

MAINE TURNPIKE AUTHORITY

ADDENDUM NO. 1

CONTRACT 2016.02

GRAY INTERCHANGE

(EXIT 63)

Make the following changes to the bid documents:

**Contract Documents:**

In the Contract Documents, Proposal, page sheets P-2, P-12, P-17, P-18, and P-19 shall be **DELETED** and **REPLACED**. Revised page sheets included in this addendum.

In the Contract Documents, Part 2 – Special Provisions, under 104.4.7 Cooperation With Other Contractors on page SP-13, **INSERT** the following sentence after the fourth paragraph: “The Contractor shall notify MTA a minimum of 4 weeks prior to the date in which the Contractor would like the MTA field office moved or relocated from the current location.”

In the Contract Documents, Part 2 – Special Provisions, Section 621 Landscaping (Tree and Shrub Planting), Subsection 621.0038 “Basis of Payment”, **REPLACE** “Dwarf Evergreen (2.50’-3’) Group B” with “Dwarf Evergreen (2’-2.50’) Group B”.

In the Contract Documents, Part 2 – Special Provisions, Section 643 Traffic Signals shall be **DELETED** and **REPLACED**. Revised page sheets included in this addendum.

In the Contract Documents, Part 2 – Special Provisions, Section 645 Highway Signing (Sign Structure Foundations) shall be **DELETED** and **REPLACED**. Revised page sheets included in this addendum.

In the Contract Documents, Part 2 – Special Provisions, Section 650 Dynamic Message Sign shall be **DELETED** and **REPLACED**. Revised page sheets included in this addendum.

In the Contract Documents, Part 2 – Special Provisions, Section 652 Maintenance of Traffic (Specific Project Management of Traffic Requirements), page SP-296 shall be **DELETED** and **REPLACED**. Revised page sheet included in this addendum.

In the Contract Documents, Part IV – Appendices, Appendix F – Product Data Sheets, page sheets AP-F24, AP-F25, AP-F26, and AP-F27 have been **ADDED**.

In the Contract Documents, Part IV – Appendices, Appendix G – Sign Text Layout Sheets, Sign Number GS-27 Detail shall be **DELETED** and **REPLACED**. Revised page sheet included in this addendum.

In the Contract Documents, Part IV – Appendices, Appendix G – Sign Text Layout Sheets, Sign Number GS-28 Detail shall be **DELETED** and **REPLACED**. Revised page sheet included in this addendum.

## **Plans:**

In the Plans – Volume 1 of 2, Sheet Number 15 of 412 shall be **DELETED** and **REPLACED**. Revised half and full size plan sheets included in this addendum.

In the Plans – Volume 1 of 2, Sheet Number 16 of 412 shall be **DELETED** and **REPLACED**. Revised half and full size plan sheets included in this addendum.

In the Plans – Volume 1 of 2, Sheet Number 199 of 412 shall be **DELETED** and **REPLACED**. Revised half and full size plan sheets included in this addendum.

In the Plans – Volume 2 of 2, Sheet Number 234 of 412 shall be **DELETED** and **REPLACED**. Revised half and full size plan sheets included in this addendum.

In the Plans – Volume 2 of 2, Sheet Number 235 of 412 shall be **DELETED** and **REPLACED**. Revised half and full size plan sheets included in this addendum.

## **Questions:**

**The following question(s) were submitted to the Maine Turnpike Authority. Answers to the questions are noted below. Bidders shall utilize this information in preparing their bid.**

- 1) Question: There are notes on the plans for “Guardrail Type 3D Long Posts”. What is meant by “Long Posts”?

*Response: A minimum of three feet shall be provided between the face of the guardrail and the break in embankment. To minimize impacts, a two foot space may be used, but seven foot guardrail posts (“Long Posts” are required.*

- 2) Question: Please clarify the differences between the schedule of items and the plants list sizes on plans sheets 233 and 234 for items 621.043, 621.044, 621.408, 621.541, 621.542, and 621.543.

*Response:*

- *Items 621.043 & 621.044 - Plant sizes are required to be a minimum of 6’ tall.*
- *Item 621.408 – Plant size should be 2’-2.50’*
- *Items 621.552, 621.553, 621.554 - These shrubs are all shown on Sheet 233.*

- 3) Question: The specifications have a special provision section 202 Removing Rumble Strips (SP-59 & 60) which states payment will be made under pay item 202.206. There is not an item 202.206 in the schedule of items. Please advise.

*Response: Item 202.206 has been added to the Contract.*

- 4) Question: Bidding Instructions specifically list that subconsultants must be prequalified with MaineDOT? Is it possible to get prequalified prior to the bidding?

*Response: Per Special Provision 103.3.1, the subconsultant can apply to get prequalified directly with the Maine Turnpike Authority prior to bidding. They will need to submit the MaineDOT form and a list of current/past projects to Nate Carll, Maine Turnpike Authority at [NCarll@maineturnpike.com](mailto:NCarll@maineturnpike.com) and marked as Pre-Qualification Package. The approximate turnaround time is one week*

Notes: The above items shall be considered as part of the bid submittal.

A Pre-Bid Conference was held on January 7, 2016 at 1:00PM at the Maine Turnpike Authority for this project. The attached agenda, sign-in sheet, and Pre-Bid Conference Questions/Comments and Responses are included.

The total number of pages included with this addendum is seventy five (75).

All bidders are requested to acknowledge the receipt of the Addendum No. 1 by signing below and faxing this sheet to Nate Carll, Purchasing Department, (207) 871-7739. Bidders are also required to acknowledge receipt of this Addendum No. 1 on Page P-8 of the bid package.

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Business Name

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Print Name and Title

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Signature

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Date

January 12, 2016

Very truly yours,

MAINE TURNPIKE AUTHORITY

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Purchasing Manager  
Maine Turnpike Authority

**SCHEDULE OF BID PRICES  
CONTRACT NO. 2016.02  
GRAY INTERCHANGE  
(EXIT 63)  
MILE MARKER 63.3**

Item No	Item Description	Units	Approx. Quantities	Unit Prices in Numbers		Bid Amount in Numbers	
				Dollars	Cents	Dollars	Cents
202.12	REMOVING EXISTING STRUCTURAL CONCRETE	Cubic Yard	160				
202.15	REMOVE MANHOLE OR CATCH BASIN	Each	9				
202.193	REMOVING EXISTING BRIDGE	Lump Sum	1				
202.202	REMOVING PAVEMENT SURFACE	Square Yard	6700				
202.201	REMOVING PAVEMENT SURFACE - BRIDGE DECK	Square Yard	1230				
202.203	PAVEMENT BUTT JOINTS	Square Yard	890				
202.206	REMOVING RUMBLE STRIPS	Linear Foot	2150				
203.20	COMMON EXCAVATION	Cubic Yard	52670				
203.25	GRANULAR BORROW	Cubic Yard	25				
203.26	GRAVEL BORROW	Cubic Yard	75				
206.061	STRUCTURAL EARTH BELOW GRADE STRUCTURE	Cubic Yard	100				
206.082	STRUCTURAL EARTH EXCAVATION – MAJOR STRUCTURES, PLAN QUANTITY	Cubic Yard	320				

**CARRIED FORWARD:**

Item No	Item Description	Units	Approx. Quantities	Unit Prices in Numbers		Bid Amount in Numbers	
				Dollars	Cents	Dollars	Cents
<b>BROUGHT FORWARD:</b>							
620.58	EROSION CONTROL GEOTEXTILE	SY	638				
621.043	EVERGREEN TR (6'-8') GP A	EA	5				
621.044	EVERGREEN TR (6'-8') GP B	EA	8				
621.248	LG DECID TR (5'-6') GP A	EA	20				
621.279	LG DECID TR (2.50"-3" CAL) GP A	EA	4				
621.408	DWF EVERGREENS (2'-2.5') GP B	EA	19				
621.536	DECID SHRUBS (12"-18") GP B	EA	4				
621.541	DECID SHRUBS (18"-24") GP B	EA	2				
621.542	DECID SHRUBS (18"-24") GP C	EA	5				
621.543	DECID SHRUBS (2'-3') GP C	EA	2				
621.552	DECID SHRUBS (3'-4') GP A	EA	7				
621.553	DECID SHRUBS (3'-4') GP B	EA	15				
621.554	DECID SHRUBS (3'-4') GP C	EA	6				

**CARRIED FORWARD:**

Item No	Item Description	Units	Approx. Quantities	Unit Prices in Numbers		Bid Amount in Numbers	
				Dollars	Cents	Dollars	Cents
<b>BROUGHT FORWARD:</b>							
634.208	REMOVE AND RESET LIGHT STANDARD	EA	5				
634.231	CONVENTIONAL LIGHT STANDARD WITH LED FIXTURE	EA	43				
643.7111	TRAFFIC SIGNAL MODIFICATIONS: US 202/ME 4/ME 115 NB RAMPS	LS	1				
643.7112	TRAFFIC SIGNAL MODIFICATIONS: US 202/ME 4/ME 115 AT SB RAMPS/ME 26A	LS	1				
643.7113	TRAFFIC SIGNAL MODIFICATIONS: US 202/ME 4/ME 115 AT ME 115/ME 100	LS	1				
643.7114	TRAFFIC SIGNAL MODIFICATIONS: US 202/ME 4 AT BROWN ST/SHAKER RD	LS	1				
643.712	LANE USE SIGNAL INSTALLATION	EA	3				
643.831	VIDEO DETECTION SYSTEM: US 202 AT NB RAMPS	LS	1				
643.832	VIDEO DETECTION SYSTEM: US 202 AT SB RAMPS	LS	1				
643.86	TRAFFIC SIGNAL LOOP DETECTOR	EA	3				
643.901	INTERCONNECT WIRE BETWEEN: SB RAMP INTERSECTION TO NB RAMP INTERSECTION	LS	1				
643.902	INTERCONNECT WIRE BETWEEN: SB RAMP INTERSECTION TO SB TOLL BUILDING	LS	1				
643.903	INTERCONNECT WIRE BETWEEN: NB RAMP INTERSECTION TO US 202 AND ME 100/ME 115	LS	1				

**CARRIED FORWARD:**

Item No	Item Description	Units	Approx. Quantities	Unit Prices in Numbers		Bid Amount in Numbers	
				Dollars	Cents	Dollars	Cents
<b>BROUGHT FORWARD:</b>							
643.904	INTERCONNECT WIRE BETWEEN: US 202 AND ME 100/ME 115 TO US 202 AND BROWN/SHAKER	LS	1				
643.91	MAST ARM POLE	EA	4				
643.93	STRAIN POLE	EA	1				
645.105	REMOVE AND STACK SIGN	EA	141				
645.109	REMOVE AND RESET SIGN	EA	67				
645.1091	CANOPY MOUNTED SIGN	EA	2				
645.121	OVERHEAD GUIDE SIGN: STA 613+60	LS	1				
645.122	OVERHEAD GUIDE SIGN: STA 628+17	LS	1				
645.123	OVERHEAD GUIDE SIGN: STA 204+11	LS	1				
645.124	OVERHEAD GUIDE SIGN: STA 417+03	LS	1				
645.151	CANTILEVER GUIDE SIGN: STA 608+15	LS	1				
645.152	CANTILEVER GUIDE SIGN: STA 704+09	LS	1				
645.251	ROADSIDE GUIDE SIGN, TYPE 1	SF	572				

**CARRIED FORWARD:**

Item No	Item Description	Units	Approx. Quantities	Unit Prices in Numbers		Bid Amount in Numbers	
				Dollars	Cents	Dollars	Cents
<b>BROUGHT FORWARD:</b>							
645.271	REGULATORY, WARNING, CONFIRMATION AND ROUTE ASSEMBLY SIGN, TYPE 1	SF	506				
645.289	STEEL H-BEAM POLES	LBS	3500				
648	INSTALL FLAGPOLE AND LIGHTING	LS	1				
650.1011	DYNAMIC MESSAGE SIGN (DMS) SYSTEM: STA 601+82 RT	LS	1				
650.1012	DYNAMIC MESSAGE SIGN (DMS) SYSTEM: STA 622+15 LT	LS	1				
650.1013	DYNAMIC MESSAGE SIGN (DMS) SYSTEM: STA 704+09 LT	LS	1				
650.2011	DMS GROUND MOUNTED CONTROL CABINET: STA 601+82 RT	EA	1				
650.2012	DMS GROUND MOUNTED CONTROL CABINET: STA 622+15 LT	EA	1				
650.2013	DMS GROUND MOUNTED CONTROL CABINET: STA 704+09 LT	EA	1				
650.9011	DMS SOLAR POWER SYSTEM: STA 601+82 RT	LS	1				
650.9012	DMS SOLAR POWER SYSTEM: STA 622+15 LT	LS	1				
650.9013	DMS SOLAR POWER SYSTEM: STA 704+09 LT	LS	1				
652.312	TYPE III BARRICADES	EA	6				

**CARRIED FORWARD:**

SPECIAL PROVISION

SECTION 643

TRAFFIC SIGNALS

The entire Section 643 Traffic Signals is deleted and replaced with the following:

643.01 Description This work shall consist of furnishing and installing or modifying existing traffic signals at the locations indicated herein and as shown in the Plans. Work shall include traffic signal modifications, new controllers, cabinets, cabinet hardware, new and relocated signal heads and signs, new video detection systems, and new interconnect wiring. The work shall include poles, foundations, backfill, and all necessary fittings, cables, and components as ordered.

The work shall consist of furnishing and installing a new mast arm traffic signal system at the intersection of US 202 / ME 4 / ME 115 and the I-95 Southbound ramps / ME 26A. The signal system shall be constructed as specified herein and as shown on the Plans.

The work shall consist of modifying an existing span wire traffic signal system at the intersection of US 202 / ME 4 / ME 115 and the I-95 Northbound ramps. The existing signal system shall be constructed as specified herein and as shown on the Plans, including furnishing and installing a new controller in a new controller cabinet, a new galvanized steel strain pole, span wire and tether wires, and relocating signal heads and signs to the new span wire

The work shall consist of modifying an existing span wire traffic signal system at the intersection of US 202 / ME 4 / ME 115 and ME 100 / ME 115. The existing signal system shall be constructed as specified herein and as shown on the Plans, including furnishing and installing a new controller in a new controller cabinet.

The work shall consist of modifying an existing span wire traffic signal system at the intersection of US 202 and Brown Street/Shaker Street. The existing signal system shall be constructed as specified herein and as shown on the Plans, including furnishing and installing a new controller in a new controller cabinet.

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.

All traffic signal controller timing parameters shall be adjusted as need to provide optimized coordinated and free operations.

643.02 Materials A list of the recommended materials required to install the system may be included as an amendment to this specification or in the Plans, but the Authority will give no guarantee as to the completeness of these lists.

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.

643.021 Traffic Signal Heads Housings shall be constructed of die cast aluminum or polycarbonate with a smooth outer surface and shall be capable of holding the optical units securely in place. 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. All traffic signals shall be furnished with a 5 inch backplate. 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.

One cap shall be supplied with each 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 banded or cabled with "Astro-Brac" by Pelco or an approved equal.

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 GelCore as manufactured by General Electric or an approved equal.

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 20 W and have an initial output of 1900-lumens.

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.

643.022 Additional Materials Materials shall also meet the requirements in the following Special Provision to Section 700 – Materials:

Twelve (12) Position Fiber Optic Patch Panel	718.13
Ethernet Switch with Fiber Optic Interfaces	718.14
Messenger Wire	718.15

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.

The Contractor shall select and design a foundation system for the steel support structures meeting the design criteria of the 2013 edition of the AASHTO “Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals” with 2014 and 2015 interims, unless otherwise specified by the Authority. The foundation design shall be in accordance with actual soil conditions as indicated in the geotechnical engineering report and the subsurface explorations. The foundation system design shop drawings and calculations shall be prepared and stamped by a licensed Professional Engineer in the State of Maine for each foundation system. The Contractor is encouraged to consider the standard foundation designs contained in the 2014 edition of the MaineDOT Standard Details, specifically Standards 626(01) through 626(04).

Construction of the foundation shall not commence until the Authority has reviewed and approved the foundation design.

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

Strain pole and mast-arm structure and foundations 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 cable 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 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 meet, as a minimum, all applicable sections of the NEMA Standards Publications for TS2 and NTCIP. The controller shall comply with NEMA TS-2 Type 1. The controller shall be a Cobalt as manufactured by the Econolite Control Group.

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 a 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 load lamps, minimum rating of 90 watts, to the load 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.

643.042 Controller Cabinet. Controller, timing and flashing mechanisms, circuitry, and other components shall be enclosed within a weather tight 1/8 inch thick aluminum "P-44" type cabinet with 2 shelves, side and back panels, a main door and a switch compartment door on a 12 inch aluminum extension base unless otherwise indicated in the Plans. All exterior seams shall be continuously welded.

Two adjustable "C" mounting channels to allow for positioning of panels and shelves shall be installed on both side walls and back of the cabinet.

The 2 adjustable equipment shelves shall span the entire width of the cabinet. No part of the back panel shall extend above the equipment shelves.

The cabinet door shall be a minimum of 80% of the front surface area and shall be hinged on the right side with a continuous hinge. The cabinet doorframe shall be flanged on all four sides with a light/alarm switch bracket located in the upper right hand corner. The latching mechanism shall be a 3-point draw roller type made of steel with a center catch. The operating handle shall have provisions for padlocking in the closed position. The main lock shall be a Corbin 1548-1 and furnished with two keys as specified by the Authority. The door shall have a gasket that forms a weather tight seal between the door and the cabinet. The lower portion of the door shall be vented with louvers on the exterior to provide 100 cfm of air flow. A filter held firmly in place by side and bottom brackets shall cover the louver vents on the door's interior. A door restraint shall be furnished to prevent door movement during windy conditions.

The exterior of the cabinet shall be natural aluminum. The interior surface of the cabinet and door, including shelves shall be painted with appliance white alkyd baked enamel paint.

A switch compartment with a removable back plate shall be furnished on the main door. The compartment door opening shall be flanged on all sides. The compartment door shall be hinged on the right side with a continuous hinge and have a gasket that forms a weather tight seal when closed. A compartment door lock Corbin R557565 with keyhole cover and two keys shall be furnished. The switch compartment shall contain:

- (a) Signal automatic/flash switch.
- (b) Signal on/off switch.
- (c) Signal automatic/manual switch.
- (d) A manual advanced police button.

A ventilation fan powered by a 115 volt single phase motor and rated at an air flow of 100 cfm shall be installed at the top of the cabinet. The screened exhaust vent shall be vented between the top of the cabinet and the door. The ventilation fan shall be controlled by means of a thermostat with a range of 70°F to 160°F with overload protection and noise suppressor.

A cabinet heat lamp of 100/150 watts shall be installed. The heat lamp shall be controlled by a thermostat located on the left side of the cabinet with a range from 0°F to 50°F.

The cabinet power panel shall be installed on the right side of the cabinet 8 inches up from the mounting flange. It shall have a 30 amp and a 15 amp circuit breaker. The 15 amp breaker shall service the GFI duplex outlet, a switched light outlet, the heat lamp and the ventilation fan. The 30 amp breaker shall service all other items. The GFI outlet shall be mounted on the power panel. The switched light outlet shall be mounted on the upper right side. An AC line filter and ISTROL series line filter for controller and conflict monitor and lightning/surge suppressor shall be installed on the power panel.

The cabinet trouble light shall be a stainless steel, flex shaft type, 18 inch in length with on/off switch. Trouble light shall be mounted on the right-inside of the cabinet.

The cabinet shall be furnished with a resealable plastic print holder and 3 sets of cabinet prints showing all wiring and one copy of the intersection drawings. Print holder shall be mounted on the inside of the door.

643.043 Power and SDLC Bus Panel. The Power and SDLC BUS Panel shall be manufactured from 1/8 inch, 5052-H32 aluminum. It shall provide a central location to supply filtered power for the controller, malfunction management unit, cabinet power supply, and all auxiliary equipment. It shall include the SDLC Bus connecting cables wired to a barrier type terminal block. As an alternate, SDLC Bus connections may be made via an SDLC Hub Assembly.

All cabinet equipment requiring filtered power to operate shall be hardwired directly to the supplied barrier type terminal blocks on the Power and SDLC BUS Panel.

All AC+ power sources shall be protected with a removable plastic cover plate.

An SDLC Hub Assembly shall include a minimum of four and maximum of eight D-Subminiature Female 15 pin (DB15) connectors that are wired in series.

643.044 Detector Rack. A minimum of one Loop Detector rack shall be provided in each cabinet. Detector racks shall be shelf mounted on the bottom shelf of the cabinet and shall support up to 16 channels of loop detection (either eight 2 channel detectors or four 4 channel detectors), 4 channels of preemption devices (either two - 2 channel devices or one – 4 channel device) and one BIU.

All connections to the back of the detector racks to the detector cards shall be soldered to a 44 terminal, double row, 0.156 inch contact spacing, Cinch Jones card edge connector 50-44A-30M, or equivalent centered vertically for each detector module. All designations shall correspond to the requirements of the TS2-2003 specification.

Card Guides shall be provided on the top and bottom of the card rack for each connector position.

Each cabinet shall contain a detector interface panel per each detector rack for the purpose of connecting field loops and vehicle detector amplifiers. The panels shall be manufactured from 1/8 inch thick 5052-H32 Aluminum and use barrier type terminal blocks.

One 16-position interface panel shall be provided for a 16-channel rack cabinet. The vehicle detection panel shall be installed on the left side of the cabinet; the bottom edge shall be 10 inches from the mounting flange.

Each interface panel shall allow for the connection of eight or sixteen independent field loops. A ground bus terminal shall be provided between each loop pair terminal to provide a termination for the loop lead-in cable ground wire.

Each interface panel shall provide a barrier style terminal block to terminate the field wires for up to two 2-channel preemption devices.

Lightning protection device mounting holes shall be provided to accommodate the potential usage of a lightning protection device. Loop field terminals shall be protected from inductive transient surges by 150 V, 10 A Metal Oxide Varistor. All detector terminals shall be identified by number and shall correspond with the cabinet print.

A cable consisting of 20 AWG twisted pair wires shall be wired directly from the interface panel to the detector rack. The twisted pair wires shall be color coded red and white wire. No connectors shall be used to connect the interface panel to the detector rack.

All termination points shall be identified by a unique number and silk screened on the panel.

Each detector rack shall accommodate rack mountable preemption devices such as Opticom

643.045 Load Switches. Load switches shall be solid state and shall conform to the requirements of Section 6.2 of the NEMA TS2 Standard.

Signal load switches shall have a minimum rating of 10 A at 120 VAC for an incandescent lamp load.

The front of the load switch shall be provided with six indicators to show the input and output signal from the controller to the load switch.

Load switches shall be dedicated per phase. The use of load switches for other partial phases is not acceptable except under the provisions of the second paragraph of Section 643.06 of this Special Provision.

The full complement of load switches shall be supplied with each cabinet to allow for maximum phase utilization for which the cabinet is designed.

The back panel shall have 16 load switch sockets completely wired including MMU. All terminals shall be labeled for identification corresponding to the back panel print.

643.046 Flash Transfer Relays. All flash transfer relays shall meet the requirements of Section 6.4 of the NEMA TS2 Standard.

The coil of the flash transfer relay must be de-energized for flash operation.

The full complement of relays shall be supplied with each cabinet to allow for maximum phase utilization for which the cabinet is designed. The relay sockets shall be wired as follows:

<u>Relay</u>	<u>Assignment</u>
Flash Relay 1	Load Switch 1 and 2
Flash Relay 2	Load Switch 3 and 4
Flash Relay 3	Load Switch 5 and 6
Flash Relay 4	Load Switch 7 and 8
Flash Relay 5	Load Switch 9 and 10
Flash Relay 6	Load Switch 11 and 12

The cabinet shall be supplied with one (1) NEMA Type 2 solid state cube type flasher.

The flasher shall be solid state and shall conform to the requirements of Section 6.3 of the NEMA TS2 Standard. The signal flasher shall be mounted on the back panel.

Flashing of field circuits for the purpose of intersection flash shall be accomplished by a separate flasher.

The flasher shall be rated at 15 amperes, double pole with a nominal flash rate of 60 FPM.

Vehicle Detector Test Panel. A vehicle detector test panel shall be surface mounted on the interior side of the cabinet door; a push type test button shall be labeled and furnished for each phase. Pushing the button shall cause a detector call to be placed on the controller for as long as the button is held. Test panel wires shall be enclosed in a cable harness.

643.047 Controller On/Off Switch. A controller on/off switch shall be surface mounted on the interior side of the cabinet door or in the upper right hand side of the cabinet.

643.048 Malfunction Management Unit (MMU). Each cabinet assembly shall be supplied with one MMU as defined by the requirements of Section 4 of the NEMA TS2 Standard. The MMU shall retain, at a minimum, complete information on the last 9 events including which channels

were active, the date and the time. The assignment of conflicting channels shall be by means of a standard NEMA program card. The MMU shall be wired to detect absence of voltage on all channels. The MMU shall have an Ethernet port for downloading. All software and cabling from the manufacturer will be supplied to the Authority to allow communication to the device with a PC.

Malfunction Management Units shall be a Type 16. The MMU shall be Reno A&E Model MMU-1600GE or approved equal.

643.049 Bus Interface Units (BIU). All BIUs shall meet the requirements of Section 8 of the NEMA TS2 Standard.

The full complement of Econolite Control Products, Inc. Model 32860G1 BIU's, or an approved equal, shall be supplied with each TS2-Type 2 cabinet to allow for maximum phase and function utilization for which the cabinet is designed.

Each Bus Interface Unit shall include power on, transmit and valid data indicators. All indicators shall be LEDs.

643.05 Cabinet Power Supply. The cabinet power supply shall meet the requirements of Section 5.3.5 of the NEMA TS2 Standard.

The cabinet power supply shall provide LED indicators for the line frequency, 12 VDC, 12 VAC, and 24 VDC outputs.

The cabinet power supply shall provide (on the front panel) jack plugs for access to the +24 VDC for test purposes.

One Econolite Control Products, Inc. Model 1084-003 cabinet power supply, or approved equal, shall be supplied with each cabinet assembly and shall be wired directly to the Power Bus Assembly via a 12-pin Molex Robotic type connector Model# 54332-1270 or an approved equal.

643.06 Fire Pre-emption. Fire pre-emption shall be activated by optical detection equipment with optical detectors. Fire pre-emption shall clear the existing phase through a normal clearance followed by the fire phase as shown on the plans for the minimum time specified. The fire phase shall give a green in the called direction; the confirmation light shall be activated only during the fire pre-emption phase, after the call phase is satisfied. Upon release of the fire pre-emption, the controller shall provide a green to the major movement. Phase selector will be Opticom model 764 as manufactured by Global Traffic Technologies. All software and cabling from the manufacturer will be supplied to the Authority to allow communication to the device with a PC.

The engineering, design, and integration of the fire pre-emption shall be by the manufacturer of the equipment, in cooperation with the supplier of the signal controller equipment. Preemption receivers will be Opticom model 700 as required.

The confirmation light shall be operated by a back panel load switch (LS #9 Yellow).

Confirmation light shall be a self-contained 120 volt AC 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.

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

#### 643.07 Video Detection.

##### 643.071 Description

The work shall consist of furnishing and installing a video detection system (GridSmart video-based vehicle detection system – no approved equals) at the traffic signals located at the intersections of US 202 / ME 4 / ME 115 and the Maine Turnpike Exit 63 (I-95) interchange ramps. The following subsection shall be added:

643.072 Video Detection System The video detection system shall meet the following minimum requirements:

##### VIDEO DETECTION DEVICE

The video detection device shall be a video based 360 degree detection device and meet the following minimum performance standards:

- a. The device shall utilize three dimensional, omni-directional tracking to provide real time vehicle detection. This data will be used by the local traffic signal controller as dynamic phase calls to service vehicles on a signalized approach.
- b. The device shall include a single wide camera with an ultra-wide lens housed in a ruggedized Wintel platform.
- c. The device shall include vision stabilization, vehicle intent digital signal processing technology and electronic shutter speed control.
- d. A device control card and module shall be housed in the traffic signal control cabinet and support the interface between the field camera and the traffic signal controller.
- e. Multiple approach detection zone programming shall be user configurable.
- f. The device shall have the ability to interface to NEMA TS-1, NEMA TS-2, type 1 and NEMA TS-2, type 2 controllers providing real time vehicle demand data.
- g. The detection device shall support the following detection functions:
  - A. Vehicle Presence
  - B. Stopped Vehicle Presence
  - C. Directional
  - D. Pedestrian
- h. The detection device shall support the following vehicle classification functions:
  - A. Turn and Vehicle Speed Data
  - B. Vehicle Count per Lane
  - C. Vehicle Class Data, compiled in 32 user defined bins
  - D. Pedestrian

- i. The device shall be supplied complete with a traffic simulator feature that will allow for modeling of various traffic flow scenarios for system testing purposes.
- j. The device shall be wirelessly configurable utilizing intuitive GUI based programming software.
- k. The device shall employ a vehicle tracking point system that will follow these data points through the intersection image to minimize occlusion.

