TOWN OF SIMSBURY, CONNECTICUT

PROJECT TECHNICAL SPECIFICATIONS *(or SPECIAL TECHNICAL PROVISIONS)* FOR BLOOMFIELD-TARIFFVILLE MULTI-USE TRAIL CONNECTOR PROJECT SIMSBURY / BLOOMFIELD, CONNECTICUT

Town Bid # 22-01 STATE PROJECT NO. L128-0001

> Project Manual Volume 2



Issued: May 2022

This page is intentionally left blank.

TABLE OF CONTENTS OF TECHNICAL SPECIAL PROVISIONS

Note: This Table of Contents has been prepared for the convenience of those using this contract with the sole express purpose of locating quickly the information contained herein; and no claims shall arise due to omissions, additions, deletions, etc., as this Table of Contents shall not be considered part of the contract.

NOTICE TO CONTRACTOR – WORK SCHEDULE	SP-3
NOTICE TO CONTRACTOR – NOISE POLLUTION	SP-3
NOTICE TO CONTRACTOR – FIRE DEPARTMENT, POLICE, AND EMERGENCY MEDICAL SERVIC	ΣES
SP-3	
NOTICE TO CONTRACTOR - SAFEGUARDING OF RESIDENCES AND PEDESTRIANS	SP-3
NOTICE TO CONTRACTOR - CONSTRUCTION STAGING AREA	SP-3
NOTICE TO CONTRACTOR - EXISTING UTILITIES	SP-4
NOTICE TO CONTRACTOR – TEMPORARY ACCESS TO AREA MERCHANTS, BUSINESSES, AND	
RESIDENCES	SP-5
NOTICE TO CONTRACTOR - COORDINATION OF WORK	SP-5
NOTICE TO CONTRACTOR - FINAL GRADES	SP-5
NOTICE TO CONTRACTOR - SHOP DRAWINGS	SP-5
NOTICE TO CONTRACTOR - SAWCUTS	SP-5
NOTICE TO CONTRACTOR - STATE LISTED SPECIES	SP-6
NOTICE TO CONTRACTOR – VEGETATED WATERWAYS	SP-6
NOTICE TO CONTRACTOR – PROPERTY BOUNDS	SP-7
NOTICE TO CONTRACTOR – OUALITY OF WORK	SP-7
NOTICE TO CONTRACTOR – TREE REMOVAL	SP-7
NOTICE TO CONTRACTOR – POLICE SERVICES	SP-8
NOTICE TO CONTRACTOR - PROCUREMENT OF MATERIALS	SP-8
NOTICE TO CONTRACTOR – SIGN INVENTORY	SP-8
NOTICE TO CONTRACTOR – NOTIFICATION TO PROPERTY OWNERS	SP-8
NOTICE TO CONTRACTOR – MINIMUM TESTING REQUIREMENTS	SP-9
NOTICE TO CONTRACTOR – TRAFFIC SIGNALS	SP-9
NOTICE TO CONTRACTOR – RECENT REVISIONS	SP-10
SECTION 1.01 – DEFINITION OF TERMS AND PERMISSIBLE ABBREVIATIONS	SP_12
SECTION 1.05 - CONTROL OF WORK	SP_13
SECTION 1.06 CONTROL OF MATERIALS	SP_1/
SECTION 1.07 - LEGAL RELATIONS AND RESPONSIBILITIES	SP_15
SECTION 1.07 - DECAE RELATIONS AND RESI ONSIDILITIES	SP-18
SECTION 1.00 - I ROSECOTION AND I ROOKESS	SD 21
SECTION 10.00 - GENERAL	. 51 - 21
DECTION 10.00 - GENERAL CLAUSES FOR HIGH WAY ILLUMINATION AND TRAFFIC SIGNAL	CD 22
TRUJECTS	SP 24
ITEM #0201001A - CLEAKING AND GRUDDING	SP-24
TIEM #0202300A - DISPOSAL/RESTORATION FOR ROCK SLOPE SCALING	SP-23
KUCK SLUPE SCALING	.SP-23
TTEM #0219011A - SEDIMENT CONTROL SYSTEM AT CATCH BASIN	. SP-20
IIEM #0406999A - ASPHALI ADJUSIMENI CUSI	.SP-2/
ITEM #0601445A - EMBANKMENT WALL (SITE NO. 1)	.SP-29
ITEM #0906201A - KOCKFALL BARKIEK	.SP-38
ITEM #094/20/A - BICYCLE STAND	.SP-39
11EM #0949001A – WEED BAKKIEK FABRIC	.SP-41
IIEM #950005A - IUKF ESIABLISHMENT	.SP-42
11EM #0950023A – LANDSCAPE EDGING	.SP-43
ITEM #0969062A - CONSTRUCTION FIELD OFFICE, MEDIUM	.SP-44
ITEM #0971001A – MAINTENANCE AND PROTECTION OF TRAFFIC	.SP-50

ITEM #1002291A - MODIFICATION OF TRAFFIC CONTROL FOUNDATION	SP-61
ITEM#1008908A - CLEAN EXISTING CONDUIT	SP-62
ITEM#1010060A - CLEAN EXISTING CONCRETE HANDHOLE	SP-63
ITEM #1105180A - 1 WAY, 1 SECTION BI-COLORED ARROW	SP-64
ITEM#1106003A-1 WAY PEDESTRIAN SIGNAL PEDESTAL MOUNTED	SP-67
ITEM #1107011A - ACCESSIBLE PEDESTRIAN SIGNAL AND DETECTOR (TYPE A)	SP-69
ITEM #1108163A - MODIFY EXISTING CONTROLLER	SP-72
ITEM #1111201A - TEMPORARY DETECTION (Site No. 1)	SP-73
ITEM #1111401A LOOP VEHICLE DETECTOR	SP-76
ITEM #1111451A - LOOP DETECTOR SAWCUT	SP-76
ITEM #1118012A REMOVAL AND/OR RELOCATION OF TRAFFIC SIGNAL EQUIPMENT	SP-80
ITEM NO. 1118051A - TEMPORARY SIGNALIZATION (SITE NO. 1)	SP-83
ITEM #1206092A - RESET SIGN	SP-87
ITEM #1208931A - SIGN FACE - SHEET ALUMINUM (TYPE IX RETROREFLECTIVE SHEETING)	SP-88
ITEM #1208938A – PROJECT SIGN	SP-90
ITEM #1403501A - RESET MANHOLE (SANITARY SEWER)	SP-92

