MAINE TURNPIKE AUTHORITY

MAINE TURNPIKE

CONTRACT DOCUMENTS

CONTRACT 2019.07

ROUTE 109/EXIT 19 IMPROVEMENTS
VOLUME II

NOTICE TO CONTRACTORS

PROPOSAL

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SPECIFICATIONS

MAINE TURNPIKE AUTHORITY

SPECIFICATIONS

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

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

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MAINE TURNPIKE AUTHORITY

NOTICE TO CONTRACTORS

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

CONTRACT 2019.07

ROUTE 109/EXIT 19 IMPROVEMENTS
VOLUME II

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 April 23, 2019 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 Bridge Construction Projects. All other bids will be rejected. In addition, contractors submitting bids must be themselves or utilize a subcontractor pre-qualified by the Maine Department of Transportation for Traffic Signals and Lighting Projects for the completion of the traffic signal work.

Contractors not currently prequalified by MaineDOT for Bridge projects can seek prequalification for this project prior to the award by submitting the prequalification application included with this notice directly to the Authority at the above address.

Subcontractors not currently prequalified by MaineDOT can seek prequalification for this project prior to the bid by submitting the prequalification application included with this notice directly to the Authority at the above address.

This Project includes a wage determination developed by the State of Maine Department of Labor.

The work consists of intersection improvements to the Route 109 and Exit 19 intersection in the Town of Wells, Maine. The work includes adding signing and modifying signals, maintenance of traffic and all other work incidental thereto in accordance with the Plans and Specifications.

Plans and Contract Documents may be examined by prospective Bidders weekdays between 8:00 a.m. and 4:30 p.m. at the office of the Maine Turnpike Authority, 2360 Congress Street, Portland, Maine. **The half size Plans** and Contract Documents may be obtained from the Authority upon payment of Fifty ($50.00) 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)482-8115. 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 or email ncarll@maineturnpike.com. Responses will not be prepared for questions received by telephone. Bidders shall not contact any other Authority staff or Consultants for clarification of Contract provisions, and the Authority will not be responsible for any interpretations so obtained.

All work shall be governed by the Specifications entitled "State of Maine, Department of Transportation, Standard Specifications, Revision of November 2014", "Standard Details, Revision of November 2014" and "Best Management Practices for Erosion and Sediment Control", latest issue. Copies and recent updates to these publications can be downloaded at: http://www.maine.gov/mdot/contractors/publications/ .

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

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

A pre-bid conference will be held on April 11, 2019 at 10:00 a.m. at the Maine Turnpike Authority, 2360 Congress Street, Portland, Maine.

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

MAINE TURNPIKE AUTHORITY

Nate Carll
Purchasing Manager
Maine Turnpike Authority

Portland, Maine

Maine Turnpike Authority

MAINE TURNPIKE

PROPOSAL

CONTRACT 2019.07

ROUTE 109/EXIT 19 IMPROVEMENTS
VOLUME II

MAINE TURNPIKE AUTHORITY

PROPOSAL

CONTRACT 2019.07

ROUTE 109/EXIT 19 IMPROVEMENTS
VOLUME II

TO MAINE TURNPIKE AUTHORITY:

The work consists of intersection improvements to the Route 109 and Exit 19 intersection in the Town of Wells, Maine. The work includes adding signing, modifying signals, maintenance of traffic and all other work incidental thereto in accordance with the Plans and Specifications.

This Work will be done under a Contract known as Contract 2019.07 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. 2019.07

Route 109/Exit 19 Improvements
Volume II

Item No.	Item Description	Units	Approx. Quantities	Unit Prices in Numbers		Bid Amount in Numbers	
				Dollars	Cents	Dollars	Cents
526.301	TEMPORARY CONCRETE BARRIER, TYPE I	Lump Sum	1				
527.342	WORK ZONE CRASH CUSHIONS - TL-2	Unit	1				
607.44	SAFETY FENCE	Linear Foot	80				
615.07	LOAM	Cubic Yard	0.5				
618.14	SEEDING METHOD NUMBER 2	Unit	0.02				
619.1202	TEMPORARY MULCH	Lump Sum	1				
626.32	24" FOUNDATION	Each	2				
627.712	WHITE OR YELLOW PAINTED PAVEMENT MARKING LINE	Linear Foot	135				
627.75	WHITE OR YELLOW PAVEMENT & CURB MARKING	Square Foot	95				
627.78	TEMPORARY PAVEMENT MARKING LINE, WHITE OR YELLOW	Linear Foot	135				

CARRIED FORWARD:		

Item No.	Item Description	Units	Approx. Quantities	Unit Prices in Numbers		Bid Amount in Numbers	
				Dollars	Cents	Dollars	Cents
				BROUGHT FORWARD:			
629.05	HAND LABOR - STRAIGHT TIME	Hour	5				
631.12	ALL PURPOSE EXCAVATOR (INCLUDING OPERATOR)	Hour	5				
631.172	TRUCK, LARGE (INCLUDING OPERATOR)	Hour	5				
631.36	FOREMAN	Hour	5				
643.71	TRAFFIC SIGNAL MODIFICATION: EXIT 19 AND ROUTE 109/SANFORD RD INTERSECTION	Lump Sum	1				
643.83	VIDEO DETECTION SYSTEM	Lump Sum	1				
643.97	WOOD POLES WITH GUYS AND SPAN WIRE	Each	1				
645.103	DEMOUNT GUIDE SIGN	Each	1				
645.106	DEMOUNT REGULATORY, WARNING, CONFIRMATION, AND ROUTE MARKER ASSEMBLY SIGN	Each	2				
645.15	CANTILEVER GUIDE SIGN: (STA. 10+62.00)	Lump Sum	1				
645.251	ROADWAY GUIDE SIGNS, TYPE I	Square Foot	150				

CARRIED FORWARD:		

Item No.	Item Description	Units	Approx. Quantities	Unit Prices in Numbers		Bid Amount in Numbers	
				Dollars	Cents	Dollars	Cents
			BROUGHT FORWARD:				
645.289	STEEL H-BEAM POLES	Pound	720				
645.292	REGULATORY, WARNING, CONFIRMATION, AND ROUTE MARKER ASSEMBLY SIGNS TYPE II	Square Foot	47				
652.33	DRUM	Each	90				
652.34	CONE	Each	30				
652.35	CONSTRUCTION SIGNS	Square Foot	240				
652.361	MAINTENANCE OF TRAFFIC CONTROL DEVICES	Lump Sum	1				
652.38	FLAGGERS	Hour	140				
656.632	30 INCH TEMPORARY SILT FENCE	Linear Foot	260				
659.10	MOBILIZATION	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 – SUPPLEMENTAL SPECIFICATIONS

Available at: http://www.maineturnpike.com/Projects-Planning/Construction-Contracts.aspx

(Rev. November 10, 2016)

MAINE TURNPIKE AUTHORITY

SPECIFICATIONS

PART II – SPECIAL PROVISIONS

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

General Description of Work

The work consists of intersection improvements to the Route 109 and Exit 19 intersection in the Town of Wells, Maine. The work includes adding signing and modifying signals, maintenance of traffic and all other work incidental thereto in accordance with the Plans and Specifications.

Plans

The drawings included in these Contract Documents, and referred to as the Plans, show the general character of the work to be done under this Contract. They bear the general title "Maine Turnpike – Contract 2019.07 – Route 109/Exit 19 Improvements Volume II". 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 Supplemental Specifications:

Independence Day 2019 (Fourth of July)	Noon Wednesday to 6:00 AM Monday
Christmas 2019	Noon Tuesday to 6:00 AM Thursday
New Year's Day 2020	Noon Tuesday to 6:00 AM Thursday

103.4 Notice of Award

The following sentence is added:

The Maine Turnpike Authority Board is scheduled to consider the Contract Award on April 23, 2019 at 11AM.

