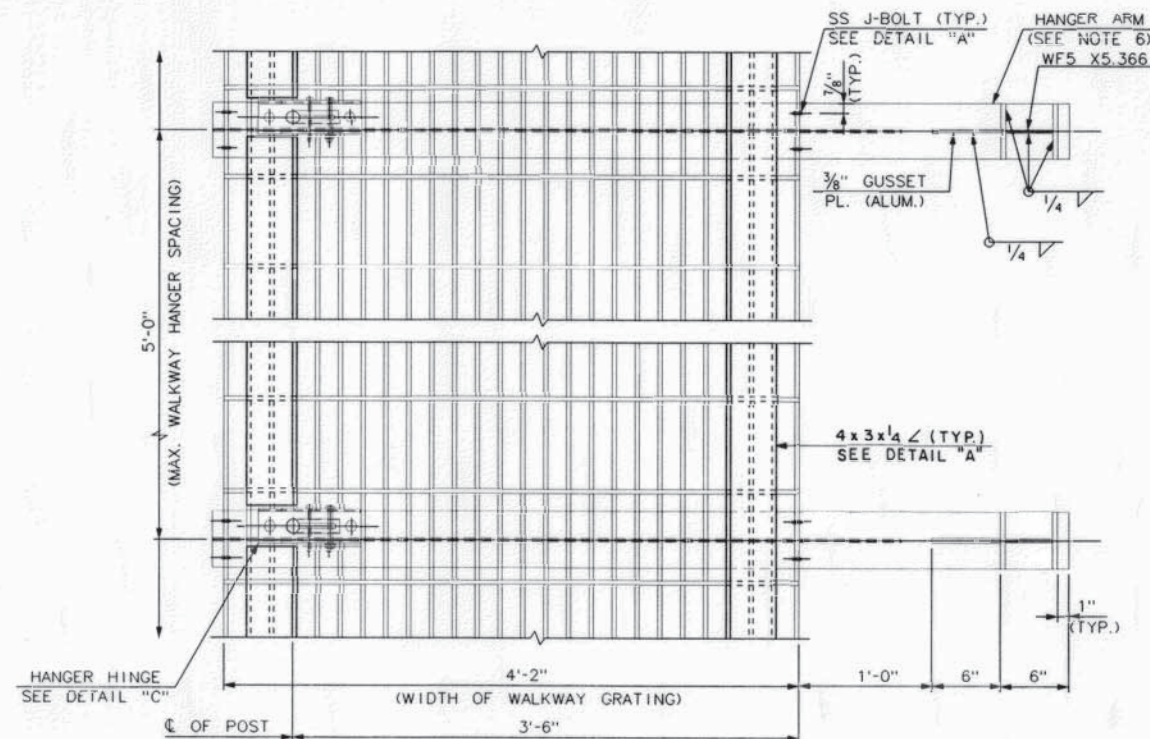
DETAIL "A"
N.T.S.



ELEVATION OF HANDRAIL

NOTE:

MAX. HANDRAIL SECTION SHALL BE 10'-0" LONG AND INCLUDE TWO POSTS.

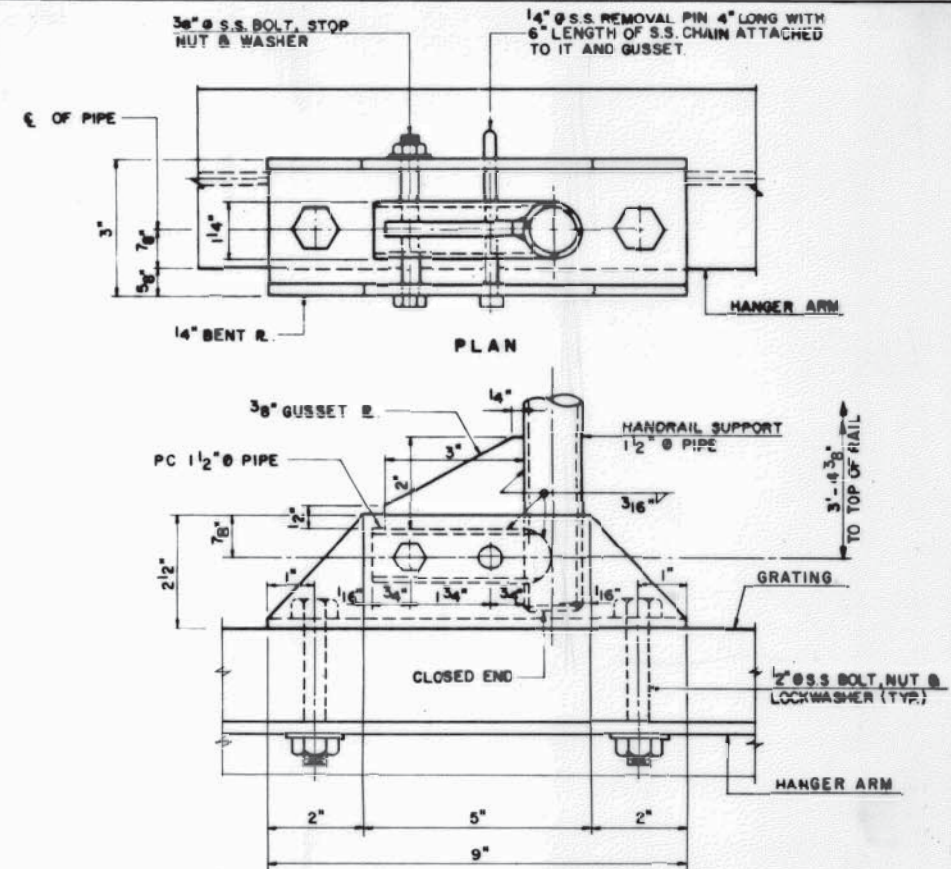


WALKWAY PLAN

N.T.S.

NOTE :

THE MINIMUM SECTION MODULUS SHALL BE 1.35 IN.³ PER FOOT WIDTH OF WALKWAY GRATING. THE INTERMEDIATE JOINTS IN THE GRATING SHALL BE AS SHOWN IN SECTION C-C. GRATING SHALL NOT CANTILEVER MORE THAN 1'-0" BEYOND HANGER ARMS AT EACH END OF THE MAINTENANCE WALKWAY. GRATING SHALL BE CONTINUOUS OVER A MINIMUM OF TWO SPANS.




ELEVATION

HANDRAIL HINGE DETAIL "C"

N. T. S.

GENERAL NOTES

1. MAINTENANCE WALKWAY AND RAILWAY SUPPORTS SHALL BE PROVIDED CONTINUOUSLY FOR THE ENTIRE LENGTH OF THE OVERHEAD SIGN SUPPORT SIGN DESIGN WIDTH, UNLESS OTHERWISE SHOWN.
2. ALL MATERIAL SHALL BE ALUMINUM ALLOY 6061-T6 UNLESS OTHERWISE NOTED.
3. ALL BOLTS, U-BOLTS, WASHERS AND NUTS SHALL BE A.S.T.M. A-320 TYPE 304, GRADE B, CLASS 1.
4. PIPE FITTINGS SHALL BE EITHER MECHANICALLY FASTENED OR WELDED TO HANDRAIL SECTION AND SHALL BE COMPATIBLE WITH THE MATERIAL USED FOR HANDRAILS. DETAILS OF FITTING SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL.
5. FILLER ALLOY FOR WELDING SHALL CONFORM TO THE REQUIREMENTS OF A.S.T.M. DESIGNATION B285, A.W.A.-A.S.T.M. CLASSIFICATION ER5556 OR ER5356.
6. CONTRACTOR SHALL BE RESPONSIBLE FOR THE DESIGN AND DETAILS FOR THE WALKWAY SUPPORTS.

<p>Maine Turnpike Authority Maine Turnpike</p>	
 <p>Trans pass</p>	<p>VARIABLE MESSAGE SIGN INSTALLATION</p>
<p>WALKWAY DETAILS</p>	
<p>HNTB</p>	<p>HOWARD NEEDLES TAMMEN & BERGENDOFF, INC ARCHITECTS ENGINEERS PLANNERS</p>
<p>Contract</p> <p>96.20</p>	<p>Sheet No.</p> <p>29 of 35</p>

MAINE TURNPIKE AUTHORITY

SPECIFICATIONS

APPENDIX C

PERMIT BY RULE

**Natural Resource Protection Act
Permit By Rule Application,
EZ Pass Lane Addition Project,
Saco Exit 36 Toll Plaza**



Prepared for:
Maine Turnpike Authority
2360 Congress Street
Portland, Maine 04102

Prepared by:
Stantec Consulting Services Inc.
30 Park Drive
Topsham, ME 04086

January 12, 2015

11/14/2013

DEPARTMENT OF ENVIRONMENTAL PROTECTION

NRPA PERMIT BY RULE NOTIFICATION FORM

(For use with DEP Regulation, Natural Resources Protection Act-Permit by Rule Standards, Chapter 305)

PLEASE TYPE OR PRINT IN BLACK INK ONLY

Name of Applicant: (owner)	Steve Tartre, P.E. Maine Turnpike Authority		Name of Agent:	Steve Tartre	
Applicant Mailing Address:	2360 Congress Street		Agent Phone # (include area code):	207-871-7771	
Town/City:	Portland, ME		PROJECT Information Name of Town/City:	Saco	
State and Zip code:	04102		Name of Wetland or Waterbody:	Unnamed Tributary to Goosefare Brook	
Daytime Phone # (include area code):	207-871-7771		Map #:	NA	Lot #: NA
Detailed Directions to Site:	From Portland, take I-95 south approximately 10.3 miles to Exit 36 for I-195.				
Existing toll plaza is approximately 2,050 feet to the SE. Project area is on the N side of I-195 and the toll plaza.					
Description of Project:			See attached		
Part of a larger project? (check one) → <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No After the Fact? (check one) → <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Check one → This project <input type="checkbox"/> does (or) <input checked="" type="checkbox"/> does not involve work below mean low water (average low water).					

NRPA PERMIT BY RULE (PBR) SECTIONS: (Check at least one)

I am filing notice of my intent to carry out work which meets the requirements for Permit By Rule (PBR) under DEP Rules, Chapter 305. I and my agents, if any, have read and will comply with all of the standards in the Sections checked below.

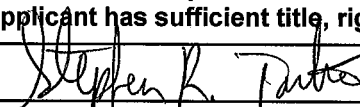
- | | | |
|--|---|--|
| <input checked="" type="checkbox"/> Sec. (2) Act. Adj. to Protected Natural Res. | <input type="checkbox"/> Sec. (10) Stream Crossing | <input type="checkbox"/> Sec. (17) Transfers/Permit Extension |
| <input type="checkbox"/> Sec. (3) Intake Pipes | <input type="checkbox"/> Sec. (11) State Transportation Facil. | <input type="checkbox"/> Sec. (18) Maintenance Dredging |
| <input type="checkbox"/> Sec. (4) Replacement of Structures | <input type="checkbox"/> Sec. (12) Restoration of Natural Areas | <input type="checkbox"/> Sec. (19) Activities in/on/over significant vernal pool habitat |
| <input type="checkbox"/> Sec. (5) REPEALED | <input type="checkbox"/> Sec. (13) F&W Creation/Enhance/Water Quality Improvement | <input type="checkbox"/> Sec. (20) Activities located in/on/over high or moderate value inland water-fowl & wading bird habitat or shore-bird feeding & roosting areas |
| <input type="checkbox"/> Sec. (6) Movement of Rocks or Vegetation | <input type="checkbox"/> Sec. (14) REPEALED | |
| <input type="checkbox"/> Sec. (7) Outfall Pipes | <input type="checkbox"/> Sec. (15) Public Boat Ramps | |
| <input type="checkbox"/> Sec. (8) Shoreline stabilization | <input type="checkbox"/> Sec. (16) Coastal Sand Dune Projects | |
| <input type="checkbox"/> Sec. (9) Utility Crossing | | |

NOTIFICATION FORMS CANNOT BE ACCEPTED WITHOUT THE NECESSARY ATTACHMENTS:

- ☒ **Attach** a check for the correct fee, payable to: "Treasurer, State of Maine". The current fee for NRPA PBR Notifications can be found at the Department's website: <http://www.maine.gov/dep/feesched.pdf>
- ☒ **Attach** a U.S.G.S. topo map or Maine Atlas & Gazetteer map with the project site clearly marked.
- ☐ **Attach** Proof of Legal Name if applicant is a corporation, LLC, or other legal entity. Provide a copy of Secretary of State's registration information (available at <http://icrs.informe.org/nei-sos-icrs/ICRS?MainPage=x>). Individuals and municipalities are not required to provide any proof of identity.
- ☒ **Attach** photos of the proposed site where activity will take place as required in PBR Sections checked above.
- ☒ **Attach** all other required submissions as outlined in the PBR Sections checked above.

I authorize staff of the Departments of Environmental Protection, Inland Fisheries & Wildlife, and Marine Resources to access the project site for the purpose of determining compliance with the rules. I also understand that **this permit is not valid until approved by the Department or 14 days after receipt by the Department, whichever is less.**

By signing this Notification Form, I represent that the project meets all applicability requirements and standards in the rule and that the applicant has sufficient title, right, or interest in the property where the activity takes place.

Signature of Agent or Applicant:		Date:	1/14/15
----------------------------------	---	-------	---------

Keep a copy as a record of permit. Send the form with attachments via certified mail or hand deliver to the Maine Dept. of Environmental Protection at the appropriate regional office listed below. The DEP will send a copy to the Town Office as evidence of the DEP's receipt of notification. No further authorization by DEP will be issued after receipt of notice. Permits are valid for two years. **Work carried out in violation of any standard is subject to enforcement action.**

AUGUSTA DEP
17 STATE HOUSE STATION
AUGUSTA, ME 04333-0017
(207)287-3901

PORTLAND DEP
312 CANCO ROAD
PORTLAND, ME 04103
(207)822-6300

BANGOR DEP
106 HOGAN ROAD
BANGOR, ME 04401
(207)941-4570

PRESQUE ISLE DEP
1235 CENTRAL DRIVE
PRESQUE ISLE, ME 04769
(207)764-0477

OFFICE USE ONLY	Ck.#	Date	Staff	Staff	After Photos
PBR #	FP		Acc. Date	Def. Date	

**NATURAL RESOURCE PROTECTION ACT PERMIT BY RULE APPLICATION, EZ PASS LANE ADDITION
PROJECT, SACO EXIT 36 TOLL PLAZA**

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APPENDIX B	- PROJECT DESIGN DRAWINGS	B.1
APPENDIX C	- SITE PHOTOGRAPHS: EXISTING CONDITIONS.....	C.1

1.0 PROJECT DESCRIPTION

The proposed project is located in Saco at the existing Interstate 195 (I-195) toll plaza (Appendix A, Project Location Map). The project will involve the addition of a dedicated E-ZPass lane to the north side of the existing on-ramp toll plaza. The primary purpose of the project is to provide additional capacity at the toll plaza during peak periods when queuing occurs as motorists leave the Saco/Old Orchard Beach area and try to access I-95. Currently west bound traffic on I-195 approaching the toll plaza backs up to the Maine Street (Route 1) interchange in Saco. The addition of this lane also will help handle traffic volumes when future toll system upgrades occur. Upgrades to equipment within the existing toll plaza are needed because the current equipment is at the end of its useful life. To complete these toll system upgrades, individual lane closures will be required, which will temporarily reduce the capacity of the toll plaza. The toll plaza will be unable to effectively handle peak traffic volumes during these required lane closures. The need for this project was identified in the *Maine Turnpike Authority Ten Year Planning Report 2014-2023* (Maine Turnpike Authority 2013)¹.

The project will begin approximately 600 feet west of the toll plaza (Station 112+70) and extend east approximately 1,160 feet (Station 124+30). The proposed additional lane will be 12 feet in width, with shoulders that vary from 7 feet to 13 feet, depending on the location. The addition of a fourth lane will require a transition from 3 to 4 lanes on the plaza approach and departure. This will involve widening of the existing road embankment, replacement/relocation of the existing guardrail, addition of a separating island, and the addition of toll equipment. The existing embankment and roadway will be widened by approximately 20 feet at the toll plaza and this width will taper back to the existing slope at the east and west ends of the project. The proposed fill slopes will be 2:1, except at the eastern end of the approach taper where a 1.5:1 slope with protection is proposed to avoid impacts on wetlands (Refer to Section 2.0).

2.0 ALTERNATIVES ANALYSIS

On May 9, 2014 and June 19, 2014, a Stantec wetland scientist conducted surveys to identify wetlands, streams, and vernal pools within and near the proposed project. No vernal pools were documented during the surveys. Three wetlands and one stream were delineated within the surveyed area (refer to Appendix B for site drawings showing wetlands and the stream in relation to the proposed project). Wetland 1 is a small emergent basin located at approximately Station 123+75 left to 124+00 left. Further to the west, at approximately Station 118+00 to 119+00 left is Wetland 2, a sparsely vegetated emergent drainage located at the toe of slope of the I-195 embankment near approximately Station 118+00 left to 119+00 left. Wetland 1 and 2 do not qualify as *Wetlands of Special Significance* under the Maine Natural

¹ Maine Turnpike Authority. December 2013. Maine Turnpike Authority Ten Year Planning Report 2014-2023.

NATURAL RESOURCE PROTECTION ACT PERMIT BY RULE APPLICATION, EZ PASS LANE ADDITION PROJECT, SACO EXIT 36 TOLL PLAZA

Resource Protection Act (NRPA) rules. Wetland 3 is a small fringing wetland associated with Stream 01AA and located near Station 117+25 left.

Stream 01AA is a perennial stream that flows south through the project area and into a 36-inch corrugated metal pipe (CMP) under I-195 at approximately Station 117+25 left (Appendix E, Site Photographs). This stream flows south to Goosefare Brook, which flows roughly parallel to I-195 south of the highway. Within the project area, the stream is generally 2 to 4 feet wide at the ordinary high water mark, and the bank full width is between approximately 2 and 5 feet. Water depth at the time of field surveys was 4 to 6 inches, and the substrate in the streambed was primarily gravel/sand with some silt and muck. A few small scattered boulders also were noted in the channel. Woody debris in the form of small-diameter trees were observed within the stream, and appeared to partially obstruct the flow.

The proposed design avoids direct impacts on wetlands and streams. However, disturbance within 75 feet of Stream 01AA and its associated fringe wetland (Wetland 3) will be necessary to complete the project. Specifically, placement of fill will be required within 63 feet of this resource to accommodate the additional proposed EZ Pass lane, shoulder, and guardrail. The project design incorporates the use of 2:1 side slopes with guardrail, reduced roadway width and lane tapers to avoid and minimize direct impacts to the delineated wetlands and Stream 01AA. In addition, the proposed area to be cleared has been reduced to include only those areas within 5 feet of the proposed slope limits. This strategy avoids potential impacts to the delineated resources. Further mitigative measures have been incorporated into the design at Station 123+25 to 124+00, where the proposed slope was steepened to 1.5:1 to avoid direct impacts to Wetland 1. In addition, the project design will include the use of exclusionary fencing to avoid unintended impacts to wetlands and Stream 01AA during construction.

As currently designed, the proposed slopes for the project are steeper than the 3:1 slope allowed under the permit by rule (PBR) standards. As a consequence, an alternatives analysis is required pursuant to NRPA rules. For this project, several alternatives were considered in an effort to minimize disturbance to the area adjacent to Stream 01AA. This included efforts to reduce the width of the new EZ Pass lane and shoulder (thereby minimizing slope disturbance by bringing the proposed top of slope closer to the existing top of slope), and steepening the side slopes of the new fill. An expanded discussion of each of these options is provided below. Detailed drawings for the proposed design are provided in Appendix B.

Under current design standards, the preferred shoulder width at the toll plaza and approach areas would be 13 feet, to allow for a 10 foot roadway shoulder and a 3 foot shelf for the guardrail.² This design provides the best option from a safety perspective, and also allows for adequate space for disabled vehicles. However, to minimize expansion of the existing slope

² Applicable design standards include: 1) State of the Practice and Traffic Control at Toll Plazas: Best Practices: FHWA http://www.mutcd.fhwa.dot.gov/rpt/tcstoll/pdf/best_practices.pdf; 2) McDonald and Stammer report 2001, 3) A Policy on Geometric Design of Highways and Streets, AASHTO

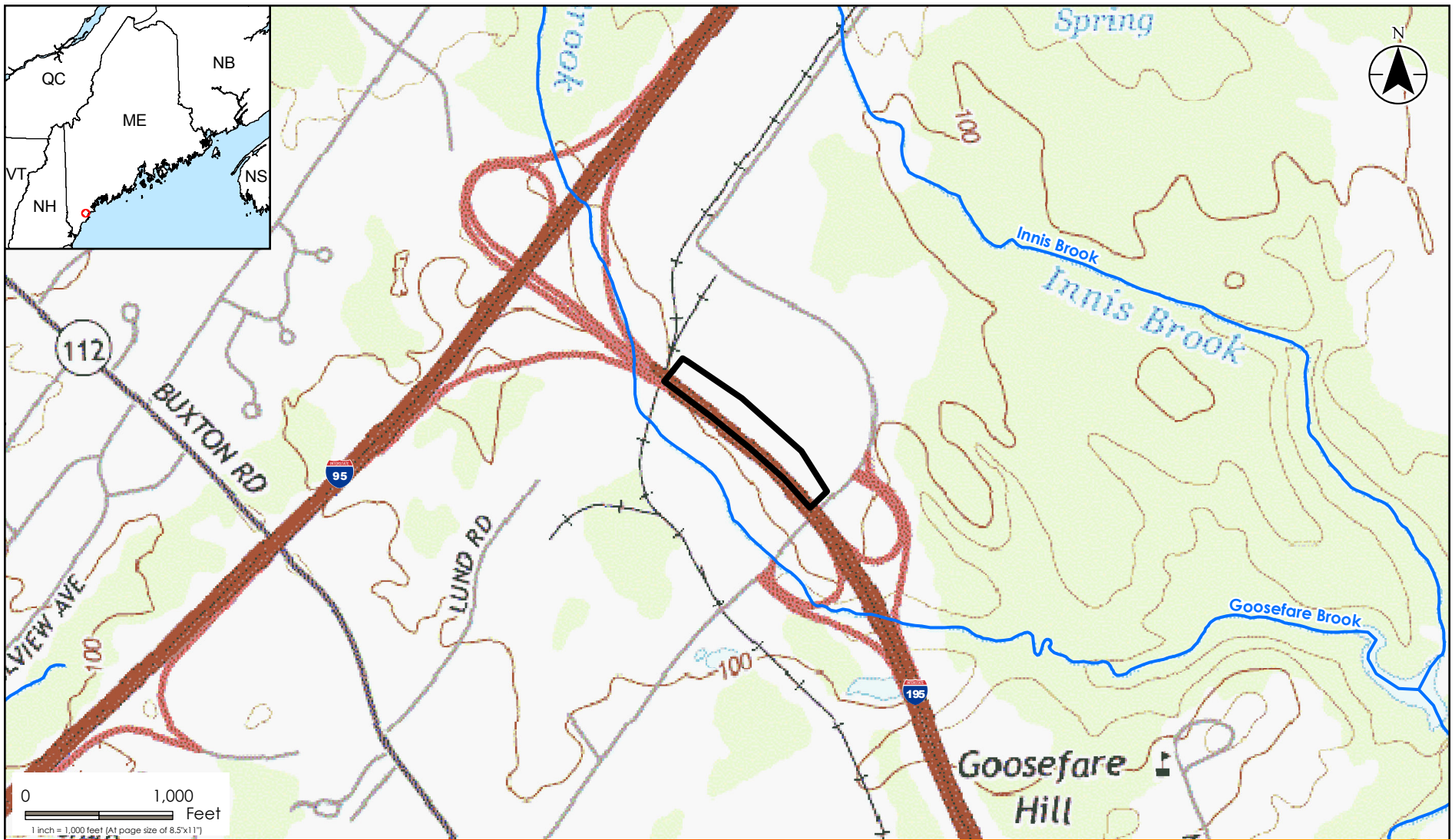
NATURAL RESOURCE PROTECTION ACT PERMIT BY RULE APPLICATION, EZ PASS LANE ADDITION PROJECT, SACO EXIT 36 TOLL PLAZA

and the project footprint, the design was modified to incorporate a reduced 7 foot shoulder (4 foot shoulder with a 3 foot shelf for guardrail) for much of its length, from approximately Station 116+50 to 121+75. This shoulder width is considered acceptable from a design standard, and is the selected design approach as it avoids direct impacts to the delineated wetlands as well as Stream 01AA. Any additional reduction of shoulder widths is not a viable option.

In addition to evaluating the use of reduced shoulder widths to reduce the project footprint, use of a retaining wall was also considered. Under normal circumstances, optimal design conditions would provide for a 4:1 side slope without guardrails. In an initial evaluation of the retaining wall option, it was determined that use of this type of structure was problematic, given the presence of high clay content soils underlying the site (Presumpscot Formation). These soils are prone to settlement over time, a condition which is not acceptable for tolling facilities. Tolling equipment is sensitive to settlement, and would cease to function properly over time. The required solution to stabilize a retaining wall and prevent settlement would involve use of a deep foundation for the wall, such as constructed on piles. These techniques would add over \$500,000 to the cost of the project, making it cost prohibitive. As a result, use of a retaining wall was determined to be not a viable option. In contrast, the proposed design involves use of steepened slopes (2:1) which effectively avoids impacts on wetlands, and minimizes disturbance areas adjacent to the Stream 01AA. The project design for the slope also has incorporated geofoam light weight fill. This lighter weight fill material will help maintain the integrity of the proposed project and limit future work and disturbance adjacent to stream 01AA and the other delineated resources.