SPECIAL PROVISIONS

NOTICE TO CONTRACTOR – WORK SCHEDULE

The Contractor is required to submit a schedule of work to be completed to the Engineer and obtain approval from the Engineer on the schedule prior to commencing work and shall update the schedule monthly. Should construction occur at a rate different from that indicated in the approved schedule, the Contractor shall submit a revised work schedule to the Engineer for approval. At a minimum, and as applicable, the Contractor must submit this revised work schedule at the next monthly status meeting with the Engineer.

NOTICE TO CONTRACTOR – NOISE POLLUTION

The Contractor shall take measures to control the noise intensity caused by his construction operations and equipment, including but not limited to equipment used for drilling, pile driving, blasting, excavation, or hauling.

All methods and devices employed to minimize noise shall be subject to the continuing approval of the Engineer and in accordance with the Town of Bloomfield and Town of Simsbury (Towns).

<u>NOTICE TO CONTRACTOR – FIRE DEPARTMENT, POLICE, AND EMERGENCY</u> <u>MEDICAL SERVICES</u>

The Contractor shall contact the Fire Department, Police, and Emergency Medical Services, prior to work and establish coordination necessary as to disruption of services during construction.

NOTICE TO CONTRACTOR – SAFEGUARDING OF RESIDENCES AND PEDESTRIANS

The Contractor shall maintain and protect traffic operations at all driveways and provide adequate sight lines. The Contractor shall not restrict sight lines with construction equipment when not actively working. The Contractor shall provide and maintain safe pedestrian operations on existing sidewalks or temporary bituminous walks at all times during and after construction hours. The Contractor shall provide adequate protection between work area and pedestrian sidewalk activities as directed by the Engineer.

NOTICE TO CONTRACTOR – CONSTRUCTION STAGING AREA

The Contractor shall submit for review and approval a plan and description for the proposed construction staging area. The plan and description shall be submitted to the Engineer within 7 calendar days after the Firm is awarded the contract.

The following is to be included in the plan and/or description:

- Location and type of erosion control measures (if required)
- Anti-tracking Pad location(s)
- Location and type of security fence (if required)

- Location and type of stockpiles stored on-site
- Location and type of hazardous materials stored on-site
- Location and type of equipment stored on-site
- Location and type of vehicles stored on-site
- Times and days in which construction activities will use the staging area
- Estimated number of trips in and out of the staging area
- Date the staging area will become active
- Date the staging area will be removed and returned to original conditions

NOTICE TO CONTRACTOR - EXISTING UTILITIES

Existing utilities shall be maintained during construction. The Contractor shall verify the location of underground, structure mounted and overhead utilities. Construction work within the vicinity of utilities shall be performed in accordance with current safety regulations.

The Contractor shall notify "Call Before You Dig", telephone: 1-800-922-4455 for the location of public utility underground facilities, in accordance with Section 16-345 of the Regulations of the Department of Public Utility Control.

Contractors are cautioned that it is their responsibility to verify locations, conditions, and field dimensions of all existing features, as actual conditions may differ from information shown on the plans or contained elsewhere in the specifications.

The Contractor shall notify the Engineer prior to the start of his work and shall be responsible for all coordination with the Department. The Contractor shall allow the Engineer complete access to the work.

The Contractor is hereby notified that utility work schedules will have to be accommodated prior to proceeding. The Contractor shall coordinate with the Utility Companies to accommodate his/her schedule with all utility company schedules. Any inconvenience or delay that may result from the utility company work shall be included in the contract proposal for the work.

All existing utility infrastructure must remain in service until the new facilities are acceptable to be put in service. The Contractor shall explore with the utilities this aspect of the project. This condition of serviceability applies to the work being done by the contractor for the utilities and to work that is being done under the control of the utility.

<u>NOTICE TO CONTRACTOR – TEMPORARY ACCESS TO AREA MERCHANTS,</u> <u>BUSINESSES, AND RESIDENCES</u>

Access to all businesses and residences must be maintained at all times.

The Contractor shall coordinate his/her work, provide safe and ready means of ingress and egress to all stores and shops, public and private professional offices, and any other businesses or residences in the project area, both day and night, for the duration of the project. As required by the Engineer, the Contractor shall install and maintain temporary ramps at driveways. The cost of installing, maintaining, and removing the temporary ramps shall be in accordance with Section 4.06.

The Contractor shall provide each abutter a minimum of 24-hour notice prior to beginning construction on private driveway entrances.

NOTICE TO CONTRACTOR - COORDINATION OF WORK

The Contractor shall coordinate his/her work with any utility companies and other contractors working within the project area.

NOTICE TO CONTRACTOR – FINAL GRADES

The Contractor shall ensure that the final grades of the trail and roadway and adjacent topography provides positive drainage. The work involved in establishing the final ay grades shall be included in the lump sum price for Construction Staking.

NOTICE TO CONTRACTOR – SHOP DRAWINGS

The Contractor shall submit electronic copies (adobe acrobat) of all shop drawings to the Engineer for review and approval prior to ordering or installing the items in accordance with Section 1.05.02 – Plans, Working Drawings and Shop Drawings of Form 818 dated 2020.