104.3.8 Wage Rates and Labor Laws

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

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

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

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

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

Title of Project --------MTA 2019.07-Route 109 Exit 19 Improvements-Volume II

Location of Project --Wells, York County

2019 Fair Minimum Wage Rates
Highway & Earth York County

Occupation Title	Minimum Wage	Minimum Benefit	Total	Occupation Title	Minimum Wage	Minimum Benefit	Total
Asphalt Raker	$16.00	$0.79	$16.79	Line Erector - Power/Cable	$31.00	$5.32	$36.32
Backhoe Loader Operator	$22.00	$5.08	$27.08	Loader Operator - Front-End	$19.50	$2.97	$22.47
Bulldozer Operator	$23.85	$4.32	$28.17	Mechanic- Maintenance	$20.50	$2.96	$23.46
Carpenter	$20.00	$2.64	$22.64	Millwright	$24.25	$8.80	$33.05
Carpenter - Rough	$19.00	$1.88	$20.88	Oil/Fuel Burner Serv.& Install	$23.00	$3.51	$26.51
Cement Mason/Finisher	$17.00	$1.34	$18.34	Painter	$17.50	$0.42	$17.92
Concrete Mixing Plant Operator	$22.11	$4.89	$27.00	Paver Operator	$21.00	$0.35	$21.35
Crane Operator =>15 Tons)	$26.80	$4.74	$31.54	Pipe-layer	$22.00	$1.49	$23.49
Crusher Plant Operator	$17.00	$3.86	$20.86	Re-claimer Operator	$21.58	$1.80	$23.38
Driller - Well	$19.83	$2.66	$22.49	Roller Operator - Earth	$22.11	$3.02	$25.13
Electrician - Licensed	$22.55	$14.26	$36.81	Roller Operator - Pavement	$19.00	$1.62	$20.62
Electrician Helper/Cable Puller	$17.00	$1.34	$18.34	Screed/Wheelman	$19.25	$1.00	$20.25
Excavator Operator	$21.00	$3.12	$24.12	Sider	$16.75	$1.38	$18.13
Fence Setter	$17.50	$2.94	$20.44	Stone Mason	$21.00	$0.95	$21.95
Flagger	$13.00	$0.00	$13.00	Truck Driver - Light	$17.00	$1.15	$18.15
Grader/Scraper Operator	$18.00	$1.62	$19.62	Truck Driver - Medium	$19.00	$3.13	$22.13
Highway Worker/Guardrail	$17.50	$1.76	$19.26	Truck Driver - Heavy	$17.50	$1.45	$18.95
Ironworker - Reinforcing	$22.11	$2.79	$24.90	Truck Driver - Tractor Trailer	$18.50	$3.20	$21.70
Laborers (Helpers & Tenders)	$15.00	$0.84	$15.84	Truck Driver - Mixer (Cement)	$17.19	$1.07	$18.26
Laborer - Skilled	$18.00	$1.59	$19.59				

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.

Determination No: **HI-094-2019**

A true copy

Filing Date: **March 26, 2019**

Attest: Scott R. Cotnoir

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

Expiration Date: **12-31-2019**

BLS(Highway & Earth 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
Augusta, Maine 04333-0045
Telephone (207) 623-7906

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

Title of Project --------MTA 2019.07-Route 109 Exit 19 Improvements-Volume II

Location of Project --Wells, York County

2019 Fair Minimum Wage Rates
Heavy & Bridge York County

Occupation Title	Minimum Wage	Minimum Benefit	Total	Occupation Title	Minimum Wage	Minimum Benefit	Total
Backhoe Loader Operator	$26.48	$4.96	$31.44	Laborer - Skilled	$19.96	$5.32	$25.28
Boilermaker	$24.00	$9.00	$33.00	Line Erector - Power/Cable	$31.00	$5.86	$36.86
Bulldozer Operator	$20.00	$3.71	$23.71	Loader Operator - Front-End	$23.00	$3.31	$26.31
Carpenter	$22.00	$4.28	$26.28	Mechanic- Maintenance	$22.25	$3.78	$26.03
Carpenter - Rough	$22.25	$8.56	$30.81	Mechanic- Refrigeration	$25.71	$5.09	$30.80
Communication Equip Installer	$23.00	$1.64	$24.64	Millwright	$24.50	$9.80	$34.30
Comm Transmission Erector	$19.80	$3.49	$23.29	Painter	$33.75	$0.42	$34.17
Concrete Mixing Plant Operator	$22.11	$4.92	$27.03	Paver Operator	$20.00	$0.00	$20.00
Crane Operator =>15 Tons)	$27.75	$4.74	$32.49	Pipe/Steam/Sprinkler Fitter	$27.00	$4.49	$31.49
Crusher Plant Operator	$17.38	$3.12	$20.50	Pipelayer	$23.00	$1.14	$24.14
Diver	$32.00	$6.91	$38.91	Plumber (Licensed)	$25.00	$4.26	$29.26
Driller - Well	$19.83	$2.66	$22.49	Plumber Helper/Trainee	$19.00	$3.10	$22.10
Earth Auger Operator	$25.84	$5.78	$31.62	Rigger	$22.50	$6.57	$29.07
Electrician - Licensed	$30.07	$15.60	$45.67	Roller Operator - Earth	$22.11	$2.77	$24.88
Electrician Helper/Cable Puller	$17.50	$5.46	$22.96	Roller Operator - Pavement	$19.00	$1.06	$20.06
Excavator Operator	$25.50	$4.27	$29.77	Sheet Metal Worker	$20.00	$4.11	$24.11
Fence Setter	$15.00	$2.00	$17.00	Stone Mason	$21.00	$0.95	$21.95
Flagger	$13.00	$0.00	$13.00	Truck Driver - Light	$17.00	$1.17	$18.17
Ironworker - Reinforcing	$28.71	$0.00	$28.71	Truck Driver - Medium	$19.00	$3.37	$22.37
Ironworker - Structural	$25.38	$3.79	$29.17	Truck Driver - Heavy	$19.00	$2.06	$21.06
Laborers (Helpers & Tenders)	$18.19	$2.23	$20.42	Truck Driver - Tractor Trailer	$21.13	$4.07	$25.20

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 MRS §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.

Determination No: **HB-013-2019**

A true copy

Filing Date: **March 26, 2019**

Attest: Scott R. Cotnoir

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

Expiration Date: **12-31-2019**

BLS(Heavy & Bridge York)

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 to avoid impacting the utilities at this site.

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 requirements. 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. Utility pole work noted on the plans is expected to be completed prior to September 3, 2019. The Contractor shall ascertain the location of the existing utilities and any other necessary information by direct inquiry at the office of the following utility owners:

AERIAL UTILITIES

Temporary utility adjustments are not anticipated on this project. Should the contractor choose to have any poles temporarily relocated, all work will be done by pole owner at the contractor's request and expense with no additional cost or schedule impacts to the Authority. All adjustments are to be made by the respective utility unless otherwise specified herein.
All of the aerial utilities have lines along and crossing the project location. There may also be underground services from the utility poles into homes or businesses.

COMMUNICATION:

Consolidated Communications (Pole Owner)
5 Davis Farm Rd
Portland, ME 04103
Tel: 207-797-1119
Cell: 207-272-7993
Martin Pease

CABLE TELEVISION:

Spectrum
118 Johnson Road
Portland, ME 04102
Tel: 207-253-2226
Cell: 207-318-6542
Peter Detesco

ELECTRIC:

Central Maine Power Company
483 Sanford Road
Alfred, ME 04002
Tel: 207-629-2531
Cell: 207-242-0673
Wayne Brown

CENTRAL MAINE POWER (CMP)

The Contractor shall give CMP 10 working days' notice prior to any construction near their facilities.

CONSOLIDATED COMMUNICATIONS

The Contractor shall give Consolidated Communications 10 working days' notice prior to any construction near their poles.

SPECTRUM CABLE

The Contractor shall give Spectrum 10 working days' notice prior to any construction near their facilities.

UNDERGROUND UTILITIES

Subsurface utility adjustments are not anticipated as part of this project. If any unexpected utility relocations become necessary, they will be scheduled in compliance with Section 104 of the Standard Specifications and will be done by the utilities in conjunction with the work by the Contractor.

Kennebunk, Kennebunkport & Wells Water District has 16" ductile iron water main in the project area. There are no expected impacts to their facilities.

Wells Sanitary District has force main and gravity sewer in the project area that are not expected be impacted.

Unitil Natural Gas has distribution lines in the project area. There are no expected impacts to their facilities.

WATER:

Kennebunk, Kennebunkport, & Wells Water District
92 Main St
Kennebunk, ME 04043
Tel: 207-985-3385
Keith Archibald

SANITARY:

Wells Sanitary District
197 Eldridge Road
Wells, ME 04090
Tel: 207-646-5906
Nick Rico

GAS:

Unitil
376 Riverside Ind Pkwy
Portland, ME 04103
Tel: 207-541-2572
Cell: 207-210-3310
Kelly Brown

104.4.7 Cooperation With Other Contractors

This Subsection is amended by the addition of the following:

Adjacent contracts currently scheduled for the 2019 construction season include:

MaineDOT Contract 023927.00 – North Berwick – Wells
Rte 9 Ultra-Thin Bonded Wearing Course

107.1 Contract Time and Contract Completion Date

This Subsection is amended by the addition of the following:

The Contractor shall not begin work at the project site until September 3, 2019.