In areas of fill or site disturbance, impacts to adjoining resource areas will be avoided through the use of erosion and sediment controls and by following Best Management Practices. In addition, the overall site will be required to comply with the requirements outlined in the Stormwater Memorandum of Agreement between Maine Department of Environmental Protection (MDEP), Maine Department of Transportation (MDOT), and the Maine Turnpike Authority (MTA). Erosion controls will include the proper installation of hay bales or silt fence at the work area limits, and the covering of exposed soil with mulch within 7 calendar days of completion of activities resulting in soil disturbance. Following completion of construction, all disturbed soils will be permanently stabilized, and erosion controls shall be removed within 30 days of final site stabilization.

Appendix A - PROJECT LOCATION MAP



Disclaimer: Stantec assumes no responsibility for data supplied in electronic format. The recipient accepts full responsibility for verifying the accuracy and completeness of the data. The recipient releases Stantec, its officers, employees, consultants and agents, from any and all claims arising in any way from the content or provision of the data.

195310985



30 Park Drive
Topsham, ME USA 04086
Phone (207) 729-1199

Prepared by KET on 2014-12-08
Reviewed by KAW on 2014-12-08

195310985_01_Locus.mxd

Legend

- Approximate Project Area
- USGS Stream

Client/Project

Maine Turnpike Authority
Saco Exit 36 E-ZPass Lane
Saco, Maine

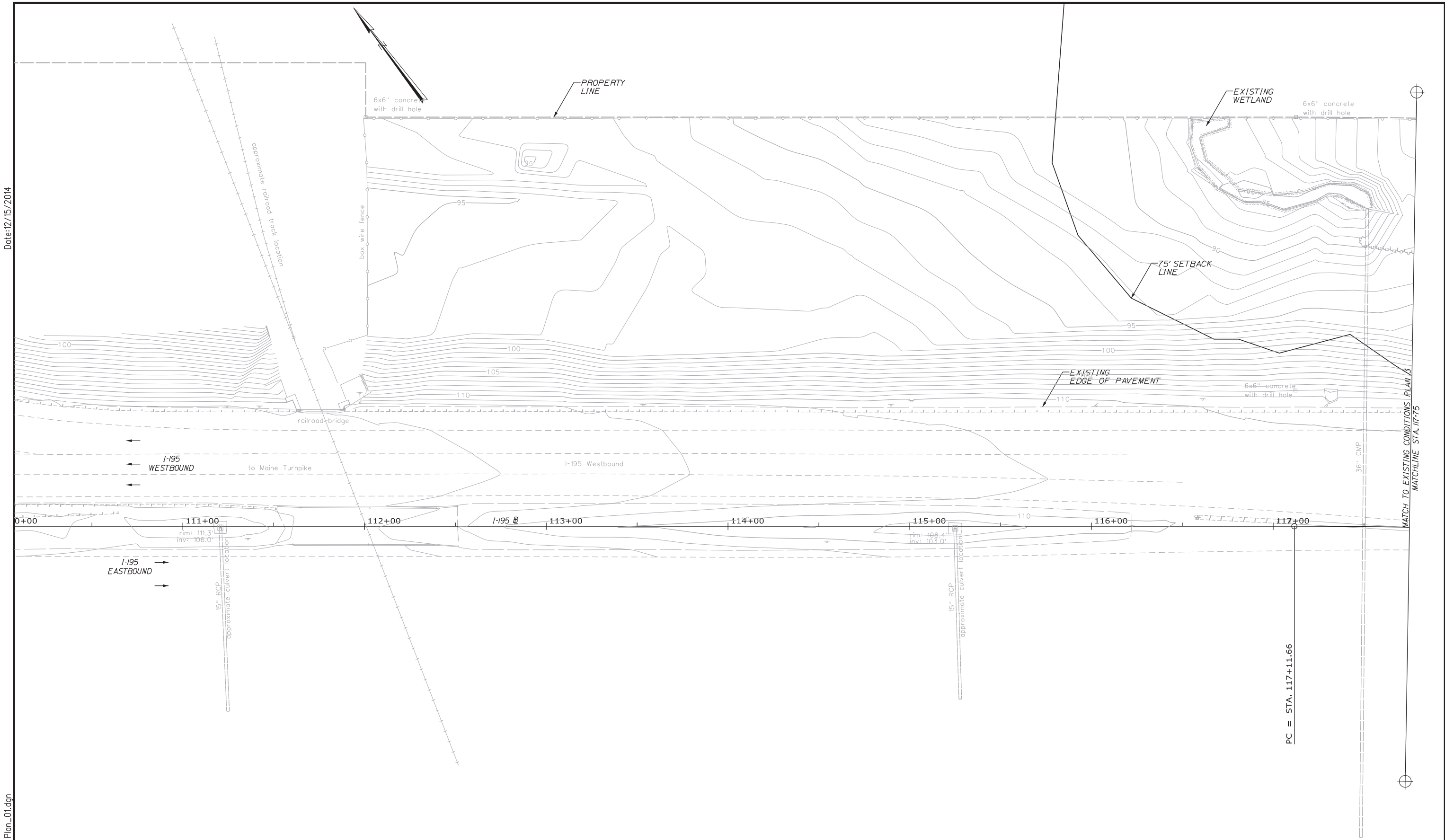
Figure No.

1

Title

Project Location
12/19/2014

Appendix B - PROJECT DESIGN DRAWINGS



File: ...MSTA\00x_ EX Plan_01.dgn

Date: 12/15/2014

Scale: 25 0 25 50
Scale of Feet

No.	Revision	By	Date

Designed by:

CONSULTANT PROJECT MANAGER: GREG EDWARDS, PE					
	By	Date		By	Date
Designed	TFD	--/--	Checked	TFD	--/--
Drawn	PZA	--/--	In Charge of	GAE	--/--

STANTEC CONSULTING SERVICES INC.
482 PAYNE ROAD
SCARBOROUGH, ME 04074
TEL (207) 887-3448
FAX (207) 883-3376

**THE GOLD STAR
MEMORIAL HIGHWAY**

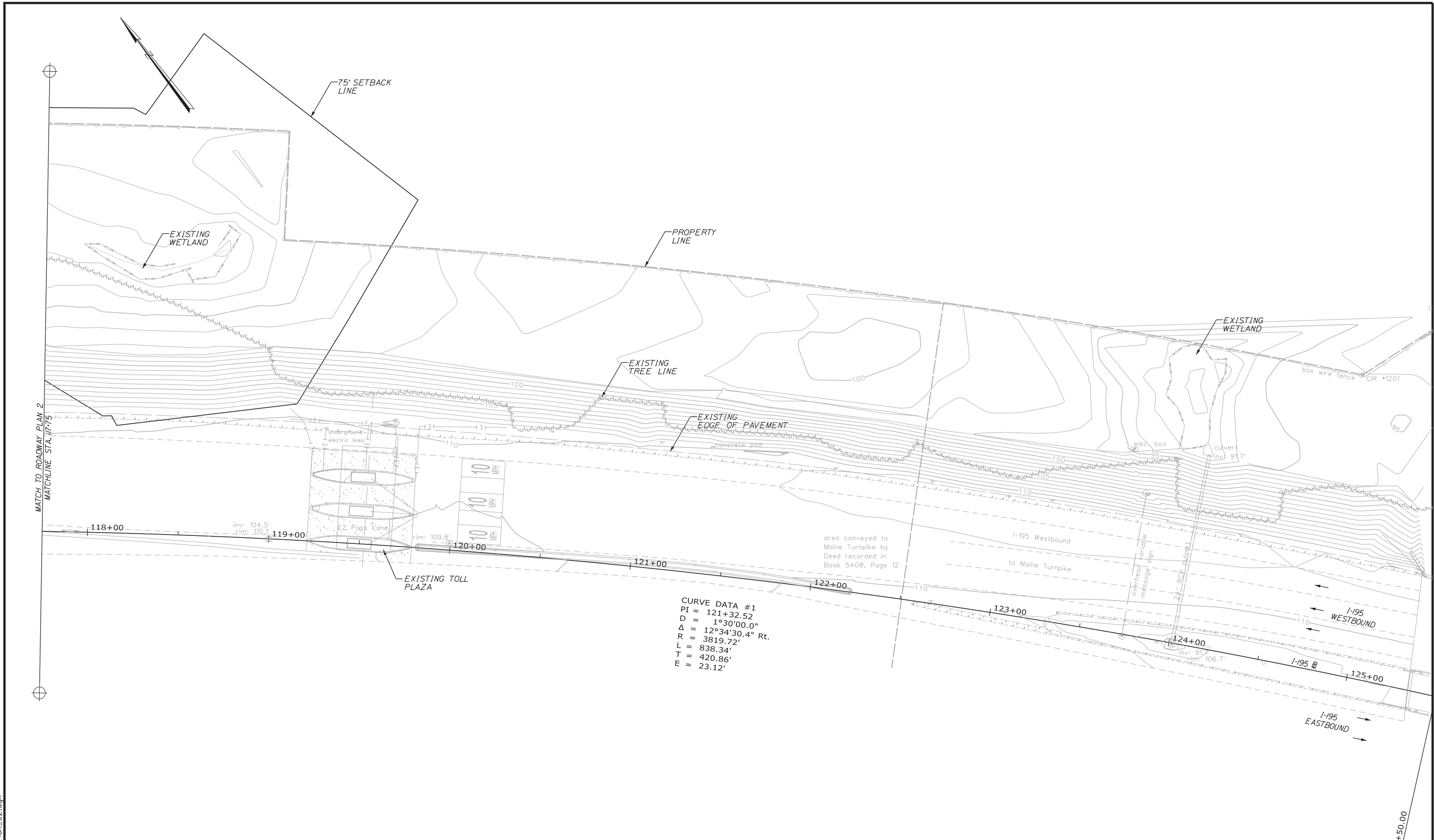
MTA PROJECT MANAGER: RALPH C. NORWOOD, IV, PE

INTERCHANGE 36
SACO TOLL PLAZA LANE ADDITION
EXISTING CONDITIONS PLAN
(1 OF 2)


SHEET NUMBER:
CONTRACT: 2015.06

9 OF 19

Filename: ...MSTA\00x_EX_Plan_02.dgn



Scale: 25 0 25 50 Scale of Feet			
No.	Revision	By	Date

Designed by: 			
CONSULTANT PROJECT MANAGER: GREG EDWARDS, PE			
	By	Date	
Designed	TFD	--/--	Checked TFD --/--
Drawn	PZA	--/--	In Charge of GAE --/--

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THE GOLD STAR
MEMORIAL HIGHWAY

MTA PROJECT MANAGER: RALPH C. NORWOOD, IV, PE

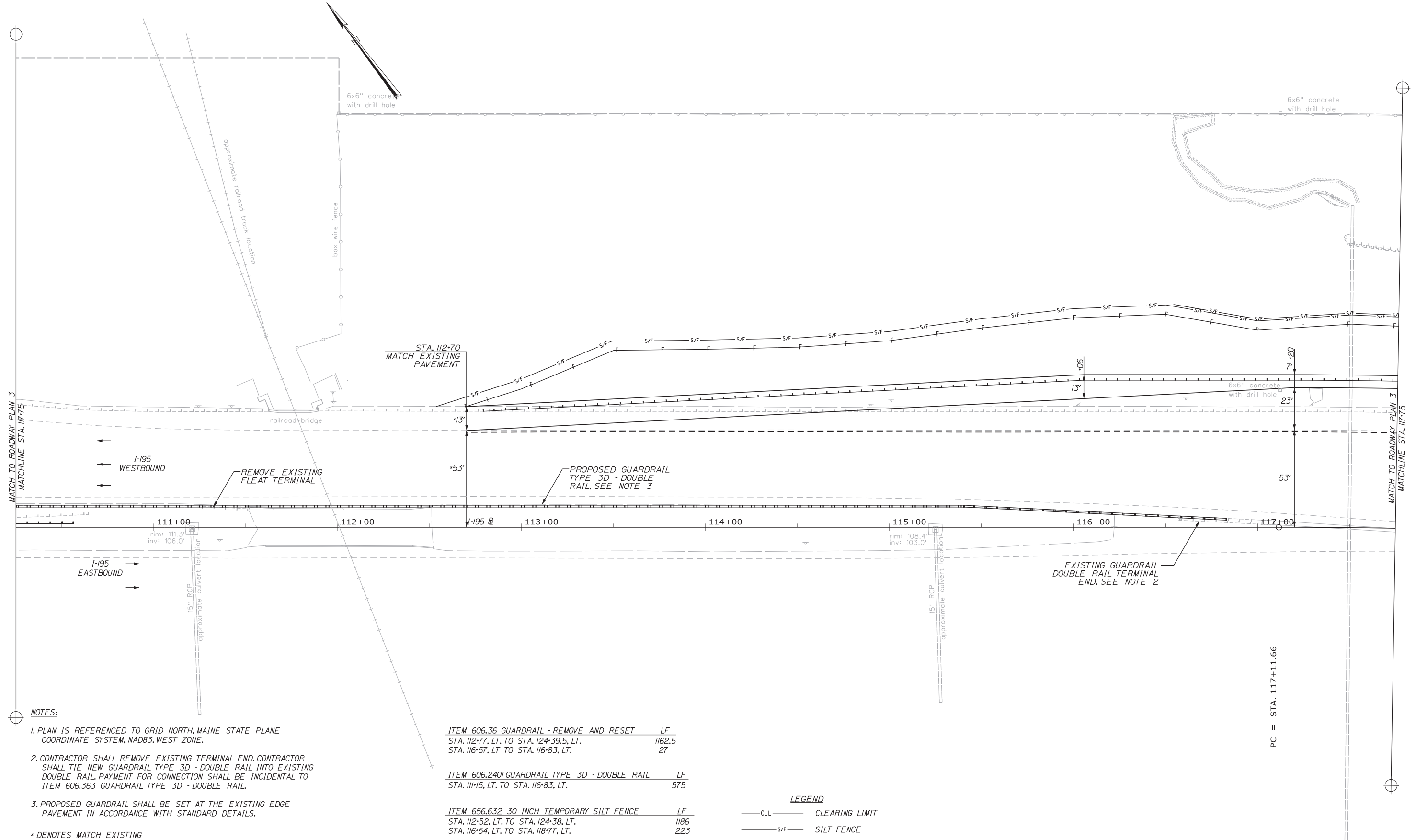
INTERCHANGE 36
SACO TOLL PLAZA LANE ADDITION
EXISTING CONDITIONS PLAN
(2 OF 2)

SHEET NUMBER:
CONTRACT:2015.06

6 OF 19

Date:12/15/2014

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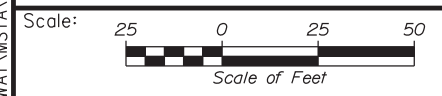
NOTES:

1. PLAN IS REFERENCED TO GRID NORTH, MAINE STATE PLANE COORDINATE SYSTEM, NAD83, WEST ZONE.
 2. CONTRACTOR SHALL REMOVE EXISTING TERMINAL END. CONTRACTOR SHALL TIE NEW GUARDRAIL TYPE 3D - DOUBLE RAIL INTO EXISTING DOUBLE RAIL. PAYMENT FOR CONNECTION SHALL BE INCIDENTAL TO ITEM 606.363 GUARDRAIL TYPE 3D - DOUBLE RAIL.
 3. PROPOSED GUARDRAIL SHALL BE SET AT THE EXISTING EDGE PAVEMENT IN ACCORDANCE WITH STANDARD DETAILS.
- * DENOTES MATCH EXISTING

ITEM 606.36 GUARDRAIL - REMOVE AND RESET		LF
STA. 112-77, LT. TO STA. 124-39.5, LT.	1162.5	
STA. 116-57, LT. TO STA. 116-83, LT.	27	
ITEM 606.240 GUARDRAIL TYPE 3D - DOUBLE RAIL		LF
STA. 111-15, LT. TO STA. 116-83, LT.	575	
ITEM 656.632 30 INCH TEMPORARY SILT FENCE		LF
STA. 112-52, LT. TO STA. 124-38, LT.	1186	
STA. 116-54, LT. TO STA. 118-77, LT.	223	

LEGEND

- CL — CLEARING LIMIT
- S/F — SILT FENCE



Designed by:					
CONSULTANT PROJECT MANAGER: GREG EDWARDS, PE					
	By	Date		By	Date
Designed	TFD	--/--	Checked	TFD	--/--
Drawn	PZA	--/--	In Charge of	GAE	--/--

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THE GOLD STAR
MEMORIAL HIGHWAY

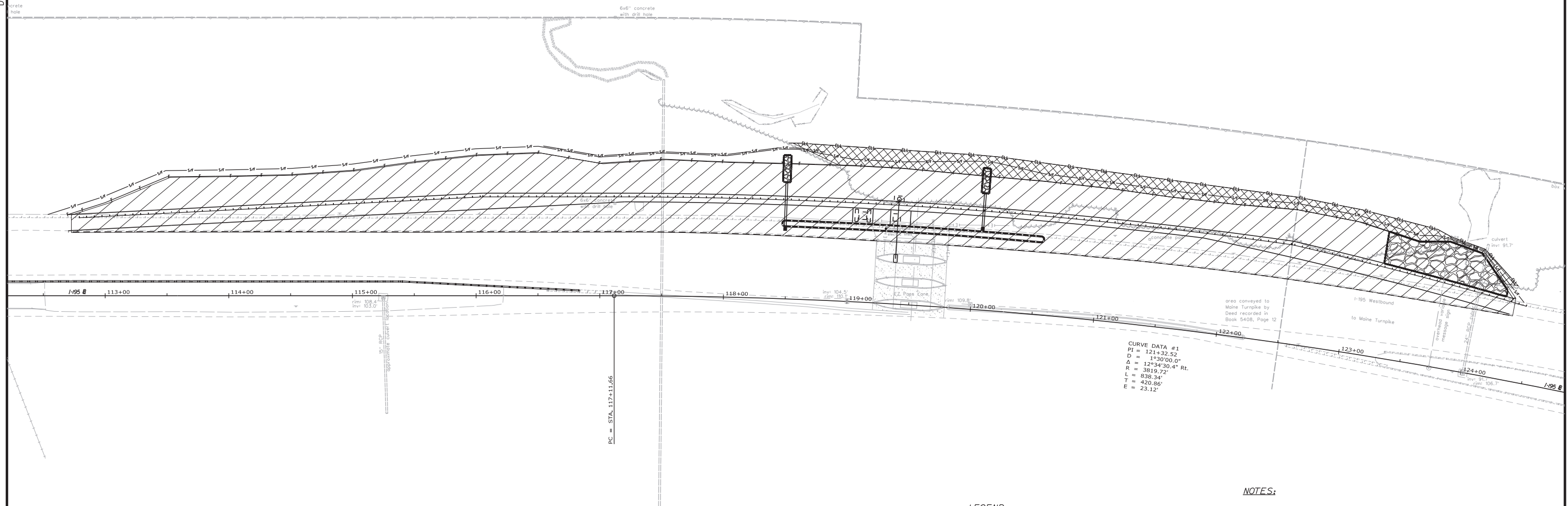
MTA PROJECT MANAGER: RALPH C. NORWOOD, IV, PE

INTERCHANGE 36
SACO TOLL PLAZA LANE ADDITION
ROADWAY PLANS
(2 OF 4)

SHEET NUMBER:
CONTRACT:2015.06
5 OF 19



—CLL— CLEARING LIMIT
—S/F— SILT FENCE




CURVE DATA #1
 PI = 121+32.52
 D = 1°30'00.0"
 Δ = 12°34'30.4" Rt.
 R = 3819.72'
 L = 838.34'
 T = 420.86'
 E = 23.12'

NOTES:

1. EROSION AND SEDIMENT CONTROL DEVICES REQUIRED FOR THE CONTRACTOR'S ACCESS LOCATIONS AND STORAGE AREAS WILL NOT BE MEASURED FOR PAYMENT.
2. SEE SPECIFICATIONS FOR CONTRACTOR'S SUBMITTAL REQUIREMENTS IF ADDING ADDITIONAL LIMITS OF DISTURBANCE TO THE PROJECT ESTIMATED QUANTITIES.
3. AN ADDITIONAL ONE ACRE HAS BEEN ESTIMATED FOR CONTRACTOR ACCESS LOCATIONS AND STORAGE AREAS.
4. TOTAL LIMIT OF DISTURBANCE FOR THIS PROJECT HAS BEEN ESTIMATED TO BE 2.59 ACRES.

LEGEND



Scale: 
Scale of Feet

Designed by:



STANTEC CONSULTING SERVICES INC.
482 PAYNE ROAD
SCARBOROUGH, ME 04074
TEL (207) 887-3448
FAX (207) 883-3376



THE GOLD STAR MEMORIAL HIGHWAY

INTERCHANGE 36
SACO TOLL PLAZA LANE ADDITION
LIMIT OF DISTURBANCE
PLAN

SHEET NUMBER:

CONTRACT:2015.06

5 OF 19

Appendix C - SITE PHOTOGRAPHS: EXISTING CONDITIONS

**NATURAL RESOURCE PROTECTION ACT PERMIT BY RULE APPLICATION, EZ PASS LANE ADDITION
PROJECT, SACO EXIT 36 TOLL PLAZA**



Photo 1: View looking east along I-195 to existing toll plaza.
June 19, 2014. Stantec.



Photo 2: Existing slope adjacent to west bound lanes of toll plaza.
June 19, 2014. Stantec.

**NATURAL RESOURCE PROTECTION ACT PERMIT BY RULE APPLICATION, EZ PASS LANE ADDITION
PROJECT, SACO EXIT 36 TOLL PLAZA**



Photo 3: Upland slope near stream 01AA.
May 9, 2014. Stantec.



Photo 4: View looking north down slope to stream 01AA.
June 19, 2014. Stantec.

**NATURAL RESOURCE PROTECTION ACT PERMIT BY RULE APPLICATION, EZ PASS LANE ADDITION
PROJECT, SACO EXIT 36 TOLL PLAZA**



Photo 5: View looking southeast along stream 01AA. Toll plaza visible in background of photo.
June 19, 2014. Stantec.



Photo 6: Existing culvert inlet under I-195.
June 19, 2014. Stantec.

**NATURAL RESOURCE PROTECTION ACT PERMIT BY RULE APPLICATION, EZ PASS LANE ADDITION
PROJECT, SACO EXIT 36 TOLL PLAZA**



Photo 7: Stream 01AA and associated floodplain wetland.
June 19, 2014. Stantec.



Photo 8: Stream 01AA.
June 19, 2014. Stantec.

MAINE TURNPIKE AUTHORITY

SPECIFICATIONS

APPENDIX D

MS4 PLANS

Maine Turnpike Authority

MS4 Stormwater Awareness Plan

Developing and implementing a Best Management Plan (BMP) Adoption Plan is a requirement of the Maine Department of Environmental Protection's (DEP's) *General Permit for the Discharge of Stormwater from Maine Department of Transportation (MaineDOT) and Maine Turnpike Authority (MTA) Municipal Separate Storm Sewer Systems (MS4s)*. Since MTA is subject to this MS4 permit and its six *Minimum Control Measures (MCMs)*, *Part IV(H)(1)(a)(ii)* requires MTA to conduct Public Education and Outreach (MCM #1) efforts that **encourage “employees and contractors to utilize BMPs that minimize stormwater pollution.”**

1.0 PERMIT LANGUAGE

Part IV(H)(1) of the MS4 Permit establishes three goals for *MCM #1 - Public Education and Outreach on Stormwater Impacts*. These include the following:

1. *To raise awareness that polluted stormwater runoff is one of the most significant sources of water quality problems for Maine's waters;*
2. *To motivate staff and contractors to use Best Management Practices (BMPs) which reduce polluted stormwater runoff; and*
3. *To reduce polluted stormwater runoff as a result of increased awareness and utilization of BMPs.*

In addition to continuing outreach efforts from the previous MS4 Permit (e.g., 5-year cycle)¹, MTA must satisfy these three goals by encouraging employees and contractors to use BMPs that minimize stormwater pollution as part of this Targeted BMP Adoption Plan. The progress and effectiveness of the Plan and associated efforts must then be evaluated and included in each annual report submitted to Maine DEP in accordance with *Part IV(J)* of the MS4 Permit. As part of this evaluation, MTA must include an assessment of process indicators and impact indicators to evaluate efforts in meeting these goals. In the fifth annual report, the BMP Adoption Plan shall be reviewed fully and include analysis of the process and impact indicators.

2.0 COVERAGE AREA

This plan has been developed for implementation by MTA to meet MS4 Permit requirements for Urbanized Areas (UAs) within MTA's right-of-way (ROW).

Process indicators are related to the execution of the program, such as (1) percent or number of employees who attend a training session; or (2) completion of a particular action item (e.g., distributing posters to employee work place and/or contractor job site).

Impact indicators are related to the achievement of the goals and objectives of the program, such as (1) observable/measurable effects on behavior; or (2) percent or number of employees to describe sources of storm water pollution, proper spill response, or maintenance of a BMP.

¹ Public education and outreach efforts continued from the previous MS4 permit cycle include (but are not limited to) conducting annual stormwater pollution prevention/spill prevention control and countermeasures (SPCC) training to MTA maintenance and engineering employees, as well as other Measurable Goals that can be found in MTA's Stormwater Program Management Plan (SPMP) dated December 2013.

3.0 OBJECTIVE

The objective of this Stormwater Awareness Plan is to raise awareness among MTA employees and contractors regarding stormwater issues. For example, stormwater runoff is one of the most significant sources of water quality problems for Maine's waters.