#### VIDEO CAMERAS

The Video Detection System shall be supplied with two (2) cameras – if the installed system does not require two cameras, the second camera shall be furnished to the Authority as a spare. The cameras shall meet the following minimum requirements:

- a. The cameras shall draw 18 watts of electrical power.
- b. The cameras shall be support Wi-Fi transmission for initial system set-up and device diagnostics.
- c. Operating range shall be -34°C to 74C° and humidity level up to 100%.
- d. Camera enclosures shall be ¼” thick cast aluminum and conform to NEMA – 4 specifications, weather adjustable and a sunshield.
- e. The lens shall be 360° wide, 5 megapixel with a CMOS image sensor.
- f. Transmission at 100 Mbps IP, 1-10,000 LUX at a useable image digital output.

#### CONTROL CARD AND MODULE

The control card and module shall meet the following minimum requirements:

- a. Card and module shall operate at 120 VAC, 60 Hz at 1.0 amps.
- b. Operating range shall be -35°C to 75C° and humidity level up to 100%.
- c. The card and module shall be rack mountable in the cabinet.
- d. Processing shall be PC-104, embedded controller consisting of a dual Pentium core, 2.8 Ghz, 1028 RAM and a 32 GB diskless hard drive.
- e. The module shall be dual channel.
- f. The Module shall come preloaded with GridSmart® software and the price of the Video Detection System shall include the cost of the software licenses and performance module.

643.08 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.

643.09 Flashers. Intersection beacon flashers shall be housed in an approved cabinet containing: 25 A NEMA cube-type flasher, 10 A circuit breaker and disconnect switch. All components shall be completely wired and mounted within the cabinet. Painting shall be in accordance with 643.1531 of this Special Provision.

643.10 Pedestals.

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

643.12 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. Actual color coding shall be used. The minimum size wire for the circuits shall be as follows:

<u>Service</u>	<u>A.W.G.#</u>
(a) To Controller	8 Stranded
(b) Controller to Pole or Pedestal	12 Stranded
(c) Pole or Pedestal to Receptacles	14 Stranded
(d) Equipment Grounding Conductor	8 Stranded

Interconnect cable shall be 6-strand multimode fiber optic cable in accordance with Section 655. Interconnect cable installed in conduit shall be suitable for outside plant installations in an underground environment. Interconnect cable installed aerially shall be continuously lashed to a messenger cable that is connected to each utility pole in a manner acceptable to the utility pole owner or as directed by the Resident.

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.

643.13 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 of federal yellow No. 13538. The door face and inside visor shall be federal black No. 17038.

643.14 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.

643.15 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).

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.

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. When directed, the concrete foundation for the controller cabinet shall be raised to any height up to 18 inches above the surface. Chamfer strips shall be used on all signal controller cabinet foundations. Forms shall be inspected before concrete is placed.

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 1/4 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.

643.152 Service and Meter Box. Electrical Service will be provided by the MTA, the Contractor shall run the needed conduit and wiring from the signal cabinet to the existing and proposed utility buildings.

Power for the traffic signals at the Turnpike ramps shall come from the power panels in the Toll Plaza building closest to the signal controller cabinet. The Contractor shall coordinate access to the toll buildings with the Resident. Contractor shall modify the electrical panels in the toll buildings as indicated herein, as shown in the Plans, or as directed by the Resident. The power panel shall be clearly labeled to indicate which circuit(s) service the traffic signal control cabinet. The traffic signal circuit shall be connected to the toll building back-up generator to provide back-up power in the event of utility power failure. The Contractor is responsible for all equipment required to provide power to the I-95 ramp intersections from the toll building power panels.

643.153 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.

Each mast arm assembly 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 or made using waterproof wire nuts. 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.

643.1531 Painting. 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           | Yellow (3)                             |
| (c) Visors             | Inside: Black (2); Outside: Yellow (3) |
| (d) Meter Box          | Same color as its mounting.            |

- |                             | 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.

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

Operating sequences shall be verified by testing.

Where fire preemption equipment is required, 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.

643.154 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 Bracs" at a right angle to the roadway.

The Contractor shall be responsible for modifying any traffic signal hardware or timing to adjust to the Contractor's construction scheduling. This work may include the installation of temporary span wire signal systems and timing modifications. All temporary wiring and cabling shall be performed by licensed electricians. Timings for temporary traffic signal systems shall be submitted to the Resident for approval prior to making the necessary modifications to the traffic signal system. The Contractor shall be responsible for any subsequent retiming or updated timing plans to accommodate the traffic flows throughout construction. The Contractor shall remove any temporary traffic signal equipment and reset the traffic signal to its final condition when the temporary adjustment is no longer required.

643.155 Operation. The Contractor shall commence the operation of the signal system only when permitted by the Resident. Unless otherwise noted, new signalized intersections 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 Resident.

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.

643.156 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 new traffic signal will be measured as a lump sum unit. When more than one unit applies, each unique item shall have a separate item number.

Video detection system relocation will be measured as a lump sum unit. When more than one unit applies, each unique item shall have a separate item number.

Interconnect wire will be paid as a lump sum for the interconnect wire that connects two locations. When more than one location pair applies, each location pair shall have a separate item number.

No separate measurement will be done for the removal of the existing traffic signal, but will be considered incidental to the new signal installation. No separate measurement will be done for the installation and subsequent removal of temporary traffic signal equipment necessary to maintain traffic through the construction phases.

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 643.90) will be paid for at the contract lump sum price, which payment will be full compensation for installation, furnishing all materials, including, but not limited to video processing unit, 360 degree video camera, GridSmart® software, supervisory PC software, and all appurtenances and incidentals required for a complete functioning installation. The Contractor shall coordinate with the Manufacturer's Representative for initial configuration and onsite training.

Payment will be made under the following:

<u>Pay Item</u>		<u>Pay Unit</u>
643.7111	Traffic Signal Modifications: US 202/ME 4/ME 115 at NB Ramps	Lump Sum
643.7112	Traffic Signal Modifications: US 202/ME 4/ME 115 at SB Ramps/ME 26A	Lump Sum
643.7113	Traffic Signal Modifications: US 202/ME 4/ME 115	

	at ME 115/ME 100	Lump Sum
643.7114	Traffic Signal Modifications: US 202/ME 4 at Brown St/Shaker Rd	Lump Sum
643.831	Video Detection System: US 202 at NB Ramps	Lump Sum
643.832	Video Detection System: US 202 at SB Ramps	Lump Sum
643.901	Interconnect Wire Between: SB Ramp Intersection to NB Ramp Intersection	Lump Sum
643.902	Interconnect Wire Between: SB Ramp Intersection to SB Toll Building	Lump Sum
643.903	Interconnect Wire Between: NB Ramp Intersection to US 202 and ME 100/ME 115	Lump Sum
643.904	Interconnect Wire Between: US 202 and ME 100/ME 115 to US 202 and Brown/Shaker	Lump Sum

SPECIAL PROVISION

SECTION 645

HIGHWAY SIGNING

(Overhead Sign Structures)  
(Sign Structure Foundations)

645.024 Bridge, Cantilever and Butterfly Support Structure Foundations

The second paragraph shall be modified to indicate use of Class A concrete rather than Class LP concrete:

Concrete shall be Class A in accordance with Section 502 – Structural Concrete.

The following paragraphs and sections are added:

The Contractor shall select and design a foundation system for the sign structures in accordance with actual soil conditions as indicated in the geotechnical engineering report and the subsurface explorations. Preliminary foundation sizes and layouts have been provided as part of the contract documents. See the figures following this Special Provision for the preliminary foundation sizes. The Contractor shall provide final foundation system designs for each sign structure that can be constructed within the limitations of the existing rights-of-way and without impact to adjacent utilities. The construction of the new foundations shall include protections for the existing utilities as required by the Utility Companies or as directed by the Resident.

645.0241 Sign Structure Foundation Submittals

All submittals shall be in electronic PDF format and all documents in each PDF shall be legible. All submittals shall be prepared jointly by the Contractor and any subcontractors that will be performing the work.

The Resident will evaluate submittals for conformance with the Plans, Specifications, and Special Provisions and provide acceptance and/or comments within 5 working days of receipt.

Work shall not begin until all the required submittals have been approved in writing by the Resident. All procedural approvals given by the Resident will be subject to trial in the field and shall not relieve the Contractor of the responsibility to satisfactorily complete the work. In addition to the submittals required for all sign structures and foundations indicated in Section 645.023, the following additional submittals shall be required for sign structure foundations that include drilled shaft construction:

- 1) Construction Experience Submittal

Prior to the start of drilled shaft construction, the Contractor shall electronically submit a project reference list to the Resident for approval verifying the successful completion by the Contractor of at least three separate foundation projects with shafts of diameters and depths similar to or larger than those shown in the Plans and ground conditions similar to those identified in the Contract. A brief description of each listed project shall be provided along with the name and current phone number of the project owner or the owner's Contractor.

Prior to the start of shaft construction, the Contractor shall electronically submit a list identifying the on-site supervisors and drill rig operators potentially assigned to the project to the Resident for approval. The list shall contain a brief description of each individual's experience in shaft excavation operations and placement of assembled steel reinforced bar cages and concrete in shafts. The individual experience lists shall be limited to a single page for each supervisor or operator.

- (a) On-site supervisors shall have a minimum 2 years of experience in supervising construction of shaft foundations of similar size (diameter and depth) and scope to those shown in the Plans and similar geotechnical conditions to those described in the boring logs and summary of geotechnical conditions. Work experience shall be direct supervisory responsibility for the on-site shaft construction operations. Project management level positions indirectly supervising on-site shaft construction operations is not acceptable for this experience requirement.
- (b) Drill rig operators shall have a minimum of 1 year experience in construction of shaft foundations.

The Resident will approve or reject the Contractor's qualifications and field personnel within 5 working days after receipt of the submission. Work shall not be started on any shaft until the Contractor's qualifications and field personnel are approved by the Resident. The Resident may suspend the shaft construction if the Contractor substitutes unapproved personnel. The suspension of work, and no adjustments in contract time resulting from the suspension of work will be allowed.

## 2) Drilled Shaft Installation Narrative Submittal

The Contractor shall electronically submit a drilled shaft installation narrative for approval by the Resident. In preparing the narrative, the Contractor shall reference the available subsurface data provided in the test boring logs and laboratory testing results provided in the Geotechnical Engineering Report as well as foundation requirements and any foundation-specific information as provided on the Plans. Unless another foundation type is specified on the plans, foundations shall consist of cast-in-place reinforced concrete drilled shafts with pier caps.

This narrative shall provide at least the following information

- (a) Proposed overall construction operation sequence.

- (b) Description, size, and capacities of proposed equipment, including, but not limited to, cranes, drills, auger, bailing buckets, final cleaning equipment, and drilling unit. The narrative shall describe why the equipment was selected and describe equipment suitability to the anticipated site conditions and work methods. The narrative shall include a project history of the drilling equipment demonstrating the successful use of the equipment on shafts of equal or greater size in similar soil conditions. The narrative shall also include details of shaft excavation and cleanout methods.
- (c) Details of the method(s) to be used to ensure shaft stability (i.e. prevention of caving, bottom heave, using temporary casing, or other means) during excavation (including pauses and stoppages during excavation) and concrete placement. If permanent casings are required, casing dimensions and detailed procedures for installation shall be provided.
- (d) Description of the method used to fill or eliminate all voids below the top of shaft between the plan shaft diameter and excavated shaft diameter, when permanent casing is specified.
- (e) Details of concrete placement, including proposed operational procedures for pumping methods, and a sample uniform yield form to be used by the Contractor for plotting the approximate volume of concrete placed versus the depth of shaft for all shaft concrete placement (except concrete placement in the dry).
- (f) When shafts are constructed in water, the submittal shall include seal thickness calculations, seal placement procedure, and descriptions of provisions for casing shoring dewatering and flooding.
- (g) Description and details of the storage and disposal plan for excavated material.
- (h) Reinforcing steel shop drawings, details of reinforcement placement, including bracing, centering, and lifting methods and the method to ensure the reinforcing cage position is maintained during construction, including use of bar boots and/or rebar cage base plates.
- (i) The reinforcing steel assembly and installation plan shall include:
  - 1. Procedure and sequence of steel reinforcing bar cage assembly.
  - 2. The tie pattern, tie types, and tie wire gages for all ties on permanent reinforcing and temporary bracing.
  - 3. Number and location of primary handling steel reinforcing bars used during lifting operations.

4. Details and orientation of all internal cross-bracing, including a description of connections to the steel reinforcing bar cage.
5. Description of how temporary bracing is to be removed.
6. Location of support points during transportation.
7. Cage weight and location of the center of gravity.
8. Number and location of pick points used for lifting for installation and for transport (if assembled off-site).

The Resident will evaluate the shaft installation narrative for conformance with the Plans, Specifications, and Special Provisions. Construction of the foundation shall not commence until the Authority has reviewed and approved the submittal.

#### 645.0242 Shaft Construction Requirements

##### 1) Shaft Construction Tolerances

Shafts shall be constructed so that the center at the top of the shaft is within a horizontal tolerance equal to 1-inch.

Shafts shall be within 1.5 percent of plumb. During drilling or excavation of the shaft, the Contractor shall make frequent checks on the plumbness, alignment and dimensions of the shaft. Any deviation exceeding the allowable tolerances shall be corrected with a procedure approved by the Resident.

Shaft steel reinforcing bar replacement tolerances shall conform to Section 506 – Reinforcing Steel.

##### 2) Shaft Excavation

Drilled Shafts shall be excavated to the required depth as shown in the Plans. Shaft excavation operations shall conform to this Section and the shaft installation narrative as approved by the Resident.

Shaft excavation shall not be started until the Contractor has received approval from the Resident for the reinforcing steel centralizers required when the casing is to be pulled during concrete placement.

##### a) Conduct of Shaft Excavation Operations

Once excavation operation has been started, the excavation shall be conducted in a continuous operation until the excavation of the shaft is completed, except for pauses and stops as noted, using approved equipment capable of excavating through the type of material expected.

Pauses, defined as momentary interruptions of the excavation operation, will be allowed only for casing splicing, tooling changes, and removal of obstructions. Shaft excavation

operation interruptions not conforming to this definition shall be considered stops. Stops for fully cased excavations shall not exceed 24 hours duration.

For stops exceeding the time durations specified above, the Contractor shall stabilize the excavation, when cased, using the following:

Backfill the hole with flowable fill in accordance with Section 502. The Contractor shall backfill the hole to a minimum of 5 feet above the bottom of casing (temporary or permanent).

During stops, the Contractor shall stabilize the shaft excavation to prevent bottom heave, caving, head loss, and loss of ground. The Contractor bears full responsibility for selection and execution of the method(s) of stabilizing and maintaining the shaft excavation. Shaft stabilization shall conform to the shaft installation narrative provided by the Contractor and approved by the Authority.

b) Temporary and Permanent Shaft Casing

The Contractor shall furnish and install required temporary and permanent shaft casings as shown in the Plans and as specified in the Special Provisions.

c) General Shaft Casing Requirements

Shaft casing shall be watertight and clean prior to placement in the excavation

The inside diameter of the casing shall not be less than the specified diameter of the shaft. The outside diameter of the casing shall not be greater than the specified diameter of the shaft plus 6 inches, except as otherwise noted for shafts 5 feet or less in diameter.

d) Permanent Shaft Casing

Permanent casing is defined as casing designed as part of the shaft structure and installed to remain in place after construction is complete. All permanent casing shall be of ample strength to resist damage and deformation from transportation and handling, installation stresses, and all pressures and forces acting on the casing. Where the minimum thickness of permanent casing is specified in the Plans, it is specified to satisfy structural design requirements only. The Contractor shall increase the casing thickness as necessary to satisfy the requirements of this Section.

e) Temporary Shaft Casing

Temporary casing is defined as casing installed to facilitate shaft construction only, which is not designed as part of the shaft structure and which shall be completely removed after shaft construction is complete unless otherwise shown in Plans. All temporary casing shall be of ample strength to resist damage and deformation from transportation and handling, installation and extraction stresses, and all pressures and

forces acting on the casing. The casing shall be capable of being removed without deforming and causing damage to the completed shaft and without disturbing the surrounding soil.

To maintain stable excavations and to facilitate construction, the Contractor shall furnish and install temporary casing in addition to the required casing specified in the Special Provisions. The Contractor shall provide temporary casing at the site in sufficient quantities to meet the needs of the anticipated construction method.

f) Permanent Slip Casing

Permanent slip casing is defined as casing installed vertically inside the drilled hole, after removal of the temporary casing and prior to pouring the exposed length of shaft, and wet-set into the shaft concrete a minimum of 2 feet below grade or to greater depth, as needed to enhance stability. The casing diameter requirements described in c) above do not apply to permanent slip casing, but the inside diameter of the permanent slip casing shall provide the steel reinforcing bar clearance specified in Table 1.

g) Conduct of Shaft Casing: Installation, Removal and Excavation Operations

The Contractor shall conduct casing installation and removal operations and shaft excavation operations such that the adjacent soil outside the casing and shaft excavation for the full height of the shaft is not disturbed. Disturbed soil is defined as soil whose geotechnical properties have been changed from those of the original in situ soil and whose altered condition adversely affects the structural integrity of the shaft foundation.

h) Bottom of Shaft Excavation

The Contractor shall use appropriate means, such as a cleanout bucket or air lift to clean the bottom of excavation of all shafts. No more than 2 inches of loose or disturbed material shall be present at the bottom of the shaft just prior to placing concrete. The excavated shaft shall be inspected and approved by the Resident with consultation with the Geotechnical Engineer prior to proceeding with construction. The bottom of the excavated shaft shall be sounded with a tape with a heavy weight attached to the end of the tape, or other means acceptable to the Resident, to determine that the shaft bottom meets the requirements in the Contract.

i) Shaft Obstructions

When obstructions are encountered, the Contractor shall notify the Resident promptly. An obstruction is defined as a specific object (including, but not limited to, boulders, logs, and manmade objects) encountered during the shaft excavation operation which prevents or hinders the advance of the shaft excavation. When efforts to advance past the obstruction to the design shaft tip elevation result in the rate of advance of the shaft drilling equipment being significantly reduced relative to the rate of advance for the portion of the shaft excavation in the geological unit that contains the obstruction, then

the Contractor shall remove, break up, or push aside the obstruction. The method of dealing with such obstructions and the continuation of excavation shall be as proposed by the Contractor and approved by the Resident.

j) Voids Between Permanent Casing and Shaft Excavation

When permanent casing is specified, excavation shall allow its installation within the specified outside diameter of the shaft. All void space occurring between the casing and shaft excavation shall be filled with concrete or excavated flowable fill, in accordance with the shaft installation narrative, as specified in the Contractor's Shaft Installation Narrative, and as approved by the Resident.

k) Maintenance of a Stable Shaft Excavation

The Contractor shall demonstrate to the satisfaction of the Resident that stable conditions are being maintained. If the Resident determines that stable conditions are not being maintained, the Contractor shall immediately take action to stabilize the shaft. The Contractor shall submit a revised shaft installation narrative that addresses the problem and prevents future instability. The Contractor shall not continue with shaft construction until the damage that has already occurred is repaired in accordance with the specifications, and until receiving the Resident's approval of the revised shaft installation narrative.

The use of slurry is not allowed.

3) Assembly and Placement of Reinforcing Steel

a) Steel Reinforcing Bar Cage Assembly

The reinforcing cage shall be rigidly braced to retain its configuration during handling and construction. Individual or loose bars will not be permitted. The Contractor shall show bracing and any extra reinforcing steel required for fabrication of the cage on the shop drawings. Shaft reinforcing bar cages shall be supported on a continuous surface to the extent possible. All rigging connections shall be located at primary handling bars, as identified in the reinforcing steel assembly and installation plan, as approved by the Resident. Internal bracing is required at each support and lift point.

The reinforcement shall be carefully positioned and securely fastened to provide the minimum clearances listed below and to ensure no displacement of the reinforcing steel bars occurs during placement of the concrete. The steel reinforcing bars shall be securely held in position throughout the concrete placement operation.

b) Steel Reinforcing Bar Cage Centralizers

The Contractor shall submit details of the proposed reinforcing cage centralizers along with the shop drawings. The reinforcing steel centralizers at each longitudinal space

plane shall be placed at least at the quarter points around the circumference of the steel reinforcing bar cage and at maximum longitudinal spacing of either 2.5 times the shaft diameter or 20 feet, whichever is less.

4) Placing Concrete

a) Concrete Cover Over Steel Reinforcing Bars

Steel reinforcing bars shall be placed as shown in the Plans with minimum concrete cover as shown in Table 1.

b) Concrete Class for Shaft Concrete

Concrete for drilled shafts and spread footings shall be Class A in accordance with Section 502 – Structural Concrete.

**TABLE 1: MINIMUM CONCRETE COVER**

<b>Shaft Diameter (feet)</b>	<b>Minimum Concrete Cover Except at Permanent Slip Casing (inches)</b>	<b>Minimum Concrete Cover at Permanent Slip Casing (inches)</b>
Less than or equal to 3	3	1 ½
Greater than 3 and less than 4	4	1 ½
Greater than or equal to 4 and less than 5	4	2
5 or larger	6	3

c) Concrete Placement Requirements

Concrete for drilled shafts shall be placed as soon after excavation as practicable to prevent debris from collecting in the excavated area. The Contractor shall provide temporary dewatering of excavations for foundations as needed, such that concrete is placed in the dry. Concrete for drilled shafts shall be placed by tremie methods as temporary casing is withdrawn to prevent debris from contaminating the foundation and to ensure concrete is cast against the surrounding soil.

Before placing concrete, the required elbows of entrance conduits, reinforcing steel, and anchor bolts shall be carefully positioned. The anchor bolt size, spacing, and the bolt circle diameter shall be as shown on the plans and field verified by the Contractor at the existing foundation locations. The Contractor shall construct an anchor bolt template from the existing conditions at each foundation prior to casting in anchor bolts at the proposed foundations. These templates shall be used in properly locating the anchor bolts to accept the existing sign truss column base plates. Anchor bolts shall be 1 ½ inch diameter, in accordance with Section 503, and shall project between 2 ½ and 3 inches above the top of the foundation. At least two threads on each anchor bolt shall project beyond the outside of the nuts holding the plumbed pole.

Conduit placement penetrating the side of the foundation concrete below grade shall be by one of the following methods:

- i) Contractor shall install the vertical conduit and elbow with a block out along the edge of the rebar cage, excavate to the block out below grade as required after concrete has cured, cut a hole in the permanent slip casing to remove the block out, and splice the conduit and grout the void as required.
- ii) Contractor shall provide compacted fill as required to raise grade at the foundation location to form the exposed length of concrete foundation in lieu of providing a permanent slip casing above grade. The conduit, including the elbow and side penetration below grade, shall be placed during the placement of the concrete in the top portion of the drilled shaft.
- iii) Contractor shall submit alternative conduit placement methods to the Resident for review and approval.

Concrete placement shall commence immediately after completion of excavation by the Contractor and inspection by the Resident. Immediately prior to commencing concrete placement, the shaft excavation shall conform to 645.0242, paragraph 2. Concrete placement shall continue in one operation to the top of the shaft, or as shown in the Plans. The Contractor shall place concrete in the dry.

During concrete placement, the Contractor shall monitor, and minimize, the difference in the level of concrete inside and outside of the steel reinforcing bar cage. The Contractor shall conduct concrete placement operations to maintain the differential concrete head as a 1-foot maximum.

If water is not present, the concrete shall be deposited through the center of the reinforcement cage by a method that prevents segregation of aggregates and splashing of concrete on the reinforcement cage. The concrete shall be placed such that the free-fall is vertical down the center of the shaft without hitting the sides, the steel reinforcing bars, or the steel reinforcing bar cage bracing.

- iv) Concrete Vibration Requirements: When placing concrete in the dry, only the top five feet of concrete shall be vibrated, in accordance with Section 502.
- v) Protection of Fresh and Curing Concrete from Vibration: The Contractor's construction operation in the vicinity of a shaft excavation with freshly placed concrete and curing concrete shall avoid operations that generate potentially damaging vibration of the freshly placed concrete.

## 5) Casing Removal

### a) Concrete Head Requirements During Temporary Casing Removal

As the temporary casing is withdrawn, the Contractor shall maintain the concrete inside the casing at a level sufficient to balance the hydrostatic pressure outside the casing and at least two feet above the bottom of the casing.

### b) Removing Portions of Permanent Casing Above the Top of Shaft

Tops of permanent casings for the shafts shall be removed to the top of the shaft.

### c) Requirements for Leaving Temporary Casing in Place

The Contractor shall completely remove all temporary casings, except as noted. The Contractor may leave some or all of the temporary casing in place, provided all the following conditions are satisfied:

- i) The Contractor shall submit the following information in writing to the Resident:
  - (1) The Contractor shall completely describe the portion of the temporary casing to remain.
  - (2) The Contractor shall specify the reason(s) for leaving the portion of the temporary casing in place.
  - (3) The Contractor shall submit structural calculations, using the design specifications and design criteria specified in the Plans, indicating that leaving the temporary casing in place is compatible with the structure, as designed in the Plans.
- ii) The Contractor shall have received the Resident's written approval of the submitted request to leave the temporary casing in place.

## 6) Contractor's Investigation and Remedial Action Plan

For all shafts determined to be unacceptable, the Contractor shall submit a plan for further investigation or remedial action to the Resident for approval. All modifications to the dimensions of the shafts, as shown in Plans, required by the investigation and remedial action plan shall be supported by calculations and working drawings, as specified in Section 626. All investigation and remedial correction procedures and designs shall be submitted to the Resident for approval. The Contractor shall not begin repair operations until receiving the Resident's approval of the investigation and remedial action plan.

## 7) Cored Holes

At the Resident's request, the Contractor shall drill a corehole in any questionable quality shaft (as determined by observation of the Resident) to explore the shaft condition.

Prior to beginning coring, the Contractor shall submit the method and equipment used to drill and remove cores from the shaft concrete to the Resident and receive the Resident's written approval. The coring method and equipment shall provide for complete core recovery and shall minimize abrasion and erosion of the core.

If a defect is confirmed, the Contractor shall pay for all coring costs. If no defect is encountered, the Maine Turnpike Authority will pay for all coring and grouting of the core hole. Materials and Work necessary, including engineering analysis and redesign, to effect corrections for shaft defects shall be furnished to the Resident's satisfaction at no additional cost to the Maine Turnpike Authority.

If soil conditions differ materially from those described on the boring logs, the Contractor shall stop work on that foundation and contact the Resident. All unsuitable material (including, but not limited to, peat, organic material, and material that has been disturbed and/or dumped) within the limits of a foundation shall be increased, as directed by the Geotechnical Engineer, to account for the unsuitable material.

## 8) Shaft Completion

All foundations shall be warranted against leaning and corrosion for two years after the project is completed. If the lean is greater than two degrees from normal or the foundation is spalling within the first two years, the Contractor shall replace the foundation at no extra cost.

The finished ground at each foundation shall be graded as shown on the Plans. If required, approved backfill material shall be added to grade the slopes as specified. There will be no additional compensation for furnishing, placing, and compacting material flush around the foundation. In all cases, the surface area around the foundation shall be graded to drain away from the foundation and loamed and seeded in accordance with the requirements of Section 615 and Section 618.

The concrete portion of the foundation exposed to view shall have a troweled finish. A drainage groove shall be formed in the horizontal surface of the foundation. The top of the concrete foundation shall be horizontal.

When the anchor bolt template is removed, the threads of the anchor bolts shall be greased and protected with a metal sleeve, held in position with nuts and washers to be furnished with the bolts. This thread protection shall remain in place until the sign structure upright is installed.