NOTICE TO CONTRACTOR – SAWCUTS

Existing pavement to remain shall be sawcut at all openings for utility work, for new or reset curb, and at all joints with proposed full-depth hot mix asphalt pavement and sidewalk, as shown on the plans or as directed by the Engineer.

NOTICE TO CONTRACTOR – STATE LISTED SPECIES

Know extant populations of State Special Concern *Glyptemys insculpta* (wood turtle) exists within the vicinity of the project site. Refer to the protection strategies in the report from the Connecticut Department of Energy and Environmental Protection, dated March 4, 2021, and included in section 6 of the project manual. Such protection strategies must be employed to lessen the impact on these species. Protection measures will not be measured for payment but shall be included in the general cost of work.

NOTICE TO CONTRACTOR – VEGETATED WATERWAYS

The Contractor shall follow these guidelines when constructing all drainageways on the project. The following is referenced from Chapter 6 of the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control.

Cross Section Design

Trapezoidal and "v-shaped" waterways are often used where space is limited.

Parabolic waterways are often used where space is available for a wide, shallow channel with low velocity flow. Stone center waterways should be used where higher velocities or persistent flows are expected.

Vegetated waterways with stone centers are useful where there is a persistent but not permanent low flow in the channel. For a channel designed to a 10-year frequency storm, the stone center shall be wide enough to safely pass a 2-year frequency storm. For a channel designed to a 25-year frequency storm, the stone center shall be wide enough to safely pass a 10-year frequency storm. The stone center shall have 6 inches of gravel bedding or a properly designed geotextile under the stone. If the d₇₅ of the stone is 8 inches or greater then a bedding over the geotextile shall be considered in the design to protect the geotextile from puncture during stone placement. The d₇₅ of the stone shall be determined from HEC-15. The minimum d₇₅ size shall be 3 inches. The d₁₀₀ size shall be 1.5 times the d₇₅ size. The d₁₅ size shall be 3 inches or one third the d₇₅ size, whichever is larger. The stone center shall have a minimum thickness of 12 inches or the d₁₀₀ size, whichever is larger. The stone shall be hard and durable.

Grading

Require the grading of all areas adjacent to the waterways to drain toward the waterway.

Outlet

The outlet shall be stable for the design storm discharge without erosion or flood damage.

Permanent Seeding or Sodding.

Where the permanent vegetative cover is established by seeding, extend the seeding to at least the design top width and include any other areas disturbed by construction activities. For seeded channels with no stone centers use Temporary Erosion Control Blanket measure to hold seed in place and protect root bases from scour during the establishment period.

Installation Requirements

Check weather forecasts to ensure a storm is not predicted during the time of construction. Delay construction until after the threat of rainfall has passed.

Site Preparation

Remove all trees, brush, stumps and other unsuitable materials and dispose of properly so as not to interfere with construction or proper functioning of the waterway. Begin construction at the outlet installing outlet protection and continue construction to the inlet. Excavate or shape the channel to the design grade and cross-section. Compact any fills and rills to prevent unequal settlement. Remove any excess soil. For a waterway stabilized with permanent seedings, prepare the seedbed in accordance with the requirement of the Permanent Seeding measure.

NOTICE TO CONTRACTOR – PROPERTY BOUNDS

The Contractor shall exercise due care when working around all property bounds which are to remain. Should any damage to a bound result from the actions of the Contractor, the bound shall be replaced and/or realigned by a CT-licensed land surveyor as directed by the Engineer at the Contractor's expense.

NOTICE TO CONTRACTOR – QUALITY OF WORK

It is the Contractor's responsibility to perform the work of this Contract in accordance with the contract plans and specifications and as directed by the Engineer. The Towns reserve the right to withhold payment for any quantity of work which, in the opinion of the Engineer and/or the Towns, does not meet the contract requirements. Any and all improvements, or parts thereof, constructed as part of this contract, which in the Engineer and/or the Towns' opinion, do not conform to the contract plans and specifications and has resulted in an unacceptable product, will not be measured for payment until corrected by the Contractor at the Contractor's own expense.

Upon receiving notification from the Town(s) that such work has been identified as unacceptable, the Contractor shall immediately proceed to either repair or remove and replace the unacceptable work as directed by the Engineer and/or the Town(s).

When, in the opinion of the Engineer and/or the Town, the corrective work has been completed and accepted, the original pay items will be measured for payment.

NOTICE TO CONTRACTOR – TREE REMOVAL

If it is necessary to remove any trees within the project limits, the Contractor is required to contact the Towns' Tree Warden prior to any removal. The Contractor will be responsible for flagging all public trees to be removed. The Engineer will then review the trees to insure conformance to the plans. The Towns will then post the trees, with a 10-day notice/waiting period required. If the tree removal is protested, an appeal process with a Public Hearing will be held prior to the tree removal.

NOTICE TO CONTRACTOR – POLICE SERVICES

The Contractor shall be responsible for contacting the Towns' Police Department Safety Officer and coordinating and requesting the necessary Police Services. The Contractor shall provide the Towns the schedule for review at least once a week.

All costs in connection with Police Services for traffic control will be paid for by the Contractor with reimbursement by the Towns as a direct cost with no mark-up. Contractor shall provide proof of payment for all Police Services prior to requesting reimbursement of these costs from the Towns.

NOTICE TO CONTRACTOR - PROCUREMENT OF MATERIALS

Upon award, the Contractor shall proceed with shop drawings, working drawings, procurement of materials, and all other submittals required to complete the work in accordance with the contract documents and in accordance with Section 1.20-1.05.02 – Shop Drawings, Product Data, Product Sample and Quality Assurance Submittals of Form 818.

NOTICE TO CONTRACTOR – SIGN INVENTORY

Prior to the commencement of construction, the Contractor and the Engineer shall conduct a joint inventory of signs, delineators and object markers. Signs, delineators or object markers that are knocked down or destroyed by the Contractor during the construction of the project shall be replaced by the Contractor at no cost to the Towns.