The goal of the Stormwater Awareness Plan is to provide information relative to stormwater impacts in an effort to raise awareness of MTA employees. For example, 100% of Highway Maintenance employees and Engineering Inspectors will attend training sessions at which stormwater issues and impacts will be addressed. Additionally, MTA will also work to raise awareness among MTA employees in other departments, such as Fare Collections by providing abbreviated Stormwater/Spill Prevention and Response training to supervisors and managers who will in turn inform additional employees regarding stormwater issues relative to MTA operations.

The goal of this Plan is to also raise awareness of contractors by providing this Plan, as well as the Targeted BMP Adoption Plan (which is designed to motivate employees and contractors to use BMPs to reduce polluted stormwater runoff), prior to starting work on MTA projects.

4.0 MESSAGE

The message MTA will strive to impart on employees and contractors will relate to the potential impacts their activities may have on stormwater runoff and water quality in Maine. The message statement is:

"The effect stormwater runoff has on the water quality of Maine waters is impacted by the level of effort put into the construction, operation, and maintenance of MTA's stormwater infrastructure. Polluted water entering the storm drain system and discharged untreated directly to waterbodies is used for drinking, fishing, and swimming, which impacts everyone in Maine."

In addition to the Stormwater Awareness Plan message, the target audience will be informed of authorized non-stormwater discharges allowed by the permit provided they do not contribute to a violation of water quality standards, as determined by the DEP. These include the following:

- Landscape irrigation
- Diverted stream flows
- Rising ground waters
- Uncontaminated ground water infiltration (as defined at 40 CFR 35.2005(20))
- Uncontaminated pumped ground water
- Uncontaminated flows from foundation drains
- Air conditioning and compressor condensate
- Irrigation water
- Flows from uncontaminated springs
- Uncontaminated water from crawl space pumps
- Uncontaminated flows from footing drains
- Lawn watering runoff
- Flows from riparian habitats and wetlands
- Residual street wash water (where spills/leaks of toxic or hazardous materials have not occurred, unless all spilled material has been removed and detergents are not used)
- Hydrant flushing and fire fighting activity runoff
- Water line flushing and discharges from potable water sources

4.1 OUTREACH TOOL(S) AND DISTRIBUTION

This Stormwater Awareness Plan and message will be provided to each MTA employee at annual training sessions and also to each contractor before commencement of work, in addition to the Targeted BMP Adoption Plan.

MTA has established or will rely on a number of outreach tools including the following:

- Existing stormwater training programs
 - For MTA employees, the internal training program will be evaluated annually (and updated, as needed) to include storm water topics in order to assess process and impact indicators; and
 - For contractors, MTA continues to require an On-Site Responsible Party (OSRP) certified by DEP's NPS Training Program to be knowledgeable of stormwater, specifically erosion prevention, sedimentation control and other potential impacts to water quality in Maine.
- Stormwater information packages to raise awareness and encourage utilization of targeted BMPs
 - For MTA employees, information will be provided during annual and supplemental training sessions. Informational packages may also be provided via MTA's newsletters and memos posted to employee bulletin boards, as well as through employee meetings, including quarterly Environmental Health & Safety Committee meetings.
 - For contractors, MTA will continue to include contractual requirements provided in the standard contract language that establishes the anticipated expectations for performance and payment. Stormwater information will be discussed or provided to contractors prior to starting work (e.g., at Pre-Construction meetings).

4.2 TIMELINE AND IMPLEMENTATION SCHEDULE

The timeline and implementation schedule is determined by:

- The training schedule established each year for MTA employees; and
- The solicitation and project award notices each year.

MTA has established a representative training schedule for each year and is similar to the table below:

Date	Training Type
April	Erosion and Sediment Control (ESC) and Stormwater Pollution Prevention for highway maintenance Supervisors and Foremen
May - June	Spill Prevention Control and Countermeasures Plan (SPCC), Stormwater and Erosion and Sediment Control (ESC) for MTA maintenance and engineering employees.
October	Spill Prevention Control and Countermeasures Plan (SPCC) and Stormwater for Fare Collections

The training sessions are designed to meet the goal of increasing awareness, as well as encouraging utilization of targeted BMPs to reduce stormwater runoff and potential impacts. In addition to these training sessions, there may be supplemental training sessions as needed and/or new information posters about stormwater BMPs posted at MTA facilities. Newsletters including stormwater information may also be sent each year to employees.

For contractors, MTA's requirement to have an OSRP certified by DEP's NPS Program ensures that the contractor is aware of stormwater related issues. In addition, MTA distributes this Stormwater Awareness Plan to contractors.

4.3 RESPONSIBLE PARTY

The primary responsible party at MTA is the Environmental Services Coordinator, John Branscom. The Environmental Services Coordinator may also rely on the following:

- MTA Supervisors, Foremen, Inspectors and/or other personnel to inform MTA employees and contractors of the targeted BMPs to be utilized;
- An environmental consulting firm, such as GZA GeoEnvironmental, Inc, to ensure MTA's employees are trained as defined by the Plan; and
- A design engineering firm, such as HNTB, who administer construction contracts, to ensure the Plan is properly implemented by the contractors.

4.4 EVALUATION PROTOCOL

MTA training is documented with attendance sign-in sheets, exam scores, in-class workshops and evaluation forms. A training database is maintained with information gathered from employees during each training session.

Process Indicators: Assessment of the program execution will be included in the annual report. The following topics will be reported for MTA employees:

1. Number of employees that attended training; and
2. Average exam scores for attendees.

Impact Indicators: Gauging the achievement of goals and objectives of the program will be included in the annual report. These will be addressed by the following behavioral change questions:

1. Number or percentage of employees to identify the goals of MCM #1 correctly;
2. Number or percentage of employees to identify source(s) of storm water pollution;
3. Number or percentage of employees to identify and differentiate between structural and non-structural BMPs; and
4. Number or percentage of employees to demonstrate an applied knowledge of BMP-specific information.

Process and impact indicators for contractors will be tracked by documenting the pre-construction meetings when this Plan and the Targeted BMP Adoption Plan are provided to each contractor and the contractor, in turn, provides MTA with the certification for their OSRP for the project.

4.5 PLAN MODIFICATION

This Stormwater Awareness Plan may require modification if evaluation data shows that efforts are not effective. Should modifications be needed, the plan will be revised or a new plan will be developed.

I have read and accept the policies outlined in this Stormwater Awareness Plan as required by MTA's MS4 Permit.

Contractor Signature of Acknowledgement

Date

Printed Name

Project Number

Maine Turnpike Authority

MS4 Targeted BMP Adoption Plan

Developing and implementing a Best Management Plan (BMP) Adoption Plan is a requirement of the Maine Department of Environmental Protection's (DEP's) *General Permit for the Discharge of Stormwater from Maine Department of Transportation (MaineDOT) and Maine Turnpike Authority (MTA) Municipal Separate Storm Sewer Systems (MS4s)*. Since MTA is subject to this MS4 permit and its six *Minimum Control Measures (MCMs)*, *Part IV(H)(1)(a)(ii)* requires MTA to conduct Public Education and Outreach (MCM #1) efforts that **encourage “employees and contractors to utilize BMPs that minimize stormwater pollution.”**

1.0 PERMIT LANGUAGE

Part IV(H)(1) of the MS4 Permit establishes three goals for *MCM #1 - Public Education and Outreach on Stormwater Impacts*. These include the following:

- 1. To raise awareness that polluted stormwater runoff is one of the most significant sources of water quality problems for Maine's waters;*
- 2. To motivate staff and contractors to use Best Management Practices (BMPs) which reduce polluted stormwater runoff; and*
- 3. To reduce polluted stormwater runoff as a result of increased awareness and utilization of BMPs.*

In addition to continuing outreach efforts from the previous MS4 Permit (e.g., 5-year cycle)¹, MTA must satisfy these three goals by encouraging employees and contractors to use BMPs that minimize stormwater pollution as part of this Targeted BMP Adoption Plan. The progress and effectiveness of the Plan and associated efforts must then be evaluated and included in each annual report submitted to Maine DEP in accordance with *Part IV(J)* of the MS4 Permit. As part of this evaluation, MTA must include an assessment of process indicators and impact indicators to evaluate efforts in meeting these goals. In the fifth annual report, the BMP Adoption Plan shall be reviewed fully and include analysis of the process and impact indicators.

2.0 COVERAGE AREA

This plan has been developed for implementation by MTA to meet MS4 Permit requirements for Urbanized Areas (UAs) within MTA's right-of-way (ROW).

Process indicators are related to the execution of the program, such as (1) percent or number of employees who attend a training session; or (2) completion of a particular action item (e.g., distributing posters to employee work place and/or contractor job site).

Impact indicators are related to the achievement of the goals and objectives of the program, such as (1) observable/measurable effects on behavior; or (2) percent or number of employees to describe sources of storm water pollution, proper spill response, or maintenance of a BMP.

¹ Public education and outreach efforts continued from the previous MS4 permit cycle include (but are not limited to) conducting annual stormwater pollution prevention/spill prevention control and countermeasures (SPCC) training to MTA maintenance and engineering employees, as well as other Measurable Goals that can be found in MTA's Stormwater Program Management Plan (SPMP) dated December 2013.

3.0 OBJECTIVE

The objective of this Targeted BMP Adoption Plan is to educate MTA's employees and contractors to use BMPs which reduce polluted stormwater runoff within UA.

The goal of the BMP Adoption Plan is to target BMPs in the MaineDOT BMP Manual to be utilized by employees and contractors that minimize stormwater pollution during construction activities, such as:

- (1) Installing silt fence prior to land disturbance; and
- (2) Ensuring that hay mulch is applied to soil at the end of each work day.

For MTA employees, focus will also be given to targeting BMPs relevant to transportation-related maintenance and good housekeeping activities, such as:

- (1) Regular sweeping of the mainline and peripheral facilities;
- (2) Annual catch basin clean-outs and sediment removal;
- (3) As needed ditch cleaning and repair;
- (4) On-going culvert maintenance and litter removal.

Contractors are also encouraged to utilize BMPs in accordance with standard construction contract language (e.g., Special Provision 656), as well as the MaineDOT BMP Manual.

4.0 MESSAGE

The message MTA will strive to impart on employees and contractors will relate to the impacts their activities have on stormwater runoff and the importance of BMPs. The message statement is:

"Implementing appropriate BMPs, as described in MaineDOT's Stormwater BMPs Manual, to all MTA related activities will help to minimize stormwater pollutants introduced to Maine's waterbodies."

4.1 OUTREACH TOOL(S) AND DISTRIBUTION

Targeted BMPs are included in the MaineDOT BMP Manual that is available at each MTA maintenance facility and referenced in standard contract language for contractors.

MTA has established or will rely on a number of outreach tools including the following:

- Existing stormwater training programs
 - For MTA employees, the internal training program will be evaluated annually (and updated, as needed) to include storm water topics in order to assess process and impact indicators; and
 - For contractors, MTA continues to require an On-Site Responsible Party (OSRP) certified by DEP's NPS Training Program to be knowledgeable in erosion prevention and sedimentation control.
- Existing standard contract language
 - Requires contractors to maintain a certified OSRP on-site who has authority to implement BMPs appropriately; and
 - Specifies that contractors must utilize MaineDOT's BMP Manual, as well as other BMPs, to ensure construction site runoff is minimized.
- Stormwater information packages to raise awareness and encourage utilization of targeted BMPs
 - For MTA employees, information will be provided during annual and supplemental training sessions. Informational packages may also be provided via MTA's newsletters

and memos posted to employee bulletin boards, as well as through employee meetings, including quarterly Environmental Health & Safety Committee meetings.

- For contractors, MTA will continue to include contractual requirements provided in the standard contract language that establishes the anticipated expectations for performance and payment. This Target BMP Adoption Plan will also be provided to contractors prior to starting work (e.g., at Pre-Construction meetings).

4.2 TIMELINE AND IMPLEMENTATION SCHEDULE

The timeline and implementation schedule is determined by:

- The training schedule established each year for MTA employees; and
- The solicitation and project award notices each year.

MTA has established a representative training schedule for each year and is similar to the table below.

Date	Training Type
April	Erosion and Sediment Control (ESC) and Stormwater Pollution Prevention for Highway Maintenance Supervisors and Foremen
May - June	Spill Prevention Control and Countermeasures Plan (SPCC), Stormwater and Erosion and Sediment Control (ESC) for MTA maintenance and engineering employees.

In addition to the training sessions above, there may be supplemental training sessions as needed and/or new information posters about stormwater BMPs posted at MTA facilities. Newsletters including stormwater information may also be sent each year to employees.

For contractors, targeted BMPs are already being implemented in accordance with contract language and the MaineDOT BMP Manual. In addition, MTA distributes this Targeted BMP Adoption Plan to contractors.

4.3 RESPONSIBLE PARTY

The primary responsible party at MTA is the Environmental Services Coordinator, John Branscom. The Environmental Services Coordinator may also rely on the following:

- MTA Supervisors, Foremen, Inspectors and/or other personnel to inform MTA employees and contractors of the targeted BMPs to be utilized;
- An environmental consulting firm, such as GZA GeoEnvironmental, Inc, to ensure MTA's employees are trained as defined by the Plan; and
- A design engineering firm, such as HNTB, who administer construction contracts, to ensure the Plan is properly implemented by the contractors.

5.0 EVALUATION PROTOCOL

MTA training is documented with attendance sign-in sheets, exam scores, in-class workshops and evaluation forms. A training database is maintained with information gathered from employees during each training session.

Process Indicators: Assessment of the program execution will be included in the annual report. The following topics will be reported for MTA employees:

1. Number of employees that attended training; and
2. Average exam scores for attendees.

Impact Indicators: Gauging the achievement of goals and objectives of the program will be included in the annual report. These will be addressed by the following behavioral change questions:

1. Number or percentage of employees to identify the goals of MCM #1 correctly;

2. Number or percentage of employees to identify source(s) of storm water pollution;
3. Number or percentage of employees to identify and differentiate between structural and non-structural BMPs; and
4. Number or percentage of employees to demonstrate an applied knowledge of BMP-specific information.

Process and impact indicators for contractors will be tracked and evaluated based on daily and/or weekly inspections conducted on-site.

6.0 PLAN MODIFICATION

This Targeted BMP Adoption Plan may require modification if evaluation data shows that efforts are not effective. Should modifications be needed, the plan will be revised or a new plan will be developed.

I have read and accept the policies outlined in this Stormwater Awareness Plan as required by MTA's MS4 Permit.

Contractor Signature of Acknowledgement

Date

Printed Name

Project Number

MAINE TURNPIKE AUTHORITY

SPECIFICATIONS

APPENDIX E

PRODUCT DATA SHEETS

Direct-View LED Traffic Controller DOT2424RG-175

PRODUCT NUMBER

5651



CABINET DIMENSIONS

24" H x 24" W x 5" D

ILLUMINATION SOURCE

Super bright, narrow viewing angle LEDs
Available in green, red, blue, amber, and white LEDs
Messages "blankout" when turned off, eliminating confusion
Long life, solid state lighting

ELECTRICAL

Integrated solid state power supply
Photocell for auto photodimming
Standard Voltage: 120 VAC, Optional Voltages: 9-36 V, 240 VAC, 277 VAC
Maximum amps per lighted message (at 120 V) shown in the table below
UL/CUL approved for wet locations

CONSTRUCTION

Faces: Single Faced Sign
Cabinet: (DOT) NEMA 4X Rated, 1/8" wall T5052 aluminum cabinet with continuously welded seams. Optional Visor
Door: Continuous hinge with a 1" x 1/4" silicone gasket and stainless steel tool free door latches
Face Material: Impact resistant, 1/4" thick smoke tinted polycarbonate

FINISH

Standard Cabinet Color: Black
Custom colors available upon request

MESSAGE	COLOR	HEIGHT	AMPS
X	30° Red Round	18.0"	0.17
Down Arrow	30° Green Round	18.0"	0.13

Trans-Tech

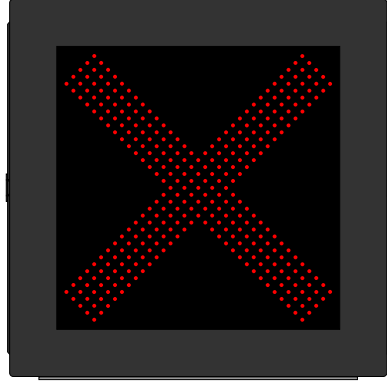
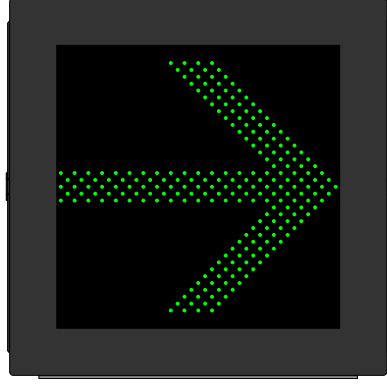
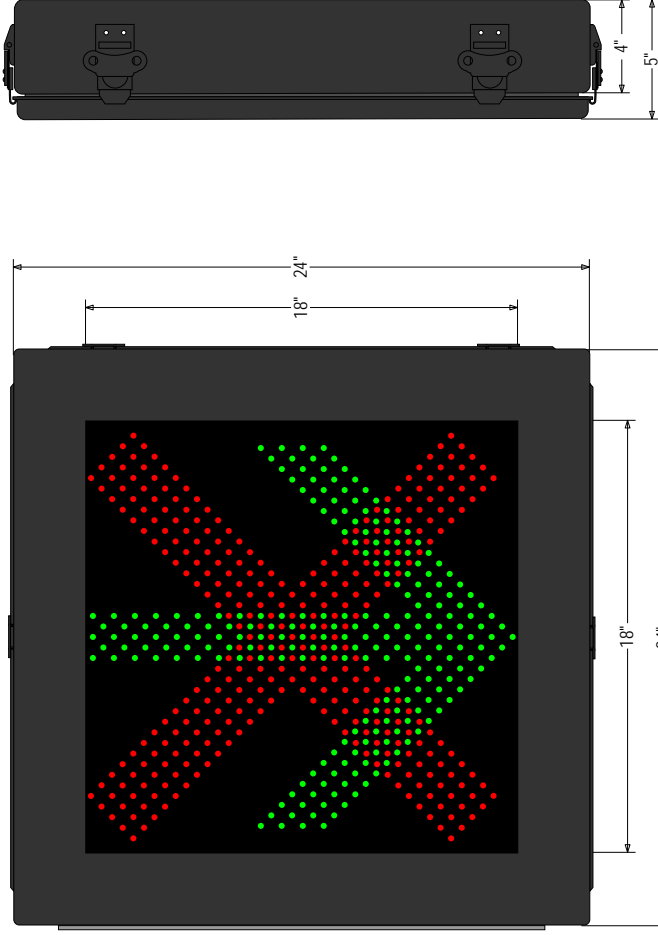
4999 Pittsburgh Ave.
Erie, PA 16509
Phone: (888) 811-7010
Fax: (814) 836-8401
Email: sales@transportation-tech.com
Website: www.transportation-tech.com



Proudly Made in the USA

Product View

NOTE: Sign image may not exactly represent the finished product. For illustration purposes only.



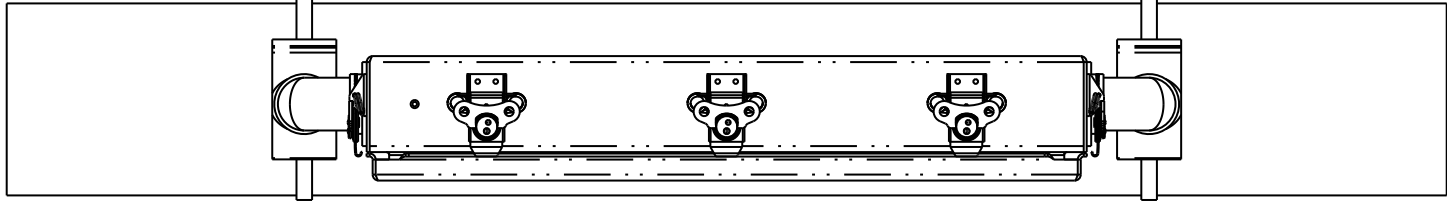
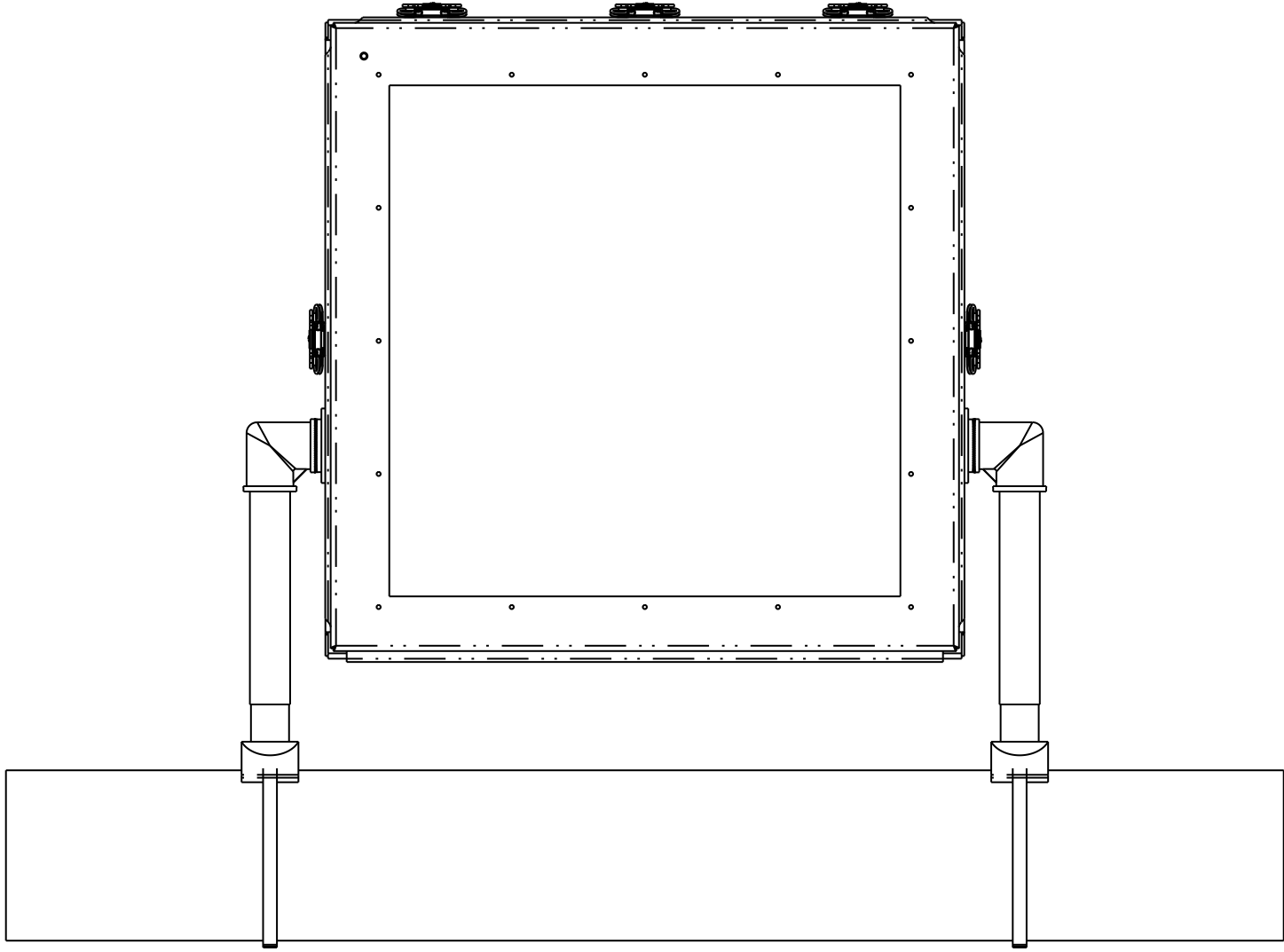
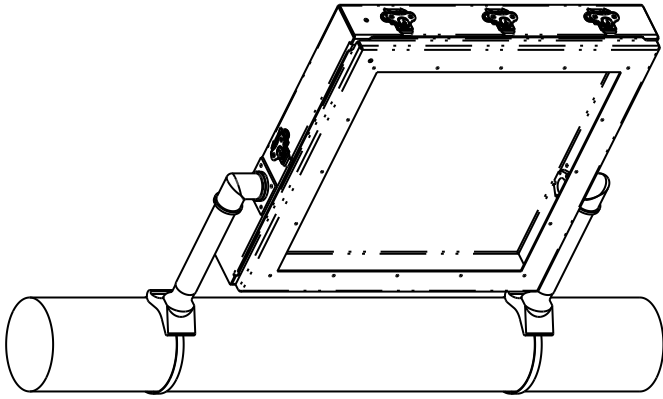
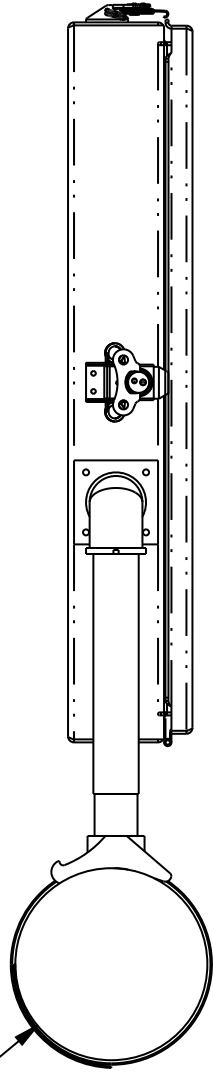
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3