#### 645.08 Method of Measurement

The following paragraphs are added:

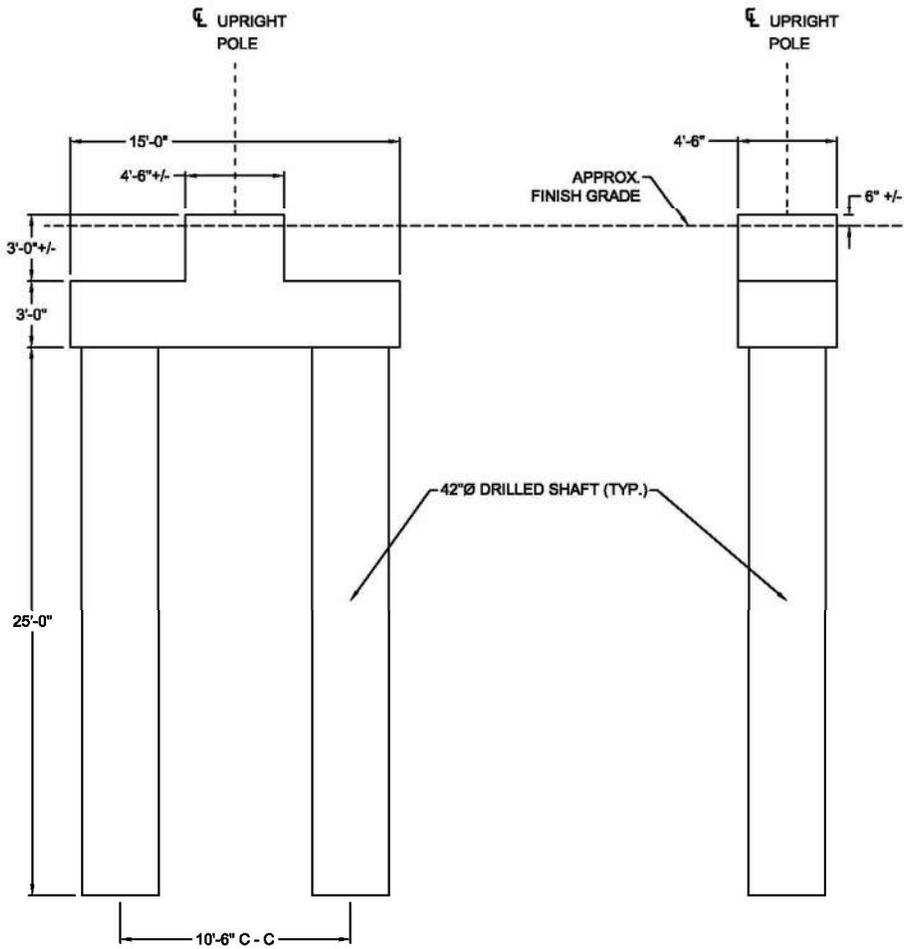
All submittals required for shaft foundation construction will not be measured but shall be incidental to the cost for the sign structure unit item.

Where more than one unit applies to Overhead Guide Signs, each unique overhead sign structure shall have a separate item number.

Where more than one unit applies to Cantilever Guide Signs, each unique cantilever sign structure shall have a separate item number.

Payment will be made under the following:

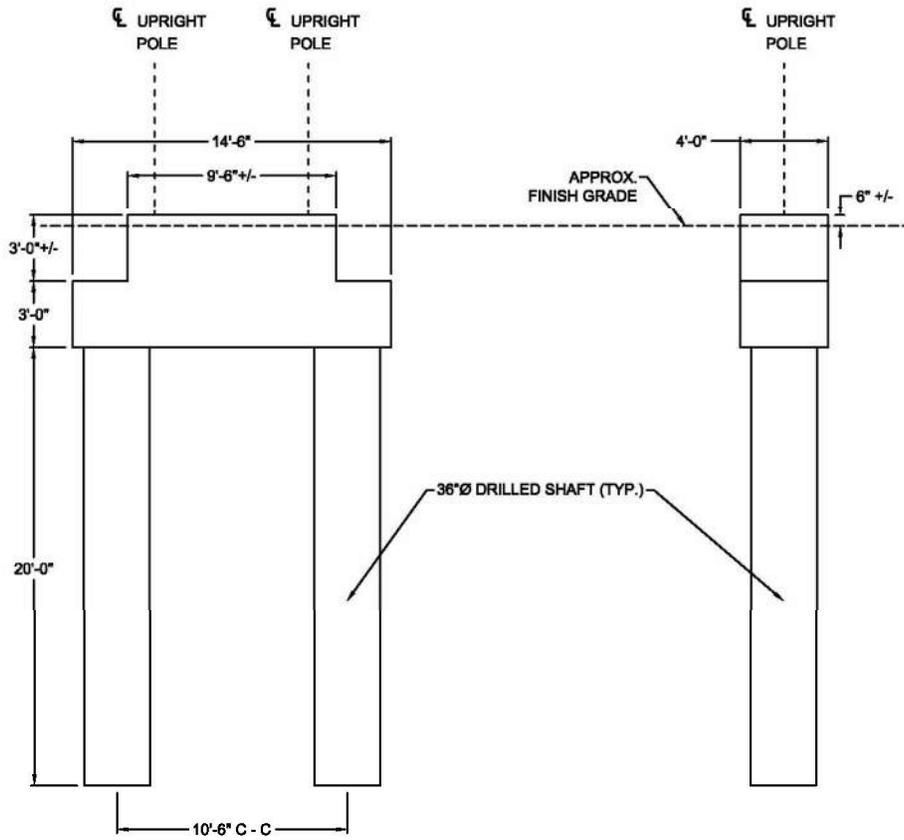
<u>Pay Item</u>		<u>Pay Unit</u>
645.121	Overhead Guide Sign: STA 613+60	Lump Sum
645.122	Overhead Guide Sign: STA 628+17	Lump Sum
645.123	Overhead Guide Sign: STA 204+11	Lump Sum
645.124	Overhead Guide Sign: STA 417+03	Lump Sum
645.151	Cantilever Guide Sign: STA 608+15	Lump Sum
645.152	Cantilever Guide Sign: STA 704+09	Lump Sum



**PRELIMINARY FOUNDATION FOR  
 CANTILEVER TYPE SIGN STRUCTURES**  
 NOT FOR CONSTRUCTION - CONTRACTOR RESPONSIBLE FOR FINAL DESIGN

GRAY INTERCHANGE, EXIT 63 - GRAY MAINE

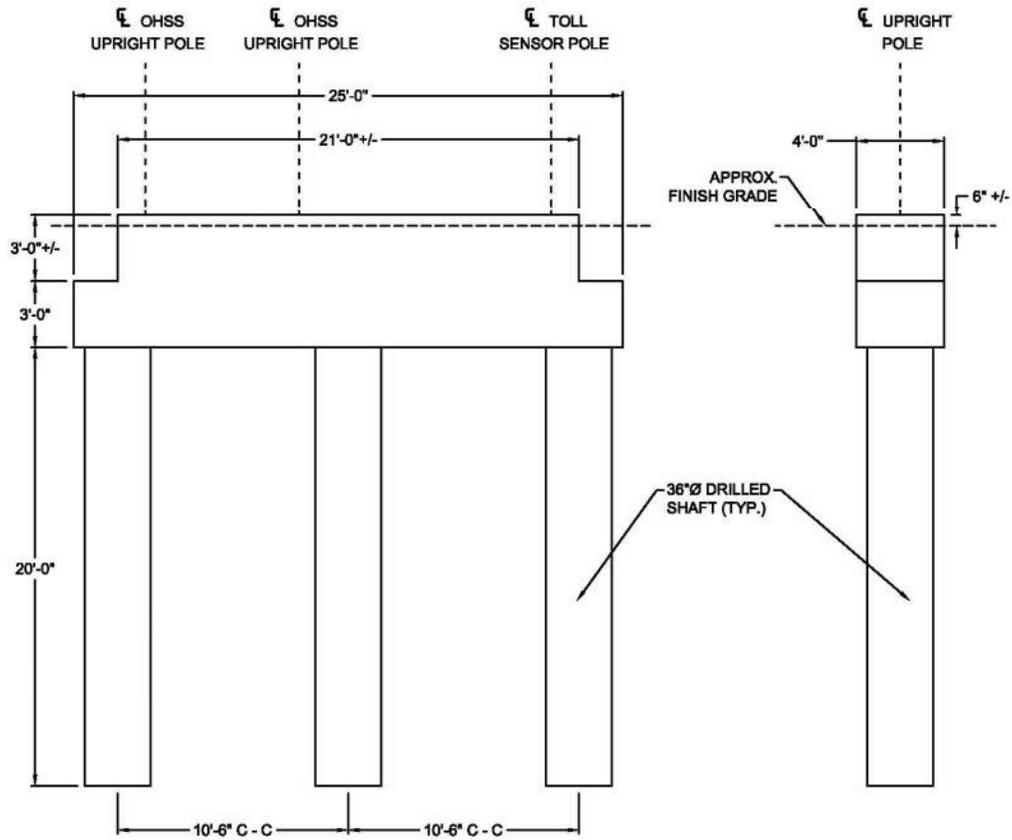
12/2/15



**PRELIMINARY FOUNDATION FOR  
 OVERHEAD TYPE SIGN STRUCTURES**  
 NOT FOR CONSTRUCTION - CONTRACTOR RESPONSIBLE FOR FINAL DESIGN

**GRAY INTERCHANGE, EXIT 63 - GRAY MAINE**

12/2/15



**PRELIMINARY FOUNDATION FOR OVERHEAD SIGN  
STRUCTURE AT STATION 304+31/417+03**

NOT FOR CONSTRUCTION - CONTRACTOR RESPONSIBLE FOR FINAL DESIGN

**GRAY INTERCHANGE, EXIT 63 - GRAY MAINE**

12/2/15

SPECIAL PROVISION

SECTION 650

DYNAMIC MESSAGE SIGN

650.01 Description This work shall consist of furnishing, installing, connecting, configuring, and testing a new dynamic message sign (DMS), DMS controller, ground mounted control cabinet, cellular modem, and solar power system. This work also consists of system training and testing. The DMS supports as well as conduits for power service and communications, are specified elsewhere in the Contract Documents.

650.02 General All equipment shall be new unless otherwise specified.

650.03 Materials Materials shall meet the following requirements:

Electrical materials shall meet the standards herein, local and public utility codes, and the National Electrical Code (NEC).

Cabinets and enclosures shall meet the standards herein and the National Electrical Manufacturer's Association (NEMA) TS-4 standards.

All grounding and electrical installations shall meet the requirements of NEC, as well as all applicable state, local, and applicable public utility codes. All grounding shall meet the requirements of the manufacturers of the devices installed on the project. In the event that the manufacturers' requirements are more stringent than those of the national, state, and local codes, then the manufacturers' grounding requirements shall apply.

The Contractor shall furnish and install Transient Voltage Surge Suppression (TVSS) device(s) for all power and communications conductors leaving the equipment cabinets, including ITS equipment and solar power cabinets, including but not limited to power service, and power and communications for all devices that are external to the cabinet.

The hardware to mount the Dynamic Message Sign (DMS) to the support structures shall be galvanized steel in accordance with AASHTO M232.

- a. The mounting bolts shall be 5/8-inch heavy hex head bolts, ASTM A325 Type 1 (AASHTO M164).
- b. The nuts to secure the bolts shall be 5/8-inch heavy hex head nuts, ASTM A563 or A194 (AASHTO M291).
- c. The washers shall be 5/8-inch hardened washers, ASTM F436 (AASHTO M293).

650.031 Dynamic Message Sign (DMS) The DMS shall be a Ver-Mac model B-1500C only; no alternatives will be considered.

Mounting: The Contractor shall furnish and install all hardware required to attach the DMS panel to the applicable supports. DMS shall be mounted using two Zee bars attached along the top and bottom of the DMS panel. For ground mounted installations, the Zee bars shall be bolted to the steel H beams on each side of the web as shown in the Plans.

Environmental:

- a. Operating temperature range: -40° to + 74°C
- b. Humidity operating range: 10 to 95 percent relative humidity, non-condensing

650.032 DMS Controller The DMS Controller shall be a Ver-Mac V-Touch Controller only; no alternatives will be considered.

- a. Environmental – The DMS controller shall have the same environmental standards as the DMS panel itself.

650.033 DMS Ground Mounted Control Cabinet The DMS Ground Mounted Control Cabinet shall be ground mounted and installed at the locations shown in the Plans, and in conformance with all requirements shown in the Plans. The DMS cabinet shall consist of an aluminum weatherproof housing, and all ancillary equipment necessary to provide a complete, operational control cabinet for the DMS equipment. This work shall include all wiring, cabling, and connectorizing from the DMS cabinet to the DMS panel.

- a. The DMS cabinet shall be NEMA 3R rated.
- b. The DMS cabinet shall be a NEMA “P-44” cabinet meeting the requirements of Section 643.042, with the exception that the DMS cabinet shall not require a switch compartment as described in the sixth paragraph of Section 643.042.
- c. A 36-inch x 30-inch x 4-inch concrete work pad shall be installed in front of the cabinet door. The pad shall be placed on a minimum of four inches of compacted granular material. The pad shall be set with at least one percent grade such that any water on the pad shall flow away from the cabinet. The DMS cabinet shall be secured to the concrete foundation provided by the Contractor as shown in the Contract Documents. Where the work pad is installed on a slope, the depth of the pad shall be increased such that there is at least two inches of the concrete pad below grade.
- d. Each cabinet shall contain a power panel. The power panel shall contain a primary circuit breaker, which will accept the incoming power from the solar power system or from the AC utility power. This primary circuit breaker shall serve as the electrical disconnect for the cabinet and shall shut off all cabinet power when in the “off” position.
- e. The DMS cabinet shall protect the electronics and interfaces against: sustained winds of 90 miles per hour (MPH), with 120 MPH wind gusts, blowing sand and dust, roadside

pollutants from vehicle exhausts, blowing rain and snow and heavy ice accumulations experienced in the project area.

- f. The cabinet door shall be supplied and installed with a Corbin 1548-1 lock for access by #2 keys.
- g. The DMS cabinet shall be supplied with a captive door restraint bar. The bar shall allow the door to be kept open at a minimum of two different angles with one at 90 degrees and the other in the fully open position. The door restraint bar shall be supplied and installed such that the door is held in place during a 40 MPH wind without the restraint bar being bent. The door restraint bar shall be provided to prevent door movement when open in windy conditions.
- h. Door hinges shall be continuous and bolted to the cabinet and door utilizing steel carriage bolts and nylock nuts. The hinges shall be made of a minimum 0.083-inch thick aluminum and shall have a minimum 0.250-inch diameter stainless steel hinge pin. The hinge pin shall be capped at the top and bottom by a weld to prevent removal.
- i. The top and bottom of the latching pushrods shall contain nylon rollers to promote secure door closure.
- j. The door handle shall be stainless steel. The latching handle shall have provisions for padlocking in the closed position. A solid 1/4" diameter weatherproof padlock approved by the Resident shall be installed with each cabinet. All padlocks supplied as part of one project shall be keyed alike.
- k. The DMS cabinet shall be covered by a one year dated warranty covering material defects for one year from date of acceptance.
- l. The DMS cabinet shall contain a power switch mounted within the cabinet to control power to all duplex outlets. The cabinet shall include a minimum of two duplex outlets (total of four outlets), each rated for 15 amps.
- m. The Contractor shall supply and install a thermostatically controlled electric fan in the cabinet to maintain the temperature within the field cabinet to that required by the equipment for outside temperatures as specified in these Special Provisions. Thermostats shall have the capability of being field adjusted from 50° F to 120° F.
- n. All exposed, high voltage electrical terminals shall be insulated with non-conducting material such as rubber boots or silicon/rubber caulking.
- o. The DMS cabinet shall be electrically bonded to all of its associated metallic DMS support structure grounding systems, as described elsewhere in this document or in the Contract Documents.

- p. All air venting arrangements shall contain air filters. The air filters shall have an average rated efficiency of 30% and an arrestance of 90% when tested in accordance with ASHRAE 52.1-1992 Test Standard. The filter shall be listed and rated Class 2 by the Underwriters Laboratories. Each cabinet shall be supplied with all required air filters. All fans shall be located above the air filters at the top of the cabinet.
- q. All intake and exhaust vents shall meet NEMA 3R requirements with and without powering the air venting arrangements. All exhaust vents shall be furnished with a screen to prevent insects from entering the DMS cabinet.
- r. The DMS cabinet shall be supplied and installed with an internal light located in the top of the cabinet inside the door. This light shall automatically turn on when the cabinet door is open and shut off when the door is closed. The light shall be hardwire connected to the cabinet's electrical power distribution buss.
- s. The Contractor shall furnish in a watertight container a control cabinet-wiring diagram. Three sets of identical wiring diagrams shall be furnished for each cabinet.

650.034 Cellular Modem The Cellular Modem shall provide the communications interconnect means between the DMS Controller and the Authority's communications system. The Cellular Modem shall meet the following requirements:

- a. The Contractor shall install, integrate and test a Cellular Modem that will be provided by the Authority for use with the DMS controller.
- b. The Contractor shall provide all necessary cables and connectors to connect the Cellular Modem to the DMS controller and to the cabinet antenna.
- c. The Contractor shall perform a cellular site survey at the DMS locations shown in the Plans to ascertain available cellular signal levels.
- d. Based on the results of the cellular site survey, the Contractor shall furnish and install a suitable cellular antenna such that the received signal strength, as measured by the Cellular Modem, shall be -65 dBm or greater. The antenna shall be weatherproof and of the type that is specifically designed for outdoor applications. If needed to achieve a -65 dBm cellular signal strength, the Contractor shall install a high gain antenna, otherwise a unity gain omnidirectional antenna shall be acceptable. The antenna shall include all required cabling and mounting hardware. The antenna shall be mounted in such a manner and location as to minimize the risk of vandalism and damage.
- e. The Cellular Modem shall include integral TVSS on its antenna, serial, and Ethernet ports, as well as its power inputs.

650.035 Solar Power System The Solar Power System shall provide power to the DMS, DMS controller, DMS control cabinet, and cellular modem. The Solar Power System shall meet the following requirements:

- a. The Solar Power System shall consist of solar panels, solar panel support structures and foundations, batteries, solar power system equipment, an independent control cabinet to house the batteries and solar power system equipment, and all associated cabling.
- b. The solar panel support structures and foundations shall meet the following requirements:
  - a. The solar array support pole and foundation shall be designed by a Professional Engineer licensed in the State of Maine and constructed to comply with all applicable sections of the 2013 AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaries and Traffic Signals with all published addendums. For other structural requirements, the Contractor shall refer to Section 643 and Section 645.
  - b. The solar panel support pole shall be a one-piece construction, galvanized steel, and shall conform to ASTM A595 Grade A with a minimum yield strength of 55 ksi, or ASTM A572 with a minimum yield strength of 65 ksi.
  - c. The solar array support pole shall be designed to support a solar array and all hardware subsidiary to the solar power system necessary to power all DMS equipment and auxiliaries. The support pole shall be designed for the number of solar panels as indicated by the approved solar power calculations. Close consideration shall be given to the effective projected area of the complete solar power system to be mounted on the pole along with the weight of attached hardware when designing the pole to meet the performance criteria, including consideration for all possible loading combinations including wind and ice loads; and the design stresses and allowable stresses for all components which comprise the proposed structure.
  - d. The structural calculations shall include a pole, base plate, and anchor bolt analysis. The pole calculations shall be analyzed at the pole base and at 5-foot pole intervals along the full height of the pole. At each of these locations, the following information shall be provided by the Contractor:
    - i. The pole's diameter, thickness, section modulus, moment of inertia, and cross sectional area.
    - ii. The centroid, weight, projected area, drag coefficient, velocity pressure, and wind force of each trapezoidal pole segment.
    - iii. The axial force, shear force, primary moment, total moment, axial stress, bending stress, allowable axial stress, allowable bending stress, and combined stress ratio (CSR) at each elevation.
    - iv. The pole's angular and linear and angular deflection at each location.
  - e. Base Plate: Base plates shall conform to ASTM A36 or A572 Grade 42.
  - f. Foundations shall be cast in place. No precast foundations shall be permitted.

- g. Anchor rods shall conform to the requirements of ASTM F1554 Grade 55 (minimum). Galvanize the entire rod per ASTM A153. Each anchor rod shall be supplied with a minimum of two hex nuts (ASTM A563 or ASTM A194) and a minimum of two flat hardened washers (ASTM F436).
  - h. The top of the foundation should be placed at least 3” higher than adjacent highest soil but not more than 4” higher than adjacent highest soil, unless otherwise specified in the Contract Documents.
  - i. All electrical materials shall meet all applicable state, local and public utility codes and requirements as well as the National Electrical Code (NEC).
  - j. The Contractor shall supply and install a grounding system at the base of the solar array support pole. The grounding system shall be connected to the pole through an appropriate ground clamp. A #4 AWG copper wire shall be installed between the support pole and the battery cabinet providing a common ground system for each terminus. A minimum one-inch conduit through the foundation to the inside of the pole shall provide the means to connect the ground wire from the inside of the pole at a ground lug to the ground rod(s).
  - k. Additional ground rods shall be installed to meet the manufacturer’s recommended resistance to ground, or a maximum of 25 ohms, whichever is less.
- c. The solar power batteries shall be sized to provide ten (10) days of autonomy to the DMS, DMS controller, DMS control cabinet, and cellular modem under no-light conditions. After ten (10) days of autonomous operation under no-light conditions, the batteries shall still retain at least 50% of their full capacity.
  - d. The batteries shall be sealed AGM type, and shall be spill proof.
  - e. The solar panels shall be sized to fully recharge the batteries in ten (10) days or less, while also supplying power to operate the DMS, DMS Controller, ITS Equipment Cabinet, and Cellular Modem, while under typical light conditions as defined by industry standard solar insolation maps for the State of Maine.
  - f. The solar panels shall be of the monocrystalline or polycrystalline type.
  - g. The mount for the solar panel array shall provide for adjustment of the angle of the face of the solar panels. The Contractor shall adjust the position of the solar panel array in a manner that maximizes solar exposure.
  - h. The Contractor shall locate the solar panel array in a location that results in no shadows being cast on the solar panels whatsoever at any time of the year. The Contractor shall consider the effects of leaves on trees, regardless of whether or not there are any leaves

on trees at the time of installation.

- i. The solar power system shall provide 24 hours per day of operation, seven (7) days per week, 365 days per year with no loss of operation. The Contractor shall submit for approval a solar calculation which demonstrates compliance with this requirement. The solar calculation shall include the manufacturer's specified loads of each piece of equipment to be powered. The solar calculation shall take into account the full required operating temperature range.
- j. The solar power system shall be designed to operate correctly over a free air temperature range of -30°F to +122°F. Solar power system components installed within the control cabinet shall be designed to operate correctly over a temperature range of -30°F to +165°F.
- k. The DMS control cabinet shall house the batteries and solar power equipment. The equipment shall include, but not be limited to, charge control circuitry that prevents overcharging of the batteries, low voltage disconnect devices which disconnect the batteries to prevent battery damage in the event of a very low state of charge, and an inverter that provides 120 VAC power to the DMS control cabinet. The inverter shall provide 120 VAC power with three (3) percent or less total harmonic distortion, and with output voltage regulation of plus or minus five (5) percent or better. The charge control circuitry shall be temperature compensated such that battery charging voltage is automatically adjusted based on temperature variations so as to maximize battery life. The control devices shall also include a system monitoring device which allows maintenance personnel to assess critical system parameters such as battery condition and solar panel output. The cabinet shall include overcurrent protection devices that limit overcurrent in the solar power system to safe levels in the event of a malfunction of the solar power system.
- l. Where the Contract Documents indicate solar power systems, the solar power control cabinet shall include all provisions for future utility power connection.
- m. The DMS control cabinet shall include an AC powered battery charger which, when operating under generator power or utility power, fully recharges the batteries in two (2) days or less, while also supplying power to operate the DMS, DMS controller, DMS control cabinet, and cellular modem.
- n. The solar panels shall be Underwriter's Laboratory (UL) approved. UL certification shall be provided with the catalog cuts and working drawings in the Technical Submittal.

650.04 AC Power Systems The Contractor shall provide utility power systems to DMS systems as indicated in the Contract Documents.

- a. The Contractor shall make the necessary arrangements with the utility company to ensure having needed utility service available at the time of equipment testing and turn-on. Any utility energization, connection, or disconnection delays will not be a valid reason for a

time extension. The Contractor shall be responsible for all utility charges, including connection and monthly service charges, until System Acceptance.

- b. The Contractor shall adhere to all applicable NEC, IEEE 1100-1992, UL 1459, and UL 1950 standards and practices.
- c. The metered service shall include a 100 amp main disconnect.
- d. The Contractor shall provide a rigid conduit riser on the exterior of the sign structure with a weatherhead at the top of the riser. The meter and disconnect equipment shall be banded to the sign structure support with a conduit below the disconnect switch entering the sign structure support.

650.05 Training The Contractor shall provide up to 6 hours training on all components of the DMS system. The Training shall meet the following requirements:

- a. The Contractor shall provide training on the configuration, operation, and maintenance of the items provided under this contract as described herein. The training shall be on the new items provided under this contract, including the DMS, DMS controller, DMS control cabinet, and solar power system.
- b. The Contractor shall develop and supply all necessary manuals, displays, class notes, and visual aids, and other instructional materials furnished by equipment manufacturers. Instructional materials shall include all data sheets and manuals from manufacturers for all contract items supplied.
- c. All training shall include hands-on use of all equipment, both field equipment and central equipment.

650.06 Testing The Contractor shall provide testing on all components of the system. The testing shall meet the following requirements:

- a. The Contractor shall propose a test plan for the DMS system and for the solar power system and submit the test plan(s) and procedures as detailed herein. Each of the test plans shall contain the following elements:
  - a. Proposed date, time, and location of the testing
  - b. Names and credentials of the Contractor personnel who will be conducting the testing
  - c. Descriptive overview of the proposed test procedure
  - d. List of test equipment required to perform the testing
  - e. Test cases and test logging forms which detail every step of the test procedure:
- b. Test logging forms shall be presented in tabular format, with separate columns for each of the following:

- a. Test case description detailing the test step to be performed.
  - b. Expected result
  - c. Actual result
  - d. Pass/fail
  - e. Comments
- c. The Contractor shall supply separate test logging forms at the time of testing for each test plan, and for each device location. The test logging forms shall show the device location, date, and the start and end times of the test.
- d. At the end of each test logging form, there shall be signature and date locations for each of the following:
- a. Contractor personnel conducting the test
  - b. Engineer representative witness
  - c. Authority Resident
- e. Signatures on the test logging form will signify only that the test was performed and witnessed, not that it passed or failed.
- f. The detailed Test Plans shall be submitted to the Engineer no later than thirty (30) days prior to the beginning of each test phase.
- g. The Contractor shall have approved test plans prior to submitting a request to schedule the start of any test activities. The Contractor shall notify the Resident no less than seven (7) days prior to the beginning of any equipment or systems testing.
- h. Testing shall provide verification and documentation that all requirements as detailed in this Section and the Plans are met. The Test Plans shall be developed by the Contractor to provide a mechanism that ensures that all contract requirements have been met and tested successfully and verified.
- i. If any deviations or changes to the approved Test Plans arise, it shall be resubmitted for review and approval by the Engineer at least fourteen (14) calendar days prior to any planned test activity stage. No tests shall be conducted until the Engineer has approved the test plan.
- j. A summary of all tests shall be produced at the completion of each testing phase of the project to ensure that all requirements defined by the system are satisfied.

#### 650.07 Method of Measurement

Dynamic Message Sign (DMS) Systems will be measured for payment by the lump sum for a fully operational system in place. When more than one unit applies, each unique item shall have a separate item number.

DMS Ground Mounted Control Cabinets will be measured for payment by each unit furnished and installed. When more than one unit applies, each unique item shall have a separate item number.

DMS Solar Power System will be measured for payment by the lump sum for a fully operational system in place. When more than one unit applies, each unique item shall have a separate item number.

The DMS ground mounted control cabinet foundations will be measured in accordance with Section 626.

650.08 Basis of Payment

The accepted quantity of Dynamic Message Sign (DMS) Systems will be paid for at the Contract lump sum price. This price shall be full compensation for furnishing, installing, configuring, testing, and training associated with the DMS panel and the DMS controller. The price also includes all costs associated with setting-up and paying for a data cellular account, technical support, and training.

The accepted quantity of DMS Ground Mounted Control Cabinets will be paid for at the Contract unit price for each unit installed. This price shall be full compensation for furnishing and installing, and for equipment that uses utility power, for all utility connections, attachments, hardware, meters, disconnects, and associated cabling. The price also includes all costs for associated equipment and hardware within the control cabinet not included in other pay items.

The accepted quantity of DMS Solar Power Systems will be paid for at the Contract lump sum price. This prices shall be full compensation for designing, furnishing, installing, testing and training associated with the DMS solar power system. The price also includes all costs associated with the structural design and fabrication of the solar panel support system and the support foundation.