NOTICE TO CONTRACTOR – NOTIFICATION TO PROPERTY OWNERS

The Contractor shall notify property owners writing at least two (2) weeks in advance of when construction is expected to disturb their property to provide enough time to remove any items that might be affected by the construction.

NOTICE TO CONTRACTOR – MINIMUM TESTING REQUIREMENTS

Materials incorporated in the project shall be tested in accordance with the Department's Schedule of Minimum Testing, which can be found in the CTDOT's November 2021 LOTCIP Guidelines.

NOTICE TO CONTRACTOR – TRAFFIC SIGNALS

The Contractor is hereby notified that certain conditions pertaining to the installation of new signals and maintenance of traffic signal operations are required when relevant, as part of this contract.

Qualified/Unqualified Workers

U.S. Department of Labor
Occupational Safety & Health Administration (OSHA) www.osha.gov
Part Number 1910
Part Title Occupational Safety & Health Administration
Subpart S
Subpart Title Electrical
Standard Number 1910.333
Title Selection and use of work practices

Completion of this project will require Contractor employees to be near overhead utility lines. All workers and their activities when near utility lines shall comply with the above OSHA regulations. In general, unqualified workers are not allowed within 10 feet of overhead, energized lines. It is the contractor's responsibility to ensure that workers in this area are qualified in accordance with OSHA regulations.

The electric distribution company is responsible to provide and install all necessary anchors and guy strands on utility poles. It is the Contractors responsibility to coordinate with the utility company to ensure proper placement of the anchor.

For utility poles owned and maintained by Frontier Communications: Frontier will be responsible to provide and install the pole anchor. The installation of the guy wire will

be the responsibility of the Contractor and should follow Frontier specifications. The contractor will be held liable for all damage to existing equipment resulting from his or his

subcontractor's actions. A credit will be deducted from monies due the Contractor for all maintenance calls responded to by Department of Transportation personnel.

All existing traffic appurtenances, in particular steel span poles, controller cabinets and pedestals shall be removed from the proposed roadway prior to excavation. The Contractor shall work with the utility companies to either relocate or install all traffic signal appurtenances prior to the roadway reconstruction.

The Contractor must install permanent or temporary spans in conjunction with utility company relocations. He then must either install the new signal equipment and controller or relocate the existing equipment.

The 30 Day Test on traffic control equipment, as specified in Section 10.00, Article 10.00.10 TESTS, will not begin until the items listed below are delivered to the Department of Transportation, Traffic Signal Lab in Rocky Hill.

Five (5) sets of cabinet wiring diagrams and one electronic PDF file copy to be sent to DOT.Trafficelectrical@ct.gov. Leave one set in the controller cabinet.

NOTICE TO CONTRACTOR – RECENT REVISIONS

The Contractor is hereby notified that the following Traffic Engineering Special Provisions have been revised:

Section 1.07 – Legal Relations and Responsibilities

• Updated service entrance inspection requirements.

Section 10.00 – General Clauses for Highway Illumination and Traffic Signal Projects

- Updated as-built plan requirements
- Added testing for video detection

1015034A – Grounding and Bonding

• Added new Special Provision for grounding and bonding procedure.

1105xxxA – X_Way_X_Section Traffic Signal:

- Painting requirements for housing, brackets, and hardware have been moved to Form 818.
- Changed LED lens to 15 years warranty type.
- Backplates:
 - changed to louvered
 - changed retroreflective strip sheeting type
 - changed aluminum alloy to 5052-H32
 - provided range for acceptable thickness

1106xxxA – X_Way_Pedestrian Signal:

- Painting requirements for housing, brackets, and hardware have been moved to Form 818.
- Changed the sign size to 9" x 15"
- Changed to include confirmation light

The Contractor is hereby notified that Traffic Engineering's following guide sheets are included:

GS_Traffic Control Foundations

• Added Portland Cement concrete number.

GS_Concrete Handhole

• Added Portland Cement concrete number.

The Contractor is hereby notified that the following Traffic Engineering Special Provision is no longer required. All pertinent information is included in the Form 818:

1001001A - Trenching and Backfilling

SECTION 1.01 – DEFINITION OF TERMS AND PERMISSIBLE ABBREVIATIONS

Article 1.01.01 is amended as follows:

All references to Commissioner, Department, Engineer, State, and State of Connecticut anywhere within the 'Standard Specifications for Roads, Bridges, and Incidental Construction" or within the Supplemental Specifications or Special Provisions shall be interpreted to mean the Town of Bloomfield and Town of Simsbury or a duly authorized agent of the Towns. Any question or ambiguity regarding any definitions shall be brought to the immediate attention of the Towns.

Towns: The Town of Bloomfield and Town of Simsbury, party of the first part to the contract, acting directly or through its agents or employees.

Contract Unit Price: The cost per established unit for each construction item as written on the Proposal Form.

Special Conditions: Additions and revisions to the Standard and Supplemental Specifications covering conditions peculiar to this individual project.

The words "as described", "as required", "as permitted", "as directed", or phrases of like effect or import as used herein shall mean that the direction, requirement, permission or allowance of the Engineer is intended, and similarly the words "approved", "reasonable", "suitable", "properly", "satisfactory", or words of like effect or import, unless otherwise particularly specified herein, shall mean approved, reasonable, suitable, properly or satisfactory in the judgment of the Engineer.

SECTION 1.05 - CONTROL OF WORK

Article 1.05.02 - Plans, Working Drawings and Shop Drawings are supplemented as follows:

Sub article 1.05.02 - (2) is supplemented by the following:

Traffic Signal Items:

When required by the contract documents or when ordered by the Engineer, The Contractor shall prepare and submit product data sheets, working drawings and/or shop drawings for all traffic signal items to the Division of Traffic Engineering for review before fabrication. The packaged set of product data sheets, working drawings and/or shop drawings shall be submitted in an electronic portable document format (.pdf).