All work shall be completed on or before November 15, 2019.

107.4.6 Prosecution of Work

The Contractor shall submit to the Authority a construction schedule which shall document that the Contractor has the necessary labor and equipment to work immediately and continuously at the project site starting in September 2019. The intent of this specification is to start work after completion of the adjacent contract outlined in Section 104.4.7 Cooperation With Other Contractors above, while providing the Contractor sufficient time to complete the work in a diligent manner.

SPECIAL PROVISION

SECTION 526

CONCRETE BARRIER

(Temporary Concrete Barrier Type I)

526.01 Description

The following paragraphs are added:

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

526.02 Materials

The following paragraphs are added:

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

526.03 Construction Requirements

The following paragraphs are added:

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

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

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

Retro-Reflective Delineators shall be mounted as follows:

- One on top of each barrier.
- One on the traffic side of every barrier used in a taper.
- One on the traffic side of every other barrier at regularly spaced intervals and locations.
- Delineators shall be installed on both sides of the barrier if barrier is used to separate opposing traffic.
- Delineators shall be physically adhered 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:

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

Payment will be made under:

Pay Item		Pay Unit
526.301	Temporary Concrete Barrier, Type I	Lump Sum

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.

The exposed end of the concrete barrier 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:

Work zone crash cushions meeting the NCHRP Report 350 TL-2 crash test requirements may be used on local roadways with posted speeds of 40 MPH or less. The Contractor shall provide the Resident with documentation of the proposed work zone crash cushion's NCHRP Report 350 Crash Test Results prior to installation at the jobsite.

527.03 Construction Requirements

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

The design speeds for work zone crash cushions shall be 35 mph for local road unless otherwise noted on the Plans.

527.05 Basis of Payment

Payment will be made under:

Pay Item		Pay Unit
527.342	Work Zone Crash Cushions – TL-2	Unit

SPECIAL PROVISION

SECTION 607

FENCES

(Safety Fence)

607.01 Description

The following paragraphs are added:

This work shall also consist of furnishing, erecting, and removing temporary Safety Fence as shown on the plans and in accordance with these Special Provisions and as directed by the Resident.

607.02 Materials

The following paragraphs are added:

Safety fences shall be high visibility orange plastic safety fence, a minimum of 36" high. Posts for safety fence shall be steel posts at least 24 inches longer than the height of the safety fence and have the means provided for fastening to the fence.

607.03 General

The following paragraphs are added:

Temporary safety fence shall be installed as shown on the plans and as directed by the Resident prior to any other work on the project. Posts shall be spaced no further than 10 feet apart and shall be driven a minimum of 18" below grade. Areas disturbed during the removal of the safety fence at the completion of the project shall be repaired and properly stabilized.

607.51 Basis of Payment

The following paragraphs are added:

Payment for safety fence shall be full compensation for furnishing and assembling all materials, for excavating and backfilling holes, for maintenance of the fence for the duration of the project, for removal and disposal of the safety fence at the completion of the project, and for all incidentals necessary to complete the work.

Payment will be made under:

Pay Item		Pay Unit
607.44	Safety Fence	LF

SPECIAL PROVISION

SECTION 619

MULCH

(Mulch – Plan Quantity)
(Temporary Mulch)

619.01 Description

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

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

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

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

619.03 General

The first paragraph is deleted and replaced with the following:

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

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

610.06 Method of Measurement

The following sentence is added:

Temporary Mulch will be paid for by the lump sum.

656.10 Basis of Payment

Temporary Mulch will be paid for at the Contract price per lump sum which shall be full compensation for furnishing and spreading the Temporary Mulch as many times as necessary as determined by the Contractor's operations and staging. The price shall also include the additional

mulch netting and snow removal necessary during the winter months.

Payment will be made under:

Pay Item		Pay Unit
619.1201	Mulch – Plan Quantity	Unit
619.1202	Temporary Mulch	Lump Sum

SPECIAL PROVISION

SECTION 626 - FOUNDATIONS, CONDUIT, AND JUNCTION BOXES FOR HIGHWAY SIGNING, LIGHTING, AND SIGNALS

626.031 Conduit

The third paragraph shall be deleted and replaced with:

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

The fourth paragraph shall be deleted and replaced with:

Where conduits enter exposed junction boxes, they shall be sloped to drain towards the conduit entrance holes, unless otherwise directed. All conduit ends in exposed junction boxes or in concrete foundations shall be fitted with bell ends. Weep holes of ¼ inch diameter shall be placed in all pull boxes, junction boxes, and fuse boxes.

626.033 Polyvinylchloride Conduit Installation

The following paragraph shall be added:

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

626.034 Concrete Foundations

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

Any concrete foundation that is damaged during placement or does not meet design requirements shall be replaced. No repairs to the foundations will be allowed.

SPECIAL PROVISION

SECTION 627

PAVEMENT MARKINGS

(White or Yellow Pavement Marking Line)

627.01 Description

The following sentences are added:

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

The following sentence is added:

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

627.02 Materials

The following is added before the last paragraph:

The paint for pavement markings shall be 100% acrylic waterbase paint.

627.04 General

The following is added to the third paragraph:

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

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

Temporary pavement marking paint and temporary pavement markers shall be applied daily prior to opening the work area to traffic during non-work hours or as approved by the Resident.

627.08 Removing Lines and Markings

The last sentence is deleted and is not replaced.

627.09 Method of Measurement

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

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

627.10 Basis of Payment

This Subsection is deleted and replaced with the following:

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

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

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

Payment will be made under:

Pay Item		Pay Unit
627.712	White or Yellow Pavement Marking Line	Linear Foot

SPECIAL PROVISION

SECTION 643 - TRAFFIC SIGNALS

(Wood Poles with Guys and Span Wire)

643.01 Description

The following paragraph shall be added:

This work shall also consist of furnishing and installing all materials and equipment necessary for the erection and use of poles with span wires for hanging signs or signals.

643.07 Span Wire, Messenger Wire, and Guy Wire

The second paragraph shall be revised to:

All span wire hanging traffic signs will have a bottom tether wire to prevent the sign from excessive swinging.

643.18 Method of Measurement

The following paragraph shall be added:

Poles with guys and span wire shall be measured as a complete system, including poles on both ends and all attendant wires, by each unit.

643.19 Basis of Payment

The following paragraph shall be added:

Poles with guys and span wire will be paid for as the complete system, each, which payment will be full compensation for furnishing and installing, but not limited to, poles, span wire, guy wire, tether wire, and all appurtenances and incidentals required to create a system ready for installation of signs and/or signals.

Payment will be made under:

Pay Item		Pay Unit
643.97	Wood Poles with Guys and Span Wire	Each

SPECIAL PROVISION

SECTION 643 - TRAFFIC SIGNALS

643.01 Description This work shall consist of modifications to the traffic signals at the intersection of the Maine Turnpike Exit 19 interchange and Sanford Road / Route 109 in Wells. Work shall include traffic signal modifications and a new video detection system installation. The work shall include cabinets, poles, foundations, backfill, and all necessary fittings, cables, and components as required to make a fully functional traffic signal and video detection system.

Traffic signal terms shall be in accordance with those defined in the NEC, MUTCD, NESC, NEMA, IMSA and the ITE Standards for traffic control equipment.

643.02 Materials A list of the recommended materials required to install the system may be included as an amendment to this specification, but the Authority will give no guarantee as to the completeness of this list. Unless otherwise specified, all equipment and components shall be new and free of defects.

Electrical materials shall meet the standards herein, local and utility codes, and the National Electrical Code, where applicable.

Drawings, manufacturer's specifications and applicable catalog cuts for all materials and components shall be submitted in accordance with Section 105.7 of the Standard Specification within 21 days after award of the Contract. An additional set of final approved documents, to total 6 sets, shall be provided to the Resident.

At the conclusion of the project, three complete sets of cabinet prints (24 inch by 36 inch) and one complete set of user manuals will be provided and left in the cabinet. The cabinet prints will be an exact representation of the wiring, including field wiring, and programming that is actually present in at the time of acceptance.