Payment will be made under:

<u>Pay Item</u>		<u>Pay Unit</u>
650.1011	Dynamic Message Sign (DMS) System: STA 601+82 RT	Lump Sum
650.1012	Dynamic Message Sign (DMS) System: STA 622+15 LT	Lump Sum
650.1013	Dynamic Message Sign (DMS) System: STA 704+09 LT	Lump Sum
650.2011	DMS Ground Mounted Control Cabinet: STA 601+82 RT	Each
650.2012	DMS Ground Mounted Control Cabinet: STA 622+15 LT	Each
650.2013	DMS Ground Mounted Control Cabinet: STA 704+09 LT	Each
650.9011	DMS Solar Power System: STA 601+82 RT	Lump Sum
650.9012	DMS Solar Power System: STA 622+15 LT	Lump Sum
650.9013	DMS Solar Power System: STA 704+09 LT	Lump Sum

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:

Route 202 and Route 26A Traffic Control Requirements

Two-lane traffic shall be maintained on Route 202 and Route 26A at all times in accordance with the details shown on the Plans and in accordance with MUTCD guidance except during construction on the Route 202 bridge when a single, reversing lane may be implemented with flaggers. The lanes may be shifted to perform the intended construction. The travel lanes and shoulders shall be a minimum of 11' and 1' respectively unless identified differently on the plans. It is anticipated that the utilization of flaggers is adequate to control traffic entering and exiting the work site for critical operations only. The cost of flaggers is paid under Item 652.38.

Maine Turnpike Traffic Control Requirements

A maintenance of traffic control plan has been developed for the construction and demolition of various elements of the project. The intent of this plan is to keep traffic moving continuously during construction of the ramps, acceleration and deceleration lanes, and the demolition of the southbound ramps bridge.

The traffic control plan allows for the complete closure of the southbound on ramp roadway for a period of up to 3 days (66 hours) to allow the Contractor to complete the connection of the proposed southbound on ramp to the temporary ramp to open the new southbound on ramp toll plaza. The travel lanes and shoulders shall be a minimum of 11' and 1' respectively unless identified differently on the plans.

It is anticipated that the utilization of flaggers is adequate to primarily control traffic entering and exiting the work site for critical operations. The cost of flaggers for construction vehicles entering and exiting the work zone will not be measured but shall be incidental to the Item 652.361 Maintenance of Traffic Control Devices.

It is envisioned that the short stoppages of traffic may be required occasionally along the mainline and in close proximity to the ramp gores, when State Police shall be required. The Contractor is required to coordinate these activities through the Resident a week in advance of the operation to ensure coordination and safety can be agreed to for these occasional operations.

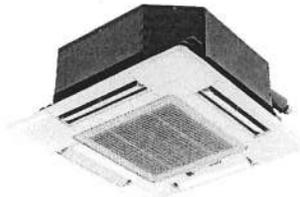
During nights of scheduled special bridge removal activities and large material deliveries, the Contractor will be permitted full use of a single closed lane as indicated in Table A. Once the nighttime lane closures and maintenance of traffic control devices are in place, per the Plans or as coordinated with the Resident Engineer, the State Police will be responsible for traffic control.

Activities are only allowed during the times noted in Table A. Travel lanes may not be impeded by traffic control devices until the time frames specified for each activity.

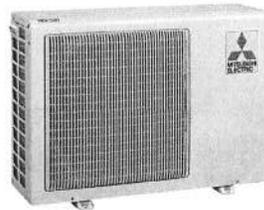
**SUBMITTAL DATA: SLZ-KA15NA & SUZ-KA15NA**

15,000 BTU/H CEILING-CASSETTE HEAT-PUMP SYSTEMS

Job Name: Falmouth toll plaza	Location: Falmouth, Me.	Date: 12/22/15
Purchaser:	Engineer:	
Submitted to:	For <input checked="" type="checkbox"/> Reference <input type="checkbox"/> Approval <input type="checkbox"/> Construction	
System Designation:	Schedule No.:	



Indoor Unit: SLZ-KA15NA



Outdoor Unit: SUZ-KA15NA

**GENERAL FEATURES**

- Four-way 2'x2' ceiling-cassette indoor unit for ceiling recessed applications
- Built-in drain mechanism for condensate removal; lifts to 19-11/16"
- Wide air-flow pattern for better air distribution
- Design features ventilation air intake knockout
- Long-life air filter included with indoor unit
- Indoor unit powered from outdoor unit using A-Control
- Choice of fan speed: Low, Medium, High
- Automatic restart following a power outage
- Limited warranty: five years parts and seven years compressors

**ACCESSORIES**
**Indoor Unit**

- Grille (SLP-15AAUW; required - shipped with unit)

**Outdoor Unit**

- Drain Pan Heater (MAC-640BH-U)
- Drain Socket (MAC-860DS)
- Three-pole Disconnect Switch (TAZ-MS303)
- Air Outlet Guide (MAC-856SG)
- Mounting Base (DSD-400N)
- Mounting Pad (ULTRILITE1)

**Controller Options**

- Wireless Wall-mounted Remote Controller Kit (MHK1)\*
- Portable Central Controller (MCCH1)\*
- Outdoor Air Sensor (MOS1)\*
- Wired Wall-mounted Controller (PAR-31MAA)\*
- Simple MA Remote Controller (PAC-YT53CRAU)\*
- \*See Submittal for information on each option.
- Remote Temperature Sensor (M21-JKO-307)
- Hand-held Wireless Remote Controller (PAR-FL32MA; req. PAR-FA32MA-E)
- Wireless Signal Receiver PAR-FA32MA (for PAR-FL32MA)
- Lockdown Bracket for Hand-held Controller (RCMKP1CB)

**Cooling\***

Rated Capacity ..... 15,100 Btu/h  
 Minimum to Maximum Capacity Range ..... 3,800 - 17,700 Btu/h  
 SEER ..... 16.0 Btu/h/W  
 EER ..... 10.2 Btu/h/W  
 Total Input ..... 1,460 W

**Heating at 47°F\***

Rated Capacity ..... 18,000 Btu/h  
 Minimum to Maximum Capacity Range ..... 3,100 - 22,200 Btu/h  
 HSPF ..... 9.6 Btu/h/W  
 COP ..... 2.71  
 Total Input ..... 1,950 W

**Heating at 17°F\***

Rated Capacity ..... 10,200 Btu/h  
 Rated Total Input ..... 1,310 W  
 COP ..... 1.99  
 Maximum Capacity\*\* ..... 12,000 Btu/h  
 Maximum Total Input ..... 1,970 W

**\* Rating Conditions per AHRI Standard**

Cooling | Indoor: 80° F (27° C) DB / 67° F (19° C) WB  
 Cooling | Outdoor: 95° F (35° C) DB / 75° F (24° C) WB  
 Heating at 47°F | Indoor: 70° F (21° C) DB / 60° F (16° C) WB  
 Heating at 47°F | Outdoor: 47° F (8° C) DB / 43° F (6° C) WB  
 Heating at 17° F | Indoor: 70° F (21° C) DB / 60° F (16° C) WB  
 Heating at 17° F | Outdoor: 17° F (-8° C) DB / 15° F (-9° C) WB

**\*\* Maximum Capacity is at full speed and performance for INVERTER-driven System.**

**Electrical Requirements**

Power Supply ..... 208 / 230V, 1-Phase, 60 Hz  
 Recommended Fuse/Breaker Size ..... 15 A

**Voltage**

Indoor - Outdoor S1-S2 ..... AC 208 / 230V  
 Indoor - Outdoor S2-S3 ..... DC ±24V

**OPERATING CONDITIONS**

		Indoor Intake Air Temp.	Outdoor Intake Air Temp.
Cooling	Maximum	95°F (35° C) DB 71° F (22° C) WB	115°F (46° C) DB
	Minimum	67° F (19° C) DB 57° F (14° C) WB	14° F (-10° C) DB
Heating	Maximum	80° F (27° C) DB 67° F (19° C) WB	75°F (24° C) DB 65°F (18° C) WB
	Minimum	70° F (21° C) DB 60° F (16° C) WB	-4°F (-20° C) DB -5°F (-21° C) WB

**Indoor Unit**

MCA ..... 1 A  
 Fan Motor Output ..... 20 W  
 Fan Motor (ECM) ..... 0.28 F.L.A.  
 Airflow (Lo - Med - Hi) ..... 280 - 320 - 390 Dry CFM  
 250 - 290 - 350 Wet CFM  
 Air Filter ..... Polypropylene Honeycomb  
 Sound Pressure Level (Lo - Med - Hi) ..... 31 - 35 - 40 dB(A)

DIMENSIONS	UNIT INCHES / MM	GRILLE INCHES / MM
W	22-7/16 / 570	25-5/8 / 650
D	22-7/16 / 570	25-5/8 / 650
H	9-1/4 / 235	13/16 / 20

**Weight (Unit/Grille)**

Lbs..... 36 / 7  
 kg..... 16.5 / 3  
 External Finish (Unit/Grille) ..... Galvanized-steel Sheets / Munsell 6.4Y 8.9 / 0.4  
 Field Drainpipe Size O.D..... 1-1/4" / 32 mm

**Outdoor Unit**

Compressor ..... DC Inverter-driven Twin Rotary  
 MCA ..... 12 A  
 MOCP ..... 15 A  
 Fan Motor (ECM) ..... 0.50 F.L.A.  
 Sound Pressure Level  
 Cooling ..... 49 dB(A)  
 Heating ..... 51 dB(A)

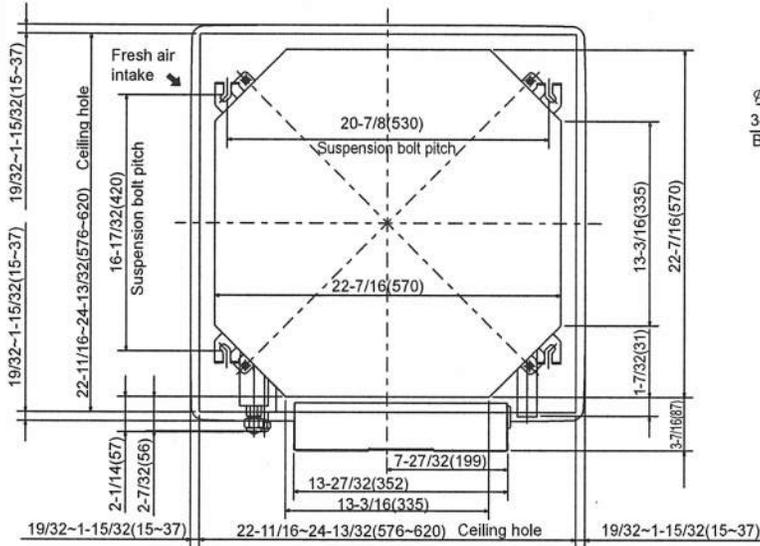
DIMENSIONS	INCHES / MM
W	31-1/2 / 800
D	11-1/4 / 285
H	21-5/8 / 550

Weight ..... 80 lbs. / 36 kg  
 External Finish ..... Munsell No. 3Y 7.8 / 1.1  
 Refrigerant Type ..... R410A  
 Refrigerant Pipe Size O.D.  
 Gas Side ..... 1/2" / 12.7 mm  
 Liquid Side ..... 1/4" / 6.35 mm  
 Max. Refrigerant Pipe Length ..... 65' / 19.8 m  
 Max. Refrigerant Pipe Height Difference ..... 40' / 12.2 m  
 Connection Method ..... Flared

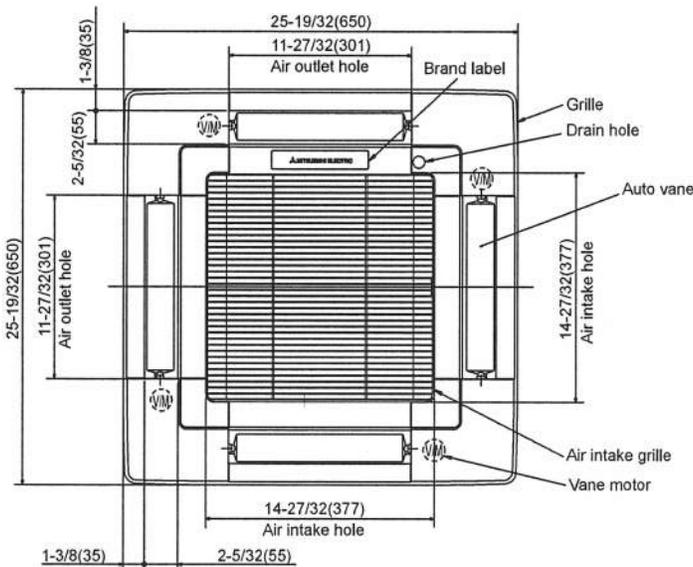
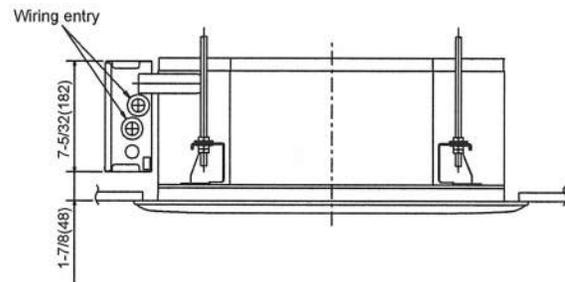
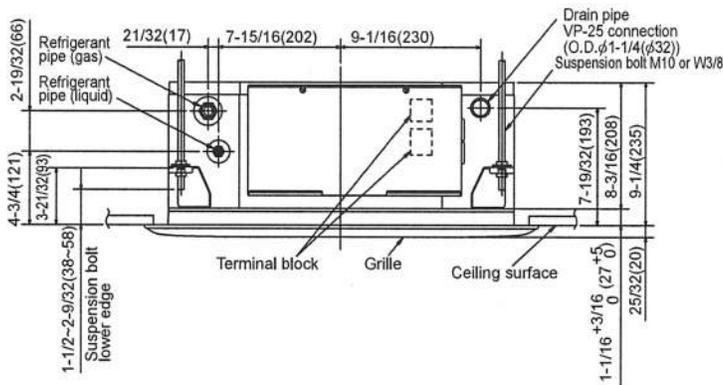
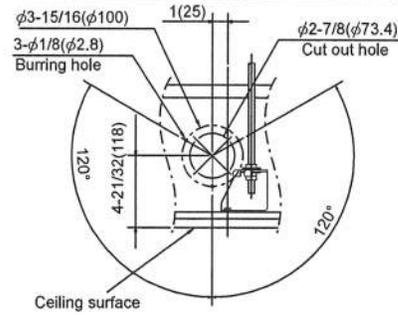
Notes:

# DIMENSIONS: SLZ-KA15NA

Unit : inch (mm)



### Detail drawing of fresh air intake



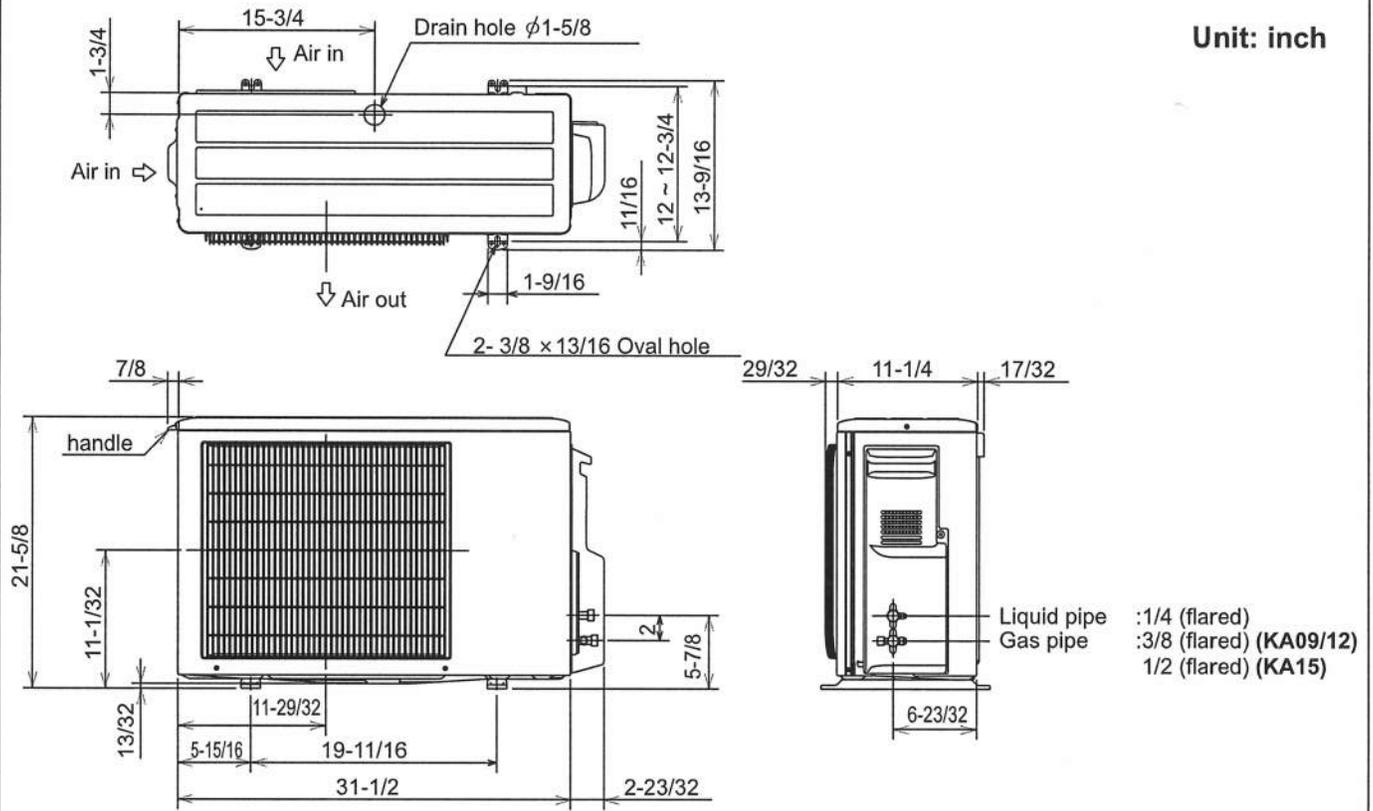
Models	Refrigerant pipe (liquid)	Refrigerant pipe (gas)
SLZ-KA09NA	1/4 inch (φ 6.35mm) flared connection	3/8 inch (φ 9.52mm) flared connection
SLZ-KA12NA	1/4 inch (φ 6.35mm) flared connection	3/8 inch (φ 9.52mm) flared connection
SLZ-KA15NA	1/4 inch (φ 6.35mm) flared connection	1/2 inch (φ 12.7mm) flared connection

Specifications are subject to change without notice.  
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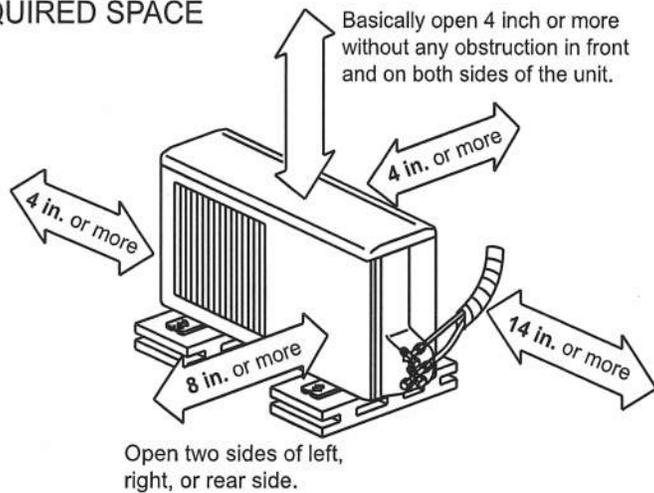
Contract 2016.02  
Addendum No. 1  
01/12/2016

# DIMENSIONS: SUZ-KA15NA

Unit: inch



## REQUIRED SPACE



1340 Satellite Boulevard  
 Suwanee, GA 30024  
 Tele: 678-376-2900 • Fax: 800-889-9904  
 Toll Free: 800-433-4822  
 www.mehvac.com

FORM# SLZ-KA15NA - SUZ-KA15NA - 201311  
 Specifications are subject to change without notice.  
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Contract 2016.02  
 Addendum No. 1  
 01/12/2016

SIGN DETAIL

1:75



**Maine Turnpike Authority**



BORDER  
R=3"  
TH=1.25"

SIGN NUMBER	GS-27
WIDTH x HGHT.	8'-6" x 3'-0"
BORDER WIDTH	1.25"
CORNER RADIUS	3"
MOUNTING	Ground
BACKGROUND	TYPE: Reflective
	COLOR: Brown
LEGEND/BORDER	TYPE: Reflective
	COLOR: White/White

SYMBOL	X	Y	WID	HT
AR_Type D 0	0	8.3	23	6
AR_Type D 90	90	6.8	8.9	6

LETTER POSITIONS (X)

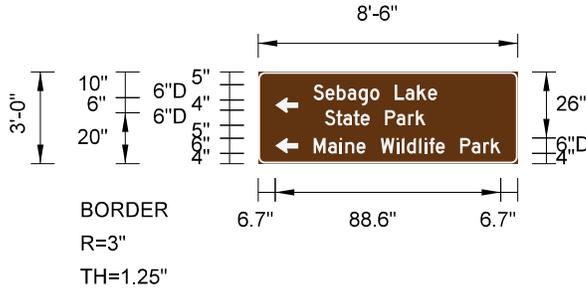
LENGTH SERIES/SIZE

M	a	i	n	e		W	i	l	d	l	i	f	e			D 2000
21.7	27.4	32	34.2	38.6	42.1	48.1	54.3	56.4	58.3	63.1	65.3	67.1	69.7	73.3		6/4.5
P	a	r	k													D 2000
79.3	83.8	88.4	91.4											73.5		6/4.5
S	e	b	a	g	o		L	a	k	e						D 2000
21.8	26.5	30.9	35.1	39.5	44	47.7	53.7	57.9	62.4	66.8				48.5		6/4.5
S	t	a	t	e		P	a	r	k							D 2000
26.3	30.7	33.5	37.5	40.3	43.8	49.8	54.4	59	62					39.5		6/4.5

SIGN DETAIL  
1:75



# Maine Turnpike Authority



SIGN NUMBER	GS-28
WIDTH x HGHT.	8'-6" x 3'-0"
BORDER WIDTH	1.25"
CORNER RADIUS	3"
MOUNTING	Ground
BACKGROUND	TYPE: Reflective
	COLOR: Brown
LEGEND/BORDER	TYPE: Reflective
	COLOR: White/White

SYMBOL	X	Y	WID	HT	
AR_Type D	90	6.7	19.9	6	9
AR_Type D	90	6.7	4	6	9

### LETTER POSITIONS (X)

LENGTH SERIES/SIZE

S	e	b	a	g	o		L	a	k	e							D 2000
21.7	26.5	30.8	35.1	39.4	44	47.6	53.6	57.8	62.4	66.7						48.5	6/4.5
S	t	a	t	e		P	a	r	k								D 2000
26.2	30.7	33.4	37.4	40.3	43.8	49.8	54.4	58.9	61.9							39.5	6/4.5
M	a	i	n	e		W	i	l	d	l	i	f	e				D 2000
21.8	27.5	32	34.2	38.6	42.2	48.2	54.3	56.5	58.4	63.2	65.3	67.1	69.8	73.3			6/4.5
P	a	r	k														D 2000
79.3	83.9	88.4	91.4													73.5	6/4.5

Date: 1/12/2016

Filename: ... \MSTA.015\_Estimated\_atv.dgn

ITEM NO.	DESCRIPTION	QUANTITY	UNIT
202.12	REMOVING EXISTING STRUCTURAL CONCRETE	160	CY
202.15	REMOVE MANHOLE OR CATCH BASIN	9	EA
202.193	REMOVING EXISTING BRIDGE	1	LS
202.202	REMOVING PAVEMENT SURFACE	6700	SY
202.2021	REMOVING PAVEMENT SURFACE - BRIDGE DECK	1230	SY
202.203	PAVEMENT BUTT JOINTS	890	SY
202.206	REMOVING RUMBLE STRIPS	2150	LF
203.20	COMMON EXCAVATION	52670	CY
203.25	GRANULAR BORROW	25	CY
203.26	GRAVEL BORROW	75	CY
206.061	STRUCTURAL EARTH BELOW GRADE STRUCTURE	100	CY
206.082	STRUCTURAL EARTH EXCAVATION - MAJOR STRUCTURES, PLAN QUANTITY	320	CY
304.09	AGGREGATE BASE COURSE - CRUSHED	5120	CY
304.10	AGGREGATE SUBBASE COURSE - GRAVEL	12140	CY
403.207	HOT MIX ASPHALT, 19.0 MM HMA	2550	T
403.2083	HOT MIX ASPHALT, 12.5 MM (POLYMER MODIFIED) - RAP	2250	T
403.209	HOT MIX ASPHALT 9.5 MM (INCIDENTALS)	170	T
403.210	HOT MIX ASPHALT 9.5 MM	1805	T
403.211	HOT MIX ASPHALT (SHIM)	1400	T
403.213	HOT MIX ASPHALT, 12.5 MM BASE	3000	T
409.15	BITUMINOUS TACK COAT, APPLIED	2310	G
419.30	SAWING BITUMINOUS PAVEMENT	5850	LF
501.54	STEEL H-BEAM PILES 117 LB/FT, DELIVERED	1326	LF
501.541	STEEL H-BEAM PILES 117 LB/FT, IN PLACE	1156	LF
501.90	PILE TIPS	34	EA
501.91	PILE SPLICES	10	EA
501.92	PILE DRIVING EQUIPMENT MOBILIZATION	1	LS
502.261	STRUCTURAL CONCRETE, GRADE BEAMS	183	CY
502.262	STRUCTURAL CONCRETE, PAVEMENT SLABS	612	CY
502.263	STRUCTURAL CONCRETE - PLAZA ISLANDS, BUMPERS AND CURTAIN WALLS	79	CY
502.266	STRUCTURAL CONCRETE - PEDESTALS & FOOTINGS	3	CY
502.701	BRIDGE DRAIN GRATE MODIFICATION	2	EA
503.14	EPOXY-COATED REINFORCING STEEL, FABRICATED AND DELIVERED	129500	LB
503.15	EPOXY-COATED REINFORCING STEEL, PLACING	129500	LB
503.18	GLASS FIBER REINFORCED POLYMER (GFRP) REINFORCING BARS, FABRICATED AND DELIVERED	33400	LB
503.19	GLASS FIBER REINFORCED POLYMER (GFRP) REINFORCING BARS, PLACING	33400	LB
503.90	SYNTHETIC FIBER REINFORCEMENT	3060	LB
504.50	TOLL PLAZA CANOPY	1	LS
504.61	TOLL GANTRY - SOUTHBOUND	1	LS
504.62	TOLL GANTRY - NORTHBOUND	1	LS
507.0928	ALUMINUM BRIDGE RAILING - RAIL SECTION REPLACE	21	LF
508.14	HIGH PERFORMANCE WATERPROOFING MEMBRANE	1	LS
515.201	PIGMENTED PROTECTIVE COATING FOR CONCRETE SURFACES	360	SY
515.202	CLEAR PROTECTIVE COATING FOR CONCRETE SURFACES	1350	SY
515.23	EPOXY OVERLAY	72	SY
516.202	CLEAR PROTECTIVE COATING FOR CONCRETE SURFACES	520	SY
518.1	ABUTMENT REPAIRS	60	SF
518.2	PIER REPAIRS	65	SF
518.391	REPAIRING GRANITE CURB JOINT AND BEDDING MORTAR	185	LF
518.392	REPAIRING CONCRETE PARAPET ELASTOMERIC JOINT SEALER	340	LF
518.8	PARTIAL DEPTH CONCRETE DECK REPAIRS	550	SF
518.81	FULL DEPTH CONCRETE DECK REPAIRS	220	SF
520.2211	EXPANSION JOINT MODIFICATION	2	EA
524.4	PROTECTIVE SHIELDING - STEEL GIRDERS	1060	SY
526.306	TEMPORARY CONCRETE BARRIER - MTA	1	LS
526.35	PIER PROTECTION CONCRETE BARRIER	1	LS
526.351	MEDIAN BARRIER TYPE 1 - PRECAST	149	LF
526.361	MEDIAN BARRIER TRANSITION TYPE 1 - PRECAST	2	EA
527.301	ENERGY ABSORBING SYSTEM (C-A-T)	2	EA
527.342	WORK ZONE CRASH CUSHIONS - TL-2	1	UN
527.343	WORK ZONE CRASH CUSHIONS - TL-3	3	UN
602.3	FLOWABLE CONCRETE FILL	9	CY
603.15	12" CULV PIPE OPTION I	15	LF