2

1

Ø8" POST,
FOR ILLUSTRATION



D

C

AP-A20

B

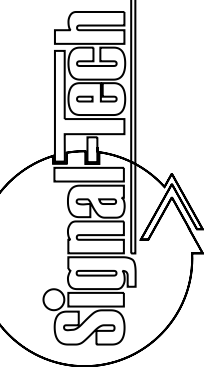
A

TYP TOL: $\pm 1/16"$
ANGLES: $\pm 2^\circ$

DATE: 10-MAR-11
SHEET 1 OF 3

3030 DOT, PELCO-MOUNTING

INV ID#:



JDG

PROD ID#:

4985 Pittsburgh Ave
Erie, PA 16509

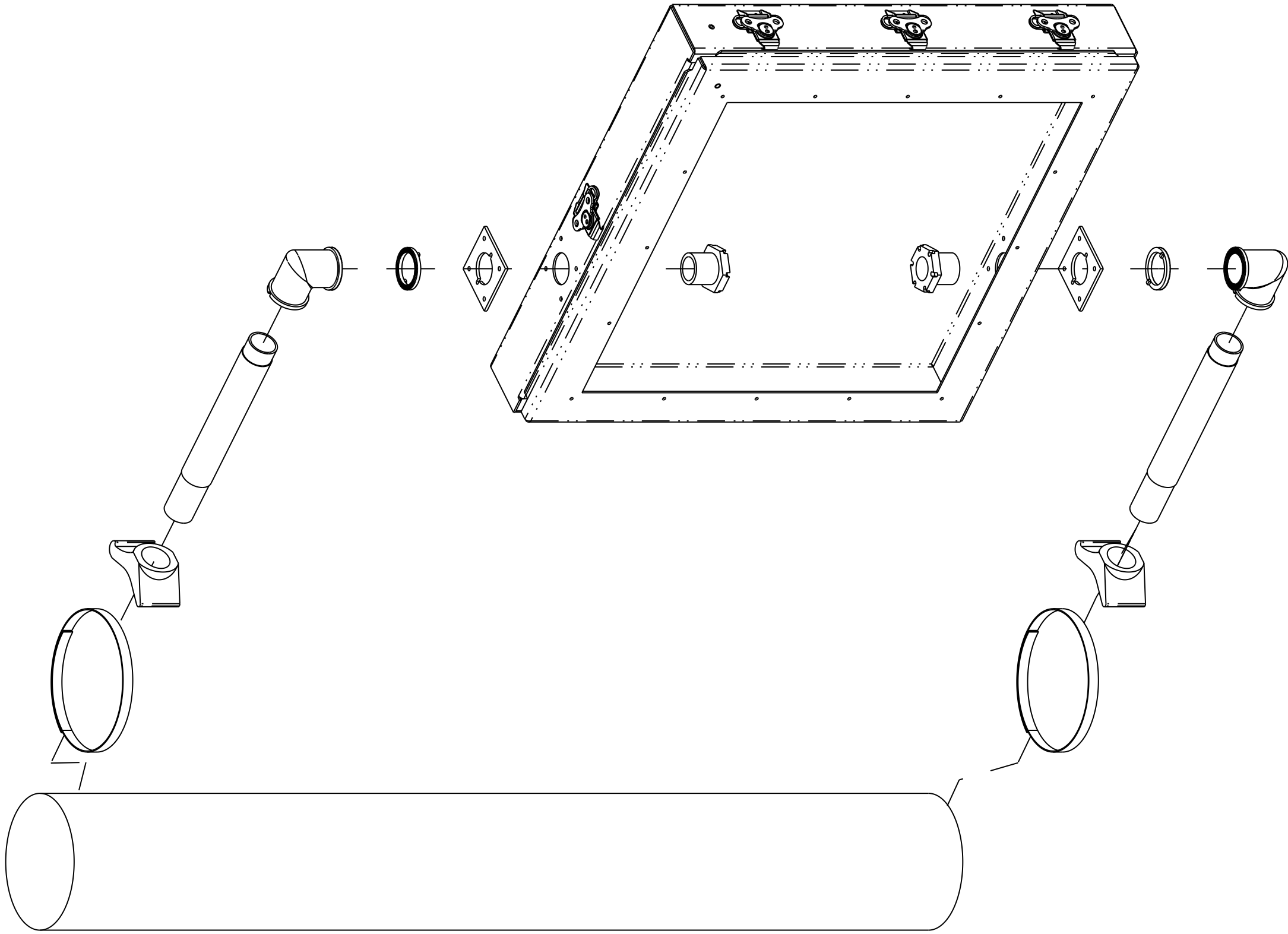
CUST ID#:

4

3

2

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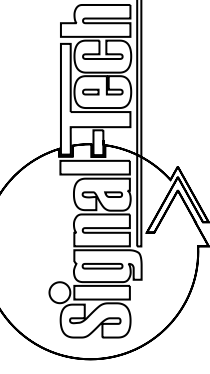


TYP TOL: $\pm 1/16"$
ANGLES: $\pm 2^\circ$

DATE: 10-MAR-11
SHEET 2 OF 3

3030 DOT, PELCO-MOUNTING

INV ID#:



JDG

PROD ID#:

4985 Pittsburgh Ave
Erie, PA 16509

CUST ID#:

EM1109/EM2000/EM2200 Mount PIPE/POLE MOUNT, MEDIUM DUTY, ENCLOSURE

Product Features

- Low Cost
- Manually Adjustable Swivel Head
- Cable Feedthrough Hole
- Supports up to 40 lb (18.14 kg)
- Mounts on Vertical or Horizontal Pipe/Pole; Mounting Straps Included
- Compatible with Most Pelco Enclosures with a 2-Inch (5.08 cm) Mounting Pole Pattern

The **EM1109/EM2000/EM2200** are medium duty enclosure mounts designed for applications where mounting on a pipe or pole is necessary. These mounts can be used with Pelco enclosures having a 2-inch (5.08 cm) mounting hole pattern and are capable of supporting up to 40 lb (18.14 kg). All three mounts feature a manually adjustable swivel head and a cable feedthrough hole to conceal wiring. Multiple mounting holes on the tilt table provide maximum 360-degree horizontal positioning of the enclosure.

The **EM1109** is a pedestal mount for use on a horizontal or vertical pipe or pole. The **EM2000** is a J-type mount for use on a vertical pipe or pole, and the **EM2200** is a "hook" type mount for use on a horizontal pipe or pole. The **EM1109/EM2000/EM2200** must be mounted on pipes or poles having a 3-inch (7.62 cm) to 8-inch (20.32 cm) diameter. Mounts are secured to the pipe or pole with stainless steel mounting straps. Two 1/4-20 mounting bolts required to secure the enclosure to the mount are also supplied.

The **EM1109/EM2000/EM2200** are constructed of aluminum and have a white epoxy powder coat finish.



EM2200



EM2000



EM1109



TECHNICAL SPECIFICATIONS

MODELS

EM1109	Medium duty pedestal mount for horizontal or vertical pipe or pole applications. Manually adjustable swivel head and cable feedthrough hole.
EM2000	Medium duty 90 degree J-mount for vertical pipe or pole applications. Manually adjustable swivel head and cable feedthrough hole.
EM2200	Medium duty "hook" mount for horizontal pipe or pole applications. Manually adjustable swivel head and cable feedthrough hole.

MECHANICAL

Pan Adjustment	Unlimited 360°
Tilt Adjustment	±75°
Locking Method	3/8-16 hex head bolts (on manually adjustable swivel head)

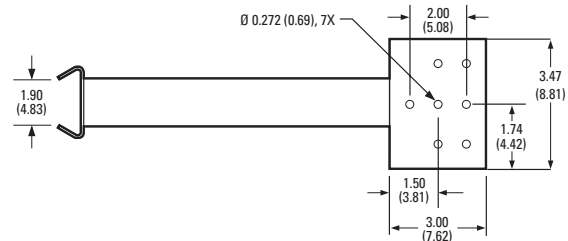
GENERAL

Suggested Mounting Method	Slots provided for mounting straps; 3 stainless steel straps supplied. Straps fit 3-inch (7.62 cm) to 8-inch (20.32 cm) diameter pole.
Enclosure Mounting	2, 1/4-20 mounting bolts (supplied)
Maximum Load	40 lb (18.14 kg)
Construction	Aluminum
Finish	White epoxy polyester powder coat
Environment	Indoor/outdoor
Unit Weight	
EM1109	1.88 lb (0.85 kg)
EM2000	3.05 lb (1.38 kg)
EM2200	3.51 lb (1.59 kg)
Shipping Weight	
EM1109	3 lb (1.36 kg)
EM2000	8 lb (3.60 kg)
EM2200	9 lb (4.10 kg)

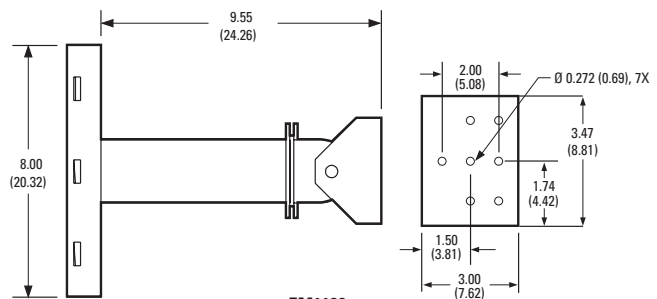
RECOMMENDED ENCLOSURES

Pelco enclosures having a 2-inch (5.08 cm) mounting hole pattern can be used with these mounts. Be sure the enclosure/camera/lens combination you select does not exceed 40 lb (18 kg) and is suitable for the type of mount you have selected. The following list indicates the most applicable enclosures.

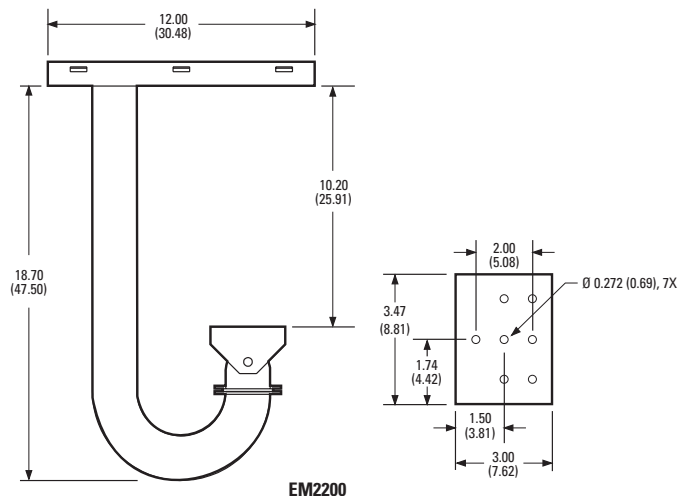
EH3010/EH3014 Series
 EH4010 EH4014 Series
 EH3508 Series, Environmental
 EH3512/EH3515 Series, Environmental
 EH4700 Series, Environmental
 EH4700DB Series, Environmental
 E700 Series, Dust-Tight
 EHX4E, Explosion-Proof
 EH8100 Series, Pressurized



EM2000



EM1109



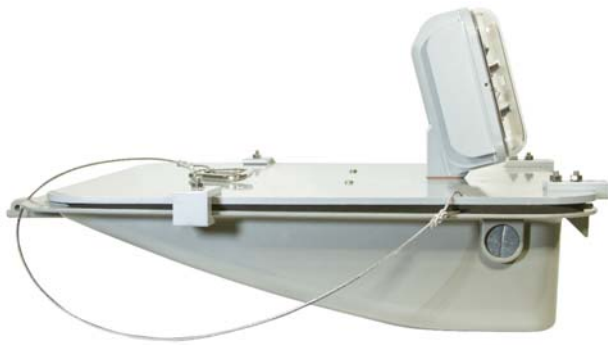
EM2200

NOTE: VALUES IN PARENTHESES ARE CENTIMETERS; ALL OTHERS ARE INCHES.



Pelco, Inc. Worldwide Headquarters:
 3500 Pelco Way, Clovis, California 93612-5699 USA
USA & Canada Tel: (800) 289-9100 • FAX: (800) 289-9150
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www.pelco.com

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StreetSense™ RS Series LED Roadway Sign Light

Certifications & Ratings:

- ▷ Recommended design practice - IES RP-19-01 roadway sign lighting
- ▷ Retrofit cover assemblies compliant to UL-1598 wet locations
- ▷ Complete fixture compliant to UL-1598 wet locations
- ▷ CSA 22.250
- ▷ ANSI C136.31-2001 (vibration)
- ▷ MIL STD 810F (salt / fog)

Features & Benefits:

- ▷ Complete performance 5 year warranty
- ▷ Mercury free
- ▷ >70% lumen maintenance after 60,000 operating hours
- ▷ Long lasting / low maintenance
- ▷ Low power consumption offers 60-70% energy savings vs. 250W MV
- ▷ Superior color rendition index compared to HPS; LPS; MH; MV
- ▷ Instant on/off operation - no cool down or warm up time required for full illumination
- ▷ Resistant to roadway vibration and shock
- ▷ Universal input 100-277 VAC (480VAC versions available)
- ▷ Weather/corrosion resistant lamp assembly and housing



Meets Buy American
For projects requiring
Buy American certification,
consult factory for additional
information and details

Application:

Dialight introduces the state-of-the-art StreetSense™ LED fixtures designed specifically for "new" and "retrofit" installations of Roadway Sign Lights.

All of Dialight's long life LED luminaires are designed to meet the most demanding specification criteria while offering maximum energy savings, reduced maintenance costs, and a superior quality of light.

Mechanical Information:

Fixture Weight: 25 lbs - Retrofit cover assembly, Holophane
25 lbs - Retrofit cover assembly, GE
32 lbs - Complete fixture

Mounting (see pages 2-3 for specific details):

Dialight complete unit including box and cover (22.7" x 20.5" x 12.3")
Holophane SIGN-VUE enclosure box (22.7" x 20.5" x 5.5") (supplied by others)
GE VERSAFLOOD II SIGNLITER® box (19" x 17.37" x 9") (supplied by others)

Electrical specifications:

System Power Consumption (nom +/- 10%):

63W
100W

Initial lumens:

4,000 (63W)
4,900 (100W)

Operating Voltage:

100-277 VAC, 50/60 Hz
347, 480VAC (consult factory)

Transient Protection:

ANSI C136.2 (600V) American National Standard for Roadway and Area Lighting Equipment - Luminaires, Voltage Classifications

EMI/RFI (Noise Suppression):

FCC Title 47, Subpart B, Section 15, class A devices

Power Factor:

> 0.90

THD (typ):

10% @ 100-240 VAC
20% @ 277 VAC

Operating Temp:

-40°F to +165°F (-40°C to +74°C)

Construction:

Body:

Polyester / epoxy powder coat gray RAL 7040

Lens:

High impact polycarbonate with UV stabilizer and hard coated for abrasion resistance

Cover:

Polyester / epoxy powder coat gray RAL 7040

Photometric Information:

CCT:

5300K (cool white)

CRI:

< 70

All values typical unless otherwise state

Ordering Information

Part Number	Color	Description	System Power Consumption (nom +/- 10%)
RS5C4F-C	Cool White	Dialight Complete Fixture¹ Box and cover assembly includes wiring box and light engine for mounting on a flat plate	63W
RS5C4K-C	Cool White	Dialight Complete Fixture¹ Box and cover assembly includes wiring box and light engine for mounting on a flat plate	100W
RS5C4F-H	Cool White	Dialight Retrofit Cover Assembly (only) For use on Holophane SIGN-VUE enclosures (see page 2 for detail)	63W
RS5C4K-H	Cool White		100W
RS5C4F-G	Cool White	Dialight Retrofit Cover Assembly (only) For use on GE VERSAFLOOD II SIGNLITER® enclosures (see page 2 for detail)	63W
RS5C4K-G	Cool White		100W

¹All units above intended to be mounted under sign only and on a fixed plate mounting structure. Not intended to be mounted inverted on top of sign or pipe or pole mount.

Note: Mounting Plate provided by others



Typical CCT Values	
High Pressure Sodium	2100K
Incandescent	2800K
Halogen	3100K
Fluorescent (standard)	3500K
Direct Sunlight	4900K
Metal Halide	5000K
Dialight LED RS Series (Cool)	5300K
Natural Daylight	6500K
Indirect Sunlight	6700K

StreetSense™ LED Roadway Sign Light

DOTs and other agencies must now choose alternative lamp sources for the replacement of these fixtures and for new construction or additions. Under the Federal Energy Policy Act (EPACT 2005) and the Energy Independence and Security Act, conventional mercury vapor lamps and all 150-500 watt metal halide ballasts were mandated to be substituted with more energy efficient alternatives.

Going GREEN

The 63 or 100W StreetSense LED fixture can typically replace a 250W or higher mercury vapor / metal halide unit while still meeting or exceeding the Roadway Sign Light Specifications, so it delivers CO2 reduction and energy savings of 60-70% over conventional lights. This efficiency is further enhanced by its instant-on/off ability with no necessary warm up to achieve full illumination. In addition its 'green' credentials are assured by the fact that it is 100% mercury free and dark skies friendly; this is assured by its highly efficient optics that focus the light just where it's needed, avoiding light spill.

Maintenance Free

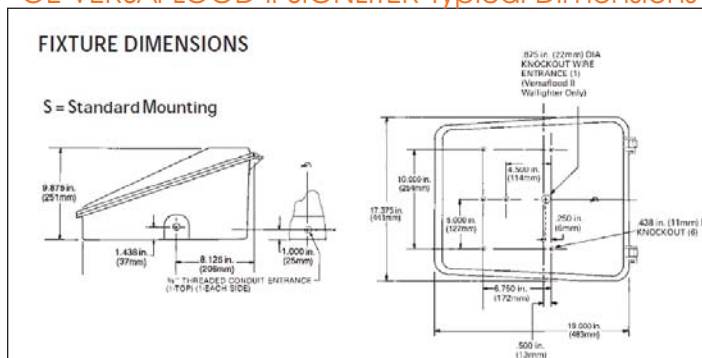
The rugged, solid state StreetSense fixture is not only an energy efficient alternative, but its projected fixture service life of ten years (50% on-time, >70% lumen maintenance after 60K hours) also brings other significant benefits. These include the elimination of frequent lamp changes and reduction of overall maintenance costs as well as reducing exposure of maintenance workers to dangerous highway traffic. For road users they deliver added safety by producing a quality of light that is vastly superior to conventional sources and by eliminating dark road signs resulting from burned out conventional lamps.

Ease of installation

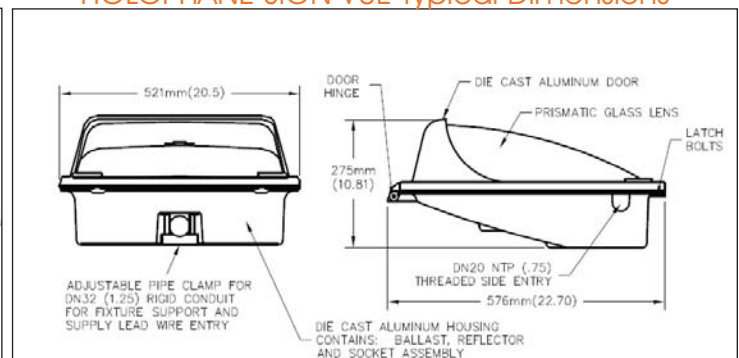
Dialight offers fixture assemblies for new applications as well as retrofit applications. A unique LED retrofit cover assembly kit option will adapt to most GE or Holophane boxes shown below. The retrofit involves only the removal of the existing fixture's cover, lamp and reflector which is then replaced with the Dialight LED cover assembly. Most of the existing wiring connections remain untouched, so the conversion is quick, simple and easy. Thus installation time both time and money.

The Dialight LED retro-fit cover assemblies for GE VERSAFLOOD II SIGNLITE and HOLOPHANE SIGN-VUE

GE VERSAFLOOD II SIGNLITE Typical Dimensions

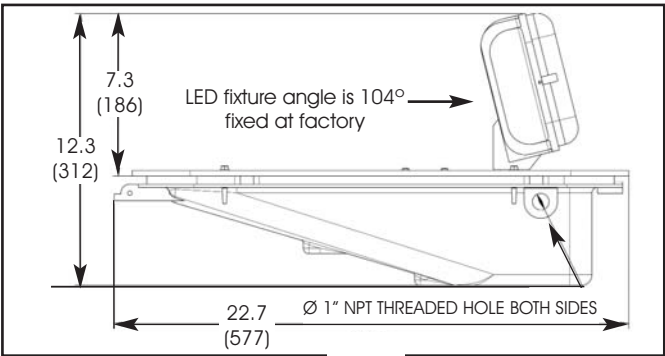
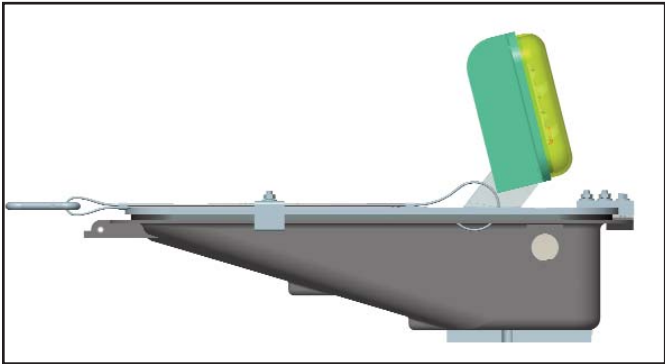


HOLOPHANE SIGN-VUE Typical Dimensions

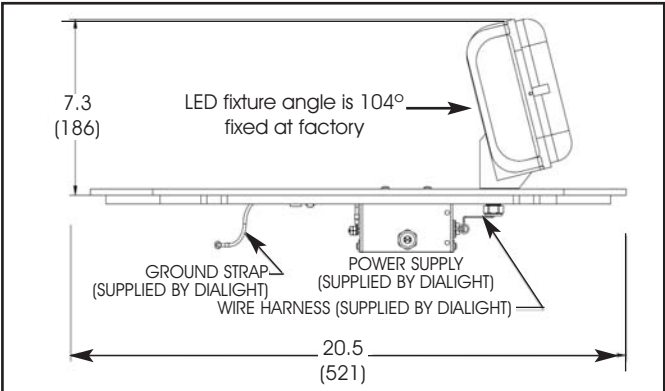
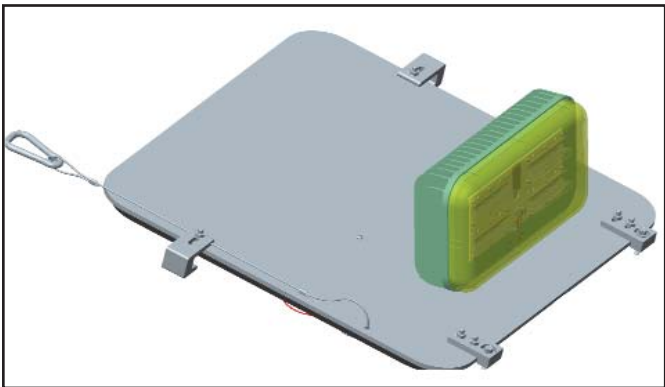


StreetSense™ RS Series LED Roadway Sign Light Mechanical Dimensions

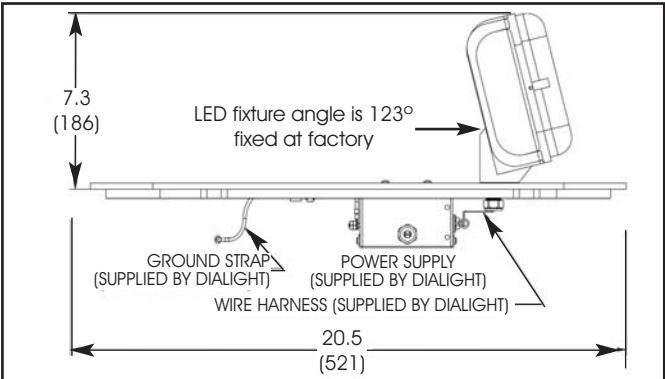
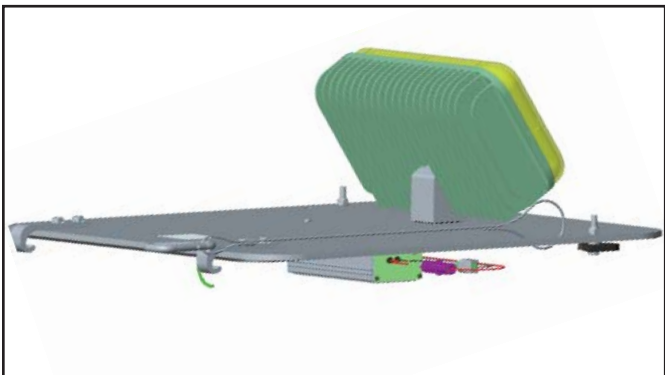
Dialight Complete Fixtures Dialight Part Numbers RS5C4F-C and RS5C4K-C



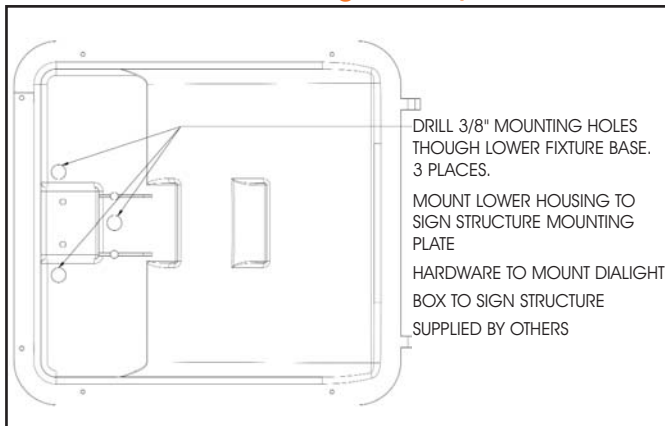
Retrofit Cover Assembly for Use on Holophane SIGN-VUE® Enclosures Dialight Part Numbers RS5C4F-H and RS5C4K-H



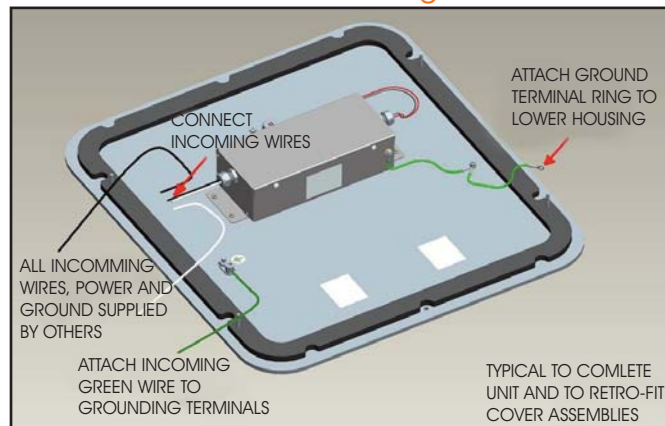
Retrofit cover assembly for use on GE VERSAFLOOD II SIGNALITER® Dialight Part Numbers RS5C4F-G RS5C4K-G



Inside box of Dialight complete unit



Internal wiring



Designs shown are for reference only. Power supply shown above is for wiring purpose only. Actual PS in unit may vary.
www.dialight.com

StreetSense™ LED Roadway Sign Light

Light Measurement Data

Photometric calculations below have been simulated based on Dialight fixture IES files. Scenarios provided are given to show projected future capabilities to meet various specifications. For accurate light output levels, a detailed photometric layout should be provided by Dialight which will show the Dialight fixture which best meets your individual roadway sign specifications. Please email us at info@dialight.com and provide the following:

- What is the width and height of the sign to be illuminated?
 - Confirm the fixture will be located on a fixed plate mounted to the sign structure below the sign face
 - How many fixtures will be used to illuminate the sign?
 - What is the fixtures for spacing required for each sign size?
 - What is the average footcandles (cd) required on the sign?
 - What is the max to min uniformity ratio required?
 - What is the fixture mounting plate location relative to the bottom edge of the sign will each fixture be placed?
- Example: How far out from the front of the sign face and how far down from the bottom edge of the sign?