643.021 Traffic Signal Heads New housings shall be constructed of die cast aluminum or polycarbonate with a smooth outer surface. All housings shall be equipped with a Quick Change Kit as manufactured by GGI Road and Traffic. Housings shall be adaptable for pedestal, bracket, or rigid mast arm vertical or horizontal mounting. The assembled housing shall be dust proof and moisture proof. Each housing shall be equipped with a hinged door of die cast aluminum or polycarbonate to hold the lens and parts of the optical units. The doors shall be designed to ensure uniform pressure around the doorframe when closed. Doors shall be fastened by two hinged wing nut assemblies or other approved fasteners. Unless otherwise indicated on the plans, lenses shall be furnished with approved tunnel visors (not less than 10 inches). If either longer visors than those specified above or louvers are deemed necessary, they shall be furnished and installed. If required, louvers shall be attached with machine screws, nuts and washers. The use of "self-tapping" machine screws will not be allowed. All traffic signals shall be furnished with a 5 inch backplate with a factory applied 2" diamond grade retroreflective border. Backplates shall be louvered aluminum coated flat black, be fastened with stainless steel hex head slotted screws and a 3/16 inch by 3/4 inch stainless steel fender washer. Signal housings shall be manufactured by the Econolite Group, Inc. or an approved equal.

The assembled housings shall be made up of individual sections fastened together with bolts; the assembly of sectional units shall present a smooth unbroken contour of pleasing appearance. Each end of the housing assembly shall have an opening for a 1-1/2 inch pipe nipple. The area around this opening shall be reinforced and serrated so that lock nuts will seat firmly. The use of "Tri-Studs" to join the signal sections together will not be permitted.

One cap shall be supplied with each new assembled housing to act as a cover over the hole in the top to prevent water from entering.

Housing adapters for pedestal mounting shall be constructed of cast iron. They shall be adjustable with serrated surfaces to permit the housing to be locked in the desired horizontal position. The adapters shall be secured to the bottom of the housing by means of a close nipple, shall slip fit at least 7 inches over a standard traffic signal post of 4 inches in diameter and shall be secured to the post by a minimum of four set screws. Adapters shall contain raceways from the housing to the post to protect the wires from the elements.

Mast arm brackets shall be cabled with "Astro-Brac" by Pelco or an approved equal.

Span wire hardware shall consist of hangers with a cast nipple. "Tri-Stud" hangers will not be permitted.

Light Emitting Diode (LED) lamps shall have a regulated power supply designed to electrically protect the diodes. The lamp shall be water tight and sealed to eliminate contaminants. The lamp shall be capable of operating at ambient air temperatures of -40° F to 140° F. LED's shall be a 48 Volt DC LED module as manufactured by Dialight or an approved equal. All LED lamps shall have a date code not to exceed 6 months prior to the start of construction.

Each LED module shall be wired with two leads which shall terminate at the terminal block in each signal head. Separate leads shall be used to wire the block to the base. Leads shall be 18 AWG stranded wire with spade type copper terminal ends. All colors shall be bright and clearly defined and cover the insulation the entire length of the lead. The color of these leads shall be as follows:

(a) From the receptacle behind the red lens: one red wire and one white wire with an optional red tracer;

(b) From the receptacle behind the yellow lens: one yellow wire and one white wire with an optional yellow tracer;

(c) From the receptacle behind the green lens: one green wire and one white wire with an optional green tracer;

(d) From the receptacle behind the green arrow: one blue wire and one white wire with an optional blue tracer.

LED lamp life shall be a minimum of 100,000 hours of continuous operation. Power consumption for 12" indications including power supply shall not exceed 10 W.

LED modules shall conform to the standards set forth by the Institute of Transportation Engineers and shall be of the color indicated, circular in shape, with a visible diameter of approximately 12 inches.

643.03 Traffic Signal Poles, Mast Arms, and Pedestals Section 720 of the Standard Specifications shall apply unless otherwise noted.

Steel Structures. Section 720.04 of the Standard Specifications shall apply.

Concrete foundation shall be concrete Class A meeting the requirements of Section 502 of the Standard Specifications - Structural Concrete. Reinforcing steel shall meet the requirements of Section 503 of the Standard Specifications – Reinforcing Steel. The foundations shall be as shown on the plans.

Anchor bolts. Section 720.07 of the Standard Specifications shall apply.

Mast-arm structure and foundation (when required) design calculations and shop drawings shall be submitted for documentation in accordance with Section 105.7 of the Standard Specifications.

Wood Utility Poles. Section 720.10 of the Standard Specifications shall apply.

Messenger, tether and guy cable shall be a minimum seven strand, 5/16 inch diameter wire with a breaking strength of 8,000 pounds, double galvanized in accordance with AASHTO M 111.

Aluminum Structures. Sections 720.01 and 720.02 of the Standard Specifications shall apply.

643.04 Traffic Signal Controllers and Cabinets. The controller shall designed to operate on 120 volt, 60 hertz (cycle) alternating current, and shall be delivered completely wired and enclosed in a weatherproof cabinet. All components shall be new, and unless noted, the use of solid state components shall be required. Controllers shall be programmable, menu driven, contain an Ethernet communication port (RJ-45 connection) and one hundred (100) logic processor commands shall be accessible from the front panel of the controller or through remote database management software. The controller shall be designed to mount to a standard EIA 19-inch rack and be 4U high. The controller shall meet, as a minimum, all applicable sections of the NEMA Standards Publications for ATC. The controller shall be a Cobalt Rackmount as manufactured by the Econolite Control Group, part COBRM21130110000.

643.041 Bench test. All components of the controller and cabinet shall be bench tested for a minimum of 72 continuous hours by the Contractor at the Contractor's facility prior to delivery to the project. A representative of the Authority shall verify the test check list. The Contractor shall notify the Authority at least 3 days prior to testing as to the date, time and place that tests are to be performed. Testing shall be performed by an IMSA qualified Signal Technician using a test board and in conformance with the design loads, phasing, timing and auxiliary equipment such as pre-emption phases. Any defective component shall be replaced, retested and continuous testing continued. Test results shall be documented on a check list as provided by the Authority and these results attested by the signature of the performing technician. Upon completion of satisfactory bench testing, a written approval will be supplied to the Contractor by the Engineer for delivery to the project only. This approval does not relieve the Contractor from ensuring proper operation of the equipment. The approval shall accompany the cabinet and controller when delivered to the project.

The checklist will contain the following items:

(a) Install all of the equipment into the cabinet as required per the plans and specifications.

(b) Set the phase timings of the controller in accordance with plans.

(c) Wire in 48 VDC Cabinet Test Display to the switch packs in simulation to the intersection as per the plans.

(d) Check all of the wiring connections for physical tightness.

(e) Power up the cabinet.

(f) Observe the sequences, timings and operations of the controller in conformance to the plans and specifications.

(g) Using the phase test push buttons, insert a call for a phase and observe this phase as it is being called for sequencing, timing and returning to rest condition. Only one separate call for each phase shall be used.

(h) Test the police panel switches, manual, on/off, flash/auto and test the police manual cord if present in the panel.

(i) Test for Fire Pre-emption - Optical Detector - with the receivers wired in the cabinet and using an emitter, test each fire run as per the plans. Hard Wired - Attach a temporary push button as per the plans and test each fire run as per the plans.

(j) Check exhaust fan controls by applying heat from a 100 watt lamp on an extension cord to the thermostat.

(k) Check heat lamp controls by cooling the thermostat.

(l) Check conflict monitor by testing for any conflicting Greens or Yellows by the use of a jumper wire attached to a displayed Green or Yellow and to the other non-parent Greens or Yellows to ascertain that conflicting colors are not present.

When all of the above procedures have been completed, the performing technician shall document the results on the approved form as provided by the Authority.

Upon completion of the project, a print out of the databases contained in the controller, CMU, Fire Preemption, Video Detection or any other equipment shall be provided to the Resident. The databases can be provided either via a hard copy printout or on a "thumb drive."

643.042 Controller Cabinet. The cabinet shall meet, as a minimum, all applicable sections of the ATC 5301 v02 StdHLD (most current revision) Standards Publications for ATCC. The ATC Cabinet shall be available in 2 different versions and include all of the MTA required items supplied in the following Econolite Cabinet Part Numbers:

48VDC ATCC 32 Channel Output / 24 Channel Input, Econolite Part Number ATCC1032

643.043 Cabinet Component Spares The following will be provided as spare equipment:
2 SIUs, 3 High Density Switch Packs, one 2212-LV Cabinet Monitor Unit with Datakey, one Monitorkey Programming Tool (per order), 5 High Density Flash Transfer Relays and a 48 VDC Cabinet Test Display (per order).

643.05 Fire Pre-emption. The existing fire pre-emption system shall be reused. The fire preemption system shall be tested before any work commences to ensure that the system is fully functional. The system will be tested again at the completion of the project and any components found to be non-functioning shall be replaced by the contractor at no cost to the Authority.