ITEM NO.	DESCRIPTION	QUANTITY	UNIT
603.155	12 INCH REINFORCED CONCRETE PIPE - CLASS III	173	LF
603.169	15" CULV PIPE OPTION III	50	LF
603.17	18" CULVERT PIPE OPT I	30	LF
603.175	18 INCH REINFORCED CONCRETE PIPE - CLASS III	290	LF
603.19	24" CULVERT PIPE OPT I	35	LF
603.195	24 INCH REINFORCED CONCRETE PIPE - CLASS III	110	LF
603.2551	60" RCP CLASS IV	170	LF
603.28	CONCRETE COLLAR FOR REINFORCED CONCRETE PIPE	20	EA
604.072	CATCH BASIN TYPE A1-C	23	EA
604.092	CATCH BASIN TYPE B1-C	3	EA
604.164	REBUILDING CATCH BASIN	1	EA
604.166	REBUILDING MANHOLE	1	EA
604.18	ADJUST MANHOLE OR CB TO GRADE	11	EA
604.262	CATCH BASIN TYPE B5-C	6	EA
605.09	6" UNDERDRAIN TYPE B	200	LF
605.11	12" UNDERDRAIN TYPE C	950	LF
605.12	15" UNDERDRAIN TYPE C	110	LF
605.13	18" UNDERDRAIN TYPE C	200	LF
605.15	24" UNDERDRAIN TYPE C	160	LF
606.1723	BRIDGE TRANSITION - TYPE 3	4	EA
606.24	GUARDRAIL TYPE 3D - SINGLE RAIL	5400	LF
606.2401	GUARDRAIL TYPE 3D - DOUBLE RAIL	205	LF
606.242	GUARDRAIL TYPE 3D - OVER 15' RADIUS	165	LF
606.265	TERMINAL END - SINGLE RAIL	1	EA
606.277	TERMINAL END - TRAILING END	14	EA
606.352	REFLECTORIZED BEAM GUARDRAIL DELINEATORS	405	EA
606.353	DELINEATOR POST	70	EA
606.354	DELINEATOR POST - REMOVE AND RESET	40	EA
606.3621	GUARDRAIL ADJUST - SINGLE RAIL	2500	LF
606.3631	GUARDRAIL - REMOVE AND DISPOSE	6150	LF
606.64	GR - THRIE BEAM - DBL RAIL	850	LF
606.65	GR - THRIE BEAM - SGL RAIL	150	LF
606.701	ASYMMETRICAL THRIE BEAM TRANSITION	4	EA
606.754	WIDEN SHOULDER FOR GUARDRAIL 350 FLARED	4	EA
606.80	GUARDRAIL FLEAT 350 TERMINAL	10	EA
607.09	WOVEN WIRE FENCE - METAL POSTS	1500	LF
607.154	DRIVEWAY GATE 21 FOOT - METAL	1	EA
607.17	CHAIN LINK FENCE - 6'	490	LF
607.173	CHAIN LINK FENCE 6' PVC CTD	320	LF
607.2325	CHAIN FENCE GATE 6'X12'OPENING	1	EA
607.26	REMOVE & STACK FENCE	430	LF
607.32	BRACING ASSEMBLY TYPE I - METAL POSTS	7	EA
607.34	BRACING ASSEMBLY CHAIN LINK FENCE	13	EA
608.08	REINFORCED CONCRETE SIDEWALK	217	SY
609.11	VERTICAL CURB TYPE 1	547	LF
609.12	VERT CURB TYPE 1- CIRCULAR	137	LF
609.13	VERTICAL BRIDGE CURB TYPE 1	300	LF
609.14	VERTICAL BRIDGE CURB TYPE 1 - CIRCULAR	80	LF
609.191	CONCRETE CURB TYPE 2	12	LF
609.234	TERMINAL CURB TYPE 1 - 4 FOOT	5	EA
609.237	TERMINAL CURB TYPE 1 - 7 FT	2	EA
609.2371	VERTICAL CURB TYPE 1 - 7 FT - CIRCULAR	1	EA
609.26	CURB TRANSITION SECT B-TYPE 1	6	EA
609.34	CURB TYPE 5	2600	LF
609.35	CURB TYPE 5 - CIRCULAR	120	LF
610.08	PLAIN RIPRAP	340	CY
610.18	STONE DITCH PROTECTION	15	CY
610.181	TEMPORARY STONE CHECK DAMS	35	CY
610.19	COBBLE GRAVEL SAND MIX	47	CY
613.319	EROSION CONTROL BLANKET	3100	SY
615.07	LOAM	3851	CY
618.1301	SEEDING METHOD NUMBER 1, PLAN QUANTITY	5	UNIT

ITEM NO.	DESCRIPTION	QUANTITY	UNIT
618.1401	SEEDING METHOD NUMBER 2 - PLAN QUANTITY	230	UN
618.1411	SEEDING METHOD NUMBER 3 - PLAN QUANTITY	90	UN
619.1201	MULCH - PLAN QUANTITY	315	UN
619.1202	TEMPORARY MULCH	1	LS
619.1401	EROSION CONTROL MIX	30	CY
620.58	EROSION CONTROL GEOTEXTILE	638	SY
621.043	EVERGREEN TR (6'-8") GP A	5	EA
621.044	EVERGREEN TR (6'-8") GP B	8	EA
621.248	LG DECID TR (5'-6") GP A	20	EA
621.279	LG DECID TR (2.50"-3" CAL) GP A	4	EA
621.408	DWF EVERGREENS (2.50"-3") GP B	19	EA
621.536	DECID SHRUBS (12"-18") GP B	4	EA
621.541	DECID SHRUBS (18"-24") GP B	2	EA
621.542	DECID SHRUBS (18"-24") GP C	5	EA
621.543	DECID SHRUBS (2'-3") GP C	2	EA
621.552	DECID SHRUBS (3'-4") GP A	7	EA
621.553	DECID SHRUBS (3'-4") GP B	15	EA
621.554	DECID SHRUBS (3'-4") GP C	6	EA
621.8	ESTABLISHMENT PERIOD	1	LS
622.11	TRANSPLANTING TREE	1	EA
625.106	WATER SERVICE SUPPLY LINE (<3 IN)	850	LF
625.107	WATER METER PIT	1	EA
626.11	PRECAST CONCRETE JUNCTION BOX	13	EA
626.12	36" X 24" X 36" QUAZITE JUNCTION BOX	80	EA
626.13	48" X 36" X 48" QUAZITE JUNCTION BOX	2	EA
626.21	METALLIC CONDUIT	160	LF
626.22	NON-METALLIC CONDUIT	5925	LF
626.221	NON-METALLIC CONDUIT, DIRECTIONAL BORE	600	LF
626.222	2 INCH NON-METALLIC CONDUIT	11740	LF
626.223	HORIZONTAL DIRECTIONAL DRILLED CONDUIT	320	LF
626.32	30" FOUNDATION	48	EA
626.33	30 INCH FOUNDATION	6	EA
626.333	48 INCH FOUNDATION	15	CY
626.335	60 INCH FOUNDATION	29	CY
626.35	CONTROLLER CABINET FOUNDATION	6	EA
626.36	REMOVE OR MODIFY CONCRETE FOUNDATION	18	EA
626.37	SPECIAL FOUNDATION	1	EA
627.18	12" SOLID WHITE PAVEMENT MARKING	3100	LF
627.407	REF PL WH OR YEL PAVE MARKING	300	SF
627.68	TEMPORARY 4 INCH PAINTED PAVEMENT MARKING LINE, YELLOW OR WHITE	6450	LF
627.681	TEMPORARY 6 INCH PAINTED PAVEMENT MARKING LINE, YELLOW OR WHITE	24100	LF
627.730	TEMPORARY 6 INCH PAVEMENT MARKING TAPE	4000	LF
627.731	TEMPORARY 6 INCH BLACK PAVEMENT MARKING TAPE	2800	LF
627.733	4" WHITE OR YELLOW PAINTED PAVEMENT MARKING LINE	21700	LF
627.744	6" WHITE OR YELLOW PAINTED PAVEMENT MARKING LINE	16800	LF
627.75	WHITE OR YELLOW PAVEMENT AND CURB MARKING	1470	SF
627.77	REMOVING EXISTING PAVEMENT MARKINGS	4100	SF
627.812	TEMPORARY RAISED PAVEMENT MARKINGS	590	EA
627.94	PAVEMENT MARKING TAPE	150	LF
629.05	HAND LABOR, STRAIGHT TIME	160	HR
631.10	AIR COMPRESSOR (INCLUDING OPERATOR)	15	HR
631.11	AIR TOOL (INCLUDING OPERATOR)	75	HR
631.12	ALL PURPOSE EXCAVATOR (INC OPERATOR)	75	HR
631.14	GRADER (INCLUDING OPERATOR)	75	HR
631.171	TRUCK - SMALL (INCLUDING OPERATOR)	75	HR
631.22	FRONT END LOADER (INCLUDING OPERATOR)	75	HR
631.32	CULVERT CLEANER (INC OPERATOR)	75	HR
631.36	FOREMAN	60	HR
631.50	JACKHAMMER (AIR TOOL INCLUDING OPERATOR)	20	HR
631.51	BUCKET TRUCK	20	HR
631.52	SCISSOR LIFT	20	HR
631.53	ELECTRICIAN	20	HR

Contract 2016.02  
Addendum No. 1  
01/12/16

Scale:

No.	Revision	By	Date
1	ADDENDUM #1	FMK	01/16

Designed by:



**vhb** Engineers  
Scientists  
Planners  
Designers

CONSULTANT PROJECT MANAGER: P. CLARY

By	Date	By	Date
Designed M.B.	10\8\15	Checked F.K.	10\8\15
Drawn B.R.	10\8\15	In Charge of P.C.	10\8\15

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**THE GOLD STAR  
MEMORIAL HIGHWAY**

MTA PROJECT MANAGER: R. NORWOOD

**EXIT 63  
GRAY, ME**

ESTIMATED QUANTITIES (1 OF 2)

SHEET NUMBER: 15  
15 OF 412

CONTRACT: 2016.02

Date: 1/12/2016

Filename: ... \MSTA 015 - Estimated\_qty.dgn

ITEM NO.	DESCRIPTION	QUANTITY	UNIT
202.12	REMOVING EXISTING STRUCTURAL CONCRETE	160	CY
202.15	REMOVE MANHOLE OR CATCH BASIN	9	EA
202.193	REMOVING EXISTING BRIDGE	1	LS
202.202	REMOVING PAVEMENT SURFACE	6700	SY
202.2021	REMOVING PAVEMENT SURFACE - BRIDGE DECK	1230	SY
202.203	PAVEMENT BUTT JOINTS	890	SY
202.206	REMOVING RUMBLE STRIPS	2150	LF
203.20	COMMON EXCAVATION	52670	CY
203.25	GRANULAR BORROW	25	CY
203.26	GRAVEL BORROW	75	CY
206.061	STRUCTURAL EARTH BELOW GRADE STRUCTURE	100	CY
206.082	STRUCTURAL EARTH EXCAVATION - MAJOR STRUCTURES, PLAN QUANTITY	320	CY
304.09	AGGREGATE BASE COURSE - CRUSHED	5120	CY
304.10	AGGREGATE SUBBASE COURSE - GRAVEL	12140	CY
403.207	HOT MIX ASPHALT, 19.0 MM HMA	2550	T
403.2083	HOT MIX ASPHALT, 12.5 MM (POLYMER MODIFIED) - RAP	2250	T
403.209	HOT MIX ASPHALT 9.5 MM (INCIDENTALS)	170	T
403.210	HOT MIX ASPHALT 9.5 MM	1805	T
403.211	HOT MIX ASPHALT (SHIM)	1400	T
403.213	HOT MIX ASPHALT, 12.5 MM BASE	3000	T
409.15	BITUMINOUS TACK COAT, APPLIED	2310	G
419.30	SAWING BITUMINOUS PAVEMENT	5850	LF
501.54	STEEL H-BEAM PILES 117 LB/FT, DELIVERED	1326	LF
501.541	STEEL H-BEAM PILES 117 LB/FT, IN PLACE	1156	LF
501.90	PILE TIPS	34	EA
501.91	PILE SPLICES	10	EA
501.92	PILE DRIVING EQUIPMENT MOBILIZATION	1	LS
502.261	STRUCTURAL CONCRETE, GRADE BEAMS	183	CY
502.262	STRUCTURAL CONCRETE, PAVEMENT SLABS	612	CY
502.263	STRUCTURAL CONCRETE - PLAZA ISLANDS, BUMPERS AND CURTAIN WALLS	79	CY
502.266	STRUCTURAL CONCRETE - PEDESTALS & FOOTINGS	3	CY
502.701	BRIDGE DRAIN GRATE MODIFICATION	2	EA
503.14	EPOXY-COATED REINFORCING STEEL, FABRICATED AND DELIVERED	129500	LB
503.15	EPOXY-COATED REINFORCING STEEL, PLACING	129500	LB
503.18	GLASS FIBER REINFORCED POLYMER (GFRP) REINFORCING BARS, FABRICATED AND DELIVERED	33400	LB
503.19	GLASS FIBER REINFORCED POLYMER (GFRP) REINFORCING BARS, PLACING	33400	LB
503.90	SYNTHETIC FIBER REINFORCEMENT	3060	LB
504.50	TOLL PLAZA CANOPY	1	LS
504.61	TOLL GANTRY - SOUTHBOUND	1	LS
504.62	TOLL GANTRY - NORTHBOUND	1	LS
507.0928	ALUMINUM BRIDGE RAILING - RAIL SECTION REPLACE	21	LF
508.14	HIGH PERFORMANCE WATERPROOFING MEMBRANE	1	LS
515.201	PIGMENTED PROTECTIVE COATING FOR CONCRETE SURFACES	360	SY
515.202	CLEAR PROTECTIVE COATING FOR CONCRETE SURFACES	1350	SY
515.23	EPOXY OVERLAY	72	SY
516.202	CLEAR PROTECTIVE COATING FOR CONCRETE SURFACES	520	SY
518.1	ABUTMENT REPAIRS	60	SF
518.2	PIER REPAIRS	65	SF
518.391	REPAIRING GRANITE CURB JOINT AND BEDDING MORTAR	185	LF
518.392	REPAIRING CONCRETE PARAPET ELASTOMERIC JOINT SEALER	340	LF
518.8	PARTIAL DEPTH CONCRETE DECK REPAIRS	550	SF
518.81	FULL DEPTH CONCRETE DECK REPAIRS	220	SF
520.2211	EXPANSION JOINT MODIFICATION	2	EA
524.4	PROTECTIVE SHIELDING - STEEL GIRDERS	1060	SY
526.306	TEMPORARY CONCRETE BARRIER - MTA	1	LS
526.35	PIER PROTECTION CONCRETE BARRIER	1	LS
526.351	MEDIAN BARRIER TYPE 1 - PRECAST	149	LF
526.361	MEDIAN BARRIER TRANSITION TYPE 1 - PRECAST	2	EA
527.301	ENERGY ABSORBING SYSTEM (C-A-T)	2	EA
527.342	WORK ZONE CRASH CUSHIONS - TL-2	1	UN
527.343	WORK ZONE CRASH CUSHIONS - TL-3	3	UN
602.3	FLOWABLE CONCRETE FILL	9	CY
603.15	12" CULV PIPE OPTION I	15	LF

ITEM NO.	DESCRIPTION	QUANTITY	UNIT
603.155	12 INCH REINFORCED CONCRETE PIPE - CLASS III	173	LF
603.169	15" CULV PIPE OPTION III	50	LF
603.17	18" CULVERT PIPE OPT I	30	LF
603.175	18 INCH REINFORCED CONCRETE PIPE - CLASS III	290	LF
603.19	24" CULVERT PIPE OPT I	35	LF
603.195	24 INCH REINFORCED CONCRETE PIPE - CLASS III	110	LF
603.2551	60" RCP CLASS IV	170	LF
603.28	CONCRETE COLLAR FOR REINFORCED CONCRETE PIPE	20	EA
604.072	CATCH BASIN TYPE A1-C	23	EA
604.092	CATCH BASIN TYPE B1-C	3	EA
604.164	REBUILDING CATCH BASIN	1	EA
604.166	REBUILDING MANHOLE	1	EA
604.18	ADJUST MANHOLE OR CB TO GRADE	11	EA
604.262	CATCH BASIN TYPE B5-C	6	EA
605.09	6" UNDERDRAIN TYPE B	200	LF
605.11	12" UNDERDRAIN TYPE C	950	LF
605.12	15" UNDERDRAIN TYPE C	110	LF
605.13	18" UNDERDRAIN TYPE C	200	LF
605.15	24" UNDERDRAIN TYPE C	160	LF
606.1723	BRIDGE TRANSITION - TYPE 3	4	EA
606.24	GUARDRAIL TYPE 3D - SINGLE RAIL	5400	LF
606.2401	GUARDRAIL TYPE 3D - DOUBLE RAIL	205	LF
606.242	GUARDRAIL TYPE 3D - OVER 15' RADIUS	165	LF
606.265	TERMINAL END - SINGLE RAIL	1	EA
606.277	TERMINAL END - TRAILING END	14	EA
606.352	REFLECTORIZED BEAM GUARDRAIL DELINEATORS	405	EA
606.353	DELINEATOR POST	70	EA
606.354	DELINEATOR POST - REMOVE AND RESET	40	EA
606.3621	GUARDRAIL ADJUST - SINGLE RAIL	2500	LF
606.3631	GUARDRAIL - REMOVE AND DISPOSE	6150	LF
606.64	GR - THRIE BEAM - DBL RAIL	850	LF
606.65	GR - THRIE BEAM - SGL RAIL	150	LF
606.701	ASYMMETRICAL THRIE BEAM TRANSITION	4	EA
606.754	WIDEN SHOULDER FOR GUARDRAIL 350 FLARED	4	EA
606.80	GUARDRAIL FLEAT 350 TERMINAL	10	EA
607.09	WOVEN WIRE FENCE - METAL POSTS	1500	LF
607.154	DRIVEWAY GATE 21 FOOT - METAL	1	EA
607.17	CHAIN LINK FENCE - 6'	490	LF
607.173	CHAIN LINK FENCE 6' PVC CTD	320	LF
607.2325	CHAIN FENCE GATE 6X12' OPENING	1	EA
607.26	REMOVE & STACK FENCE	430	LF
607.32	BRACING ASSEMBLY TYPE I - METAL POSTS	7	EA
607.34	BRACING ASSEMBLY CHAIN LINK FENCE	13	EA
608.08	REINFORCED CONCRETE SIDEWALK	217	SY
609.11	VERTICAL CURB TYPE 1	547	LF
609.12	VERT CURB TYPE 1- CIRCULAR	137	LF
609.13	VERTICAL BRIDGE CURB TYPE 1	300	LF
609.14	VERTICAL BRIDGE CURB TYPE 1 - CIRCULAR	80	LF
609.191	CONCRETE CURB TYPE 2	12	LF
609.234	TERMINAL CURB TYPE 1 - 4 FOOT	5	EA
609.237	TERMINAL CURB TYPE 1 - 7 FT	2	EA
609.2371	VERTICAL CURB TYPE 1 - 7 FT - CIRCULAR	1	EA
609.26	CURB TRANSITION SECT B-TYPE 1	6	EA
609.34	CURB TYPE 5	2600	LF
609.35	CURB TYPE 5 - CIRCULAR	120	LF
610.08	PLAIN RIPRAP	340	CY
610.18	STONE DITCH PROTECTION	15	CY
610.181	TEMPORARY STONE CHECK DAMS	35	CY
610.19	COBBLE GRAVEL SAND MIX	47	CY
613.319	EROSION CONTROL BLANKET	3100	SY
615.07	LOAM	3851	CY
618.1301	SEEDING METHOD NUMBER 1, PLAN QUANTITY	5	UNIT

ITEM NO.	DESCRIPTION	QUANTITY	UNIT
618.1401	SEEDING METHOD NUMBER 2 - PLAN QUANTITY	230	UN
618.1411	SEEDING METHOD NUMBER 3 - PLAN QUANTITY	90	UN
619.1201	MULCH - PLAN QUANTITY	315	UN
619.1202	TEMPORARY MULCH	1	LS
619.1401	EROSION CONTROL MIX	30	CY
620.58	EROSION CONTROL GEOTEXTILE	638	SY
621.043	EVERGREEN TR (6'-8") GP A	5	EA
621.044	EVERGREEN TR (6'-8") GP B	8	EA
621.248	LG DECID TR (5'-6") GP A	20	EA
621.279	LG DECID TR (2.50"-3" CAL) GP A	4	EA
621.408	DWF EVERGREENS (2.50"-3") GP B	19	EA
621.536	DECID SHRUBS (12"-18") GP B	4	EA
621.541	DECID SHRUBS (18"-24") GP B	2	EA
621.542	DECID SHRUBS (18"-24") GP C	5	EA
621.543	DECID SHRUBS (2'-3") GP C	2	EA
621.552	DECID SHRUBS (3'-4") GP A	7	EA
621.553	DECID SHRUBS (3'-4") GP B	15	EA
621.554	DECID SHRUBS (3'-4") GP C	6	EA
621.8	ESTABLISHMENT PERIOD	1	LS
622.11	TRANSPLANTING TREE	1	EA
625.106	WATER SERVICE SUPPLY LINE (<3 IN)	850	LF
625.107	WATER METER PIT	1	EA
626.11	PRECAST CONCRETE JUNCTION BOX	13	EA
626.12	36" X 24" X 36" QUAZITE JUNCTION BOX	80	EA
626.13	48" X 36" X 48" QUAZITE JUNCTION BOX	2	EA
626.21	METALLIC CONDUIT	160	LF
626.22	NON-METALLIC CONDUIT	5925	LF
626.221	NON-METALLIC CONDUIT, DIRECTIONAL BORE	600	LF
626.222	2 INCH NON-METALLIC CONDUIT	11740	LF
626.223	HORIZONTAL DIRECTIONAL DRILLED CONDUIT	320	LF
626.32	30" FOUNDATION	48	EA
626.33	30 INCH FOUNDATION	6	EA
626.333	48 INCH FOUNDATION	15	CY
626.335	60 INCH FOUNDATION	29	CY
626.35	CONTROLLER CABINET FOUNDATION	6	EA
626.36	REMOVE OR MODIFY CONCRETE FOUNDATION	18	EA
626.37	SPECIAL FOUNDATION	1	EA
627.18	12" SOLID WHITE PAVEMENT MARKING	3100	LF
627.407	REF PL WH OR YEL PAVE MARKING	300	SF
627.68	TEMPORARY 4 INCH PAINTED PAVEMENT MARKING LINE, YELLOW OR WHITE	6450	LF
627.681	TEMPORARY 6 INCH PAINTED PAVEMENT MARKING LINE, YELLOW OR WHITE	24100	LF
627.730	TEMPORARY 6 INCH PAVEMENT MARKING TAPE	4000	LF
627.731	TEMPORARY 6 INCH BLACK PAVEMENT MARKING TAPE	2800	LF
627.733	4" WHITE OR YELLOW PAINTED PAVEMENT MARKING LINE	21700	LF
627.744	6" WHITE OR YELLOW PAINTED PAVEMENT MARKING LINE	16800	LF
627.75	WHITE OR YELLOW PAVEMENT AND CURB MARKING	1470	SF
627.77	REMOVING EXISTING PAVEMENT MARKINGS	4100	SF
627.812	TEMPORARY RAISED PAVEMENT MARKINGS	590	EA
627.94	PAVEMENT MARKING TAPE	150	LF
629.05	HAND LABOR, STRAIGHT TIME	160	HR
631.10	AIR COMPRESSOR (INCLUDING OPERATOR)	15	HR
631.11	AIR TOOL (INCLUDING OPERATOR)	75	HR
631.12	ALL PURPOSE EXCAVATOR (INC OPERATOR)	75	HR
631.14	GRADER (INCLUDING OPERATOR)	75	HR
631.171	TRUCK - SMALL (INCLUDING OPERATOR)	75	HR
631.22	FRONT END LOADER (INCLUDING OPERATOR)	75	HR
631.32	CULVERT CLEANER (INC OPERATOR)	75	HR
631.36	FOREMAN	60	HR
631.50	JACKHAMMER (AIR TOOL INCLUDING OPERATOR)	20	HR
631.51	BUCKET TRUCK	20	HR
631.52	SCISSOR LIFT	20	HR
631.53	ELECTRICIAN	20	HR

Contract 2016.02  
Addendum No. 1  
01/12/16

Scale:			
No.	Revision	By	Date
1	ADDENDUM #1	FMK	01/16

Designed by:



**vhb** Engineers  
Scientists  
Planners  
Designers

CONSULTANT PROJECT MANAGER: P. CLARY

By	Date	By	Date
M.B.	10\8\15	F.K.	10\8\15
Drawn	B.R.	In Charge of	P.C.

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**THE GOLD STAR  
MEMORIAL HIGHWAY**

MTA PROJECT MANAGER: R. NORWOOD

EXIT 63  
GRAY, ME

ESTIMATED QUANTITIES (1 OF 2)

SHEET NUMBER: 15  
15 OF 412

CONTRACT: 2016.02

Date: 1/11/2016

Filename: ... \MSTA.016\_Earthwork\_sum.dgn

ITEM NO.	DESCRIPTION	QUANTITY	UNIT
631.54	ELECTRICIAN'S APPRENTICE	20	HR
631.55	PLUMBER	20	HR
633.01	PROPANE SERVICE TRENCH	180	LF
633.21	PROPANE TANK SUPPORTS	4	EA
633.31	PROPANE TANK PAD	27	SY
633.41	PROPANE TANK RELOCATION	1	LS
634.16	HIGHWAY LIGHTING	1	LS
634.175	REPLACEMENT LED FIXTURE	5	EA
634.208	REMOVE AND RESET LIGHT STANDARD	5	EA
634.231	CONVENTIONAL LIGHT STANDARD WITH LED FIXTURE	43	EA
643.7111	TRAFFIC SIGNAL MODIFICATIONS: US 202/ME 4/ME 115 NB RAMPS	1	LS
643.7112	TRAFFIC SIGNAL MODIFICATIONS: US 202/ME 4/ME 115 AT SB RAMPS/ME 26A	1	LS
643.7113	TRAFFIC SIGNAL MODIFICATIONS: US 202/ME 4/ME 115 AT ME 115/ME 100	1	LS
643.7114	TRAFFIC SIGNAL MODIFICATIONS: US 202/ME 4 AT BROWN ST/SHAKER RD	1	LS
643.712	LANE USE SIGNAL INSTALLATION	3	EA
643.831	VIDEO DETECTION SYSTEM: US 202 AT NB RAMPS	1	LS
643.832	VIDEO DETECTION SYSTEM: US 202 AT SB RAMPS	1	LS
643.86	TRAFFIC SIGNAL LOOP DETECTOR	3	EA
643.901	INTERCONNECT WIRE BETWEEN: SB RAMP INTERSECTION TO NB RAMP INTERSECTION	1	LS
643.902	INTERCONNECT WIRE BETWEEN: SB RAMP INTERSECTION TO SB TOLL BUILDING	1	LS
643.903	INTERCONNECT WIRE BETWEEN: NB RAMP INTERSECTION TO US 202 AND ME 100/ME 115	1	LS
643.904	INTERCONNECT WIRE BETWEEN: US 202 AND ME 100/ME 115 TO US 202 AND BROWN/SHAKE	1	LS
643.91	MAST ARM POLE	4	EA
643.93	STRAIN POLE	1	EA
645.105	REMOVE AND STACK SIGN	141	EA
645.109	REMOVE AND RESET SIGN	67	EA
645.1091	CANOPY MOUNTED SIGN	2	EA
645.121	OVERHEAD GUIDE SIGN: STA 613+60	1	LS
645.122	OVERHEAD GUIDE SIGN: STA 628+17	1	LS
645.123	OVERHEAD GUIDE SIGN: STA 204+11	1	LS
645.124	OVERHEAD GUIDE SIGN: STA 417+03	1	LS
645.151	CANTILEVER GUIDE SIGN: STA 608+15	1	LS
645.152	CANTILEVER GUIDE SIGN: STA 704+09	1	LS
645.251	ROADSIDE GUIDE SIGN, TYPE 1	572	SF
645.271	REGULATORY, WARNING, CONFIRMATION AND ROUTE ASSEMBLY SIGN, TYPE 1	506	SF
645.289	STEEL H-BEAM POLES	3500	LBS
648.00	INSTALL FLAGPOLE AND LIGHTING	1	LS
650.1011	DYNAMIC MESSAGE SIGN (DMS) SYSTEM: STA 601+82 RT	1	LS
650.1012	DYNAMIC MESSAGE SIGN (DMS) SYSTEM: STA 622+15 LT	1	LS
650.1013	DYNAMIC MESSAGE SIGN (DMS) SYSTEM: STA 704+09 LT	1	LS
650.2011	DMS GROUND MOUNTED CONTROL CABINET: STA 601+82 RT	1	EA
650.2012	DMS GROUND MOUNTED CONTROL CABINET: STA 622+15 LT	1	EA
650.2013	DMS GROUND MOUNTED CONTROL CABINET: STA 704+09 LT	1	EA
650.9011	DMS SOLAR POWER SYSTEM: STA 601+82 RT	1	LS
650.9012	DMS SOLAR POWER SYSTEM: STA 622+15 LT	1	LS
650.9013	DMS SOLAR POWER SYSTEM: STA 704+09 LT	1	LS
652.312	TYPE III BARRICADES	6	EA
652.33	DRUM	250	EA
652.34	CONE	75	EA
652.35	CONSTRUCTION SIGNS	2214	SF
652.361	MAINTENANCE OF TRAFFIC CONTROL DEVICES	1	LS
652.38	FLAGGER	470	HR
652.39	PORTABLE LIGHT TOWER	4	EA
652.41	PORTABLE CHANGEABLE MESSAGE SIGN	6	EA
652.45	TRUCK MOUNTED ATTENUATOR	100	CD
655.01	INSTALLATION OF ORT CONTROLLER CABINET	1	EA
655.012	INSTALLATION OF CASH LANE CONTROLLER CABINET	5	EA
655.02	DVAS MOUNT INSTALLATION	6	EA
655.04	INSTALLATION OF SENSOR LOOPS	1	LS
655.05	INSTALLATION OF AVI ANTENNAS	10	EA
655.06	INSTALLATION OF AVI READERS	2	EA
655.07	TRAFFIC CONTROL PEDESTAL PREPARATION WORK	3	EA