If a retrofit installation provide all of the information below plus the following:

- What type of lamp fixture is being replaced (MH, MV, HPS)?
- Who is the manufacturer of the currently installed fixture GE or Halophane?
What is the GE or Halophane Part number
- What is the wattage or the fixture currently installed?

Some typical photometric specification scenerios using Dialight's complete fixtures

RS5C4F-C - 63W complete fixture

RS5C4K-C - 100W complete fixture

Sign Width (ft)	Sign Height (ft)	# of Fixtures	Fixture placement out from front of sign (ft) / Down from lower bottom edge or up from top edge (ft) ¹	Wattage (W)	Average Illuminance Footcandles (FC)	Illuminance Uniformity max/min
8	8	1	4 ft / 1 ft	100	41.64	3.56
8	8	1	4 ft / 1 ft	63	31.5	3.98
8	8	1	6 ft / 1.5 ft	100	24.85	2.41
8	8	1	6 ft / 1.5 ft	63	18.16	2.65
10	12	2	4 ft / 1ft	100	52.97	6.97
10	12	2	4 ft / ft	63	37.50	5.92
10	12	2	4.5 ft / 1 ft	100	48.7	5.08
10	12	2	4.5 ft / 1 ft	63	34.51	3.98
10	14	2	4 ft / 1 ft	100	44.2	6.91
10	14	2	4 ft / 1 ft	63	34.37	6.03
10	14	2	4.5 ft / 1 ft	100	40.71	4.37
10	14	2	4.5 ft / 1 ft	63	32.85	4.22
10	14	2	6 ft / 1.5 ft	100	31.2	2.65
10	14	2	6 ft / 1.5 ft	63	24.4	2.67
14	14	3	4.5 ft / 1 ft	100	47.0	15.63
14	14	3	4.5 ft / 1 ft	63	36.65	14.96
14	14	3	6 ft / 1.5 ft	100	39.88	5.43
14	14	3	6 ft / 1.5 ft	63	30.33	5.22

¹Where 1 fixture is shown for the 8' sign, placement of the fixture is on center of sign.

Where 2 fixtures are shown for the 10' sign, placement of the fixtures is 1.5' from left edge and 1.5' from the right edge of the sign.

Where 3 fixtures are shown for the 14' sign, placement is as follows: one fixture is 2' from the left edge second fixture center of sign, Third fixture is 2' from right edge.

Dialight reserves the right to make changes at any time in order to supply the best product possible.

The most current version of this document will always be available at:

www.dialight.com/Assets/Brochures_And_Catalogs/Illumination/MDTFSL3X001.pdf

MDTSRSSTX001_C

MAINE TURNPIKE AUTHORITY

SPECIFICATIONS

APPENDIX F

EXISTING TOLL PLAZA PLANS

SACO

STATE OF MAINE DEPARTMENT OF TRANSPORTATION



SACO
YORK COUNTY
MAINE FEDERAL AID INTERSTATE
PROJECT NO. I-195-2(16)35
TOTAL LENGTH 0.000 MILES

TOLL PLAZA

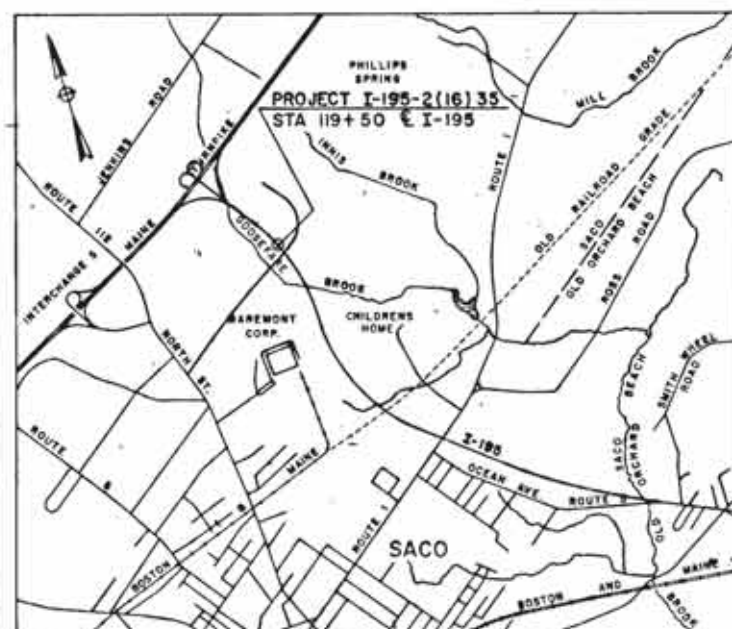
1983

CONVENTIONAL SIGNS

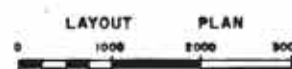
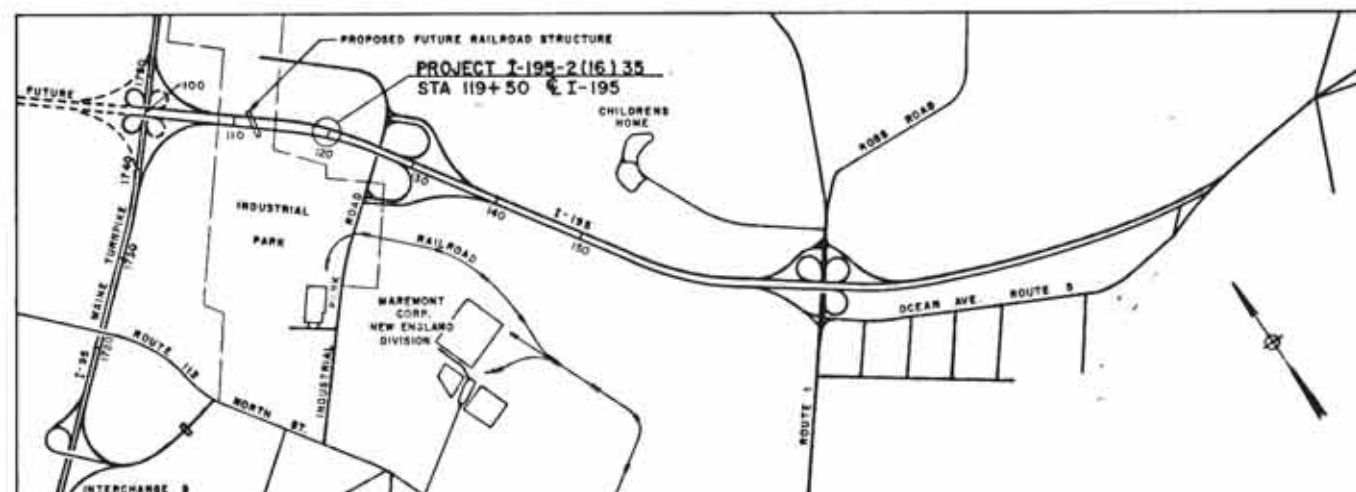
COUNTY LINES	----	TRAVELLED WAY - PROPOSED	=====
TOWN LINES	----	UNDERGROUND UTILITIES - EXISTING	----
PROPERTY LINES	----	UNDERGROUND UTILITIES - PROPOSED	----
R/W LINES - EXISTING	----	RAILROAD - SINGLE TRACK	=====
R/W LINES - NEW - ACCESS CONTROL	----	RAILROAD - DOUBLE TRACK	=====
R/W LINES - NEW - NO ACCESS CONTROL	----	UTILITY POLE - EXISTING	o
CULVERT - EXISTING	----	UTILITY POLE - JOINT OCCUPANCY	o
CULVERT - PROPOSED	----	PROPOSED UTILITY POLE - TEMPORARY	x
CURBING - EXISTING	----	PROPOSED UTILITY POLE - PERMANENT	o
CURBING - PROPOSED	----	TREES	~~~~~
TRAVELLED WAY - EXISTING	=====	WOODS	~~~~~

INDEX OF SHEETS

1	TITLE SHEET
2	ESTIMATED QUANTITIES & GENERAL NOTES
3-4	STANDARD DETAILS
5-21	TOLL PLAZA PLANS
22	SITE PLAN
23	UTILITY PROFILE



A PORTION OF YORK COUNTY



TRAFFIC DATA

A.D.T.	1979	812
A.D.T.	1999	13587
D.H.V.		2310
T. (%)		9
D. (%)		70
V.		70
P.S.D. (%)		N/A
18 KIPS		248

NOTE:
ALL WORK CONTEMPLATED UNDER THIS CONTRACT TO BE GOVERNED BY AND IN CONFORMITY WITH THE STANDARD SPECIFICATIONS (REVISION OF JUNE 1981) AND SUPPLEMENTS THERETO, EXCEPT AS MODIFIED ON THE PLANS AND IN THE SPECIAL PROVISIONS.



APPROVED:

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION
George N. Coleman
COMMISSIONER
Richard A. Coleman
CHIEF ENGINEER

DATE
MARCH 19, 1982
MARCH 19, 1982



Carl J. Mellea
CARL J. MELLEA

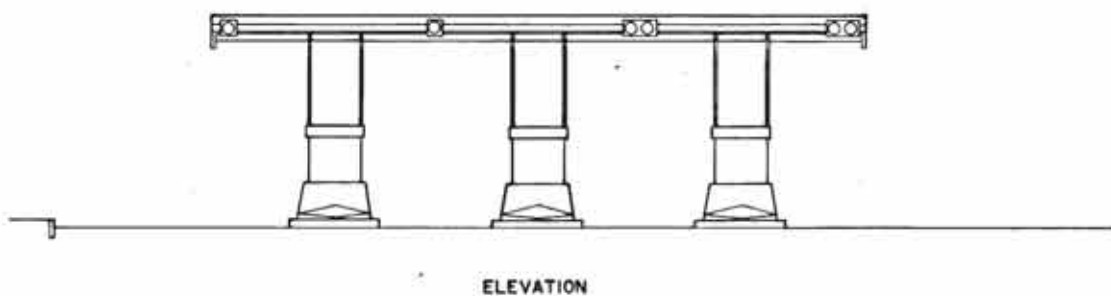
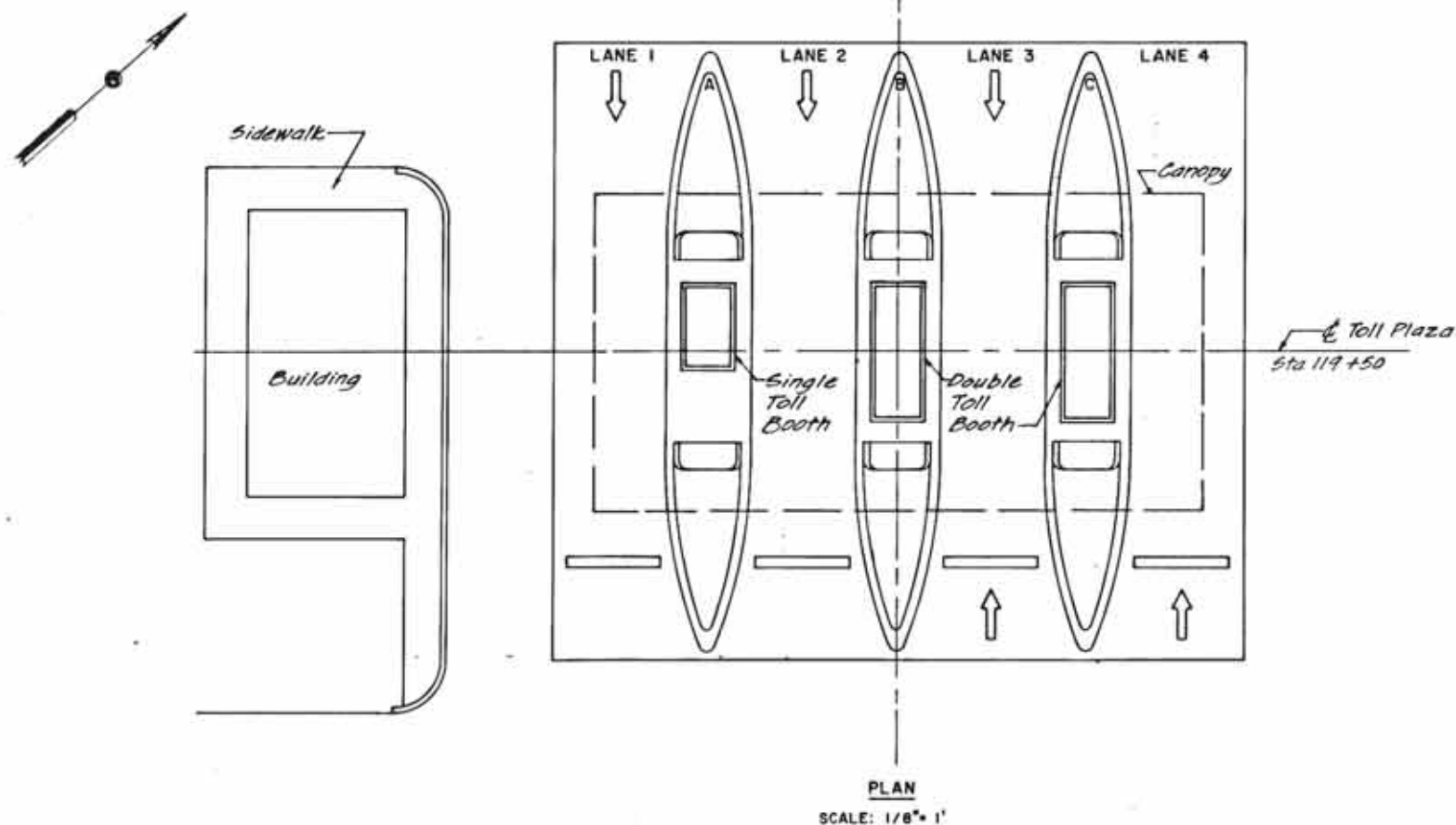
HNTB
HOWARD NEEDLES TAMMEN & BERENSON
CONSULTING ENGINEERS
BOSTON

As BUILT by D.B. SHERLOCK 1983

UNITED STATES
DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
REGION 1

APPROVED:
DIVISION ADMINISTRATOR
DATE

DATE	STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
1	MAINE	I-195-2(16)	5	23



SACO - BARRIER TOLL PLAZA

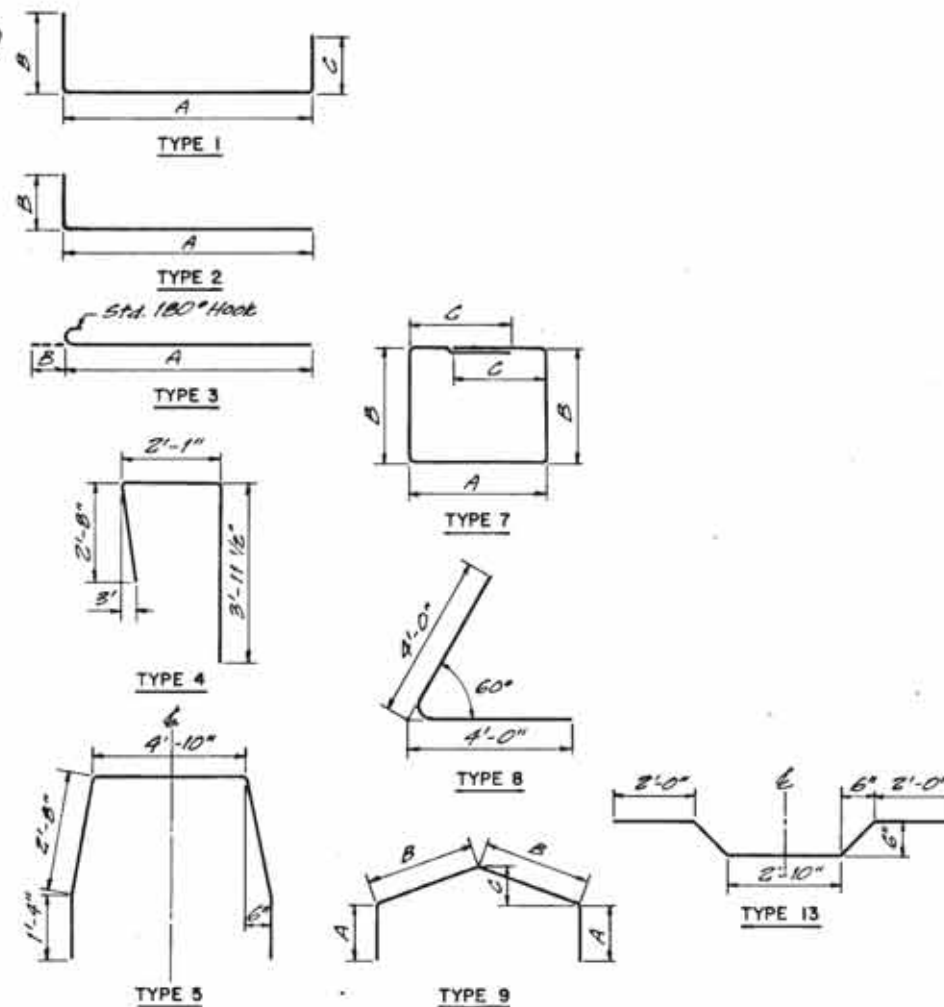
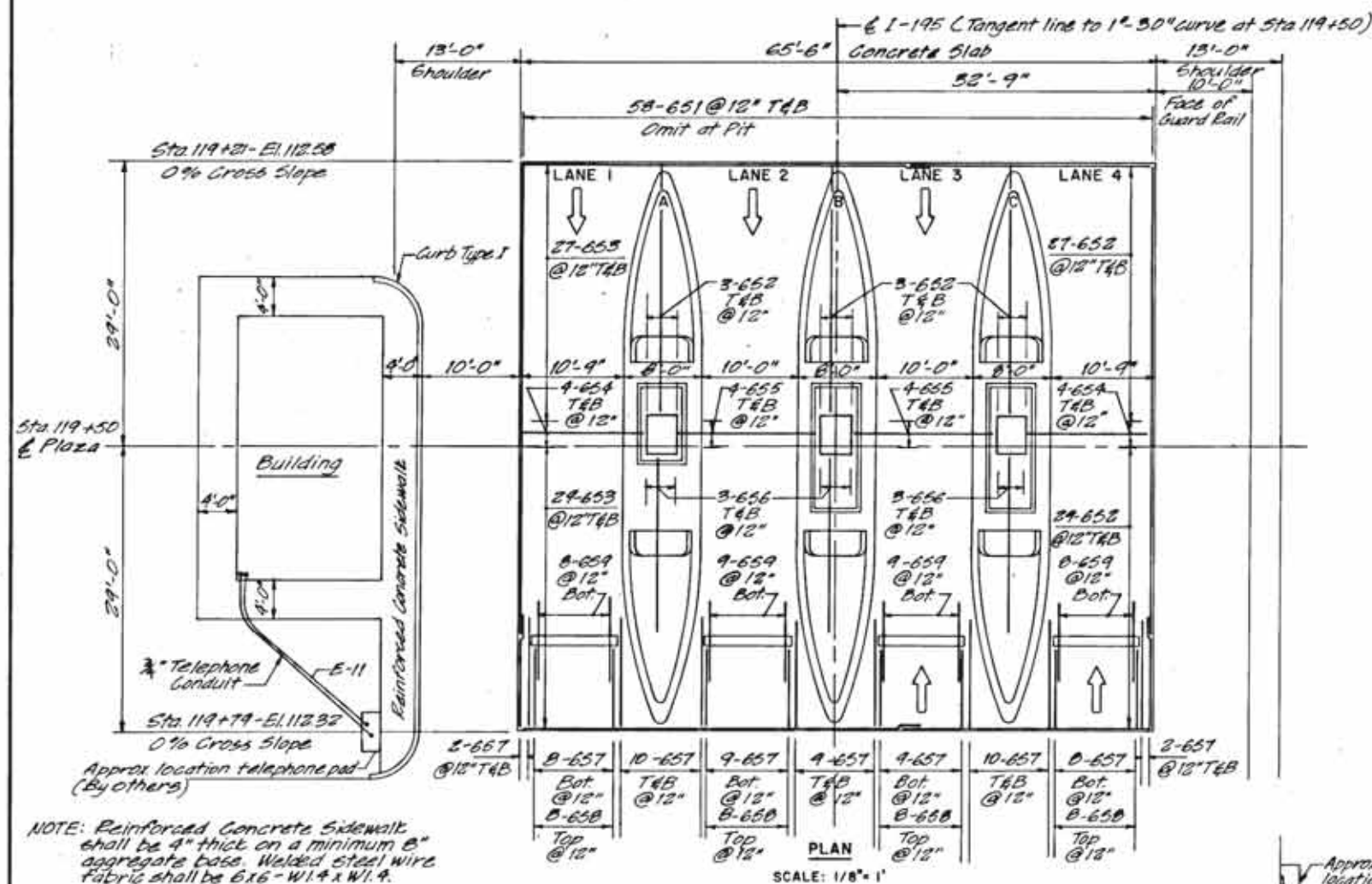
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		TRACED		
		CHECKED		

HNTB
HOWARD NEEDLES TAMM & BERENSON
CONSULTING ENGINEERS BOSTON

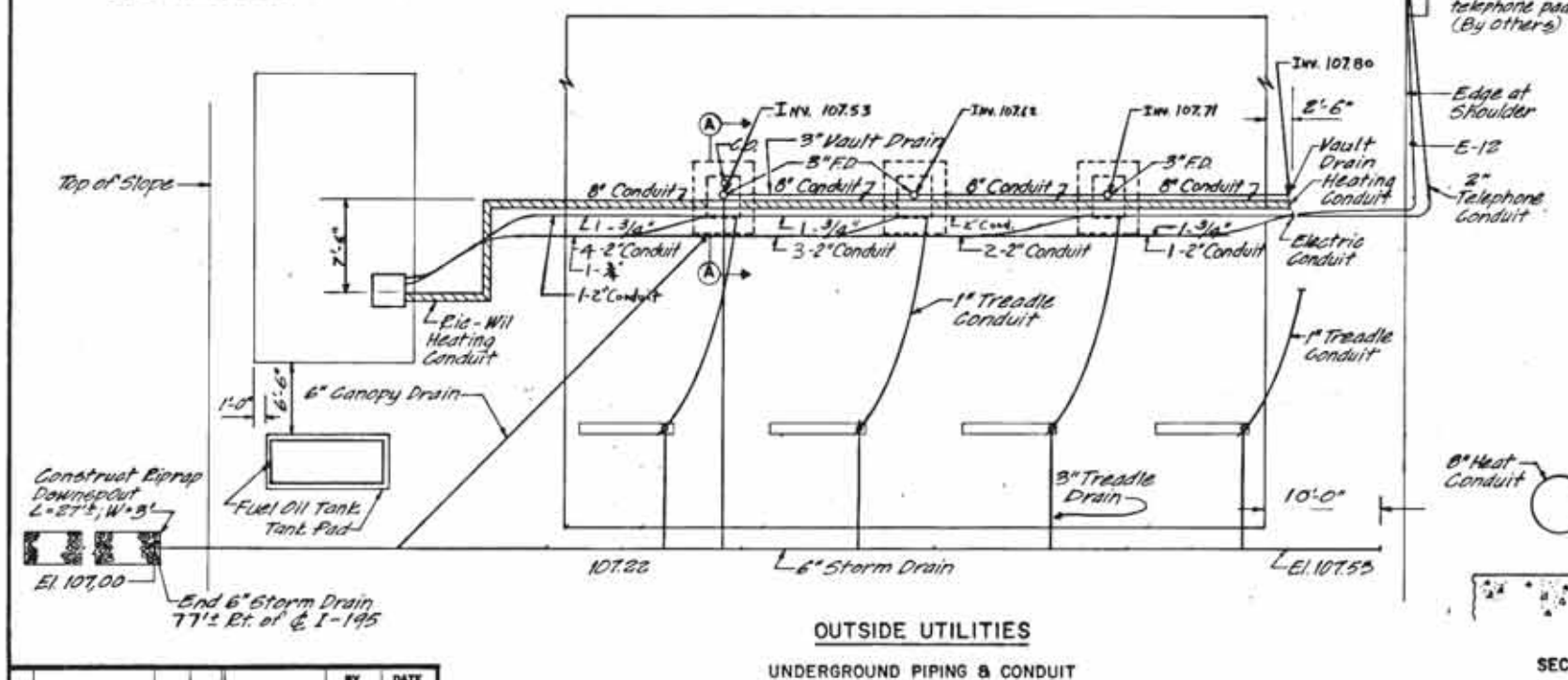
STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