The existing confirmation light shall be removed and replaced. The new confirmation light shall be a self-contained LED, 48 volt DC industrial strobe light beacon with a weather-resistant, fully enclosed, rugged, cast aluminum base and lexan red optic lens as manufactured by Whelen Engineering Company Inc. or an approved equal.

The confirmation light shall be operated by a HDSP (ie channel #9 Yellow).

Optical detector locations shall be verified by the Authority to assure optimum reception. Optical detector cable shall run unspliced from the optical detector head to the controller cabinet.

Each optical detector lead-in cable shall be marked with plastic tape. The fire preemption shall correspond to the following chart associating the fire preemption call with its corresponding phase:

PREEMPTION PHASE CODE

Preempt 3	Phases 1 & 6
Preempt 4	Phases 2 & 5
Preempt 5	Phases 3 & 8
Preempt 6	Phases 4 & 7

643.06 Video Detection. The work shall consist of furnishing and installing a video detection system (Econolite Autoscope Vision video-based vehicle detection system – no approved equals) at the traffic signals located at the intersection of Route 109 and the Maine Turnpike Exit 19(I-95) interchange ramps. The following subsections shall be added:

643.061 System Hardware. The video detection system shall be comprised of two major hardware components: a video sensor and a communications interface panel. An optional wired input/output card shall be available for certain cabinet types.

643.0611 Video Sensor. The video detection system shall include a video sensor that integrates a high-definition (HD) camera with an embedded processor for analyzing the video and performing detection. Each video sensor shall maintain a time-stamped operations log of routine and special events in non-volatile memory for later retrieval and analysis.

643.0612 Camera and Processor. The camera shall be a color CMOS imaging array and shall have HD resolution of at least 720p (1280x720 pixels). The camera shall include a minimum 10X optical zoom. It shall be possible to zoom the lens as required to satisfy across-the-intersection detection objectives, including stop line and advance detection. It shall be possible to zoom the lens remotely from the TMC for temporary traffic surveillance operations or to inspect the cleanliness of the faceplate. The camera shall have direct, real-time iris and shutter speed

control by the integrated processor. The processor shall support H.264 video compression for streaming output. The system shall include one spare camera.

643.0613 Video Sensor Enclosure Assembly The camera and processor shall be housed in a sealed IP-67 enclosure. The faceplate of the enclosure shall be glass and shall have hydrophilic coating on the exterior surface to reduce debris accumulation and maintenance and shall have a thermostatically-controlled indium tin oxide (ITO) heater applied directly on the interior surface to keep the faceplate clear of condensation, snow, ice and frost. An adjustable aluminum visor shall shield the faceplate from the sun and extraneous light sources. An integral aiming sight shall assist in aiming the camera for the detection objectives. A removable rear cap and cable strain relief shall seal the power connection and shall be tethered to the enclosure to avoid dropping the cap during installation. The rear cap shall be fastened to the body of the video sensor with a single, captive bolt. The rear cap and enclosure shall include Gore breathers to equalize internal and external pressure. The sensor shall be self-supporting on manufacturer's mounting brackets for easier fastening during installation. It shall be possible to rotate the field-of-view 360° without changing the angle of the visor.

643.0614 Power and Communications Power and communications for the video sensor shall be carried over a single three-conductor cable. Termination of the three-conductor cable shall be inside the rear cap of the enclosure on a three-position, removable Phoenix terminal block. Each conductor shall be attached to the Phoenix plug via a screw connection. The video sensor shall operate normally over an input voltage range of 89 to 265 VAC at 50 or 60 Hz. Power consumption shall be no more than 16 watts typical. No supplemental surge suppression shall be required outside the cabinet. All communications to the video sensor shall be broadband-over-power via the same three-conductor cable that powers the unit. Coaxial cable shall not be required.

643.062 Communications Interface Panel The video detection system shall include an interface panel in the traffic cabinet that manages communications between the video sensors, the traffic management center, a maintenance technician, and the traffic cabinet itself. The communications interface panel shall maintain a time-stamped operations log of routine and special events in non-volatile memory for later retrieval and analysis. The system provided shall include one spare Communications Interface Panel.

643.0621 Video Sensor Connection The communications interface panel shall provide connection points for four video sensors, each sensor connection shall be a 3-pole terminal block, which supplies power and broadband-over-power communications to the sensor. The broadband-over-power communications shall provide a throughput of 70 to 90 Mbps and shall support at least 1,000 feet of cabling to the video sensor. Each video sensor connection shall include a power switch and there shall be an LED for each video sensor to indicate the state of the power to the sensor and an LED for each video sensor to indicate the status of communications. Each video sensor connection shall contain a resettable fuse. Each video sensor connection shall provide high-energy transient protection.

643.0622 Traffic Management Center (TMC) Communications. An Ethernet port capable of supporting 10/100/1000 Mbps communication shall be provided to connect to a remote Traffic Management Center (TMC). The communications interface panel shall proxy all network requests that arrive on the TMC connection to avoid unwanted network traffic from reaching the broadband-over-power network between the communications interface panel and the video

sensors. All communications to the video detection system through the TMC connection shall be to a single IP address.

643.0623 Local User Communications. A wired Ethernet port capable of supporting 10/100/1000 Mbps communications shall be provided to connect the technician at the cabinet to the video detection system for setup and maintenance purposes. All communications to the video detection system through the maintenance port shall be to a single IP address. The maintenance port shall support DHCP to automatically assign an IP address to the user's computer, if desired. An 802.11g Wi-Fi access point shall allow wireless connection to the video detection system at the cabinet for setup and maintenance purposes. All communications to the video detection system through the Wi-Fi access point shall be to a single IP Address. The Wi-Fi access point shall support DHCP to automatically assign an IP Address to the user's computer. The Wi-Fi access point shall include a dipole, omnidirectional antenna. A momentary pushbutton shall allow the user to turn the Wi-Fi access point on or off. The Wi-Fi access point shall turn itself off automatically after a period of inactivity from connected devices. An LED shall indicate when the Wi-Fi access point is enabled. The Wi-Fi access point shall operate simultaneously with the wired maintenance port and with the TMC connection.

643.0624 Traffic Controller Connection. The communications interface panel shall provide one connection to communicate to the traffic controller through the cabinet. The traffic controller connection shall support a TS2 Type 1 compatible SDLC interface utilizing a 15-pin female metal shell D subminiature type connector to support a standard NEMA TS2 or TEES SDLC cable. The traffic controller connection shall support a protocol interface to SDLC capable traffic controllers (NEMA or TEES). The traffic controller connection shall support the NEMA TS2 SDLC protocol to include up to 64 detector outputs and 32 inputs. The traffic controller connection shall be able to connect to a wired input/output card, which supports wired I/O in cabinets without a SDLC-capable controller. The wired I/O data communications link shall support at least 24 outputs and 16 inputs. It shall be possible to connect and use both SDLC communications and communication to the wired input/output card simultaneously.

643.0625 USB Ports. The communications interface panel shall include two USB 2.0 ports. If a communications interface panel fails to start and run due to a software or operating system failure, it shall be possible to reinstall all system and application software from a USB memory stick without necessitating removal of the communications interface panel from the cabinet.

643.0626 Power. The communications interface panel shall accept input voltage in the range of 89-265 VAC, 50/60 Hz power from the transient-protected side of the cabinet. The communications interface panel shall be protected by two slow blow fuses. Spares shall be attached to the panel.

643.063 Wired Input/Output Card. The video detection system shall support an optional wired input/output card that communicates with the communications interface panel for real-time detection states and other I/O to the traffic controller. The card may reside in a standard detector rack or shelf-mount enclosure with power module. The optional wired input/output card shall comply with the form factor and electrical characteristics to plug directly into a NEMA type C or D detector rack or Caltrans TEES Input File. The card shall occupy two slots of the detector rack and shall provide four detector outputs on its rear-edge connector. A front connector shall provide communication to the communications interface panel. A front connector shall allow 16 inputs and 24 contact-closure detector outputs for wiring into the cabinet. A front panel LED for each of the 16 inputs and 24 outputs shall indicate the state of the input or output. The wired

input/output card shall support optional expansion cards in other slots. Each expansion card shall support 4 outputs to the back edge of the card. The wired input/output card shall support optional harnesses for connection to Input Files or C1, C4, C11, and C12 ports to support Type 170 or Type 2070 controllers.

643.064 System Management Software. Management software shall be a Windows-based application and shall be compatible with Windows 7 and Windows 10 operating systems. The software shall communicate with the video detection system via Ethernet. The management software shall automatically determine all video sensors and communications interface panels available on the local network and populate a list of all devices. The management software shall provide the user a means to name individual video sensors and communications interface panels.