ITEM NO.	DESCRIPTION	QUANTITY	UNIT
655.08	#2/0 WIRE FOR UPS	2000	LF
655.10	#4 AWG WIRE	2400	LF
655.101	#6 AWG WIRE	1200	LF
655.11	#10 AWG WIRE	3200	LF
655.12	#12 AWG WIRE	14000	LF
655.13	#14 AWG WIRE	1000	LF
655.14	4PR/24 (CATEGORY 5E) CABLE	4500	LF
655.15	LMR 400 CABLE	1200	LF
655.16	FIBER OPTIC CABLE - 6 FIBER	5500	LF
655.17	IVIS HOMERUN LOOP CABLE (IMSA 50-2 #16)	1200	LF
655.18	HALF DIAMOND LOOP WIRE (#16 XHHW OR XLP STRANDED WIRE)	500	LF
655.2021	1" SCHEDULE 80 PVC CONDUIT	120	LF
655.203	1 1/2" SCHEDULE 80 PVC CONDUIT	450	LF
655.2031	2" SCHEDULE 80 PVC CONDUIT	2300	LF
655.204	3" SCHEDULE 80 PVC CONDUIT	6450	LF
655.205	4" SCHEDULE 80 PVC CONDUIT	1800	LF
655.2051	5" SCHEDULE 80 PVC CONDUIT	1650	LF
655.2052	12" SCHEDULE 80 PVC CONDUIT	200	LF
655.206	1" GALVANIZED RIGID METAL CONDUIT	375	LF
655.207	1 1/2" GALVANIZED RIGID METAL CONDUIT	140	LF
655.208	3" GALVANIZED RIGID METAL CONDUIT	100	LF
655.209	1/2" LIQUID TIGHT METALLIC FLEXIBLE CONDUIT	50	LF
655.2101	1 1/2" LIQUID TIGHT METALLIC FLEXIBLE CONDUIT	100	LF
655.2102	2" LIQUID TIGHT METALLIC FLEXIBLE CONDUIT	100	LF
655.221	TYPE A PULL BOX INSIDE	6	EA
655.222	TYPE C PULL BOX INSIDE	12	EA
655.223	TYPE D PULL BOX OUTDOOR	3	EA
655.224	TYPE E PULL BOX INSIDE	4	EA
655.225	TYPE F PULL BOX OUTSIDE	7	EA
655.226	TYPE G PULL BOX OUTSIDE	2	EA
655.30	12" X 12" X 6" GALVANIZED JUNCTION BOX	4	EA
655.31	18" X 18" X 6" GALVANIZED JUNCTION BOX	4	EA
655.42	36" X 30" X 20" NEMA 4X CABINET	1	EA
655.63	4-INCH X 4-INCH PLASTIC NEMA 4R WIREWAY	20	LF
655.64	6-INCH X 6-INCH PLASTIC NEMA 4R WIREWAY	20	LF
655.71	REMOVAL OF EXISTING SELECT TOLL EQUIPMENT	1	LS
655.80	LIGHTNING SUPPRESSION SYSTEM	1	LS
655.81	KEY SWITCH	8	EA
655.82	DUPLEX RECEPTACLE	8	EA
655.83	NEMA L5-30R RECEPTACLE	4	EA
655.84	QUADPLEX RECEPTACLE	6	EA
655.90	DYNAMIC MESSAGE SIGN FOR SB CANOPY - CENTER LANE	1	LS
655.92	LED CANOPY LIGHT FIXTURE	6	EA
655.94	NEW STAND-BY GENERATOR AND TRANSFER SWITCH	1	LS
656.50	BALED HAY, IN PLACE	170	EA
656.632	30 INCH TEMPORARY SILT FENCE	14550	LF
659.10	MOBILIZATION	1	LS
670.01	SEWAGE DISPOSAL REPLACEMENT SYSTEM	1	LS
800.01	TOLL BUILDING	1	LS
800.10	ELECTRICAL DEMOLITION	1	LS
800.20	MECHANICAL DEMOLITION	1	LS
800.30	TOLL PLAZA BOOTHS, CANOPY AND GANTRY DEMOLITION	1	LS
800.40	NEW TOLL BOOTH INSTALLATION	1	LS
800.90	GENERATOR PAD	1	LS
800.91	TRANSFORMER PAD	1	LS

<b>COMMON EXCAVATION FOR ESTIMATE</b>	
COMMON EXCAVATION (FROM CROSS SECTIONS)	48,530
GRUBBING IN FILL	844
PAVEMENT SALVAGE IN FILL	1,742
TOTAL COMMON EXCAVATION	51,116
<b>ITEM 203.20 COMMON EXCAVATION</b>	<b>SAY 51,500 CY</b>
<b>FILL FOR BORROW CALCULATIONS</b>	
COMMON FILL (FROM CROSS SECTIONS)	6,105
GRUBBING IN FILL	844
TOTAL FILL	6,949
<b>AVAILABLE COMMON EXCAVATION FOR BORROW CALCULATIONS</b>	
(1) TOTAL COMMON EXCAVATION	51,116
DEDUCTIONS:	
GRUBBING IN CUT	4,367
GRUBBING IN FILL	844
PAVEMENT SALVAGE IN FILL	1,742
(2) TOTAL DEDUCTIONS	6,953
TOTAL AVAILABLE COMMON EXCAVATION (1) MINUS (2)	44,163
TOTAL AVAILABLE STRUCT. EXCAVATIONS (USUALLY UNDERDRAIN ONLY)	
TOTAL AVAILABLE NON-ROCK EXCAVATION	44,163
<b>COMPUTATION FOR COMMON BORROW FOR ESTIMATE</b>	
(3) TOTAL FILL	6,949
TOTAL AVAIL. NON-ROCK EXCAV.	44,163 x 0.85 = 37,539
(4) TOTAL AVAILABLE EXCAVATION	= 37,539
BORROW NEEDED = TOTAL FILL MINUS TOTAL AVAILABLE EXCAVATION	-30,589
<b>SURPLUS MATERIAL =</b>	<b>30589 CY</b>

Contract 2016.02  
Addendum No. 1  
01/12/16

Scale:			
No.	Revision	By	Date
1	ADDENDUM #1	FMK	01/16

Designed by:



**vhb** Engineers  
Scientists  
Planners  
Designers

CONSULTANT PROJECT MANAGER: P. CLARY

By	Date	By	Date
Designed M.B.	10\8\15	Checked F.K.	10\8\15
Drawn B.R.	10\8\15	In Charge of P.C.	10\8\15

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**THE GOLD STAR  
MEMORIAL HIGHWAY**

MTA PROJECT MANAGER: R. NORWOOD

**EXIT 63  
GRAY, ME**

ESTIMATED QUANTITIES (2 OF 2)  
& EARTHWORK SUMMARY

SHEET NUMBER: 16  
16 OF 412

CONTRACT: 2016.02

Date: 1/11/2016

Filename: ... \MSTA 016 - Ear thwork \_sum .dgn

ITEM NO.	DESCRIPTION	QUANTITY	UNIT
631.54	ELECTRICIAN'S APPRENTICE	20	HR
631.55	PLUMBER	20	HR
633.01	PROPANE SERVICE TRENCH	180	LF
633.21	PROPANE TANK SUPPORTS	4	EA
633.31	PROPANE TANK PAD	27	SY
633.41	PROPANE TANK RELOCATION	1	LS
634.16	HIGHWAY LIGHTING	1	LS
634.175	REPLACEMENT LED FIXTURE	5	EA
634.208	REMOVE AND RESET LIGHT STANDARD	5	EA
634.231	CONVENTIONAL LIGHT STANDARD WITH LED FIXTURE	43	EA
643.7111	TRAFFIC SIGNAL MODIFICATIONS: US 202/ME 4/ME 115 NB RAMPS	1	LS
643.7112	TRAFFIC SIGNAL MODIFICATIONS: US 202/ME 4/ME 115 AT SB RAMPS/ME 26A	1	LS
643.7113	TRAFFIC SIGNAL MODIFICATIONS: US 202/ME 4/ME 115 AT ME 115/ME 100	1	LS
643.7114	TRAFFIC SIGNAL MODIFICATIONS: US 202/ME 4 AT BROWN ST/SHAKER RD	1	LS
643.712	LANE USE SIGNAL INSTALLATION	3	EA
643.831	VIDEO DETECTION SYSTEM: US 202 AT NB RAMPS	1	LS
643.832	VIDEO DETECTION SYSTEM: US 202 AT SB RAMPS	1	LS
643.86	TRAFFIC SIGNAL LOOP DETECTOR	3	EA
643.901	INTERCONNECT WIRE BETWEEN: SB RAMP INTERSECTION TO NB RAMP INTERSECTION	1	LS
643.902	INTERCONNECT WIRE BETWEEN: SB RAMP INTERSECTION TO SB TOLL BUILDING	1	LS
643.903	INTERCONNECT WIRE BETWEEN: NB RAMP INTERSECTION TO US 202 AND ME 100/ME 115	1	LS
643.904	INTERCONNECT WIRE BETWEEN: US 202 AND ME 100/ME 115 TO US 202 AND BROWN/SHAKE	1	LS
643.91	MAST ARM POLE	4	EA
643.93	STRAIN POLE	1	EA
645.105	REMOVE AND STACK SIGN	141	EA
645.109	REMOVE AND RESET SIGN	67	EA
645.1091	CANOPY MOUNTED SIGN	2	EA
645.121	OVERHEAD GUIDE SIGN: STA 613+60	1	LS
645.122	OVERHEAD GUIDE SIGN: STA 628+17	1	LS
645.123	OVERHEAD GUIDE SIGN: STA 204+11	1	LS
645.124	OVERHEAD GUIDE SIGN: STA 417+03	1	LS
645.151	CANTILEVER GUIDE SIGN: STA 608+15	1	LS
645.152	CANTILEVER GUIDE SIGN: STA 704+09	1	LS
645.251	ROADSIDE GUIDE SIGN, TYPE 1	572	SF
645.271	REGULATORY, WARNING, CONFIRMATION AND ROUTE ASSEMBLY SIGN, TYPE 1	506	SF
645.289	STEEL H-BEAM POLES	3500	LBS
648.00	INSTALL FLAGPOLE AND LIGHTING	1	LS
650.1011	DYNAMIC MESSAGE SIGN (DMS) SYSTEM: STA 601+82 RT	1	LS
650.1012	DYNAMIC MESSAGE SIGN (DMS) SYSTEM: STA 622+15 LT	1	LS
650.1013	DYNAMIC MESSAGE SIGN (DMS) SYSTEM: STA 704+09 LT	1	LS
650.2011	DMS GROUND MOUNTED CONTROL CABINET: STA 601+82 RT	1	EA
650.2012	DMS GROUND MOUNTED CONTROL CABINET: STA 622+15 LT	1	EA
650.2013	DMS GROUND MOUNTED CONTROL CABINET: STA 704+09 LT	1	EA
650.9011	DMS SOLAR POWER SYSTEM: STA 601+82 RT	1	LS
650.9012	DMS SOLAR POWER SYSTEM: STA 622+15 LT	1	LS
650.9013	DMS SOLAR POWER SYSTEM: STA 704+09 LT	1	LS
652.312	TYPE III BARRICADES	6	EA
652.33	DRUM	250	EA
652.34	CONE	75	EA
652.35	CONSTRUCTION SIGNS	2214	SF
652.361	MAINTENANCE OF TRAFFIC CONTROL DEVICES	1	LS
652.38	FLAGGER	470	HR
652.39	PORTABLE LIGHT TOWER	4	EA
652.41	PORTABLE CHANGEABLE MESSAGE SIGN	6	EA
652.45	TRUCK MOUNTED ATTENUATOR	100	CD
655.01	INSTALLATION OF ORT CONTROLLER CABINET	1	EA
655.012	INSTALLATION OF CASH LANE CONTROLLER CABINET	5	EA
655.02	DVAS MOUNT INSTALLATION	6	EA
655.04	INSTALLATION OF SENSOR LOOPS	1	LS
655.05	INSTALLATION OF AVI ANTENNAS	10	EA
655.06	INSTALLATION OF AVI READERS	2	EA
655.07	TRAFFIC CONTROL PEDESTAL PREPARATION WORK	3	EA

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655.14	4PR/24 (CATEGORY 5E) CABLE	4500	LF
655.15	LMR 400 CABLE	1200	LF
655.16	FIBER OPTIC CABLE - 6 FIBER	5500	LF
655.17	IVIS HOMERUN LOOP CABLE (IMSA 50-2 #16)	1200	LF
655.18	HALF DIAMOND LOOP WIRE (#16 XHHW OR XLP STRANDED WIRE)	500	LF
655.2021	1" SCHEDULE 80 PVC CONDUIT	120	LF
655.203	1 1/2" SCHEDULE 80 PVC CONDUIT	450	LF
655.2031	2" SCHEDULE 80 PVC CONDUIT	2300	LF
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655.208	3" GALVANIZED RIGID METAL CONDUIT	100	LF
655.209	1/2" LIQUID TIGHT METALLIC FLEXIBLE CONDUIT	50	LF
655.2101	1 1/2" LIQUID TIGHT METALLIC FLEXIBLE CONDUIT	100	LF
655.2102	2" LIQUID TIGHT METALLIC FLEXIBLE CONDUIT	100	LF
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655.222	TYPE C PULL BOX INSIDE	12	EA
655.223	TYPE D PULL BOX OUTDOOR	3	EA
655.224	TYPE E PULL BOX INSIDE	4	EA
655.225	TYPE F PULL BOX OUTSIDE	7	EA
655.226	TYPE G PULL BOX OUTSIDE	2	EA
655.30	12" X 12" X 6" GALVANIZED JUNCTION BOX	4	EA
655.31	18" X 18" X 6" GALVANIZED JUNCTION BOX	4	EA
655.42	36" X 30" X 20" NEMA 4X CABINET	1	EA
655.63	4-INCH X 4-INCH PLASTIC NEMA 4R WIREWAY	20	LF
655.64	6-INCH X 6-INCH PLASTIC NEMA 4R WIREWAY	20	LF
655.71	REMOVAL OF EXISTING SELECT TOLL EQUIPMENT	1	LS
655.80	LIGHTNING SUPPRESSION SYSTEM	1	LS
655.81	KEY SWITCH	8	EA
655.82	DUPLEX RECEPTACLE	8	EA
655.83	NEMA L5-30R RECEPTACLE	4	EA
655.84	QUADPLEX RECEPTACLE	6	EA
655.90	DYNAMIC MESSAGE SIGN FOR SB CANOPY - CENTER LANE	1	LS
655.92	LED CANOPY LIGHT FIXTURE	6	EA
655.94	NEW STAND-BY GENERATOR AND TRANSFER SWITCH	1	LS
656.50	BALED HAY, IN PLACE	170	EA
656.632	30 INCH TEMPORARY SILT FENCE	14550	LF
659.10	MOBILIZATION	1	LS
670.01	SEWAGE DISPOSAL REPLACEMENT SYSTEM	1	LS
800.01	TOLL BUILDING	1	LS
800.10	ELECTRICAL DEMOLITION	1	LS
800.20	MECHANICAL DEMOLITION	1	LS
800.30	TOLL PLAZA BOOTHS, CANOPY AND GANTRY DEMOLITION	1	LS
800.40	NEW TOLL BOOTH INSTALLATION	1	LS
800.90	GENERATOR PAD	1	LS
800.91	TRANSFORMER PAD	1	LS

**COMMON EXCAVATION FOR ESTIMATE**

COMMON EXCAVATION (FROM CROSS SECTIONS)	48,530	
GRUBBING IN FILL	844	
PAVEMENT SALVAGE IN FILL	1,742	
TOTAL COMMON EXCAVATION		51,116
<b>ITEM 203.20 COMMON EXCAVATION</b>	<b>SAY</b>	<b>51,500 CY</b>

**FILL FOR BORROW CALCULATIONS**

COMMON FILL (FROM CROSS SECTIONS)	6,105	
GRUBBING IN FILL	844	
TOTAL FILL		6,949

**AVAILABLE COMMON EXCAVATION FOR BORROW CALCULATIONS**

(1) TOTAL COMMON EXCAVATION		51,116
DEDUCTIONS:		
GRUBBING IN CUT	4,367	
GRUBBING IN FILL	844	
PAVEMENT SALVAGE IN FILL	1,742	
(2) TOTAL DEDUCTIONS		6,953
TOTAL AVAILABLE COMMON EXCAVATION (1) MINUS (2)		44,163
TOTAL AVAILABLE STRUCT. EXCAVATIONS (USUALLY UNDERDRAIN ONLY)		
TOTAL AVAILABLE NON-ROCK EXCAVATION		44,163

**COMPUTATION FOR COMMON BORROW FOR ESTIMATE**

(3) TOTAL FILL		6,949
TOTAL AVAIL. NON-ROCK EXCAV.	44,163 x 0.85 =	37,539
(4) TOTAL AVAILABLE EXCAVATION		37,539
BORROW NEEDED = TOTAL FILL MINUS TOTAL AVAILABLE EXCAVATION		-30,589
<b>SURPLUS MATERIAL =</b>	<b>30589 CY</b>	

Contract 2016.02  
Addendum No. 1  
01/12/16

Scale:

No.	Revision	By	Date
1	ADDENDUM #1	FMK	01/16

Designed by:



**vhb** Engineers  
Scientists  
Planners  
Designers

CONSULTANT PROJECT MANAGER: P. CLARY

By	Date	By	Date
Designed	M.B. 10\8\15	Checked	F.K. 10\8\15
Drawn	B.R. 10\8\15	In Charge of	P.C. 10\8\15

Vanasse Hangen Brustlin, Inc.  
500 Southborough Dr.  
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FAX (207) 253-5596



**THE GOLD STAR  
MEMORIAL HIGHWAY**

MTA PROJECT MANAGER: R. NORWOOD

EXIT 63  
GRAY, ME

ESTIMATED QUANTITIES (2 OF 2)  
& EARTHWORK SUMMARY

SHEET NUMBER: 16  
CONTRACT: 2016.02  
16 OF 412

Date: 12/23/2015

ITEM 202.15 - REMOVE MANHOLE OR CATCH BASIN EA  
 STA. 610-07.7, 33.8' RT

ITEM 604.18 - ADJUST MANHOLE OR CB TO GRADE EA  
 STA. 609-08.6, 27.1' LT  
 STA. 610-07.8, 27.7' LT  
 STA. 612-34.1, 11.8' RT  
 STA. 613-78.9, 11.7' RT  
 STA. 700-44.8, 20.4' RT

CONSTRUCT THE FOLLOWING DRIVES AND ENTRANCES EA  
 STATION OFFSET TYPE  
 STA. 202-33.2 LT PAVED

ITEM 606.24 - GR TYPE 3D - SINGLE RAIL LF  
 STA. 123-47.5 TO STA. 129-00.0 LT 552.5  
 STA. 202-07.1 LT TO STA. 201-74.0 LT 33.1  
 STA. 612-59.0 RT TO STA. 612-75.0 RT 14.9  
 STA. 613-27.5 TO STA. 617-15.0 LT 387.5

ITEM 606.242 - GR TYPE 3D - OVER 15' RADIUS LF  
 STA. 202-07.1 TO STA. 202-23.0 LT 25  
 STA. 201-74.0 TO STA. 612-59.0 LT 113.5  
 STA. 129-00.0 TO STA. 129-22.5 LT 25

ITEM 606.265 - TERMINAL END - SINGLE RAIL EA  
 STA. 202-23.0 TO STA. 202-23.0 LT

ITEM 606.277 - TERMINAL END - TRAILING END EA  
 STA. 613-15.0 TO STA. 613-27.5 LT

ITEM 606.80 - GUARDRAIL FLEAT 350 TERMINAL EA  
 STA. 129-22.5 TO STA. 610-37.1 LT

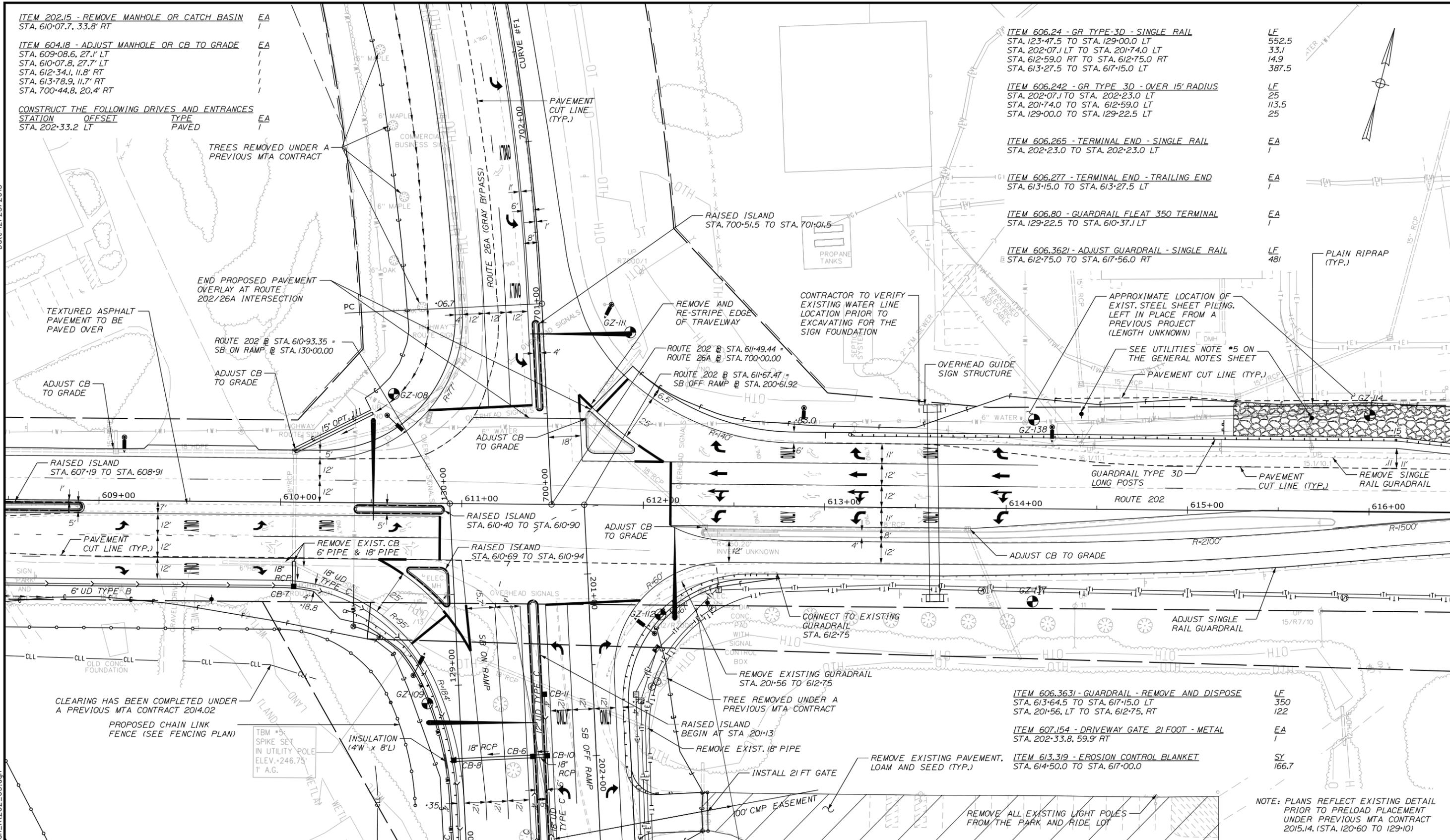
ITEM 606.3621 - ADJUST GUARDRAIL - SINGLE RAIL LF  
 STA. 612-75.0 TO STA. 617-56.0 RT 481

ITEM 606.3631 - GUARDRAIL - REMOVE AND DISPOSE LF  
 STA. 613-64.5 TO STA. 617-15.0 LT 350  
 STA. 201-56. LT TO STA. 612-75, RT 122

ITEM 607.154 - DRIVEWAY GATE 21 FOOT - METAL EA  
 STA. 202-33.8, 59.9' RT

ITEM 613.319 - EROSION CONTROL BLANKET SY  
 STA. 614-50.0 TO STA. 617-00.0 166.7

NOTE: PLANS REFLECT EXISTING DETAIL PRIOR TO PRELOAD PLACEMENT UNDER PREVIOUS MTA CONTRACT 2015.14. (STA. 120-60 TO 129-10)



Scale: 25 0 25 50  
 Scale in Feet

No.	Revision	By	Date
1	ADDENDUM #1	FMK	01/16

Designed by:

**vhb** Engineers  
 Scientists  
 Planners  
 Designers

CONSULTANT PROJECT MANAGER: P. CLARY

By	Date	By	Date
Designed	M.B. 10\8\15	Checked	F.K. 10\8\15
Drawn	B.R. 10\8\15	In Charge of	P.C. 10\8\15

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**THE GOLD STAR MEMORIAL HIGHWAY**

MTA PROJECT MANAGER: R. NORWOOD

EXIT 63  
 GRAY, ME

Contract 2016.02  
 Addendum No. 1  
 01/12/16

HIGHWAY PLAN 10

SHEET NUMBER: 199  
 199 OF 412

CONTRACT: 2016.02

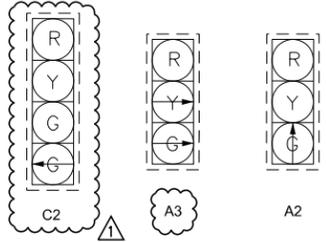
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Date: 1/12/2016

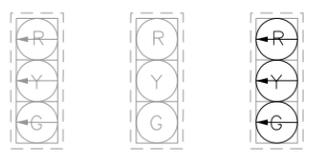
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**PROPOSED INDICATIONS**



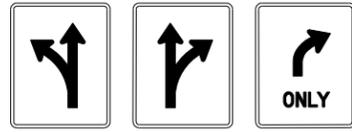
NOTE:  
ALL INDICATIONS SHALL BE 12" LIGHT EMITTING DIODES (LED'S) WITH 5" LOUVERED BACKPLATES

**EXISTING INDICATIONS**



(\* - EXISTING HOUSING WITH NEW LED MODULES)

**PROPOSED SPAN WIRE MOUNTED SIGNS**



R3-6L 30x36 1-PROPOSED  
R3-6R 30x36 1-PROPOSED  
R3-5R 30x36 1-PROPOSED

**EXISTING SPAN WIRE MOUNTED SIGNS**



R3-5L 3-RELOCATED  
R3-5a 2-REMOVED 1-RELOCATED  
R3-5R 1-RELOCATED



**SIGNAL TIMING**

	PHASE 1	PHASE 2	PHASE 6	PHASE 7	PHASE 8
MIN GREEN	5	10	10	5	8
EXTENSION	3	3	3	3	3
MAX 1	15	40	40	15	30
MAX 2	20	60	60	10	40
VEH CLEAR	4	4	4	4	4
RED CLEAR	2	2	2	2	2
WALK	-	-	-	-	-
PED CLEAR	-	-	-	-	-
RECALL	OFF	SOFT	SOFT	OFF	OFF

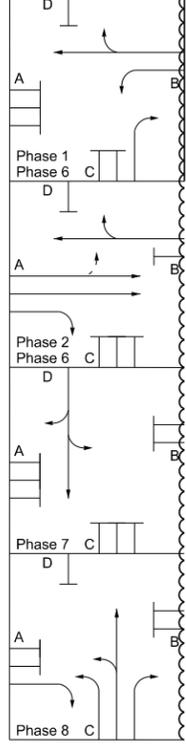
NOTE:  
1. IN THE EVENT OF A CONFLICT OR MALFUNCTION PHASES 2 AND 6 SHALL FLASH YELLOW AND ALL OTHER PHASES SHALL FLASH RED.  
2. MAX 2 SHALL BE PROGRAMMED DURING COORDINATION.