The packaged set submitted in an electronic portable document format (.pdf) shall be in an individual file with appropriate bookmarks for each item. The electronic files for product data sheets shall be created on ANSI A ($8\frac{1}{2}$ " x 11"; 216 mm x 279mm; letter) sheets. Working drawings and shop drawings shall be created on ANSI B (11" x 17"; 279 mm x 432 mm; ledger/tabloid) sheets.

Please send the pdf documents via email to:

DOT.TrafficElectrical@ct.gov

SECTION 1.06 CONTROL OF MATERIALS

Article 1.06.01 - Source of Supply and Quality:

Add the following:

Traffic Signal Items:

For the following traffic signal items the contractor shall submit a complete description of the item, shop drawings, product data sheets and other descriptive literature which completely illustrates such items presented for formal review. Such review shall not change the requirements for a certified test report and materials certificate as may be called for. All documents shall be grouped into one separate file for each group of items as indicated by the Roman numerals below (for example, one pdf file for all of the pedestal items). The documents for all of the traffic signal items shall be submitted at one time, unless otherwise allowed by the engineer.

- I. 10080XX Rigid Metal Conduit
- II. 11020XX Aluminum Pedestals
- III. 11050XXA Traffic Signals, Span Mounted LEDs, Housings and Hardware
- IV. 11060XXA Pedestrian Signals LEDs, Housings, and Hardware
 11070XXA Pedestrian Pushbutton & Sign Button, Housings & Sign (Type)
 11070XXA Accessible Pedestrian Signal & Detector Button, Housings & Sign (Type)
- V. 11114XXA Loop Detector Amplifier, Sealant, Wire and Lead in Wire
- VI. Cable Control Cable

SECTION 1.07 - LEGAL RELATIONS AND RESPONSIBILITIES

Article 1.07.13 - Contractor's Responsibility for Adjacent Property, Facilities and Services is supplemented as follows:

The following company and representative shall be contacted by the Contractor to coordinate the protection of their utilities on this project 30 days prior to the start of any work on this project involving their utilities:

Comcast of Connecticut, Inc Mr. Jim Bitzas, Sr. Manager of Western New England 1110 East Mountain Road Westfield, MA 01085 Phone: (413) 562-9923 EXT: 5783252 Mobile: (617)279-7485 E-mail: jim_bitzas@cable.comcast.com

The Connecticut Light and Power Company dba Eversource Energy - Electric Distribution Mr. Thomas Woronik, Supervisor - Construction Engineering 22 East High Street East Hampton, CT 06424 Phone: (860) 267-3891 E-mail: Thomas.Woronik@eversource.com

Connecticut Natural Gas Corporation, Engineering Department Mr. Jonathan Gould, Gas Engineer 76 Meadow Street, 2nd Floor East Hartford, CT 06108 Phone: (860) 727-3044 E-mail: jgould@ctgcorp.com

Lightower Fiber Networks I, LLC dba Crown Castle Fiber Mr. Eric Clark, Manager Fiber Construction 1781 Highland Avenue, Suite 102 Cheshire, CT 06410 Phone: (203) 649-3904 Mobile: 860-863-8311 E-mail: Eric.Clark@crowncastle.com Mobilitie Mr. Peter Jeffrey, Regional Director New England, Network Deployment Boott Mill South 116 John St., Suite 210 Lowell, MA 01852 Phone: (877) 244-7889 Mobile: 857-210-6206 E-mail: peter.jeffrey@mobilitie.com

The Southern New England Telephone Company dba Frontier Communications of Connecticut Ms. Lynne DeLucia, Manager - Engineering & Construction 1441 North Colony Road Meriden, CT 06450-4101 Phone: (203) 238-5000 Mobile: 860-967-4389 E-mail: Lynne.m.delucia@ftr.com

MCI Communications Services, Inc. dba Verizon Enterprise Solutions Mr. Eric C Johnson, Engr Iv Spec-Ntwk Eng & Ops 85 High St Pawtucket, RI 02860 Phone: (401) 727-9558 Mobile: (401) 729-0630 E-mail: eric.c.johnson@verizon.com

Kinder Morgan, Inc. (Tennessee Gas Pipeline L.L.C.) Mr. David Wood, Project Manager - Ops 8 Anngina Drive Enfield, CT 06082 Phone: (860) 763-6005 Mobile: (413) 530-7117 E-mail: David Wood@kindermorgan.com

The Metropolitan District Mr. Richard Norris, P.E. Project Engineer / Utility Liaison 555 Main Street, P.O. Box 800 Hartford, CT 06142-0800 Phone: (860) 278-7850 EXT: 3450 E-mail: rnorris@themdc.com Aquarion Water Company of Connecticut Mr. Carlos Vizcarrondo, Relocations Coordinator 600 Lindley Street Bridgeport, CT 06606 Phone: (203) 337-5950 Mobile: (203) 395-3097 E-mail: cvizcarrondo@aquarionwater.com

Avon Water Company Mr. Robert W. Wesneski, Secretary/Superintendent 14 West Main Street Avon, CT 06001 Phone: (860) 678-0001 E-mail: <u>avonwater@snet.net</u>

Mr. Mark Russo District 4 Electrical Supervisor Department of Transportation Southbury, Connecticut 06488 (203) 264-9590

SECTION 1.08 - PROSECUTION AND PROGRESS

Section 1.08 - Prosecution and Progress is amended as follows:

Article 1.08.03 – Prosecution of Work of the Standard Specifications Form 818 is amended as follows:

Add the following:

Before starting any work under this Contract, the Contractor shall prepare, and submit to the Engineer for approval, a minimum of 30 days in advance, a plan illustrating the Typical Traffic Management Plan for all roadways to be milled/reconstructed during construction. This plan shall illustrate typical use and layout of construction signs, drums, and other traffic control devices to be employed during each time period of work to maintain traffic and access to abutting properties. The Contractor must obtain approval of the Typical Traffic Management Plan from the Engineer prior to commencing work on the specified roadways.