TOLL BOOTHS & CANOPY
PLAN & ELEVATION

SHEET OF AUGUSTA, MAINE



BAR MARK	NO.	LENGTH	TYPE	A	B	C
651	116	48'-0"	5TR			
652	120	25'-6"	5TR			
653	113	41'-6"	5TR			
654	16	12'-8"	5TR			
655	16	14'-2"	5TR			
656	18	18'-0"	5TR			
657	100	11'-6"	5TR			
658	32	8'-0"	5TR			
659	24	8'-3"	13			
6510	24	8'-0"	8			
6511	24	7'-6"	5TR			
6512	24	8'-6"	5TR			
6P1	21	7'-0"	5TR			
6P2	24	6'-4"	5TR			
6P3	21	15'-4"	1	5'-0"	3'-10"	3'-10"
6P4	16	13'-0"	1	6'-4"	3'-9"	3'-9"
6P5	54	5'-0"	2	4'-0"	1'-0"	
4P6	16	12'-4"	1	5'-7"	3'-7"	3'-7"
4P7	18	6'-11"	1	5'-7"	0'-0"	0'-8"
4P8	16	7'-7"	1	6'-3"	0'-8"	0'-8"
4B1	16	28'-0"	5TR			
4B2	9	10'-8"	5TR			
4B3	9	13'-0"	5TR			
4B4	6	17'-4"	3	16'-10"	0'-6"	
4B5	12	15'-4"	3	14'-10"	0'-6"	
4B6	12	11'-4"	3	10'-10"	0'-6"	
4B7	12	6'-6"	3	6'-0"	0'-6"	
4B8	6	2'-0"	1	0'-10"	0'-7"	0'-7"
4B9	6	2'-6"	1	1'-4"	0'-7"	0'-7"
4B10	48	6'-6"	5TR			
4B14	600	3'-0"	9	0'-10"	0'-8"	0'-0 1/2"
76N		8'-8"	9	1'-2"	3'-1"	10"
4B12	24	18'-10"	5			
5B13	36	8'-9"	4			
5B14	36	5'-0"	5TR			
4B15A	600	15'-0"	7	4'-10"	2'-0"	3'-1"
76C		16'-0"	7	5'-10"	1'-10"	3'-4"
4B16	180	2'-9"	2	1'-2"	1'-2"	



SECTION A-A

Note: For treadle details, see Sheet 3

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

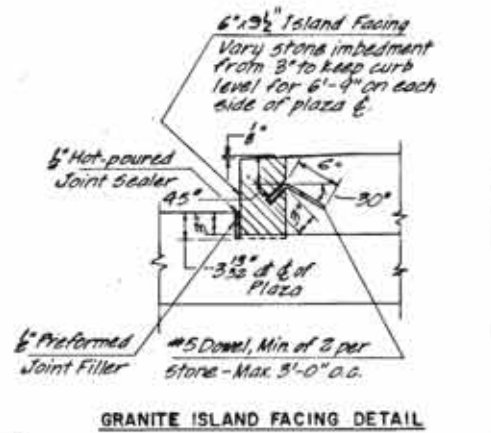
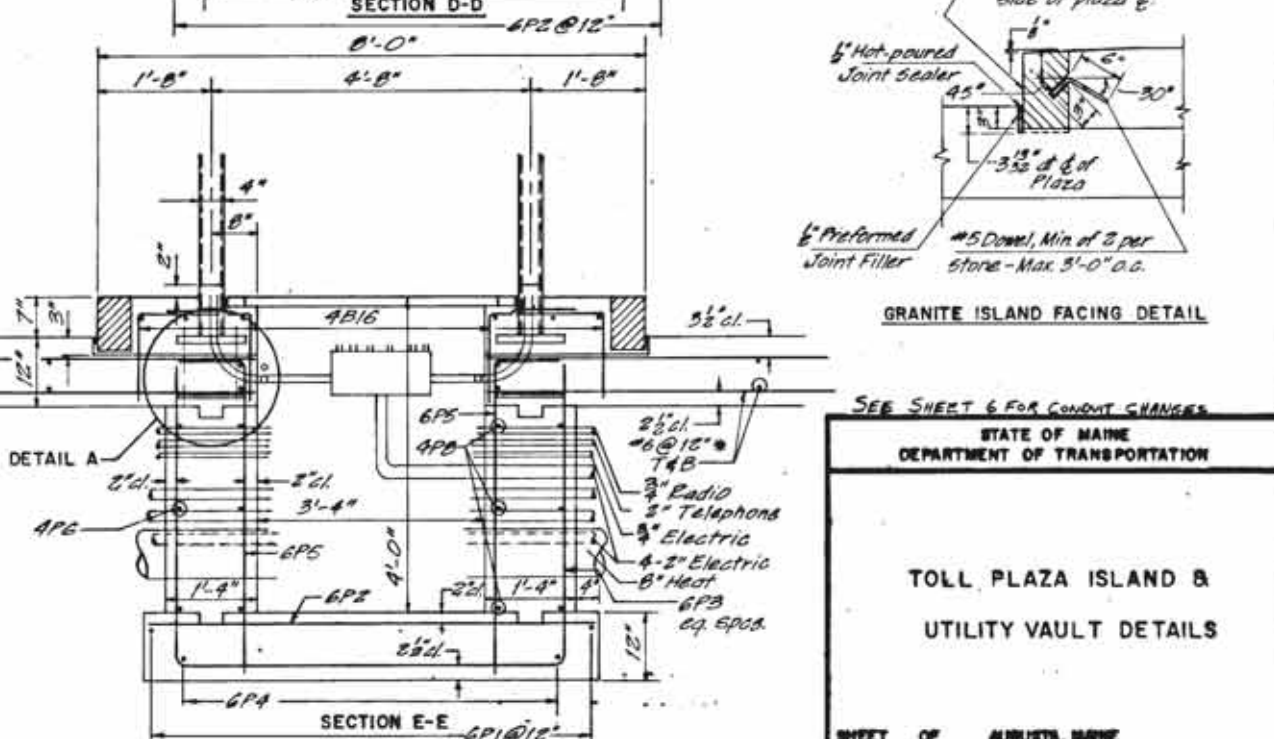
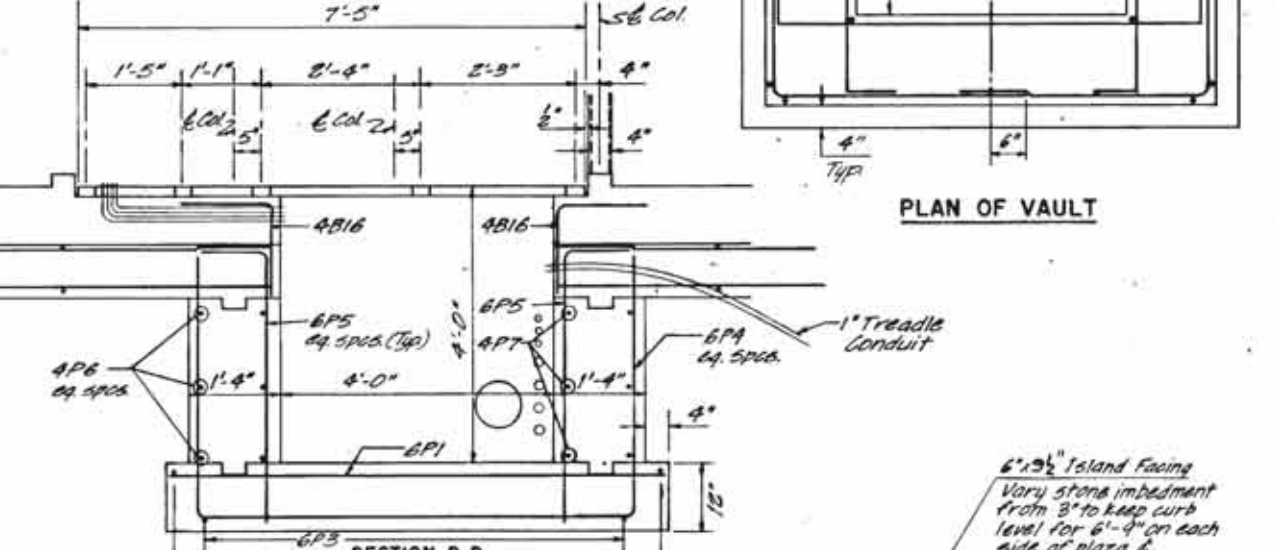
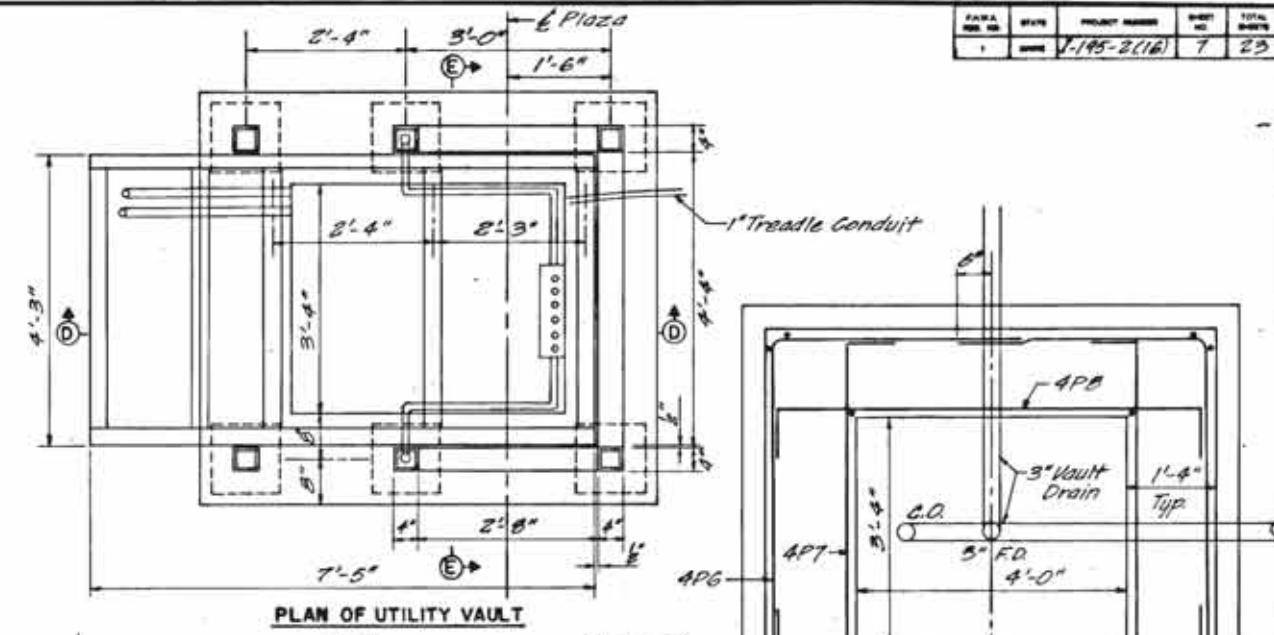
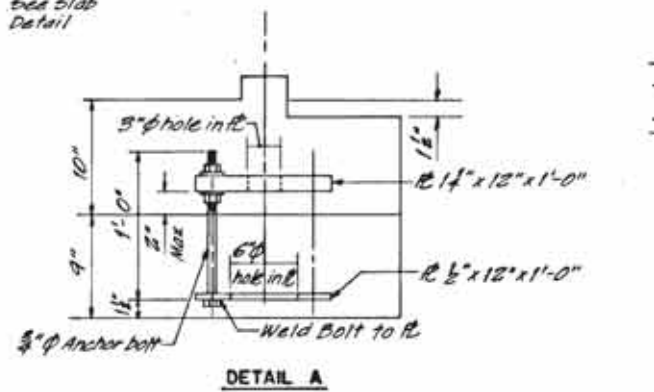
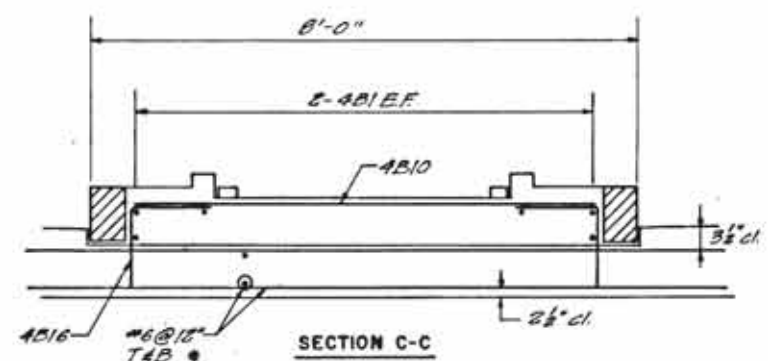
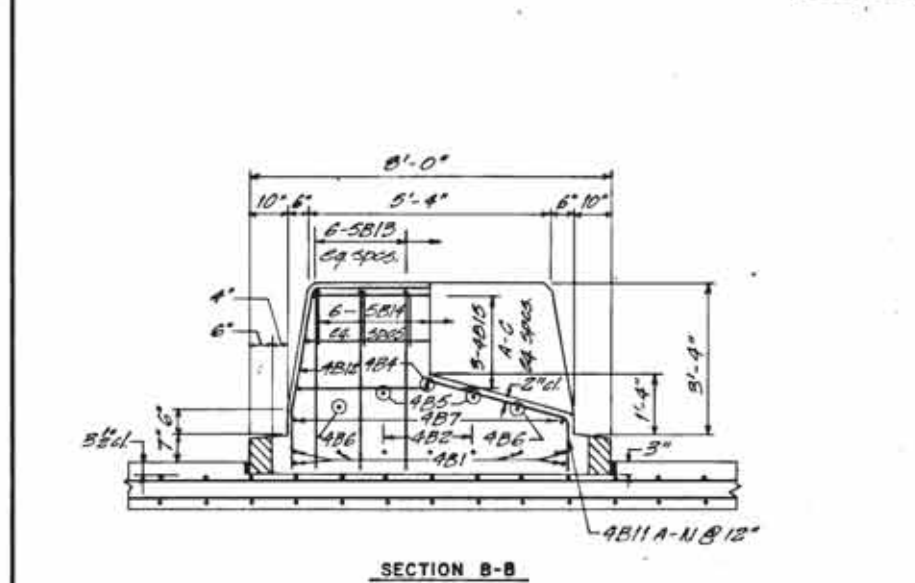
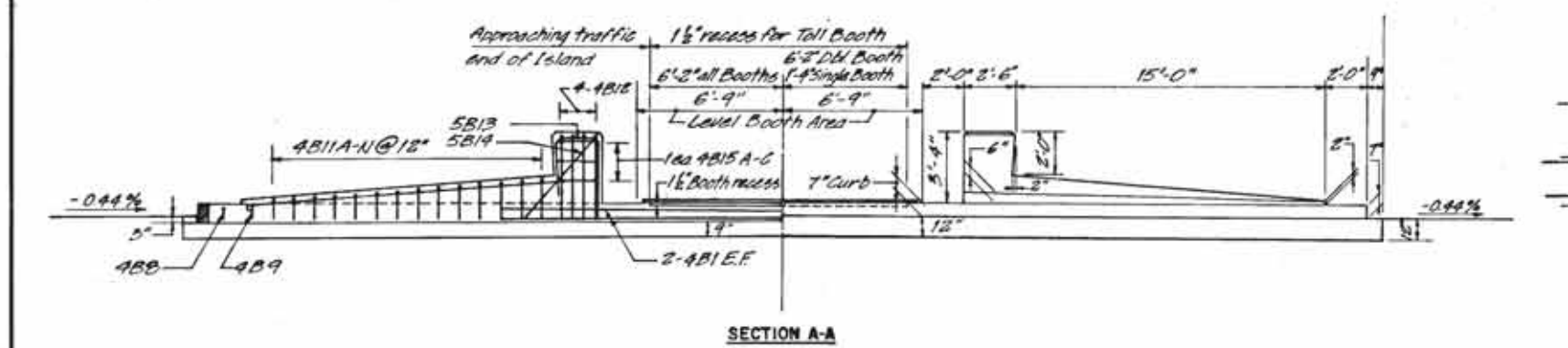
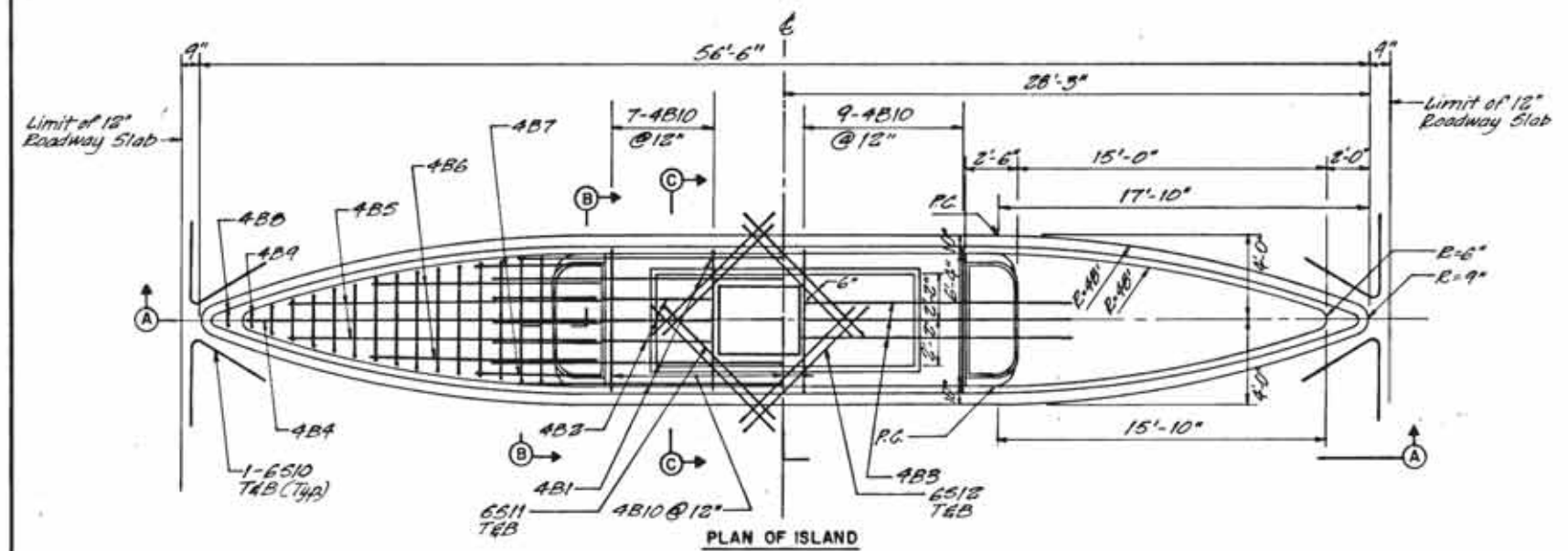
TOLL PLAZA PLAN