**LIST OF MAJOR ITEMS**

EQUIPMENT AND WORK ITEMS 643.71	QUANTITY
FURNISH AND INSTALL NEW ECONOLITE COBALT NEMA TS2, TYPE 1 ETHERNET EQUIPPED CONTROLLER IN NEW P-44 TYPE GROUND MOUNTED CONTROLLER CABINET WITH 15-INCH EXTENSION BASE COMPLETE WITH ALL ANCILLARY EQUIPMENT AND WIRING	1
FURNISH AND INSTALL NEW 16-CHANNEL ETHERNET EQUIPPED ENHANCED MALFUNCTION MANAGEMENT UNIT (MMU)	1
REMOVE AND SALVAGE EXISTING STRAIN POLE	1
REMOVE AND SALVAGE METERED SERVICE	1
FURNISH AND INSTALL ONE-WAY 3-SECTION 12-INCH FEDERAL YELLOW SIGNAL HEADS WITH LED MODULES WITH TUNNEL VISORS AND LOUVERED BACKPLATES MOUNTED ON SPAN WIRE	2
FURNISH AND INSTALL ONE-WAY 4-SECTION 12-INCH FEDERAL YELLOW SIGNAL HEADS WITH LED MODULES WITH TUNNEL VISORS AND LOUVERED BACKPLATES MOUNTED ON SPAN WIRE	1
FURNISH AND INSTALL 12-INCH LED LENSES	3
REMOVE AND RESET EXISTING TRAFFIC SIGNAL HEADS	8
FURNISH AND INSTALL SPAN WIRE MOUNTED LANE USE SIGNS	3
FURNISH AND INSTALL PREEMPTION CABLE TO CONNECT EXISTING RADAR UNIT FOR RAMP QUEUE DETECTION	2233 LF
REMOVE AND RESET EXISTING LANE USE SIGNS	5
FURNISH AND INSTALL CISCO IE-3000-4TC ETHERNET SWITCH	1
FURNISH AND INSTALL 12 POSITION PATCH PANEL	1
FURNISH AND INSTALL SPAN AND TETHER WIRE	570 LF
FURNISH AND INSTALL 3 CONDUCTOR 4 AWG CABLE FOR SIGNAL POWER	330 LF
FURNISH AND INSTALL NEW SIGNAL CABLE	-
IMPLEMENT LOCAL AND SYSTEM TIMING	-

THE LISTED QUANTITIES ARE APPROXIMATE AND ARE FURNISHED FOR INFORMATION ONLY.

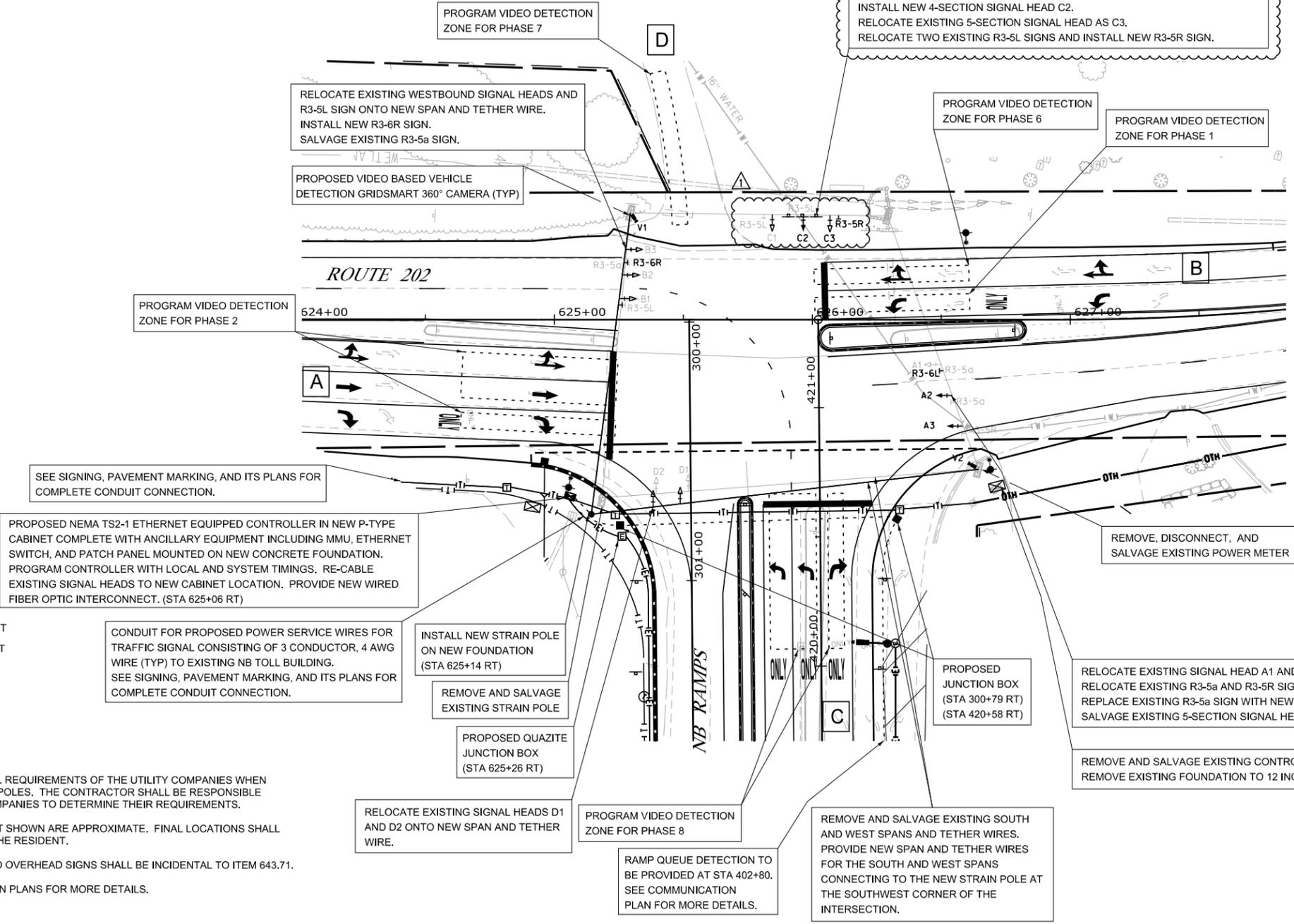
**PHASE DIAGRAM**



WHERE:  
— PROTECTED TRAFFIC MOVEMENT  
- - - PERMISSIVE TRAFFIC MOVEMENT

**SIGNAL PLAN NOTES:**

1. THE CONTRACTOR SHALL MEET ALL REQUIREMENTS OF THE UTILITY COMPANIES WHEN INSTALLING EQUIPMENT ON THEIR POLES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONTACTING THE UTILITY COMPANIES TO DETERMINE THEIR REQUIREMENTS.
2. THE LOCATIONS OF ALL EQUIPMENT SHOWN ARE APPROXIMATE. FINAL LOCATIONS SHALL BE DETERMINED IN THE FIELD BY THE RESIDENT.
3. THE COST OF SPAN WIRE MOUNTED OVERHEAD SIGNS SHALL BE INCIDENTAL TO ITEM 643.71.
4. SEE US ROUTE 202 COMMUNICATION PLANS FOR MORE DETAILS.



PROPOSED NEMA TS2-1 ETHERNET EQUIPPED CONTROLLER IN NEW P-TYPE CABINET COMPLETE WITH ANCILLARY EQUIPMENT INCLUDING MMU, ETHERNET SWITCH, AND PATCH PANEL MOUNTED ON NEW CONCRETE FOUNDATION. PROGRAM CONTROLLER WITH LOCAL AND SYSTEM TIMINGS. RE-CABLE EXISTING SIGNAL HEADS TO NEW CABINET LOCATION. PROVIDE NEW WIRED FIBER OPTIC INTERCONNECT. (STA 625+06 RT)

CONDUIT FOR PROPOSED POWER SERVICE WIRES FOR TRAFFIC SIGNAL CONSISTING OF 3 CONDUCTOR, 4 AWG WIRE (TYP) TO EXISTING NB TOLL BUILDING. SEE SIGNING, PAVEMENT MARKING, AND ITS PLANS FOR COMPLETE CONDUIT CONNECTION.

INSTALL NEW STRAIN POLE ON NEW FOUNDATION (STA 625+14 RT)

REMOVE AND SALVAGE EXISTING STRAIN POLE

PROPOSED QUAZITE JUNCTION BOX (STA 625+26 RT)

RELOCATE EXISTING SIGNAL HEADS D1 AND D2 ONTO NEW SPAN AND TETHER WIRE.

PROGRAM VIDEO DETECTION ZONE FOR PHASE 8

RAMP QUEUE DETECTION TO BE PROVIDED AT STA 402+80. SEE COMMUNICATION PLAN FOR MORE DETAILS.

REMOVE AND SALVAGE EXISTING SOUTH AND WEST SPANS AND TETHER WIRES. PROVIDE NEW SPAN AND TETHER WIRES FOR THE SOUTH AND WEST SPANS CONNECTING TO THE NEW STRAIN POLE AT THE SOUTHWEST CORNER OF THE INTERSECTION.

RELOCATE EXISTING SIGNAL HEAD A1 AND INSTALL NEW SIGNAL HEADS A2 AND A3. RELOCATE EXISTING R3-5a AND R3-5R SIGNS. REPLACE EXISTING R3-5a SIGN WITH NEW R3-6L SIGN. SALVAGE EXISTING 5-SECTION SIGNAL HEAD AND R3-5a SIGN.

REMOVE AND SALVAGE EXISTING CONTROLLER CABINET REMOVE EXISTING FOUNDATION TO 12 INCHES BELOW GRADE

REMOVE, DISCONNECT, AND SALVAGE EXISTING POWER METER

**LEGEND**

- ☒ BASE MOUNTED TS2-1 CABINET WITH CONTROLLER
- ➔➔ PROPOSED VEHICULAR HEAD
- ➔➔ RELOCATED VEHICULAR HEAD
- ⊥ OVERHEAD SIGN
- - - UNDERGROUND SIGNAL CONDUIT
- VIDEO DETECTION CAMERA
- - - VIDEO DETECTION ZONE
- JUNCTION BOX
- Ⓚ QUAZITE JUNCTION BOX (SEE DETAILS)
- |— COMMUNICATIONS CONDUIT (1-3" CONDUIT)
- |— ELECTRICAL CONDUIT (1-2" CONDUIT)

Contract 2016.02  
Addendum No. 1  
01/12/16



Designed by: **vhb** Engineers Scientists Planners Designers

Vanasse Hangen Brustlin, Inc.  
500 Southborough Dr.  
Suite 105B  
South Portland, ME 04106  
TEL (207) 889-3150  
FAX (207) 253-5596

CONSULTANT PROJECT MANAGER: P. CLARY

By	Date	By	Date
Designed M.G.	10\8\15	Checked M.S.	10\8\15
Drawn J.R.	10\8\15	In Charge of P.C.	10\8\15

MAINE TURNPIKE

**THE GOLD STAR MEMORIAL HIGHWAY**

MTA PROJECT MANAGER: R. NORWOOD

**EXIT 63 GRAY, ME**

**US 202/ME 4/ME 115 AT I-95 NB RAMP**

**SIGNALIZATION PLAN**

SHEET NUMBER: 234

CONTRACT: 2016.02

234 OF 412

Date: 1/12/2016

DAILY & WEEKLY COORDINATION PROGRAM

	MON.-FRI.	SATURDAY	SUNDAY
PLAN 1 90 SECS MAX 2	0645-0830	1000-1600	1045-1600
PLAN 2 110 SECS MAX 2	1530-1815	-	-
PLAN 3 FREE OPERATIONS MAX 1	0000-0645 0830-1530 1815-2400	0000-1000 1600-2400	0000-1045 1600-2400

COORDINATION CYCLE/SPLIT/OFFSET SCHEDULE

ALL ENTRIES IN SECONDS

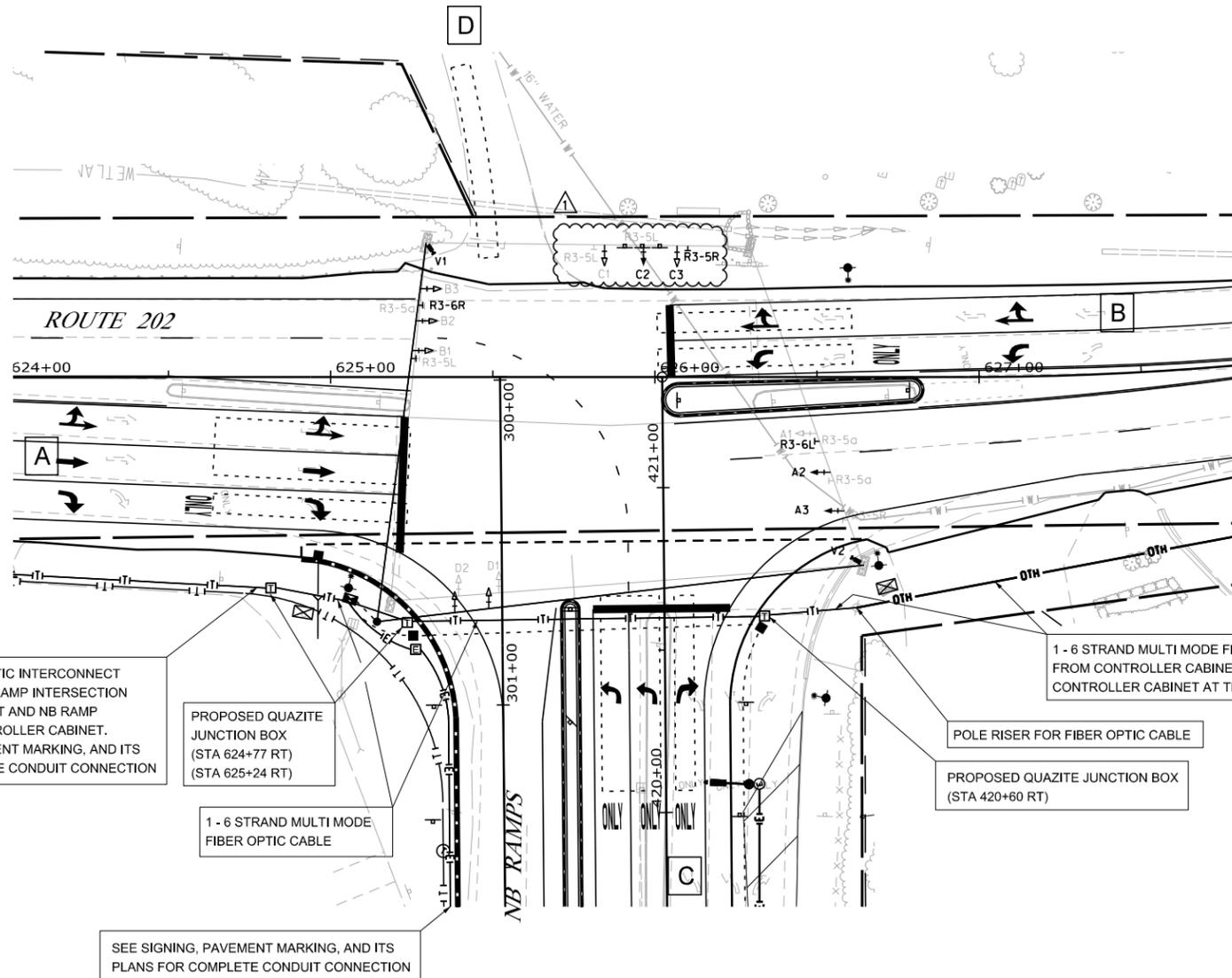
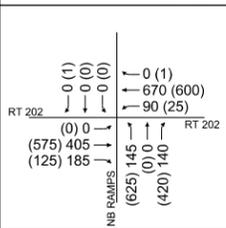
	PLAN 1	PLAN 2
CYCLE LENGTH	90	110
OFFSET (END GRN)	14	60
COORDINATED Ø	2+6	2+6
SPLIT TIME Ø1	16	21
SPLIT TIME Ø2	44	37
SPLIT TIME Ø3	14	14
SPLIT TIME Ø4	16	38
SPLIT TIME Ø5	0	0
SPLIT TIME Ø6	60	58
SPLIT TIME Ø7	14	14
SPLIT TIME Ø8	16	38

COORDINATION MODE SET  
TO FIXED FORCE-OFF

COORDINATION NOTES:

- OFFSET IS REFERENCED TO THE END OF THE COORDINATED PHASE GREEN (SEE TABLE ABOVE).
- COORDINATION TO OPERATE BY TIME-OF-DAY (SEE DAILY AND WEEKLY COORDINATION SCHEDULE)
- PHASES 3 AND 4 ARE DUMMY PHASES TO BE SET WITH SPLIT TIMES FOR NTCIP COMPLIANCE.

2017 SYSTEM DESIGN VOLUMES AM(PM)



LIST OF MAJOR ITEMS

ASSOCIATED EQUIPMENT AND WORK	QUANTITY
FURNISH AND INSTALL PRECAST CONCRETE JUNCTION BOX (ITEM 626.11)	7
FURNISH AND INSTALL 36"x24"x36" QUAZITE JUNCTION BOX (ITEM 626.12)	9
FURNISH AND INSTALL NON-METALLIC CONDUIT (ITEM 626.22)	2485 LF
FURNISH AND INSTALL 48-INCH STRAIN POLE FOUNDATION (ITEM 626.333)	1
FURNISH AND INSTALL CONTROLLER CABINET FOUNDATION (ITEM 626.35)	1
FURNISH AND INSTALL VIDEO DETECTION SYSTEM CONSISTING OF TWO 360 DEGREE ALDIS GRIDSMART CAMERA, GRIDSMART CONTROL UNIT WITH VIDEO PROCESSOR CARD AND ANCILLARY EQUIPMENT (ITEM 643.83)	1
FURNISH AND INSTALL INTERCONNECT WIRE BETWEEN: SB RAMP INTERSECTION AND NB RAMP INTERSECTION (1340 LINEAR FEET) (ITEM 643.90)	1
FURNISH AND INSTALL GALVANIZED STEEL STRAIN POLE (ITEM 643.93)	1

THE LISTED QUANTITIES ARE APPROXIMATE AND ARE FURNISHED FOR INFORMATION ONLY.

SEE SIGNING, PAVEMENT MARKING, AND ITS PLANS FOR COMPLETE OVERHEAD CABLE CONNECTION

1 - 6 STRAND MULTI MODE FIBER OPTIC CABLE FROM CONTROLLER CABINET AT THE NB RAMP INTERSECTION TO THE CONTROLLER CABINET AT THE INTERSECTION OF US 202 WITH ME 100 / ME 115

POLE RISER FOR FIBER OPTIC CABLE

PROPOSED QUAZITE JUNCTION BOX (STA 420+60 RT)

PROPOSED QUAZITE JUNCTION BOX (STA 625+24 RT)

1 - 6 STRAND MULTI MODE FIBER OPTIC CABLE

PROPOSED FIBER OPTIC INTERCONNECT CABLE BETWEEN SB RAMP INTERSECTION CONTROLLER CABINET AND NB RAMP INTERSECTION CONTROLLER CABINET. SEE SIGNING, PAVEMENT MARKING, AND ITS PLANS FOR COMPLETE CONDUIT CONNECTION

SEE SIGNING, PAVEMENT MARKING, AND ITS PLANS FOR COMPLETE CONDUIT CONNECTION

LEGEND	
	BASE MOUNTED TS2-1 CABINET WITH CONTROLLER
	PROPOSED VEHICULAR HEAD
	RELOCATED VEHICULAR HEAD
	UNDERGROUND SIGNAL CONDUIT
	VIDEO DETECTION CAMERA
	VIDEO DETECTION ZONE
	JUNCTION BOX
	QUAZITE JUNCTION BOX (SEE DETAILS)
	COMMUNICATIONS CONDUIT (1-3" CONDUIT)
	ELECTRICAL CONDUIT (1-2" CONDUIT)

Contract 2016.02  
Addendum No. 1  
01/12/16



Designed by:



Vanasse Hangen Brustlin, Inc.  
500 Southborough Dr.  
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South Portland, ME 04106  
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FAX (207) 253-5596



THE GOLD STAR MEMORIAL HIGHWAY

EXIT 63  
GRAY, ME  
US 202/ME 4/ME 115 AT I-95 NB RAMP  
SIGNALIZATION PLAN

No.	Revision	By	Date
1	ADDENDUM #1	MLG	01/16

CONSULTANT PROJECT MANAGER: P. CLARY			
	By	Date	
Designed	M.G.	10\8\15	Checked M.S. 10\8\15
Drawn	J.R.	10\8\15	In Charge of P.C. 10\8\15

MTA PROJECT MANAGER: R. NORWOOD

CONTRACT:2016.02

SHEET NUMBER: 235

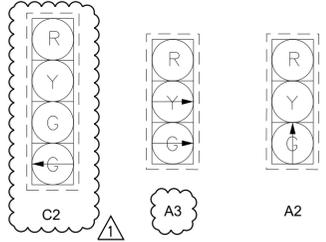
235 OF 412

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Date: 1/12/2016

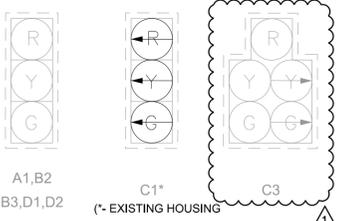
Filename: ... \MSTA\234\_Signal\_01\_RT202.dgn

PROPOSED INDICATIONS



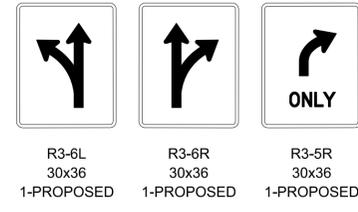
NOTE:  
ALL INDICATIONS SHALL BE 12" LIGHT EMITTING DIODES (LED'S) WITH 5" LOUVERED BACKPLATES

EXISTING INDICATIONS



(\* EXISTING HOUSING WITH NEW LED MODULES)

PROPOSED SPAN WIRE MOUNTED SIGNS



EXISTING SPAN WIRE MOUNTED SIGNS



SIGNAL TIMING

	PHASE 1	PHASE 2	PHASE 6	PHASE 7	PHASE 8
MIN GREEN	5	10	10	5	8
EXTENSION	3	3	3	3	3
MAX 1	15	40	40	15	30
MAX 2	20	60	60	10	40
VEH CLEAR	4	4	4	4	4
RED CLEAR	2	2	2	2	2
WALK	-	-	-	-	-
PED CLEAR	-	-	-	-	-
RECALL	OFF	SOFT	SOFT	OFF	OFF

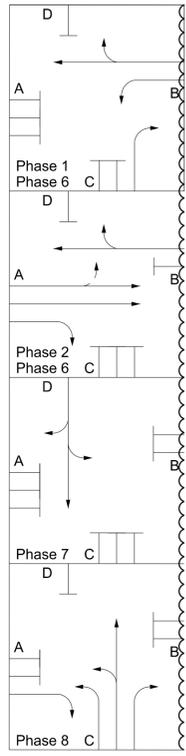
NOTE:  
1. IN THE EVENT OF A CONFLICT OR MALFUNCTION PHASES 2 AND 6 SHALL FLASH YELLOW AND ALL OTHER PHASES SHALL FLASH RED.  
2. MAX 2 SHALL BE PROGRAMMED DURING COORDINATION.

LIST OF MAJOR ITEMS

EQUIPMENT AND WORK ITEMS 643.71	QUANTITY
FURNISH AND INSTALL NEW ECONOLITE COBALT NEMA TS2, TYPE 1 ETHERNET EQUIPPED CONTROLLER IN NEW P-44 TYPE GROUND MOUNTED CONTROLLER CABINET WITH 15-INCH EXTENSION BASE COMPLETE WITH ALL ANCILLARY EQUIPMENT AND WIRING	1
FURNISH AND INSTALL NEW 16-CHANNEL ETHERNET EQUIPPED ENHANCED MALFUNCTION MANAGEMENT UNIT (MMU)	1
REMOVE AND SALVAGE EXISTING STRAIN POLE	1
REMOVE AND SALVAGE METERED SERVICE	1
FURNISH AND INSTALL ONE-WAY 3-SECTION 12-INCH FEDERAL YELLOW SIGNAL HEADS WITH LED MODULES WITH TUNNEL VISORS AND LOUVERED BACKPLATES MOUNTED ON SPAN WIRE	2
FURNISH AND INSTALL ONE-WAY 4-SECTION 12-INCH FEDERAL YELLOW SIGNAL HEADS WITH LED MODULES WITH TUNNEL VISORS AND LOUVERED BACKPLATES MOUNTED ON SPAN WIRE	1
FURNISH AND INSTALL 12-INCH LED LENSES	3
REMOVE AND RESET EXISTING TRAFFIC SIGNAL HEADS	8
FURNISH AND INSTALL SPAN WIRE MOUNTED LANE USE SIGNS	3
FURNISH AND INSTALL PREEMPTION CABLE TO CONNECT EXISTING RADAR UNIT FOR RAMP QUEUE DETECTION	2233 LF
REMOVE AND RESET EXISTING LANE USE SIGNS	5
FURNISH AND INSTALL CISCO IE-3000-4TC ETHERNET SWITCH	1
FURNISH AND INSTALL 12 POSITION PATCH PANEL	1
FURNISH AND INSTALL SPAN AND TETHER WIRE	570 LF
FURNISH AND INSTALL 3 CONDUCTOR 4 AWG CABLE FOR SIGNAL POWER	330 LF
FURNISH AND INSTALL NEW SIGNAL CABLE	-
IMPLEMENT LOCAL AND SYSTEM TIMING	-

THE LISTED QUANTITIES ARE APPROXIMATE AND ARE FURNISHED FOR INFORMATION ONLY.

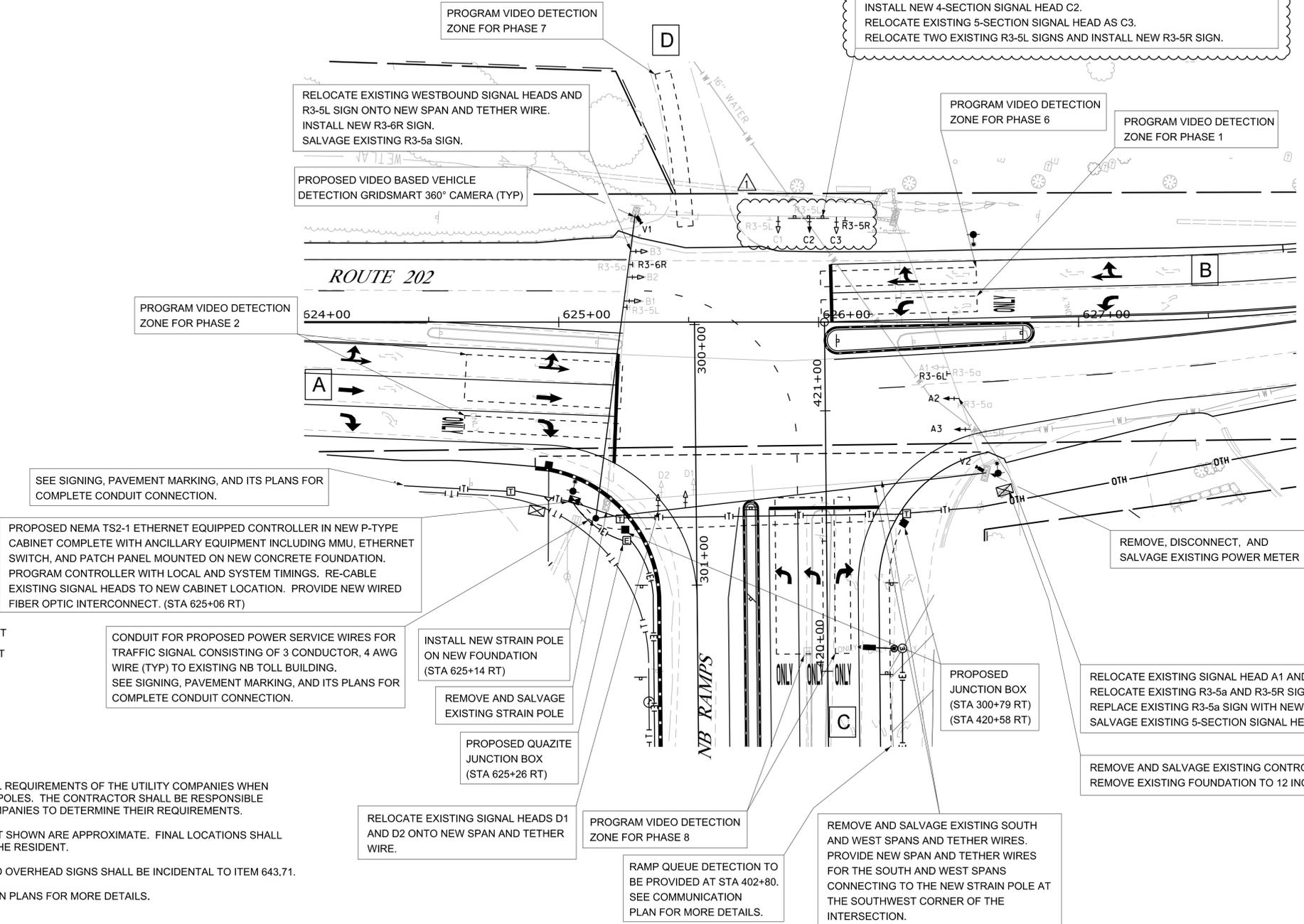
PHASE DIAGRAM



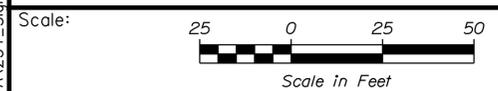
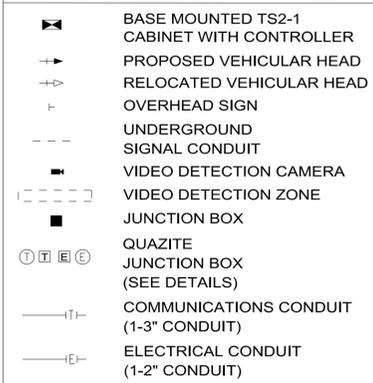
WHERE:  
→ PROTECTED TRAFFIC MOVEMENT  
- - - PERMISSIVE TRAFFIC MOVEMENT

SIGNAL PLAN NOTES:

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- THE LOCATIONS OF ALL EQUIPMENT SHOWN ARE APPROXIMATE. FINAL LOCATIONS SHALL BE DETERMINED IN THE FIELD BY THE RESIDENT.
- THE COST OF SPAN WIRE MOUNTED OVERHEAD SIGNS SHALL BE INCIDENTAL TO ITEM 643.71.
- SEE US ROUTE 202 COMMUNICATION PLANS FOR MORE DETAILS.