The management software shall provide a means for the user to zoom the camera optics while viewing a live video stream. The management software shall provide a means for the user to calibrate distances in the field of view. The management software shall provide the user a means to create 4-sided detection zones in the field of view using either a still snapshot or live video. The management software will overlay an outline of each detection zone over the background image. It shall be possible for the user to place detection zones anywhere in the field of view for stop line detection and/or advance detection. It shall be possible for the user to set the desired color of both the on and off states of the detection zone overlay. It shall be possible for the user to alter the size and shape of any previously created zone. It shall be possible for the user to overlap zones, either partially or fully. It shall be possible for the user to name each zone uniquely. It shall be possible for the user to assign each zone to detect vehicles, to detect bicycles, or to detect both, and to specify different outputs for each type. It shall be possible for the user to assign the same output to multiple zones such that the output will be on if any of the zones are detecting a vehicle or bicycle. It shall be possible for the user to assign a single zone to more than one output such that if a vehicle or bicycle is detected, all the assigned outputs shall be turned on. The management software shall be capable of creating at least 99 detection zones per video sensor.

It shall be possible for the management software to retrieve all configuration parameters from video sensors or communications interface panels. It shall be possible for the user to save all the settings for a video sensor or a communications interface panel to a laptop file. The management software shall provide a means to read or import all the settings from a previously saved configuration file for a video sensor or a communications interface panel. The management software shall be able to download a new version of the application software into a communications interface panel and its attached video sensors. The management software shall provide a screen to monitor operation of a video sensor. The monitoring screen shall include a live video stream from the video sensor with at least HD 1280x720 pixel resolution. The monitoring screen shall show indications of detection in real time by changing the color of the detection zone.

It shall be possible for the user to configure different indications for vehicle detections vs. bicycle detections when both are configured for the same zone. The monitoring screen shall include the following optional, configurable objects. It shall be possible for the user to size and position them anywhere on the screen and to change the color and size of text:

A. An indication of when an output is on or off, along with a user-configurable name for that indicator
B. The current time in the video sensor.

C. A user-configurable title or name.
D. The version number of the video sensor software.
E. It shall be possible for the user to turn the overlay graphics on or off with a single setting.

The management software shall provide a screen to monitor operation of the intersection with a quad-view video stream from the communications interface panel. The quad-view video stream shall have a resolution of at least HD 1280x720 pixels, where each of the sensor videos comprising the quad-view shall be at least 640x360 pixels. It shall be possible for the user to configure the order that the sensor videos appear in the quad-view. The real-time quad-view video stream shall be capable of displaying the overlay graphics for all four sensors simultaneously. While monitoring the video of a single video sensor or of the quad-view, it shall be possible for the user to request a "snapshot" or single-frame image to save to a named file on a laptop. While monitoring the video of a single video sensor or of the quad-view, it shall be possible for the user to record a period of the video to save to a named file on a laptop.

The video detection system and management software shall provide three methods to synchronize the time of day clocks in the communication interface panel and the video sensors, as follows:

A. Manual time synchronization operation by the user, which sets the time to the current time on the laptop where the management software is running.
B. A configuration setting to allow the communications interface panel to automatically obtain time from the NEMA TS2 protocol on the SDLC channel and broadcast it to the video sensors.
C. A configuration setting to allow the communications interface panel to automatically obtain time from up to five Network Time Protocol (NTP) sources and broadcast it to the video sensors.

In addition to the ability to view video streams in the management software, it shall be possible to view video from individual sensors or to view the quad-view from the communications interface panel using a third-party video player application on a tablet, smartphone or laptop computer.

643.065 Detection Performance. The video detection system shall detect the presence of vehicles in defined zones and turn on the assigned output when the vehicle is present in the zone.

For stop line detection zones, the probability of not detecting the presence of a vehicle shall be 1% or less under all operating conditions when the video sensor is installed and configured properly. For detection zones placed at the stop line, the probability of falsely detecting a vehicle that is not present shall be 3% or less under all operating conditions when the video sensor is installed and configured properly.

For advance detection zones it shall be possible to place the zones such that the farthest point of the zone is up to 600 feet from the video sensor. Advance detector zone placement shall include 2-3 car lengths of field-of-view beyond the farthest point of the zone. To ensure statistical significance for the above detection performance specifications, the data shall be collected over 24-hour time intervals (so as to avoid a single lighting condition) and will contain a minimum of one hundred (100) vehicles per lane. The calculations of detection performance

will not include turning movements where vehicles do not pass through the detectors, vehicle lane-change anomalies, or where they stop short or stop beyond the combined detection zones.

643.066 Failsafe Mode. The video detection system shall provide a failsafe mode for each video sensor. If the failsafe mode is enabled, all programmed presence detection outputs for the video sensor shall be turned on, thus placing constant calls to the controller. When failsafe mode is disabled, all outputs revert to normal on/off operations. The video sensor shall continuously monitor the overall contrast in the video. If the overall contrast falls below a preset level (such as caused by dirty faceplate, severe glare, extreme fog, or temporary ice/snow on the faceplate), the sensor shall enable the failsafe mode. When sufficient contrast is restored in the video, the sensor will disable the failsafe mode.

The communications interface panel shall continuously monitor the connectivity status of the attached video sensors. If any video sensor goes offline due to either electrical failure or internal software failure, the communications interface panel shall enable the failsafe mode for that video sensor. If the video sensor comes back online, failsafe mode shall be disabled.

643.067 Data Collection. The video detection system shall automatically collect and store traffic flow data in non-volatile memory for later retrieval and analysis. No additional hardware or software shall be necessary. The data shall include vehicle counts and vehicle average speeds. The management software shall be able to retrieve collected data for a specified period of time or for all currently stored data and save into a standard CSV file.

643.068 Installation and Setup. The video detection system hardware shall be designed for flexible, fast and easy installation and setup. It shall be possible to mount the video sensor on an intersection pole, mast arm, or luminaire arm. No special tools or extra equipment, other than a laptop for configuration, will be required. Once all hardware is installed, connected and functional, it shall be possible to configure the video detection system for a typical 4-approach, 8-phase intersection in 15 minutes or less.

643.069 Warranty, Service and Support. The video detection system shall be provided with the following warranty, service and support options.

643.0691 Warranty. The manufacturer shall warrant the video detection system for a minimum of three (3) years. An option for up to six (6) years of warranty shall be available.

643.0692 Service. Ongoing software support by the manufacturer will include software updates of the video sensor, communications interface panel, and management software. These updates will be provided free of charge during the warranty period. The manufacturer will maintain a program for technical support and software updates following expiration of the warranty period. This program will be available to the contracting agency in the form of a separate agreement for continuing support.

643.0693 Support. A quick-start guide, installation guide, application notes, and other materials shall be available from the manufacturer to assist in product installation and setup for various applications. In addition, training online or in person shall be available. Training shall be available to personnel of the contracting agency in application design, operation, setup, and maintenance of the video detection system. Manufacturer shall provide a tech support website and an 800 number for technical support.

643.07 Contacts. All contacts used in connection with interval indications shall be of pure coin silver or equivalent, and shall be capable of breaking and carrying 15 A at 125 V alternating current. The contacts shall be readily accessible and capable of being replaced in the timer without the use of any tools other than pliers and screw driver.

643.08 Pedestals. Meter pedestal shall be as indicated on the plans.

643.09 Radio and television interference. Electrical equipment shall be prevented from interfering with radio and television reception.

643.10 Cable and Wire. Cable shall be plastic covered cable meeting the applicable requirements of the International Municipal Signal Association (IMSA) specifications. The conductor color coding shall not be by means of printed code. All wiring shall be new. Reuse of existing cable will not be allowed. Actual color coding shall be used. The minimum size wire for the circuits shall be as follows:

	Minimum A.W.G. #
(a) Service to Cabinet	2 Stranded
(b) Cabinet to Pole or Pedestal	12 Stranded
(c) Cabinet to Luminaire	10 Stranded
(c) Pole or Pedestal to Receptacles	14 Stranded
(d) Equipment Grounding Conductor	8 Stranded

Each lead-in cable shall be marked with plastic tape corresponding to the following color code to identify which phase it pertains to at the splice(s) in both the pull box(es) and in the cabinet.

PHASE COLOR CODE

Phase 1	1 Blue
Phase 2	1 Green
Phase 3	1 Yellow
Phase 4	1 Red
Phase 5	2 Blue
Phase 6	2 Green
Phase 7	2 Yellow
Phase 8	2 Red

Traffic signal conduit, pull boxes, frames, and covers shall conform to Section 626 of the Standard Specifications. Conduit for all lines shall be 3 inch in diameter unless noted on the plans. Unless otherwise noted, all conduits shall be schedule 80 PVC.