All appropriate Maintenance and Protection of Traffic devices are to be installed prior to commencing construction operations.

Particular care shall be taken to establish and maintain methods and procedures that will not create unnecessary or unusual hazards to public safety. Traffic control devices required only during working hour operations shall be removed at the end of each working day.

Signs having messages that are irrelevant to normal traffic conditions shall be removed or properly covered at the end of each work period. Signs shall be kept clean at all times and legends shall be distinctive and unmarred.

The Contractor shall notify all public safety agencies at least 48 hours prior to beginning any construction operation which will provide less than an 11-foot travel lane along any project roadway.

The Contractor shall notify the project engineer on construction projects, or the district permit agent on permit jobs, when all traffic signal work is completed. This will include all work at signalized intersections including loop replacements, adjusting existing traffic signals or any relocation work including handholes. The project engineer or district permit agent will notify the Division of Traffic Engineering to coordinate a field inspection of all work. Refer to Section 10.00 – General Clauses For Highway Illumination And Traffic Signal Projects, Article 10.00.10 and corresponding special provision.

Article 1.08.04 - Limitation of Operations is supplemented by the following:

In order to provide for traffic operations as outlined in the special provision "Maintenance and Protection of Traffic", the Contractor will not be permitted to perform any work which will interfere with normal traffic operation on any project road during the following periods:

On the following Legal Holidays:

New Year's Day Martin Luther King Day President's Day Memorial Day Independence Day Labor Day Veterans Day Thanksgiving Day Christmas Day

All construction activities, including the loading and unloading of materials and equipment, shall be limited to Monday through Friday, 7:00 a.m. to 4:00 p.m. Any work that will interfere with traffic shall not be performed between 7:00 a.m. and 9:00 a.m.

The Contractor is further advised that once the bituminous surface of a project roadway has been removed, it shall be the Contractor's responsibility to immediately proceed with the necessary grading to establish a base that is of the shape and strength to receive the specified overlays. These roadways will **NOT** be allowed to be left with an exposed aggregate surface for greater than 15 calendar days unless specific written authorization has been requested from, and received by, the Engineer. If said roadway is not overlaid within the specified 15-calendar day limit, the Engineer shall notify the Contractor of the deficient condition and the Contractor shall cease all other construction activities until the subject roadway is properly prepared and the specified overlays completed.

The Contractor shall further schedule construction operations to minimize the period of time that vehicle traffic is placed upon any intermediate or leveling overlay course. Prior to the construction of subsequent bituminous courses, any damage noted by the Engineer on the previously placed bituminous courses shall be repaired as directed by the Engineer at the Contractor's expense.

The Contractor shall notify the Engineer 24 hours in advance of the commencement of any paving operations. The purpose of this notice period is to allow ample time to conduct pre-paving condition inspection, obtain approval to pave and to secure paving inspection and testing personnel.

Detours are not allowed at any time during construction.

Other Limitations

No roadway, with the exception of transition areas, shall be open to traffic unless the appropriate pavement markings have been installed. The transition areas shall have pavement markings applied immediately upon opening to traffic.

Longitudinal dropdowns greater than 2 inches will not be allowed during those periods when the maximum number of lanes of through traffic are required. The Contractor shall temporarily provide a 4:1 traversable slope of suitable material in those areas where a longitudinal dropdown

exists. The cost of furnishing, installing and removing this material shall be included in the contract lump sum for "Maintenance and Protection of Traffic".

The Contractor shall schedule operations so that pavement removal and roadway resurfacing shall be completed full width across a roadway section by the end of a workday. All transverse height differentials on a roadway surfaces shall be tapered to negate any "bump" to traffic as specified elsewhere in this contract or as approved by the Engineer. Material for this taper shall be as approved by the Engineer.

All temporary concrete barriers, other protective systems and traffic control devices as called for by the contract or ordered by the Engineer must be on-hand and available in sufficient quantity for immediate installation prior to any stage change.

SECTION 1.08 - GENERAL

Article 1.08.16 - Notification for Press Releases:

The Contractor shall give the Engineer a seven (7) day advance written notice of proposed changes in construction activities that will alter traffic patterns that result in lane shifts, detours, temporary closures of lane(s), permanent closures of lane(s), or lane reductions. This advance notification will allow the Towns to publish news releases and/or provide public radio announcements to inform the public of revised traffic patterns or possible traffic delays. Failure of the Contractor to provide such timely notice shall be considered a breach of contract and will subject the Contractor to stop work orders until such time as the seven (7) day notice has been received.

<u>SECTION 10.00 - GENERAL CLAUSES FOR HIGHWAY ILLUMINATION AND TRAFFIC</u> <u>SIGNAL PROJECTS</u>

Article 10.00.03 – Plans:

In the first paragraph, replace the 2nd, 3rd, and 4th sentences with the following:

The Contractor shall digitally mark, in red, any changes on the plan(s) using a pdf program. Markups shall also include field-obtained GPS coordinates for installed span pole, mast arm assembly, controller, and light standard locations.

- The GPS technology used should be able to provide coordinates that are within 12" of accuracy.
- Coordinates provided are to be as accurate as possible for locations where satellite coverage is compromised by tree canopies, buildings, etc.

The Contractor shall submit the digital pdf file(s) to the Engineer and to <u>DOT.TrafficElectrical@ct.gov</u>, for Traffic Signals, prior to requesting the Functional Inspection.

Also prior to requesting the Functional Inspection, the Contractor shall deliver to the Engineer the following:

In item no. 1, replace "Four (4)" with "Digital PDF Files and Five (5)" [paper prints of schematics and wiring diagrams and one electronic PDF file copy to be sent to DOT.Trafficelectrical@ct.gov...].