LEGEND



Designed by: **vhb** Engineers Scientists Planners Designers

Vanasse Hangen Brustlin, Inc. 500 Southborough Dr. Suite 105B South Portland, ME 04106 TEL (207) 889-3150 FAX (207) 253-5596

CONSULTANT PROJECT MANAGER: P. CLARY

By	Date	By	Date
Designed	M.G. 10\8\15	Checked	M.S. 10\8\15
Drawn	J.R. 10\8\15	In Charge of	P.C. 10\8\15

**MAINE TURNPIKE**

**THE GOLD STAR MEMORIAL HIGHWAY**

MTA PROJECT MANAGER: R. NORWOOD

EXIT 63  
GRAY, ME  
US 202/ME 4/ME 115 AT I-95 NB RAMP  
SIGNALIZATION PLAN

SHEET NUMBER: 234  
234 OF 412

CONTRACT: 2016.02

Date: 1/12/2016

DAILY & WEEKLY COORDINATION PROGRAM

	MON.-FRI.	SATURDAY	SUNDAY
PLAN 1 90 SECS MAX 2	0645-0830	1000-1600	1045-1600
PLAN 2 110 SECS MAX 2	1530-1815	-	-
PLAN 3 FREE OPERATIONS MAX 1	0000-0645 0830-1530 1815-2400	0000-1000 1600-2400	0000-1045 1600-2400

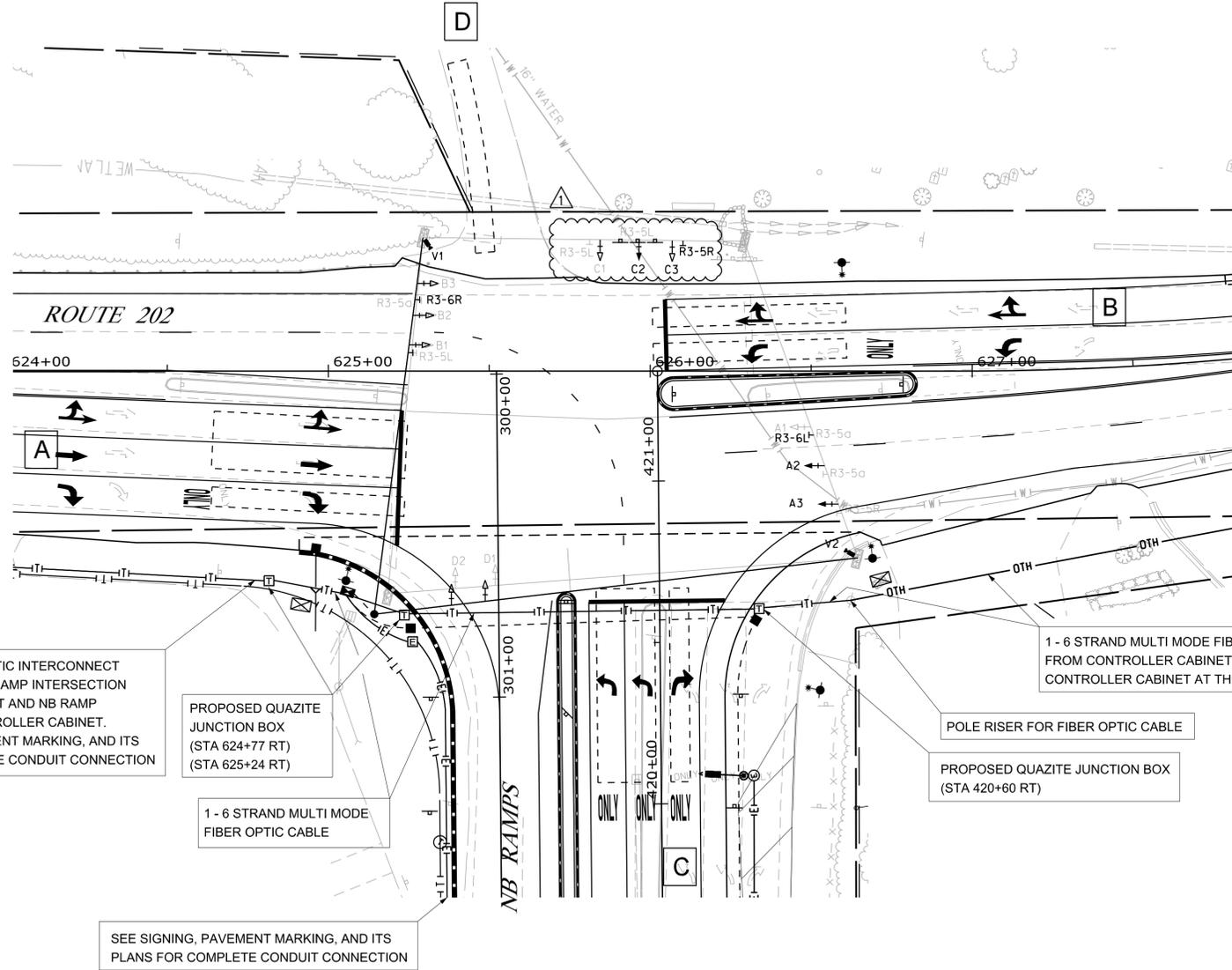
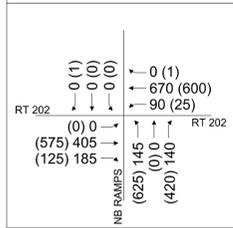
COORDINATION CYCLE/SPLIT/OFFSET SCHEDULE  
ALL ENTRIES IN SECONDS

	PLAN 1	PLAN 2
CYCLE LENGTH	90	110
OFFSET (END GRN)	14	60
COORDINATED Ø	2+6	2+6
SPLIT TIME Ø1	16	21
SPLIT TIME Ø2	44	37
SPLIT TIME Ø3	14	14
SPLIT TIME Ø4	16	38
SPLIT TIME Ø5	0	0
SPLIT TIME Ø6	60	58
SPLIT TIME Ø7	14	14
SPLIT TIME Ø8	16	38

COORDINATION NOTES:

- OFFSET IS REFERENCED TO THE END OF THE COORDINATED PHASE GREEN (SEE TABLE ABOVE).
- COORDINATION TO OPERATE BY TIME-OF-DAY (SEE DAILY AND WEEKLY COORDINATION SCHEDULE)
- PHASES 3 AND 4 ARE DUMMY PHASES TO BE SET WITH SPLIT TIMES FOR NTCIP COMPLIANCE.

2017 SYSTEM DESIGN VOLUMES AM(PM)



LIST OF MAJOR ITEMS

ASSOCIATED EQUIPMENT AND WORK	QUANTITY
FURNISH AND INSTALL PRECAST CONCRETE JUNCTION BOX (ITEM 626.11)	7
FURNISH AND INSTALL 36"x24"x36" QUAZITE JUNCTION BOX (ITEM 626.12)	9
FURNISH AND INSTALL NON-METALLIC CONDUIT (ITEM 626.22)	2485 LF
FURNISH AND INSTALL 48-INCH STRAIN POLE FOUNDATION (ITEM 626.333)	1
FURNISH AND INSTALL CONTROLLER CABINET FOUNDATION (ITEM 626.35)	1
FURNISH AND INSTALL VIDEO DETECTION SYSTEM CONSISTING OF TWO 360 DEGREE ALDIS GRIDSMART CAMERA, GRIDSMART CONTROL UNIT WITH VIDEO PROCESSOR CARD AND ANCILLARY EQUIPMENT (ITEM 643.83)	1
FURNISH AND INSTALL INTERCONNECT WIRE BETWEEN: SB RAMP INTERSECTION AND NB RAMP INTERSECTION (1340 LINEAR FEET) (ITEM 643.90)	1
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SEE SIGNING, PAVEMENT MARKING, AND ITS PLANS FOR COMPLETE OVERHEAD CABLE CONNECTION

1 - 6 STRAND MULTI MODE FIBER OPTIC CABLE FROM CONTROLLER CABINET AT THE NB RAMP INTERSECTION TO THE CONTROLLER CABINET AT THE INTERSECTION OF US 202 WITH ME 100 / ME 115

POLE RISER FOR FIBER OPTIC CABLE

PROPOSED QUAZITE JUNCTION BOX (STA 420+60 RT)

PROPOSED QUAZITE JUNCTION BOX (STA 624+77 RT)  
 (STA 625+24 RT)

1 - 6 STRAND MULTI MODE FIBER OPTIC CABLE

SEE SIGNING, PAVEMENT MARKING, AND ITS PLANS FOR COMPLETE CONDUIT CONNECTION

PROPOSED FIBER OPTIC INTERCONNECT CABLE BETWEEN SB RAMP INTERSECTION CONTROLLER CABINET AND NB RAMP INTERSECTION CONTROLLER CABINET. SEE SIGNING, PAVEMENT MARKING, AND ITS PLANS FOR COMPLETE CONDUIT CONNECTION

LEGEND

- ☒ BASE MOUNTED TS2-1 CABINET WITH CONTROLLER
- ➔➔➔ PROPOSED VEHICULAR HEAD
- ➔➔➔ RELOCATED VEHICULAR HEAD
- UNDERGROUND SIGNAL CONDUIT
- ☒ VIDEO DETECTION CAMERA
- ☒ VIDEO DETECTION ZONE
- ☒ JUNCTION BOX
- ☒ QUAZITE JUNCTION BOX (SEE DETAILS)
- COMMUNICATIONS CONDUIT (1-3" CONDUIT)
- ELECTRICAL CONDUIT (1-2" CONDUIT)

Contract 2016.02  
 Addendum No. 1  
 01/12/16



Designed by:



Vanasse Hangen Brustlin, Inc.  
 500 Southborough Dr.  
 Suite 105B  
 South Portland, ME 04106  
 TEL (207) 889-3150  
 FAX (207) 253-5596



THE GOLD STAR MEMORIAL HIGHWAY

EXIT 63  
 GRAY, ME  
 US 202/ME 4/ME 115 AT I-95 NB RAMPs  
 SIGNALIZATION PLAN

No.	Revision	By	Date
1	ADDENDUM #1	MLG	01/16

CONSULTANT PROJECT MANAGER: P. CLARY

	By	Date	By	Date	
Designed	M.G.	10\8\15	Checked	M.S.	10\8\15
Drawn	J.R.	10\8\15	In Charge of	P.C.	10\8\15

MTA PROJECT MANAGER: R. NORWOOD

CONTRACT: 2016.02

SHEET NUMBER: 235

235 OF 412

Filename: ... \MSTA\235\_Signal\_02\_R1202.dgn

# MAINE TURNPIKE AUTHORITY

## Pre-Bid Conference

### CONTRACT 2016.02

#### Gray Interchange Exit 63 Mile 63.3

January 7, 2016 1:00 PM

1) Location:

The general limits of work are as shown in the contract plans. The general limits of work along the Maine Turnpike begin at Mile Marker 62.8 and continues northerly to Mile Marker 63.5. The work along Route 202 begins approximately 0.2 miles west of the intersection with Route 26A and continues easterly for approximately 0.5 miles into Gray Village. The work along Route 26A begins at the intersection with Route 202 and extends northerly for approximately 0.1 miles.

2) General Description:

The work consists of highway, bridge, and toll system improvements at the Gray Interchange. These improvements include new southbound ramps and a new southbound toll plaza on the west side of the Maine Turnpike where they are proposed to intersect with Route 202 and Route 26A. The improvements include work along the Maine Turnpike, the northbound and southbound ramps, Route 202 and Route 26A. The toll plaza work includes a new toll administration building and toll plaza at the southbound ramps and reconstruction of the existing toll plaza for the northbound ramps.

3) Bid:

- a) January 22, 2016 at 11:00 A.M. at MTA headquarters 2360 Congress Street, Portland.
- b) All bid and contractual questions shall be directed to Purchasing Department, Phone No. (207) 482-8115.
- c) All questions on plans and specifications shall be in writing and shall be directed (faxed) to Purchasing Department, of the Maine Turnpike Authority a minimum of 48 hours prior to the bid opening. Fax No. (207) 871-7739. Or ncarll@maineturnpike.com

4) Notification:

- a) Contractor shall notify and obtain approval from the Authority prior to visiting the Project site for field inspection. The contact person is Mr. Steve Tartre at (207) 871-7771, ext. 144.

5) Construction Schedule/Prosecution of Work:

- |    |                    |  |
|----|--------------------|--|
| a) | February 8, 2016   | Contract Start (Tentative)   |
| b) | June 30, 2016      | Intermediate Completion Date for the reconstruction of the southbound on ramp near the southbound mainline, the southbound acceleration lane, and the Center Road Bridge pier protection |
| c) | June 30, 2016      | Intermediate Completion Date for the pavement rehabilitation and drainage work along the northbound acceleration lane  |
| d) | Date – per CPM     | Existing southbound off ramp closure (a maximum of 66 hours) to complete the connection from the toll plaza area to the temporary southbound on ramp                                     |
| e) | December 1, 2016   | Intermediate Completion Date for the final proposed southbound on and off ramps, the toll plaza, and the toll utility building and guide signs.  |
| f) | Date – per CPM     | Proposed Route 202 bridge deck work shall not begin until the proposed final southbound ramps are fully operational  |
| g) | September 29, 2017 | Contract Substantial Completion Date   |
| h) | October 31, 2017   | Contract Completion Date   |

1. Liquidated damages assessed in accordance with Subsection 107.7.2 for each calendar day intermediate and substantial completion is not achieved for items a, b, c, e, f, g and h above.
  2. Supplemental Liquidated Damages for item d above shall be assessed in accordance with the language under Subsection 107.1.1 on page SP-40. The collection of tolls at the southbound on ramp is a continual revenue source for MTA and the traffic detour associated with the closure increases user costs to the travelers and increases business costs. Therefore, the maximum closure duration of 66 hours has been established to minimize the loss of revenue and minimize increases to user and business costs. The Supplemental Liquidated Damages have been set accordingly to emphasize the importance of meeting the maximum closure duration.
- 6) Maine Department of Transportation Standard Specifications, December 2002 Edition
    - a) Revised Division 100 that incorporates some of the Maine Department of Transportation Standard Specifications, November 2014 Edition language.
  - 7) Bid Responsiveness (Special Provision 102.11)
    - a) Sections 102.22.1 Non-Curable Bid Defects and Section 102.11.2 Curable Bid Defects have been revised.
  - 8) Post Bid Qualification (Special Provision 103.3)
    - a) Subsections 103.3.1 Prequalification Requirement for Award, 103.3.2 Notice and Information Gathering, and 103.3.3 Notice of Determination have all been revised.
  - 9) Maine Department of Labor – Fair Hourly Wages (Special Provision 104.3.8)
    - a) Building 2 (other than 1 & 2 family homes)
    - b) Highway and Earthwork
    - c) Heavy and Bridge
  - 10) Responsibility for Property of Others (Special Provision 104.3.11):
    - a) Contractor responsible for responding to all damage claims within 15 days. This language has been revised from previous MTA contracts.
  - 11) Construction Surveying (Special Provision 105.6)
    - a) Utilizes the new MaineDOT Specification requiring Contractor to provide MTA with same survey/layout (Rover) equipment being utilized by contractor for the duration of the project.
  - 12) Permit Requirements (Special Provision 105.8.2)
    - a) A Tier 3 Maine Natural Resources Protection Act permit from Maine DEP and a Maine General Permit Category 2 Notice permit from the USACOE have been secured to construct the Project with amendments currently in review for minor increases in the limit of disturbance and wetlands impacts.
    - b) The Project is subject to the requirements of the Maine Pollutant Discharge Elimination System (MPDES) General Permit for Stormwater Discharge from Construction Activity.
    - c) The Notice of Intent (NOI), accompanied by the Limit of Disturbance (LOD) plans have been submitted on behalf of MTA.
    - d) Compliance with the erosion and sedimentation control requirements outlined in this Contract is required by the Contractor.
    - e) The Contractor shall note that the existing bridge and toll structures likely contain lead based paint and a copy of the limited scope report is included in Appendix B.
    - f) The Contractor shall note that the existing structure(s) have undergone Asbestos Containing Material Determination Survey(s), and have tested negative for asbestos containing materials. A copy of the Asbestos Containing Determination Survey report is attached as Appendix B. However, should during construction asbestos material is encountered, the removal and disposal of the asbestos containing materials is specified in Special Provision 202, Removing Structure and Obstructions (Removing Asbestos Containing Materials). The Contractor is advised that there may be asbestos containing materials in the existing highway lighting conduit.
  - 13) Wetland and Water Body Impacts (Special Provision 105.8.3)

The Contractor shall submit for approval a detailed construction plan for the stream crossing. The plan shall outline the schedule, equipment, and materials the Contractor will utilize to construct the culvert in accordance with the Plans. Work in these areas will not be allowed to start until after the Contractor has demonstrated that he has the necessary equipment, material, and manpower to complete the crossing in a logical and timely manner. The Resident will review the plan to assure that the Contractor is constructing the crossing in accordance with the Contract Documents and permit requirements. The Contractor shall complete the stream crossing in a timely manner and in accordance with the timeline provided in the MDEP NRPA Permit.

14) General Requirements

- a) U-Turns at toll plazas and median openings not allowed. (General Provision 105.5.1)
- b) Contractor access to and from the mainline shall not negatively impact mainline traffic flow. The Contractor may be required to establish lane closures to provide for safe access. Refer to Special Provision 652, Specific Project Maintenance of Traffic Requirements, for lane closure requirements and restrictions.
- c) All vehicles used on the Project, including concrete delivery trucks, shall be equipped with amber flashing beacons in accordance with the Special Provision 652.2.4. The requirements for flashing beacons has been revised and should be reviewed.
- d) Class 3 safety vests must be worn at all times in accordance with Special Provision 652.2.5

15) Section 108.2. Mobilization Payments - Section has been revised

16) Section 109 Adjustments for Delay – Section has been revised

17) Section 110.3.6 Builders Risk Insurance

- a) The contractor shall provide Builder's risk insurance for this project in the amount equal to or greater than his bid price for Item 800.01 – Toll Administration Building.

18) Resolution of Disputes (Special Provision Section 111) – Section has been revised

19) Traffic Control (Special Provision Section 652):

- a) Contractor is responsible for supplying all traffic control devices.
- b) Contractor is responsible for placement, relocation, removal and maintenance of traffic control devices. Maintenance of traffic control devices is a 24-hour a day, seven day per week, responsibility. Contractor shall inspect devices as required.
- c) Route 26A and Route 202 shall maintain two-lane traffic at all times with a minimum of 11' travel ways and 1' shoulders unless identified differently on the plans.
- d) Contractor is required to maintain access to all driveways and side roads during construction unless otherwise shown on the plans.
- e) When night work occurs (either scheduled or unscheduled), the Contractor shall provide and maintain lighting on all equipment and at all work stations.
- f) The cost of flaggers for construction vehicles entering and exiting the work zone will not be measured but shall be incidental to the Item 652.361 Maintenance of Traffic Control Devices.
- g) The cost of flaggers when paid for is paid under Item 652.38.
- h) Activities are only allowed during times noted in Table A.
- i) Complete stoppages of traffic will only be allowed outlined in Special Provision Section 652, Specific Project Maintenance of Traffic Requirements, or as approved by the Resident. State Police will be used to stop traffic.
- j) The traffic control plans for the contract have been included within the plans. However, should the Contractor propose an alternative approach to access and egress to this area, all applicable MaineDOT, MTA, and MUTCD standards, details, and guidance shall be applied to the traffic control for the construction of the project. Any alternative traffic control plans that are proposed shall be designed by the Contractor and submitted to MTA for review and approval. The plan shall be stamped and sealed by a licensed Professional Engineer in the State of Maine.
- k) All signs, which do not apply to current construction activity, shall be 100% covered or removed in accordance with the plans. This includes any speed limit signs when work zone speed is in operation.

- l) Traffic control devices shall be NCHRP 350 compliant.

## 20) Specific Contract Items

### a) General Items

- i) All clearing has been completed under a previous MTA contract or by MTA staff. (stumps were not removed) Any additional clearing will be incidental to this contract.
- ii) The primary soil consolidation for the proposed southbound ramps under MTA Contract 2015.14 has been completed and construction activities in the areas are not subject to any additional settlement period.
- iii) The survey is a combination of aerial and ground survey with the interface between the two types of survey being blended. The contractor shall confirm actual elevations where the proposed work is matching into existing pavement surfaces.
- iv) All work shall conform to the 2002 Maine Department of Transportation Standard Specifications for Highway and Bridges, except as modified by Maine Turnpike Authority's General and Special Provisions.
- v) The contractor may not use the existing MTA Maintenance Facility for access to either the southbound mainline or to Route 26A.
- vi) A copy of the Geotechnical Report, the USACOE & MaineDEP Permits are available for viewing on the MTA website.
- vii) MTA has established a field office for the project and assumes all associated costs.

### b) Cooperation with other Contractors – MTA has identified the following construction contracts that are anticipated to be in the vicinity of this project:

- i) MTA Contract 2016.01 – Pavement Rehabilitation Project between Mile 54 and 64
- ii) MTA Contract 2016.06 – Guide Signs Installation Project between Mile 75 and 109
- iii) MaineDOT PIN 18802.00 – Pavement Overlay Project on Route 4 from 0.4 miles south of Lotts Drive in Windham and extending easterly 7.42 miles ending just east of McConkey Road on Route 4.
- iv) MTA Contract 2017.0xx – Guide Signs Installation Project between Mile 46 and 63
- v) Gray Water District - upgrading their 6" water line along the left side of Route 202 adjacent to the MTA Maintenance Facility (Sta. 614+00 +/- to Sta. 617+00 +/-). This proposed construction work is anticipated to be completed by March 15, 2016.

### c) Utilities (Subsection 104.4.6 of the Special Provisions)

- i) The following utilities have been identified within the contract limits:
  - (1) Maine Turnpike Authority (Underground)
  - (2) Maine Department of Transportation (Signals and lighting)
  - (3) Central Maine Power Company (Aerial)
  - (4) Gray Water District (Underground)
  - (5) OTT Communications (Aerial)
  - (6) Time Warner Cable (Aerial)
- ii) Aerial and underground relocations are required as a result of the project
- iii) Existing utilities on the plans were compiled from field survey and other sources and the locations, sizes and types are not guaranteed.
- iv) The Contractor and MTA are required to contact Dig Safe prior to the start of work.

### d) Bridges and Structures

- i) The Route 202 bridge work generally consists of full and partial deck repairs, pier and abutment concrete repairs, expansion joint modifications, membrane and pavement replacement, and slope erosion repairs in front of the eastern bridge abutment.
- ii) The existing SB ramps bridge will be removed.
- iii) A pier protection concrete barrier is proposed adjacent to the southbound acceleration lane Center Road Bridge pier.
- iv) There are six (6) overhead and cantilevered sign structures that require Contractor designs for the foundations and sign structures themselves. One of the overhead sign structures has a combined foundation with the proposed gantry over the northbound ramps.

### e) Roadway

- i) The roadway work generally consists of the following:
  - (1) Pavement overlay and step box widening of Routes 202

- (2) Step box widening of the northern side of Route 26A
  - (3) Pavement rehabilitation and reconstruction of the northbound ramps and acceleration lane
  - (4) Construction of the southbound ramps and acceleration lane
  - (5) Signal system replacement at the proposed intersection of Route 202 and the southbound ramps
  - (6) Signal modifications and upgrades at the intersection of Route 202 with the northbound ramps, Route 100, and Route 26
  - (7) ITS installation of three (3) dynamic message signs
  - (8) Horizontal directional drill southerly of the Route 202 bridge for signal and toll plaza conduit
  - (9) Landscaping improvements at the northbound and southbound ramp intersections with Route 202 and at the toll plaza
  - (10) Replacement of the existing 48" metal pipe culvert with a 60" concrete culvert (embedded) beneath the southbound ramps
  - (11) Existing culvert end replacement at various locations
  - (12) New lighting along Route 202, the ramps and at the toll plaza
  - (13) MTA is making their Bennett Road Pit in New Gloucester available through June 30, 2016 for disposal of the preload material and other clean excavation from the project site (no stumps, debris, building material, pavement, concrete or etc.)
- f) Toll Plaza
- i) The existing toll plaza will be removed and replaced with a new toll gantry, new concrete slabs and other tolling equipment and features within the northbound ramps. The existing toll building will remain in place with minor modifications to support the interconnection of communications to the new toll plaza for the southbound ramps and the new toll gantry operations.
  - ii) The new toll plaza for the southbound ramps includes the toll plaza itself along with a new toll administration building, subsurface wastewater system and parking area.
  - iii) The Contractor, per plan and specification, shall allow ten working days for the System Integrator (TransCore) to install new toll lane equipment in each lane and commission each lane.

21) Questions:

MAINE TURNPIKE AUTHORITY

CONTRACT 2016.02

Gray Park and Ride  
and Preload for Gray Interchange

**PRE-BID CONFERENCE JANUARY 7, 2016 1:00 PM**

ATTENDANCE SHEET

ORGANIZATION	NAME	PHONE	EMAIL
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**MAINE TURNPIKE AUTHORITY**

**Pre-Bid Conference Questions and Responses (January 7, 2016)**

CONTRACT 2016.02

GRAY INTERCHANGE  
(EXIT 63)

- 1) Question: How will access to the Bennett Road Pit be allowed?  
*Response: Maine Turnpike Authority will not allow access exiting from the Turnpike Northbound. Access will be allowed entering from the Turnpike Southbound with the appropriate MUTCD signage.*
- 2) Question: How will Concrete Collars and Concrete Anti-Seep Collars be paid for?  
*Response: Concrete Collars will be paid for under Item 603.28 – Concrete Collar for Reinforced Concrete Pipe (EA). Concrete Anti-Seep Collars are incidental to their related pipe item.*
- 3) Question: Will the Resident's approval be required for all locations where HDPE may be used in place of RCP with the Concrete Collar?  
*Response: Maine Turnpike Authority will allow either RCP or HDPE to be used. No approval by Maine Turnpike Authority is required. It will be the contractor's option.*
- 4) Question: Will there be in-stream work restrictions?  
*Response: There are no current restrictions.*
- 5) Question: Are pipe removals incidental on this project?  
*Response: Yes, all pipe removals are incidental.*
- 6) Question: Error when attempting to download plans from the Maine Turnpike Authority website  
*Response: Maine Turnpike Authority has no issues downloading the plans from the website.*
- 7) Question: Maine Turnpike Authority indicated that Addendum #1 will be posted on January 12, 2016 and Addendum #2 is anticipated on January 19, 2016?  
*Response: No response required.*