FINTE

HONORABLE MEMBERS SENATE & REPRESENTATIVE
COMMITTEE ENGINEERS BOSTON

SHEET OF AUGUSTA, MAINE

					BY	DATE
				MADE		
				TRACED		
				CHECKED		
NO.	REVISION	BY	DATE	IN CHARGE OF		



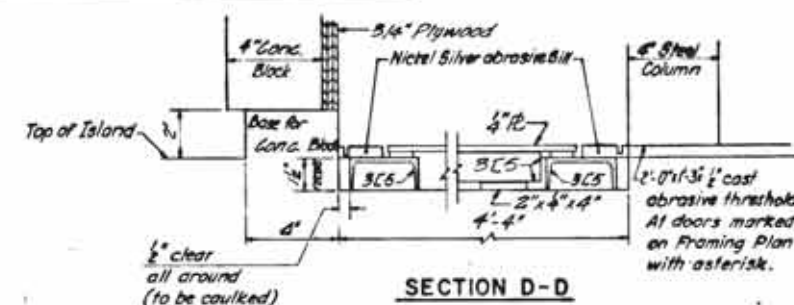
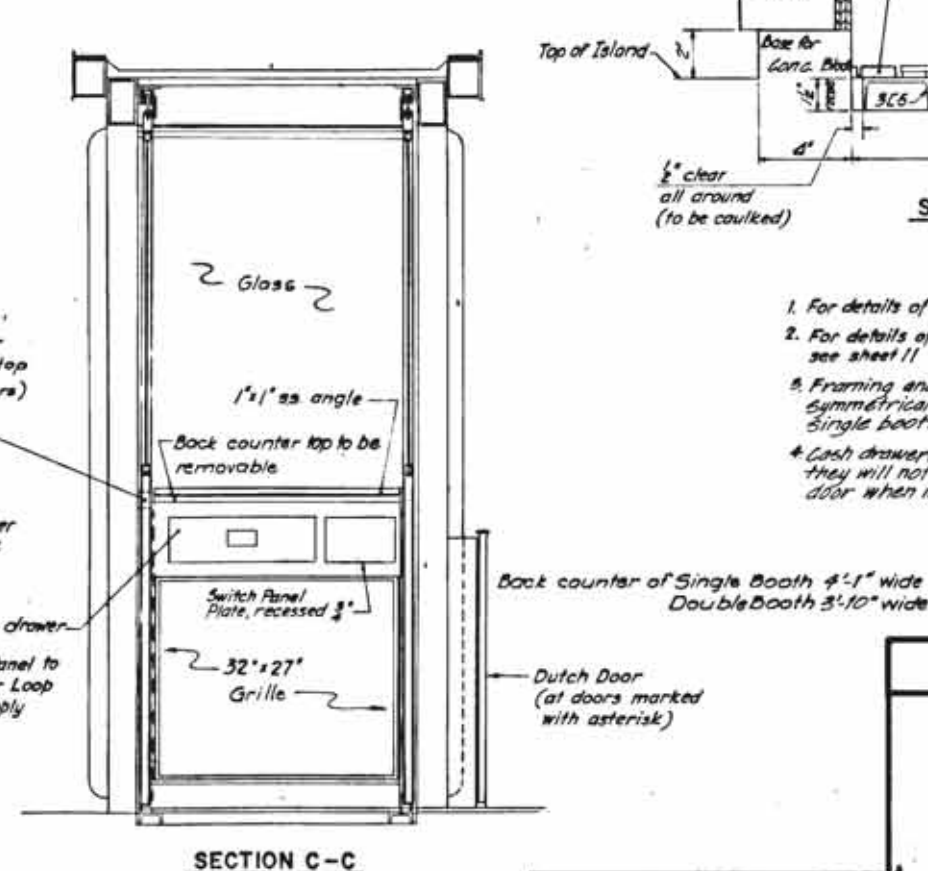
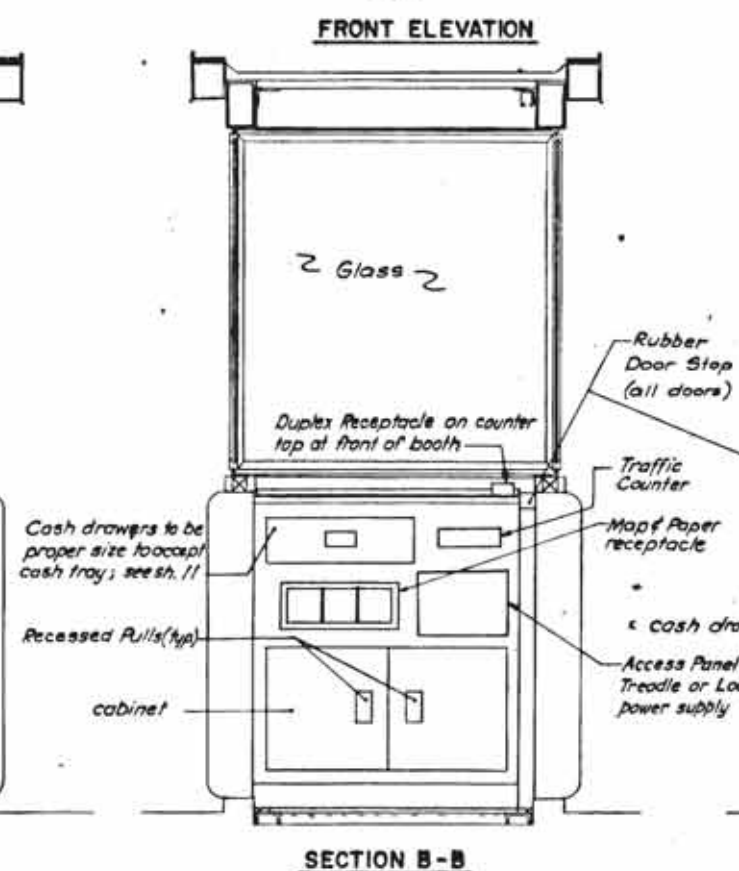
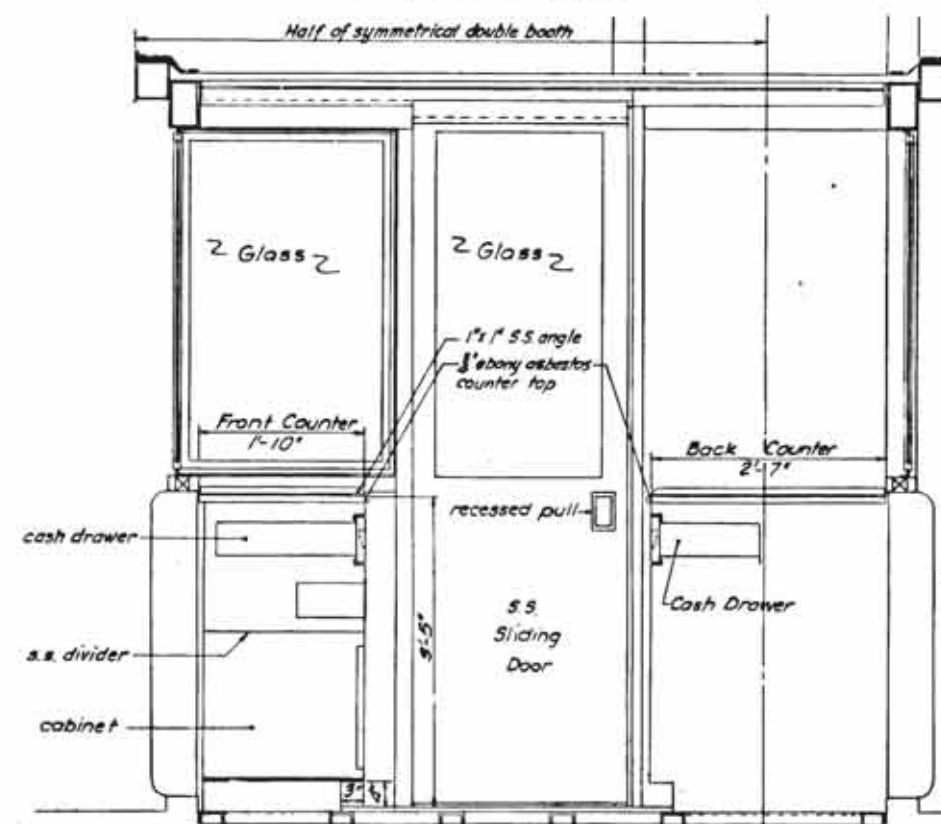
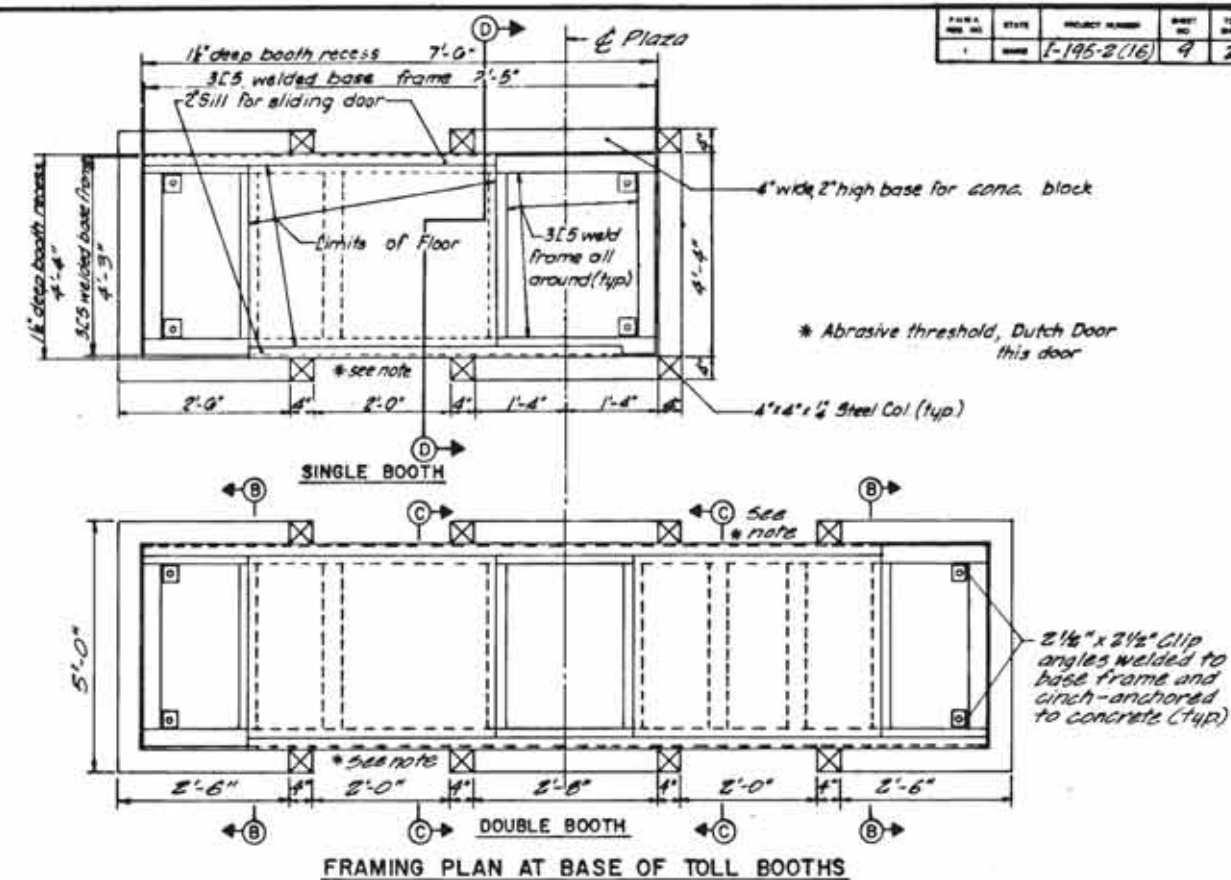
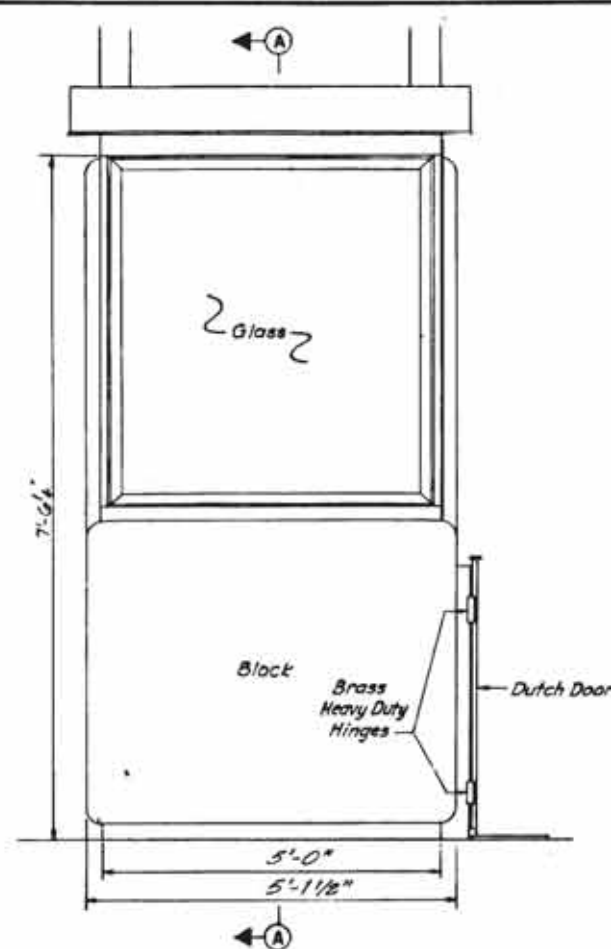
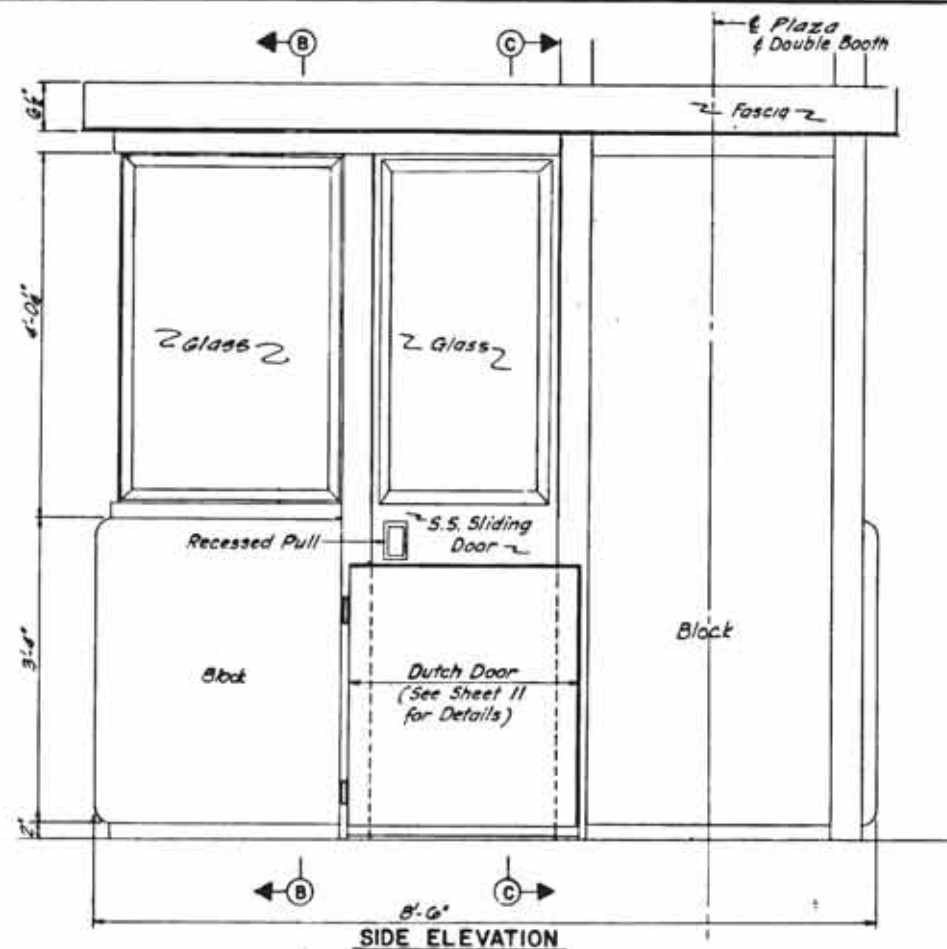
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SEE SHEET 6 FOR CONDUIT CHANGES

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

TOLL PLAZA ISLAND &
UTILITY VAULT DETAILS

SHEET OF AUGUSTA, MAINE



1. For details of booth construction see sheet 10
2. For details of cash tray and map receptacle see sheet 11
3. Framing and shell of double booth are symmetrical about $\frac{1}{2}$ and same as single booth.
4. Cash drawers are to be so located that they will not interfere with the sliding door when in the open position.

NO.	REVISION	BY	DATE	IN CHARGE OF

SECTION A-A

SECTION B-B

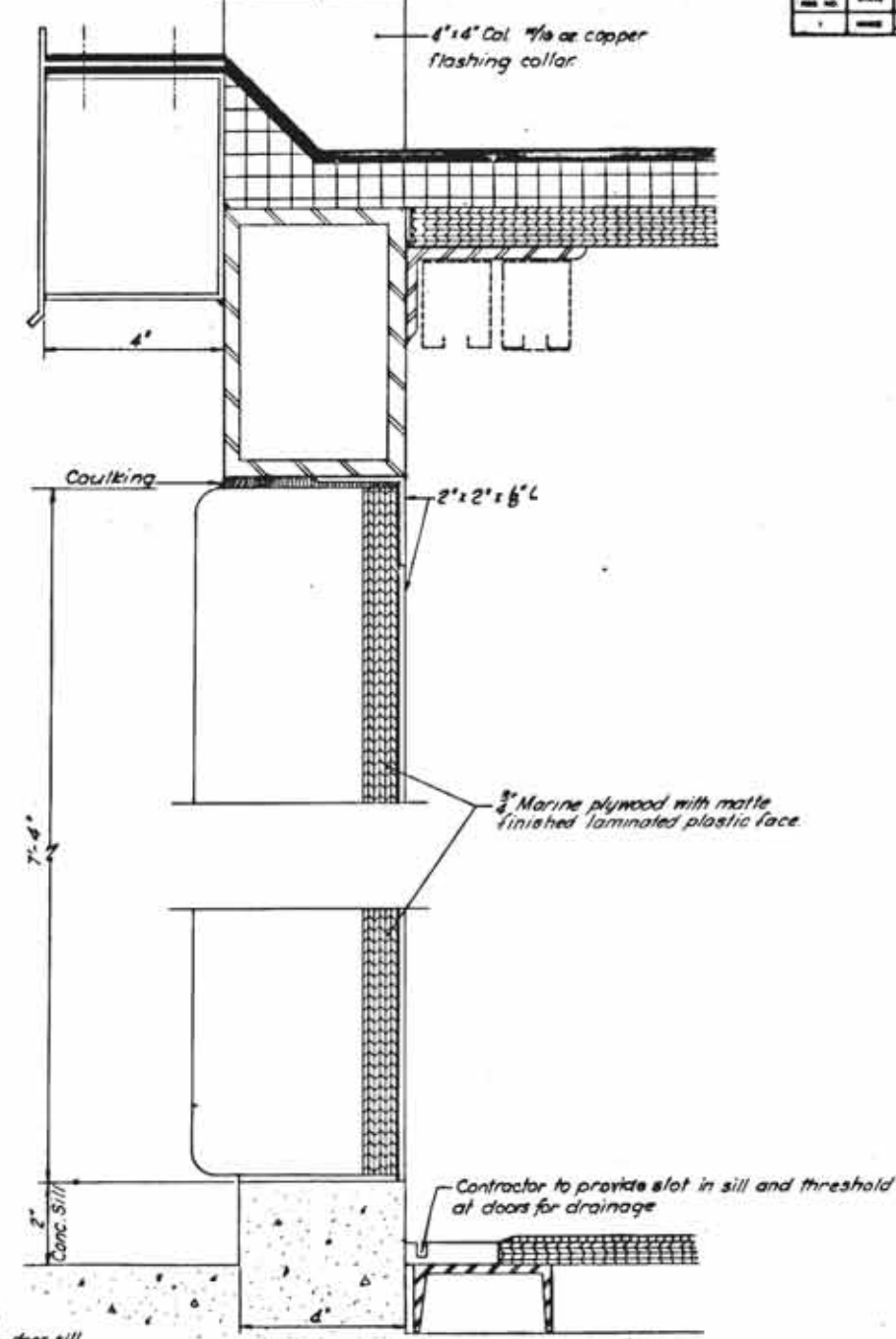
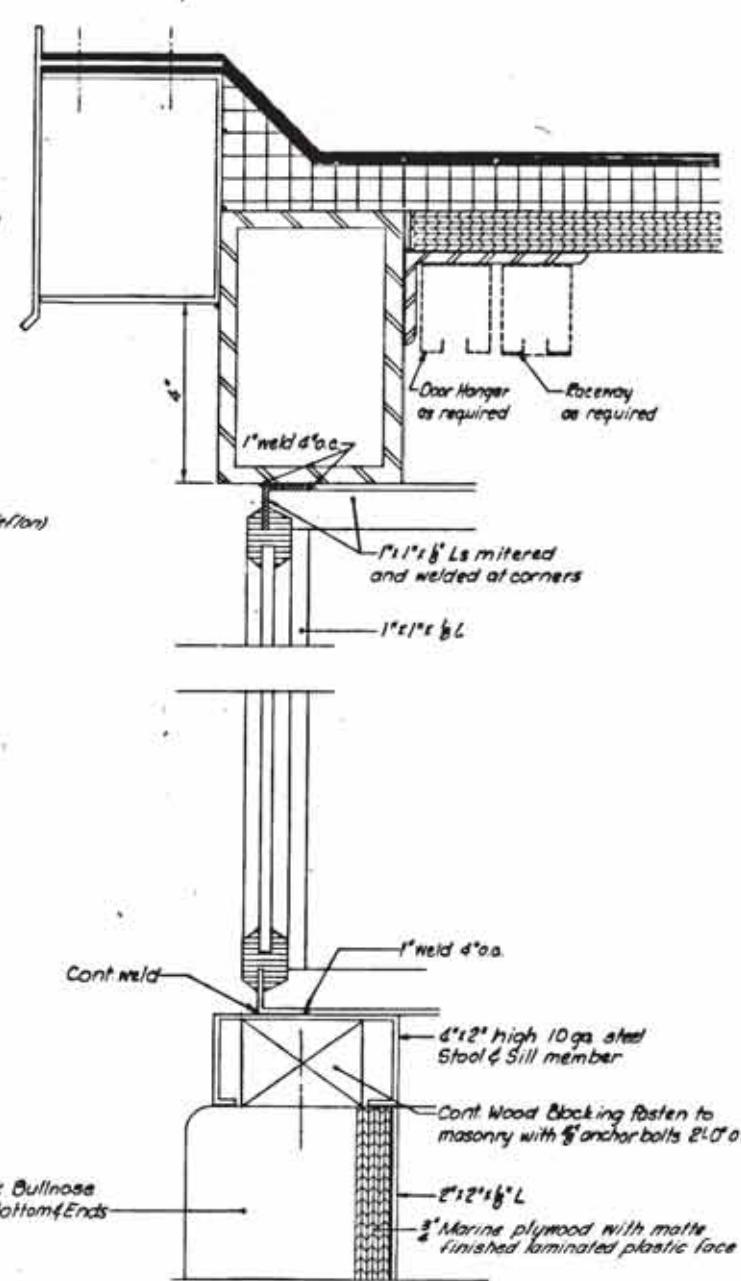
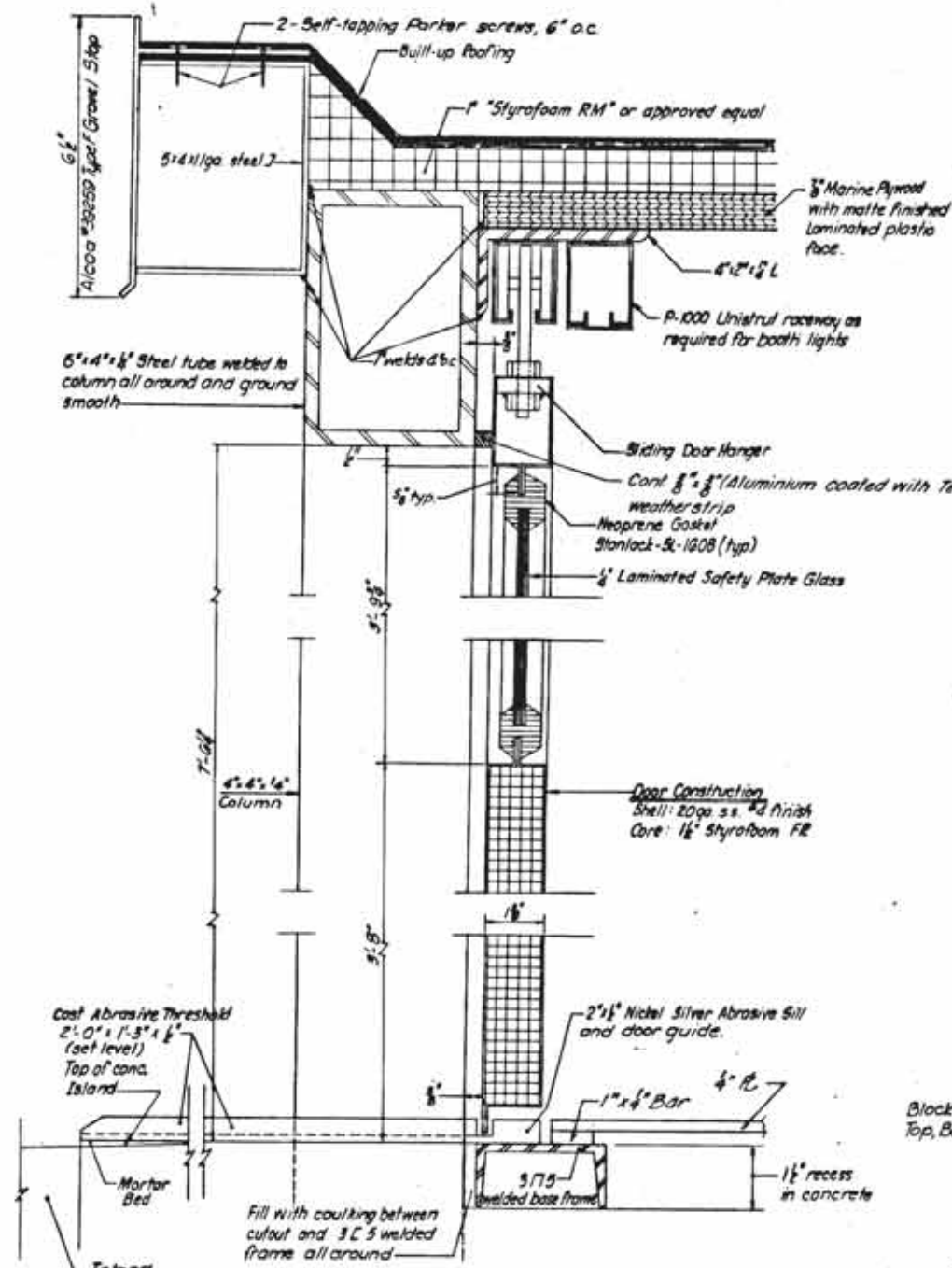
SECTION C-C

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

TOLL BOOTHS
ELEVATIONS & SECTIONS

HNTB
HARRISON NEEDLES THORNTON & BERNARDSON
CONSULTING ENGINEERS BOSTON

SHEET OF 1 ALBUQUERQUE, NM



SLIDING DOOR DETAILS

WINDOW DETAIL

WALL DETAIL

NOTE:

1. Dutch Door omitted from these Sections. For Dutch Door details see Sheet 11
2. All details are half size.

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

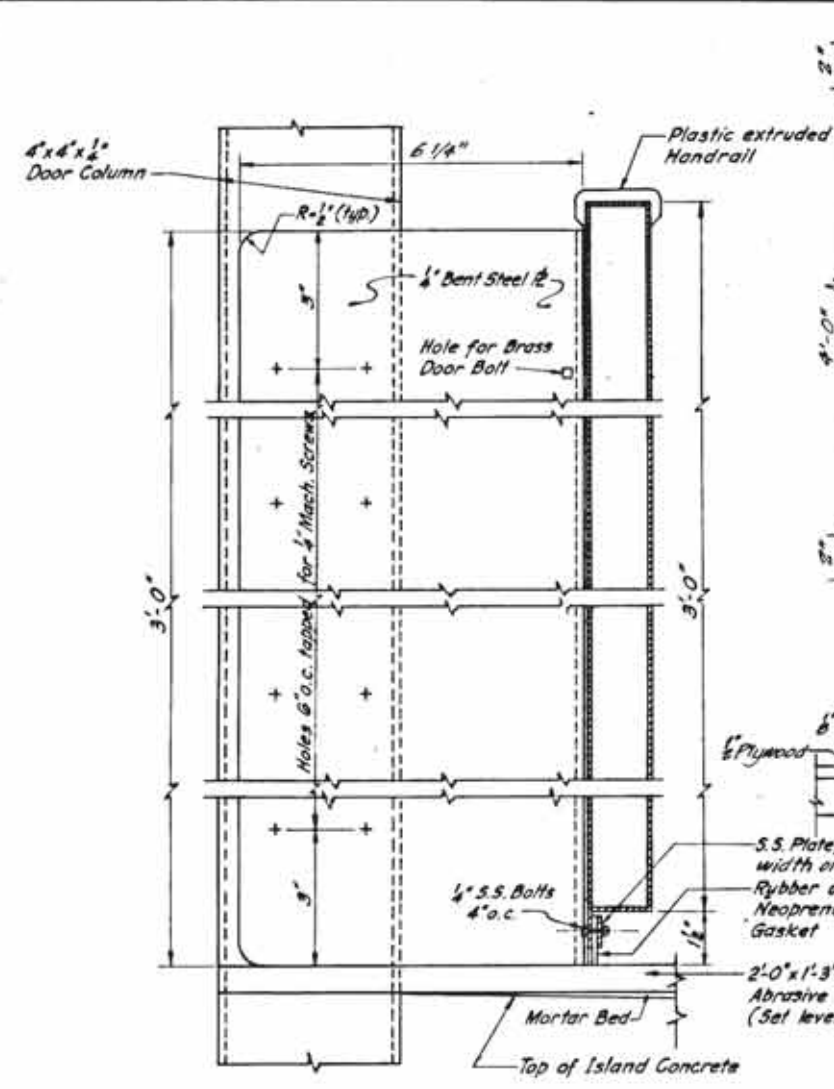
TOLL BOOTH DETAILS

HNTB

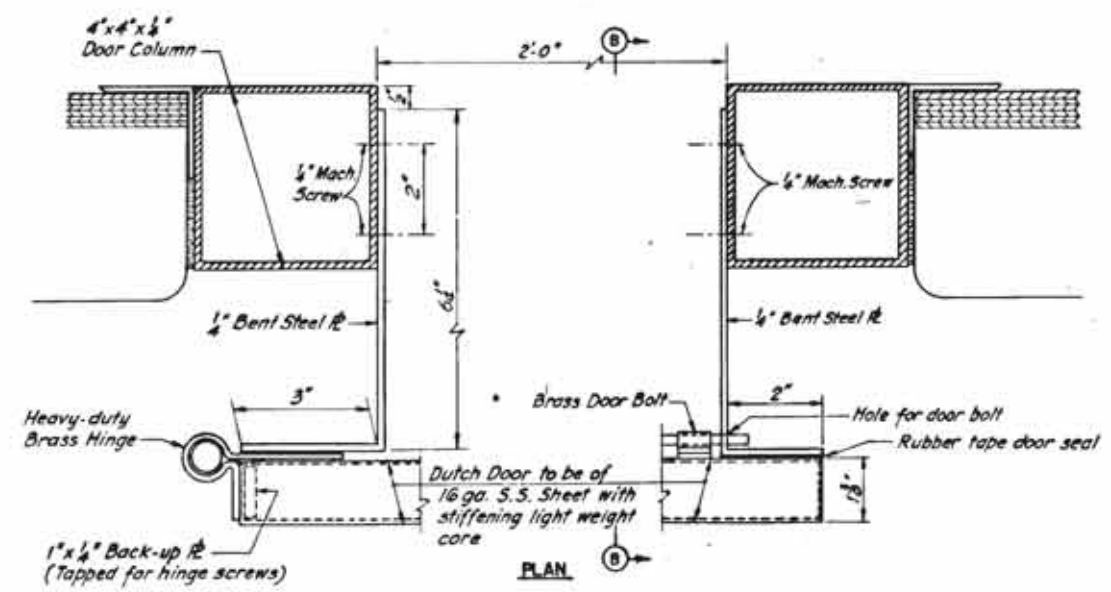
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CONSULTING ENGINEERS BOSTON