After item no. 3, add an item no. 4 as the following:

- 4. Digital field pictures, in .JPG format and labeled appropriately, of the following constructed items:
 - a. Signals heads facing each approach. The pictures are to be taken along each intersection approach in order to observe the relation between the signal faces and the approach centerline, lane line(s), and edge line.
 - b. Inside of hand holes
 - c. Inside of the controller cabinet
 - d. Traffic foundations (Span poles, MAA, Controller Cabinet, Light Standards, Pedestals)
 - e. Video detector locations and mountings
 - f. Utility Clearances from span wire and MAAs
 - g. Screen shots of detection zones

Article 10.00.10 Section 2. Subsection b) Part 3. Functional Inspection:

In the first paragraph, after the 2nd sentence, add the following:

Prior to the Functional Inspection, the Contractor shall verify with the CTDOT Traffic Signal Lab that each detection camera is operating properly. In instances where the existing traffic control equipment is being revised or replaced, the verification with the CTDOT Traffic Signal Lab shall be prior to the required Preliminary Functional Test. The Contractor shall have a bucket truck with crew on site during the Functional Inspection to make any necessary aerial signal and detection equipment adjustments as directed by the Engineer.

After the fourth paragraph, add the following:

Upon the successful completion of the Functional Inspection and once all corrections and adjustments resulting from the Functional Inspection are completed, the Contractor shall update as-built plans and pictures to reflect any changes made and submit as required in Section 10.00.03 within 7 days of the completion of the 30-day test.

Article 10.00.12 - Negotiations with utility company: Add the following:

The Contractor shall give notice to utility companies a minimum of 30 days prior to required work or services to the utility company. Refer to Section 1.07 – Legal Relations and Responsibilities for the list of utility companies and representatives the contractor shall use.

The Contractor shall perform all work in conformance with Rules and Regulations of Public Utility Regulatory Authority (PURA) concerning Traffic Signals attached to Public Service Company Poles. The Contractor is cautioned that there may be energized wires in the vicinity of the specified installations. In addition to ensuring compliance with NESC and OSHA regulations, the Contractor and/or its Sub-Contractors shall coordinate with the appropriate utility company for securing/protecting the site during the installation of traffic signal mast arms, span poles or illumination poles.

When a span is attached to a utility pole, the Contractor shall ensure the anchor is in line with the proposed traffic signal span wire. More than 5 degree deviation will lower the holding strength and is not allowed. The Contractor shall provide any necessary assistance required by the utility company, and ensure the anchor and guy have been installed and properly tensioned prior to attaching the span wire to the utility pole.

ITEM #0201001A - CLEARING AND GRUBBING

Section 2.01.01 is amended as follows:

10.01.01 – Description: *Add after the first paragraph:*

This work shall also include the cleaning of the existing swales at the top the rock slope to allow runoff to effectively flow to the existing outfalls at the bottom of the slope.

ITEM #0202300A – DISPOSAL/RESTORATION FOR ROCK SLOPE SCALING

Description:

Work under this item shall consist of the removal of loose overhangs, weathered pockets, or unconnected rock from the slope adjacent to the multi-use trail.

Construction Methods:

This worked shall be performed under the supervision of a Geotechnical Engineer. Rock slopes should be scaled for any loose rock that could be a falling hazard to the multi-use path or adjacent roadway. Prior to scaling operations, all vegetation should be cleared from the rock slopes to improve inspection, permit effective scaling of the rock, and allow for construction clearances.

Scaling operations may proceed either manually (with hand tools) or with mechanical assistance (backhoe, etc.) to pull loose rock and other debris from the slope. The roadway must be protected with temporary concrete barriers and/or fencing during all intrusive operations, including scaling on the slope. Scaling conducted from the top of the slope should be considered if the reach of the equipment in use is limited.

Method of Measurement:

This work will be paid for on a lump sum basis and will not be measured for payment.

Basis of Payment:

This work will be paid for at the contract lump sum for "Disposal/Restoration for Rock Slope Scaling" which price shall include all equipment, tools and labor incidental to the completion of this item.

All cost associated with the removal of vegetation from the rock slope shall be included in the item "Clearing and Grubbing".

ITEM NO.	DESCRIPTION	UNIT
ITEM #0202300A	DISPOSAL/RESTORATION FOR	LS
	ROCK SLOPE SCALING	

ITEM #0219011A – SEDIMENT CONTROL SYSTEM AT CATCH BASIN

Work under this item shall conform to the applicable provisions of Section 2.19 of the Standard Specifications Form 818 amended as follows:

DESCRIPTION

This work shall consist of furnishing, placing, maintaining and removing sedimentation control systems at catch basins as shown on the plans and as directed by the Engineer. Maintaining shall include the cleanout and proper disposal of accumulated sediment.

MATERIALS

Geotextile for this work shall conform to Section 7.55 and M.08.

CONSTRUCTION METHODS

Sediment Control System at Catch Basin shall be installed by the Contractor at locations shown on the plans or as directed by the Engineer in accordance with the applicable sections of Section 2.19 of the Standard Specifications and the details in the plans.

METHOD OF MEASUREMENT

This work will be measured for payment by the actual number of catch basins installed and accepted with a Sediment Control System at Catch Basin installation.

BASIS OF PAYMENT

This work will be paid for at the contract unit price each for 'Sediment Control System at Catch Basin' complete in place, which price shall include all materials, equipment, tools, and labor incidental to the installation, maintenance, replacement, removal and disposal of the system and surplus material. No payment shall be made for the cleanout of accumulated sediment.

ITEM NO.	DESCRIPTION	<u>UNIT</u>
ITEM #0219011A	SEDIMENT CONTROL SYSTEM AT CATCH BASIN	EA

ITEM #0406999A – ASPHALT ADJUSTMENT COST

Description: The Asphalt Adjustment Cost will be based on the variance in price for the performance-graded binder component of hot mix asphalt (HMA), Polymer Modified Asphalt (PMA), and Ultra-Thin Bonded Hot-Mix Asphalt mixtures completed and accepted during the Contract.