643.11 Painting. Prior to erection and assembly, if not manufactured of polycarbonate material, the entire traffic or pedestrian signal housing and visors shall be painted with an approved zinc-rich primer and a finish enamel coat as noted below. All paint shall conform to Section 708 of the Standard Specifications. The following colors of enamel shall be used:

(a) Controller Cabinet	Outside: Natural Aluminum
(b) Housings	Black (2)
(c) Visors	Inside: Black (2); Outside: Black (2)
	Federal No.
(1) Green Enamel =	H8-577
(2) Black Enamel =	17038
(3) Federal Yellow Enamel =	13538

After the signals have been completely installed, two coats of enamel shall be applied to all unpainted or scratched surfaces after the surface has been lightly sanded to remove gloss.

643.12 Backfill for foundations. Unless otherwise ordered, backfill for foundations shall be material conforming to the requirements of Section 203.26 of the Standard Specifications – Gravel Borrow.

643.13 Construction Requirements. All traffic signal and electrical installations shall comply with the requirements specified herein, local and utility codes, MUTCD, and the National Electrical Code (NEC). All employees of the signal subcontractor shall have an OSHA 10 Hour Certification. The signal subcontractor shall have at least one representative onsite at all times with an IMSA Traffic Signal Level 2 Field certification.

A preconstruction meeting with the Contractor, signal Subcontractor, Engineer and Maine Turnpike Authority representative shall be arranged not less than 3 days prior to the start of signal installation, to resolve any problems.

Upon commencement of any signal work within the intersection, the contractor will be responsible for any ongoing trouble calls at the intersection. There will be no separate payment for this work but shall be considered incidental to the traffic signal modification item.

Any operating traffic signal shall be left in a non-flash operating condition at the end of each work day, with or without detection.

The signal Subcontractor shall notify the Maine Turnpike Authority ITS / Toll Manager no less than 3 days prior to final inspection of signal installation. This final inspection is required prior to signal activation.

Each signal head mounted on a mast arm shall be installed with a 1/8 inch diameter aircraft cable, looped around the mast arm and mast arm bracket, as a safety device to prevent the signal head from falling. Cable ends shall be fastened by two opposing “U” clamps. When suspended

by this cable, the top of the signal head shall be no more than 6 inches below the bottom of the mast arm.

All conduit lines necessary shall be constructed for the proper operation of the signals and shall conform to Section 626 of the Standard Specifications.

All conduits terminating in the cabinet shall be sealed with duct sealant.

Concrete foundations with anchor bolts to secure the traffic signal structures, flasher or controller cabinets, and meter pedestals, shall be installed at the locations specified on the plans. The concrete foundation for the controller cabinet shall be raised a minimum height of 3 inches up to a maximum height of 18 inches above the finished surface as directed by the Resident. Chamfer strips shall be used on all signal controller cabinet foundations. Forms shall be inspected before concrete is placed. The use of a precast foundation for the controller cabinet will not be permitted.

Poles shall not be mounted on the leveling nuts until the concrete has cured for at least 7 days or attained a minimum of at least 80 percent of its design compressive strength.

Provide protection for wiring from rodents and other elements as approved by the Engineer and/or as shown on the Plans.

Prior to placing the controller cabinet on its foundation, silicone sealant shall be applied to the area of contact.

The Contractor shall use bolt pattern templates when setting mast-arm anchor bolts, signal pedestal bolts and controller cabinet mounting bolts. The templates shall remain in place for a minimum of 24 hours.

Wood poles shall be placed in the ground to a depth of 20% of their overall length, with a maximum deviation from the vertical of ¼ inch in 5 feet.

Wood poles with a back-guy cable shall be placed in the ground to a depth of 20% of their overall length. Poles shall be back-guyed using a 10-inch expanding anchor with a 3/4 inch by 96-inch anchor rod. Thimble eyes of anchor rods shall extend 12 inches above finish ground. Cable used for back-guying shall be attached to the anchor rod by a short bail automatic type grip and to the guy hook on the pole by a preformed type grip. The pole shall be drilled 14 inches from top and a 5/8 inch oval eyebolt installed with one square flat washer and square nut on the messenger side and one square washer, square nut and guy hook on the opposite side. Any guy wire, messenger wire or span wire installations done on Utility Company poles shall follow Utility Company requirements.

643.131 Service and Meter Box. Electrical Service for the signal will be provided by the Authority, the contractor shall run the needed conduit and wiring from the signal cabinet to the existing junction box in the northwest corner of the intersection.

643.132 Signal Cable and Wire Installation. The Contractor shall furnish and install sufficient cable and wire to operate the system properly and at least 4 spare conductors in each cable run shall be provided. Pulling a separate cable to achieve the required number of spares will not be allowed.

Each approach to the intersection shall have a dedicated cable run from the controller cabinet.

No more than one cable shall be permitted in a conduit except to eliminate splices in pull boxes. When more than one cable is permitted the area of combined cables shall not exceed 30 percent of the inside area of the conduit.

Messenger cable shall run unspliced between poles and shall be installed with a 5 percent sag in the wire when measured from the point of attachment to the middle of span. The cable shall be attached to the pole eyebolt by a preformed type grip on one end and an automatic type grip on the opposite end. Messenger cable shall be grounded to the back-guy cable.

Signal bases, housings and controllers shall be furnished and installed as required. All structures and housings shall be plumb after erection.

Multiple housings on a single post shall be grouped together using 1-1/2 inch galvanized pipe and 1-1/2 inch galvanized rail fittings. All attachments to the posts shall be made by means of adapters conforming to the following. Housing adapters for pedestal mounting shall be constructed of cast iron. They shall be adjustable with serrated surfaces to permit the housing to be locked in the desired horizontal position. The adapters shall be secured to the bottom of the housing by means of a close nipple, shall slip fit at least 7 inch over a standard traffic signal post of 4 inches in diameter and shall be secured to the post by a minimum of four set screws. Adapters shall contain raceways from the housing to the post to protect the wires from the elements. The center of all housings shall be in the same horizontal plane.

Miscellaneous electrical equipment. All additional electrical fittings, service conduit, switches, fuses, traffic signal bulbs, and such other hardware as is necessary to properly and securely install the equipment shall be furnished. All electrical fittings shall be weatherproof.

Wiring and connections. All connections shall be spliced, soldered, compounded, and taped within a splice boot. The use of wire nuts will not be permitted. Each span shall have one splice boot for the purpose of the phases on that span only. The following color code shall be used:

(a) Red Wire	Red, Artery
(b) Orange Wire	Yellow, Artery
(c) Green Wire	Green. Artery
(d) Red with tracer	Red, Side Street
(e) Orange with tracer	Yellow, Side Street
(f) Green with tracer	Green, Side Street
(g) White	Neutral for all signals
(h) Blue	All steady burning arrows
(i) Blue with tracer	Intermittent arrows
(j) Remaining	Push buttons and spares

Note: The white wire shall be used for all neutral connections and shall be connected to the service ground.

No street lighting splices will be permitted in the mast-arm shaft. Splices for street lighting and lightning arrestors shall be located inside the nearest street light pull box.

Ground connections. All installations and equipment shall be bonded and grounded to the service ground rod in accordance with the requirements of the electric power company.

Each signal cable run shall be installed with one green plastic covered copper ground wire to which all equipment shall be bonded in accordance with standard practice. Each base and post, cabinet, and any other component that would be considered a part of the signal system shall be bonded to the ground wire. This ground wire shall be connected to the ground rod at the controller cabinet.

643.133 Installation of signals and equipment. The signals and equipment shall be installed by competent workmen or the manufacturer's representative.

Prior to placing the signals in operation, the signal housing shall be hooded with approved non-transparent material or turned to clearly indicate that the signals are not in operation.

Signs mounted on the signals not applicable to construction conditions shall be covered as specified in Section 645 of the Standard Specifications.

All material including poles, foundations, fittings and cable shall be supplied and installed to make a complete operative installation.

Signs installed on signal arms shall be mounted with "Astro Sign Bracs" at a right angle to the roadway. Signs mounted on span wire shall be mounted with Pelco "Span Wire Sign Hangar Assemblies," or approved equal.

The existing controller cabinet, controller, cabinet equipment and spanwire mounting hardware shall be the property of the Authority. All existing signal heads and LED's shall become the property of the contractor.