SHEET OF AUGUSTA, MAINE

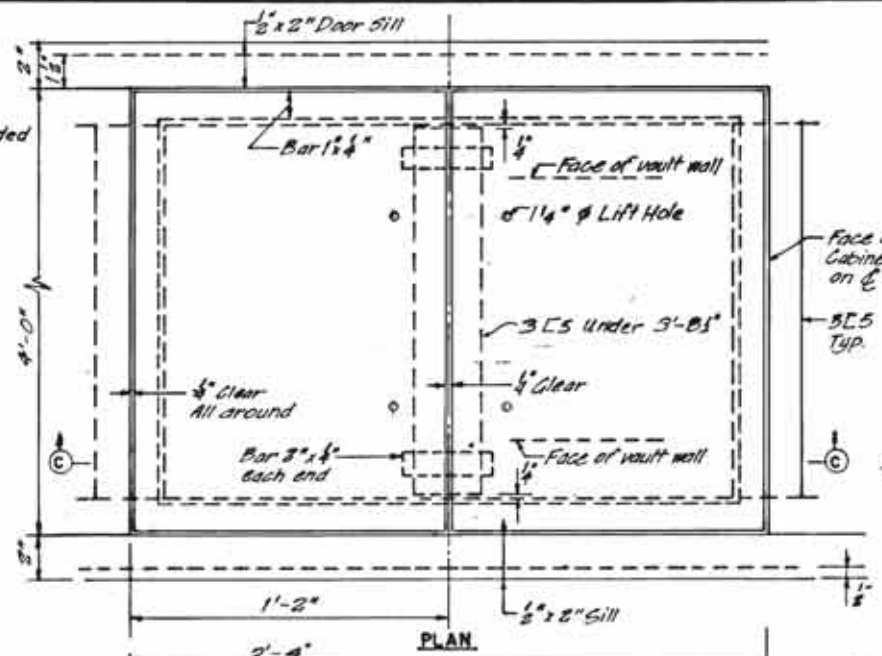
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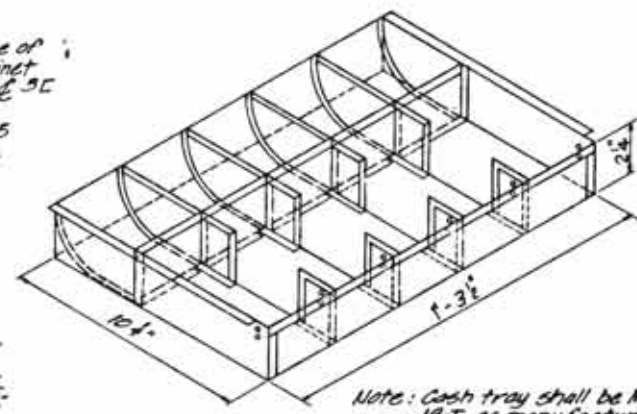
SECTION B-B



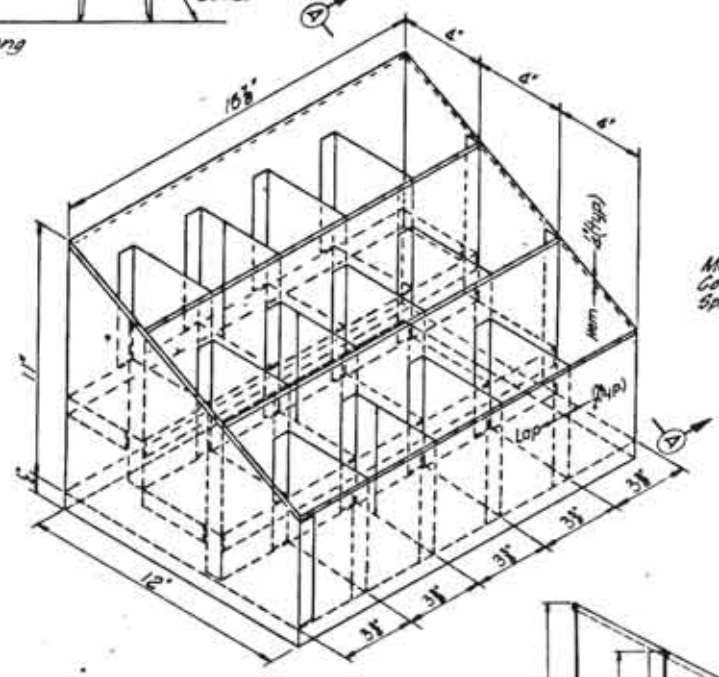
DUTCH DOOR DETAILS
Half Size



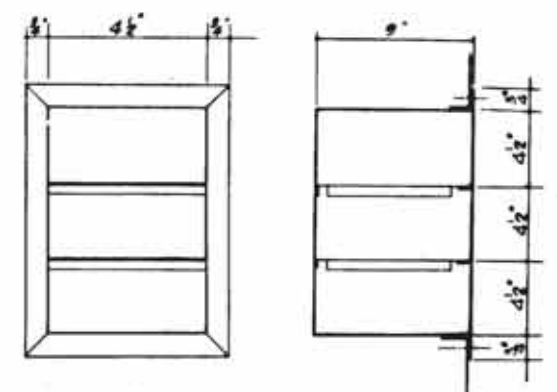
SECTION C-C
VAULT LID



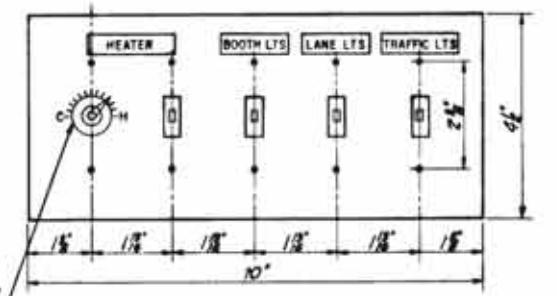
CASH TRAY INSERT
3'-1'-0"



TOLL TICKET HOLDER
3'-1'-0"



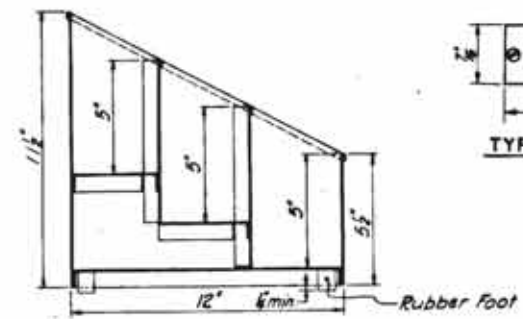
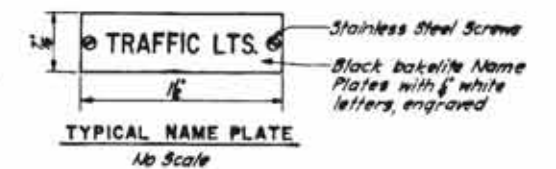
MAP & PAPER RECEPTACLE
Not to Scale



SWITCH PANEL PLATE DETAIL

Half Size
Note: Plate shall be Stainless Steel .040" Recessed 1/4" into face of Counter.

SWITCH SCHEDULE:
Heater - 20A (Furnished by Heating Mfg.)
Double Booth Lts - 20A-2-pole Hubbell Cat. No. 2972
Single Booth Lts - 20A-1-pole Hubbell Cat. No. 2971
Lane Lts - 30A-1-pole Hubbell Cat. No. 2923
Traffic Lts - 20A-3-way Hubbell Cat. No. 2973 or 20A-1-pole Hubbell Cat. No. 2971 as req'd.



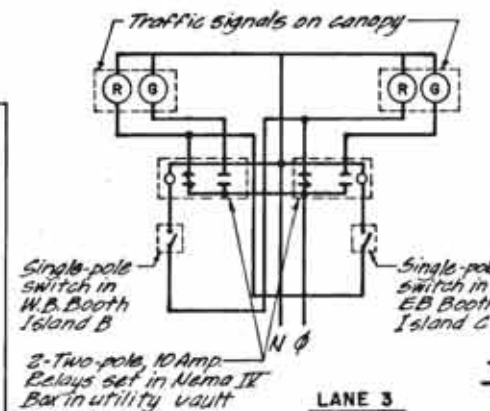
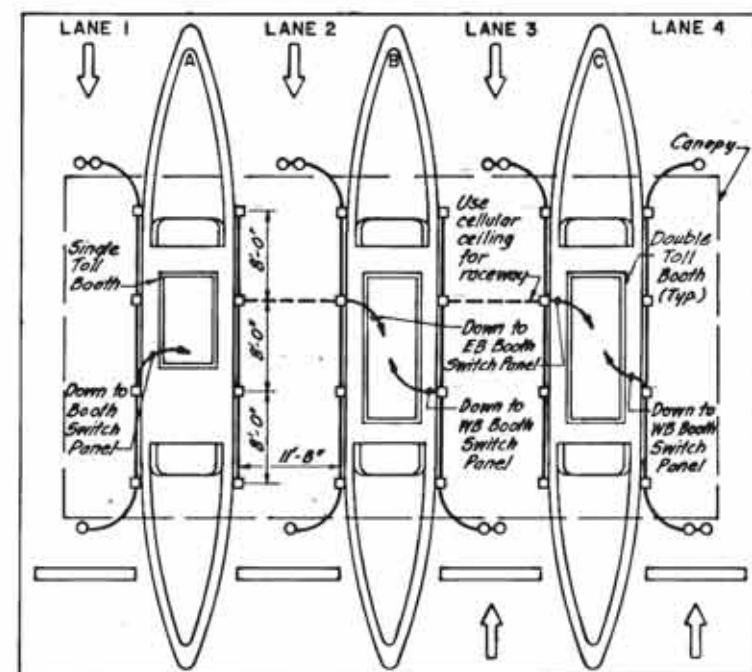
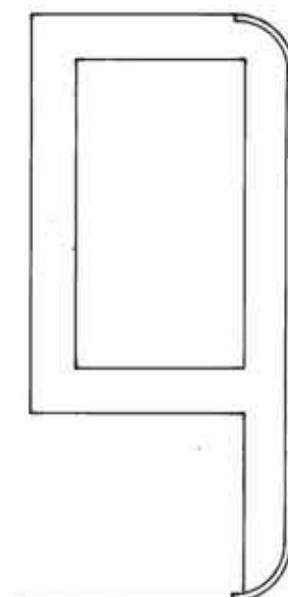
NO.	REVISION	BY	DATE	IN CHARGE OF

HNTB
HENRIK HENRIKSEN TRAVEL & ENGINEERING
CONSULTING ENGINEERS
BOSTON

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

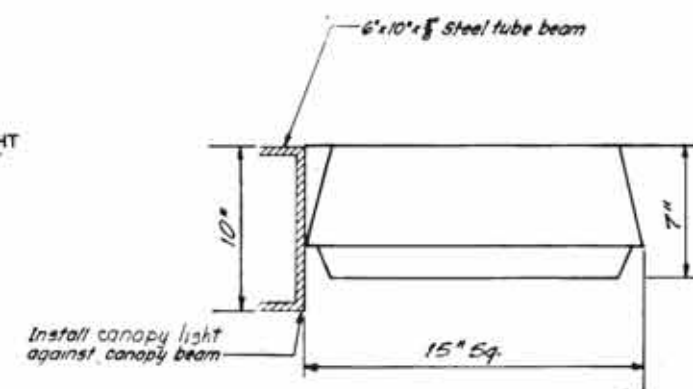
MISCELLANEOUS DETAILS

SHEET OF AUGUSTA, MAINE

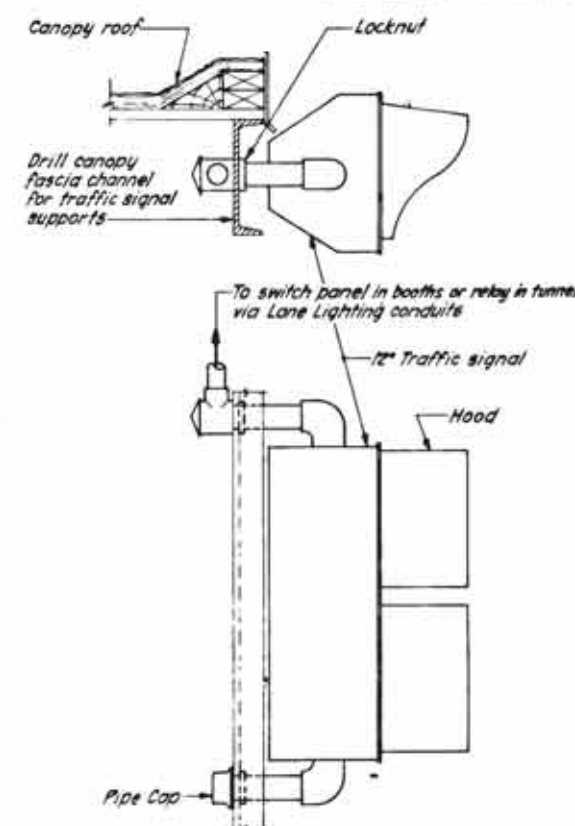


TRAFFIC CONTROL WIRING DIAGRAMS
No Scale

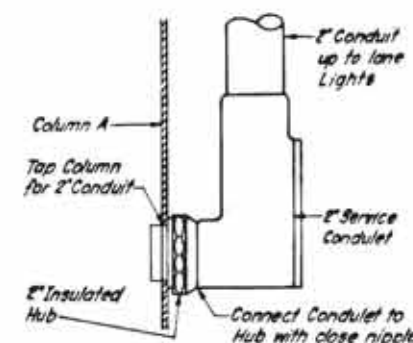
- LEGEND**
- CONDUIT
 - CANOPY LIGHT
 - LANE LIGHT



CANOPY LIGHT DETAIL
No Scale
Canopy Light to be manufactured by Hubbell Cat. No. 5-917XXXG



TRAFFIC SIGNAL LIGHTING DETAILS
No Scale



DETAIL A
No scale
For Location see Sheet # 8

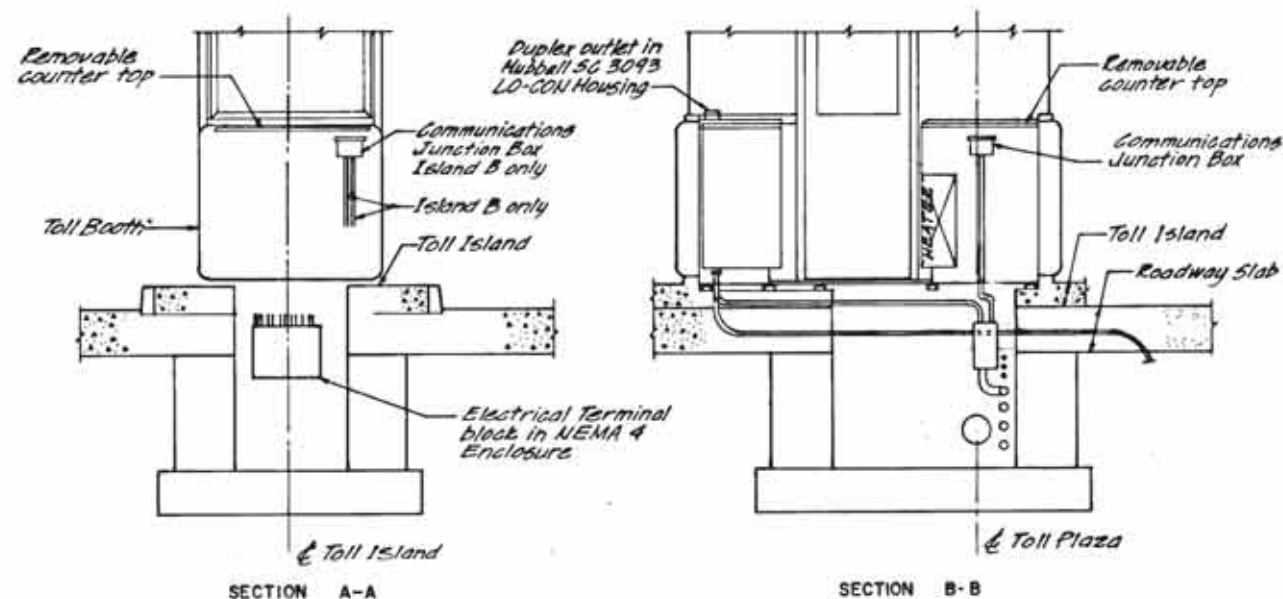
NO.	REVISION	BY	DATE	IN CHARGE OF

HNTB
HOBAS, NEEDLES, TOWNSEND & BROWN
CONSULTING ENGINEERS BOSTON

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

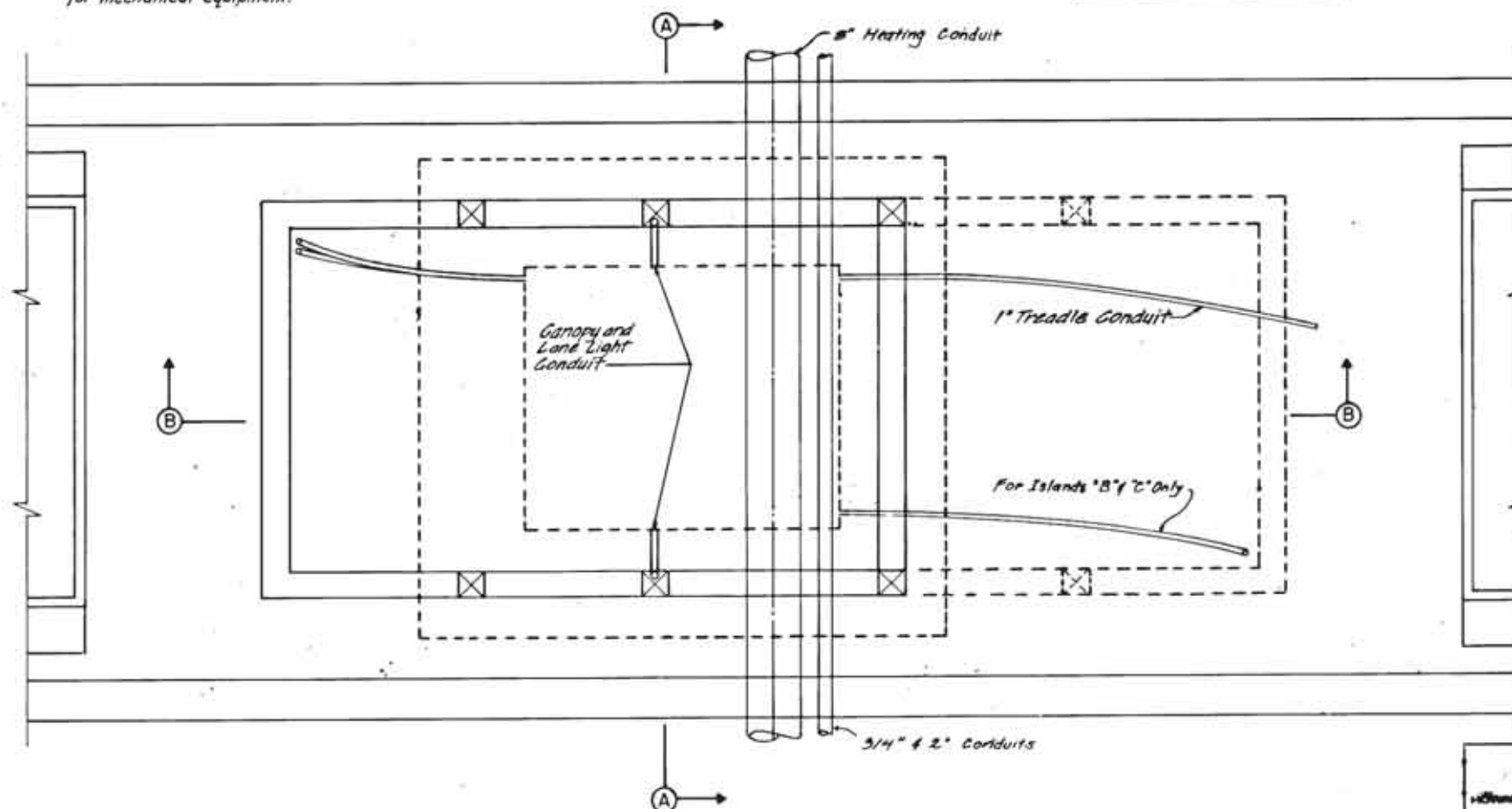
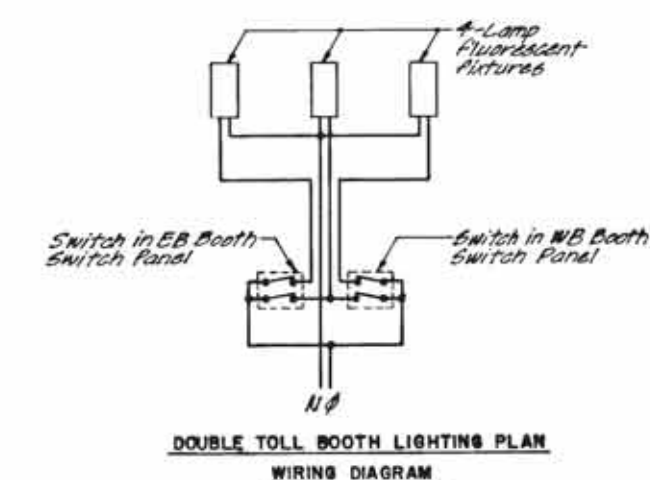
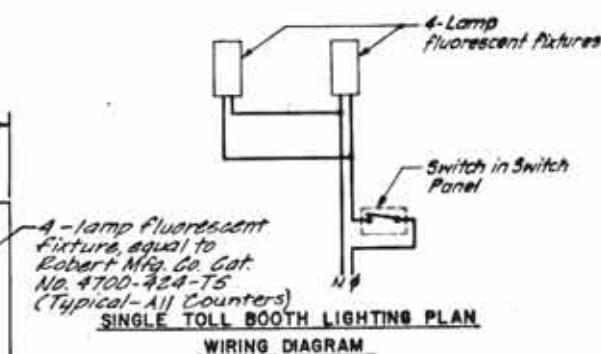
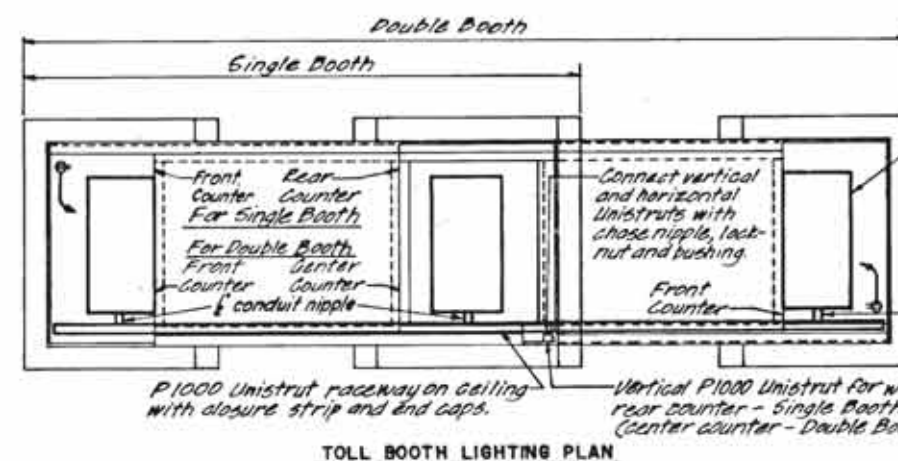
**TOLL PLAZA LIGHTING PLAN
AND DETAILS**

SHEET OF 25



NOTES

1. Provide a Unistrut support system complete with fittings and connections for mounting conduits and piping.
2. Both ends of all conduits shall be identified with brass wrap-around tags embossed with $\frac{1}{4}$ " high numbers.
3. Conduit in back of booth to be located in conjunction with space requirements for mechanical equipment.



NO.	REVISION	BY	DATE	IN CHARGE OF

FINTE
HOWARD FINEBERG & ASSOCIATES
CONSULTING ENGINEERS BOSTON

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

TOLL PLAZA & BOOTH
ELECTRICAL DETAILS

SHEET OF AUGUSTA, MAINE