643.14 Operation. The Contractor shall commence the operation of the signal system only when permitted by the Engineer. Unless otherwise noted, signals shall be placed in flash a minimum of 1 week before the planned start of operation. New signals shall be made operational between the hours of 10:00 AM and 2:00 PM unless approved by the Engineer.

Operating sequences shall be as shown on the plans or as ordered.

Operating sequences shall be verified by testing.

In cooperation with the Fire Department, the Contractor shall make trial runs to ascertain proper timing of the fire pre-emption system. The minimum time shall be approved by the Chief of the Fire Department or the Chief's representative.

The Contractor shall provide a qualified technician to thoroughly review and confirm that the system is satisfactory and operational as designed. Prior to the final inspection, the Contractor

shall have a review with the Authority's Toll / ITS Manager and local officials (including Fire Department technician) to review and comment upon the system.

643.15 Warranty. Upon completion of the project, the Contractor shall forward to the Authority all warranties to the purchaser that the equipment which has been installed hereunder shall be free from defects in materials, workmanship and title, and shall be of the kind and quality designated or described in the Contract. The foregoing warranty supersedes all other warranties whether written, oral, or implied. If it appears within 24 months from the date of Acceptance of the work that the equipment installed hereunder does not meet the warranties specified above, the Contractor shall promptly correct any defect or nonconformance with the specifications. This warranty does not relieve the Contractor of the requirement of Section 106 of the Standard Specifications.

643.16 Method of Measurement. The traffic signal modifications will be measured as a lump sum unit. The video detection system will be measured as a lump sum unit.

643.17 Basis of Payment. The accepted quantity of traffic signals will be paid for at the Contract lump sum price complete in place.

When an item of conduit appears in the Contract, conduit for traffic signals will be paid for under Section 626 of the Standard Specification. When no item for conduit appears in the Contract, any conduit required will be incidental.

All miscellaneous electrical equipment required shall be subsidiary.

Video Detection System (Item 643.83) will be paid for at the contract lump sum price, which payment will be full compensation for installation and furnishing all materials and all appurtenances and incidentals required for a complete functioning installation. The Contractor shall coordinate with the Manufactures Representative for initial configuration and onsite training.

Payment will be made under:

Pay Item		Pay Unit
643.71	Traffic Signal Modifications at Exit 19 and Sanford Road	Lump Sum
643.83	Video Detection System	Lump Sum

SPECIAL PROVISION

SECTION 645

HIGHWAY SIGNING

(Cantilever Guide Sign)

645.023 Support Structures

The following paragraph shall replace the second paragraph under section b. Bridge, Cantilever, and Butterfly Type Sign Supports:

Signs shall be placed on the support structure such that the bottom edges are aligned (unless written consent from the Fabrication Engineer is obtained), while accommodating the minimum height requirement – see Section 645.06. The Contractor shall use the Contract Drawings in order to determine the approximate horizontal placement of signs. Installation shall be in accordance with Section 645.06 – Installation of Type I Signs. The overhead sign structure foundations have been designed with the assumption that the installed signs represent the maximum sign design areas for the respective structures. The new overhead sign structures shall be designed to accommodate the sign area proposed on each structure as shown on the Contract Documents. There shall be no allowance for future sign area increase.

645.024 Bridge, Cantilever and Butterfly Support Structure Foundations The following paragraphs are added to the end of this subsection:

If an alternate foundation system is proposed, it shall be designed and sealed by a professional engineer licensed in the State of Maine in accordance with MaineDOT Specification 626.034 with the following additional requirements:

a. Shallow spread footings shall bear on a continuous 1-foot thick layer of compacted bedding material conforming to MaineDOT Standard Specification 703.19 Granular Borrow Material for Underwater Backfill that is placed on prepared subgrade. The bottom of the footings shall be founded at least 5 feet below the lowest surrounding final grade for frost protection. Regardless of the calculated factored bearing pressures, the footings shall not be less than 4 feet square. The designer shall select appropriate resistance factors, as well as site-specific values for bearing capacity, modulus of subgrade reaction, and interface friction angle. Use of presumptive bearing capacities shall not be allowed.

b. If a pair of drilled shafts is proposed to support the overhead sign, the designer shall evaluate the reactions at the top of each drilled shaft that are imparted by the actual loads (axial, bending moment, and torsion) by use of vetted group drilled shaft software, such as Group or FB Multipier. The designer shall select appropriate resistance factors, as well as site-specific values for groundwater depth, and nominal unit side resistance and tip resistance.

645.08 Method of Measurement Add the following to the end of the second paragraph:

Structural excavation, rock excavation, and/or rock doweling necessary for foundation construction will be considered incidental to the sign item.

645.09 Basis of Payment This subsection is amended by the addition of the following:

Payment will be made under:

Pay Item		Pay Unit
645.15	Cantilever Guide Sign: (Sta. 10+62)	Lump Sum

SPECIAL PROVISION

SECTION 645

HIGHWAY SIGNING

(Protection of Signs with Type XI Sheeting)

645.04 Fabrication of Type I Guide Signs

The following paragraphs are added after the second paragraph in part b. Reflective Sheeting:

The Contractor and Sign Fabricator shall exercise all due caution to avoid any creases, bends, tears, punctures, or other damage to any Type XI sign sheeting, perceptible or not. Sign sheeting shall be protected at all times following application to the extruded aluminum surface. Any defect which becomes perceptible either under direct, indirect or no light conditions shall be cause for rejection of the sign panel.

Following the application of the sign legend and borders, the sign panel shall be protected from all hazards that may cause a defect to the sign sheeting (either background, legend or borders) in accordance with the manufacturer's recommendations. Fabricated signs shall not be stacked during storage, transport, or erection such that concentrated pressure is placed on one area of the sign face that is not uniform across the full sign face.

645.08 Method of Measurement

The fifth (5^{th}) paragraph is deleted and replaced by the following paragraph:

The area of roadside guide signs, regulatory, warning, confirmation and route marker assembly signs of the respective types, will be measured by the area in square feet, computed to the nearest hundredth of a square foot (0.01 SF), as determined by the overall height multiplied area of the sign that becomes perceptible under direct, indirect, or no light conditions shall be cause for rejection of the whole sign panel.

SPECIAL 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. These requirements may be adjusted based on the traffic volume when authorized by the Authority.

Traffic Control Requirements

A minimum of one lane of traffic in each direction shall be maintained on Route 109/Sanford Road at all times, in accordance with the details shown on the Plans. A minimum of two lanes of traffic on the Exit 19 off-ramp shall be maintained at all times except as noted below in accordance with the details shown on the Plans with the exception of installing or removing traffic control devices or as noted below. Travel lanes shall be at least 11 feet wide.

Work directly over traffic or within six feet of a travel lane as measured from the painted pavement marking line or traffic control device will require a lane closure. This work includes installation of sign structures and installation of signs.

No temporary lane closures will be allowed between 6AM and 9AM in the morning and between 3PM and 7PM in the evening. Travel lanes may not be impeded by traffic control devices until the time frames specified. Lane Closures shall be removed if construction is not ongoing. Unattended lane closures are not allowed.

All work associated with 643 pay items that are within travel lanes and associated temporary lane closures shall occur at night, between the hours of 9PM at night and 5AM the following morning.

A barrier-protected shoulder closure shall be used for installation of sign structure foundations in accordance with the details shown on the Plans.

SPECIAL PROVISION

SECTION 719

SIGNING MATERIAL

Section 719.01 Reflective Sheeting

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

Retroreflective sheeting for signs shall meet at a minimum the requirements for ASTM 4956 – Type XI (Prismatic) manufactured by 3M Company, for all signs.

Reflective sheeting, used in sign construction, shall have been manufactured within the six months immediately prior to the fabrication of each sign. Upon delivery at the job site of each shipment of signs, a letter of certification shall be provided that the reflective sheeting conforms to the requirements.

For Type 1 Guide Signs, all reflective sheeting shall be color matched on each sign unit.

All warning signs shall be fluorescent yellow except for Ramp Advisory Speed signs which shall be yellow.

All Construction Series signs that use orange backgrounds shall be fluorescent orange.

All Pedestrian Signs shall be fluorescent yellow-green.

EZ-PASS Purple shall conform to the FHWA Purple color box.

719.02 Demountable High Intensity Reflectorized Letters, Numerals, Symbols, and Borders

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

719.02 Direct Applied Reflectorized Letters, Numerals, Symbols, and Borders

Direct applied letters, numerals, symbols and borders shall consist of cut out sheeting that shall meet at a minimum the requirements for ASTM 4956 – Type XI (Prismatic) sheeting. The sheeting material used for the direct applied legend shall be the same type as used for the background.