The Asphalt Price is available on the Department of Transportation website at:

http://www.ct.gov/dot/asphaltadjustment

Construction Methods:

An asphalt adjustment will be applied only if all of the following conditions are met:

- I. For HMA and PMA mixtures:
 - a. The HMA or PMA mixture for which the adjustment would be applied is listed as a Contract item with a pay unit of tons.
 - b. The total quantity for all HMA and PMA mixtures in the Contract or individual purchase order (Department of Administrative Service contract awards) exceeds 1000 tons or the Project duration is greater than 6 months.
 - c. The difference between the posted *Asphalt Base Price* and *Asphalt Period Price* varies by more than \$5.00 per ton.
- II. For Ultra-Thin Bonded HMA mixtures:
 - a. The Ultra-Thin Bonded HMA mixture for which the adjustment would be applied is listed as a Contract item.
 - b. The total quantity for Ultra-Thin Bonded HMA mixture in the Contract exceeds:
 - i. 800 tons if the Ultra-Thin Bonded HMA item has a pay unit of tons.
 - ii. 30,000 square yards if the Ultra-Thin Bonded HMA item has a pay unit of square yards.
 - Note: The quantity of Ultra-Thin Bonded HMA measured in tons shall be determined from the material documentation requirements set forth in the Ultra-Thin Bonded HMA item Special Provision.
 - c. The difference between the posted *Asphalt Base Price* and *Asphalt Period Price* varies by more than \$5.00 per ton.
 - d. No Asphalt Adjustment Cost will be applied to the liquid emulsion that is specified as part of the Ultra-Thin Bonded HMA mixture system.
- III. Regardless of the binder used in all HMA or PMA mixtures, the Asphalt Adjustment Cost will be based on PG 64-22.

The Connecticut Department of Transportation (CTDOT) will post on its website, the average per ton selling price (asphalt price) of the performance-graded binder. The average is based on the high and low selling price published in the most recent available issue of the **Asphalt Weekly Monitor**® furnished by Poten & Partners, Inc. under the "East Coast Market – New England, New Haven, Connecticut area," F.O.B. manufacturer's terminal.

The selling price furnished from the Asphalt Weekly Monitor ® is based on United States dollars per standard ton (US\$/ST).

Method of Measurement:

Formula: HMA x [PG%/100] x [(Period Price - Base Price)] = \$_____

where

- HMA:
 - 1. For HMA, PMA, and Ultra-Thin Bonded HMA mixtures with pay units of tons: The quantity in tons of accepted HMA, PMA, or Ultra-Thin Bonded HMA mixture measured and accepted for payment.
 - 2. For Ultra-Thin Bonded HMA mixtures with pay units of square yards:
 - The quantity of Ultra-Thin Bonded HMA mixture delivered, placed, and accepted for payment, calculated in tons as documented according to the Material Documentation provision (Construction Methods, paragraph G) of the Ultra-Thin Bonded HMA Special Provision.
- *Asphalt Base Price*: The asphalt price posted on the CTDOT website 28 days before the actual bid opening posted.
- *Asphalt Period Price*: The asphalt price posted on the CTDOT website during the period the HMA or PMA mixture was placed.
- **PG%:** Performance-Graded Binder percentage
 - 1. For HMA or PMA mixes:
 - PG% = 4.5 for HMA S1 and PMA S1
 - PG% = <u>5.0</u> for HMA S0.5 and PMA S0.5
 - PG% = <u>6.0</u> for HMA S0.375, PMA S0.375, HMA S0.25 and PMA S0.25
 - For Ultra-Thin Bonded HMA mixes: PG% = <u>Design % PGB</u> (Performance Graded Binder) in the approved job mix formula, expressed as a percentage to the tenth place (e.g. 5.1%)

The asphalt adjustment cost shall not be considered as a changed condition in the Contract as result of this provision since all bidders are notified before submission of bids.

Basis of Payment: The "Asphalt Adjustment Cost" will be calculated using the formula indicated above. A payment will be made for an increase in costs. A deduction from monies due the Contractor will be made for a decrease in costs.

The sum of money shown on the Estimate and in the itemized proposal as "Estimated Cost" for this item will be considered the bid price although the adjustment will be made as described above. The estimated cost figure is not to be altered in any manner by the bidder. If the bidder should alter the amount shown, the altered figure will be disregarded and the original cost figure will be used to determine the amount of the bid for the Contract.

Pay Item	Pay Unit
Asphalt Adjustment Cost	est.

ITEM #0601445A - EMBANKMENT WALL (SITE NO. 1)

Description: This item will consist of designing, furnishing and constructing an embankment retaining wall in the location, grades, and to the dimensions shown on the contract drawings, and in accordance with these specifications.

Retaining Wall Selection: The Contractor shall select the proprietary embankment retaining wall from the Department's current approved list shown below. The Engineer will reject any proposed retaining wall that is not listed below.

The following is a list of the proprietary embankment retaining walls for this project:

1. <u>VERSA-LOK Retaining Wall</u> VERSA-LOK of New England P.O. Box 6002 Nashua, NH 03063 (603) 883-3042

 <u>MESA Retaining Wall System</u> TENSAR Earth Technology, Inc.
 Ritter Road
 Sewickley, PA 15143
 (412) 749-9190 <u>KeySystem I Retaining Wall</u> Keystone Retaining Wall Systems 13453 County Road 1 Fairhope, AL 36532 (251) 990-5761

4. <u>Pyramid Modular Blockwall</u> The Reinforced Earth Company 133 Park Street North Reading, MA 01864 (978) 664-2830

5. <u>Redi-Rock Retaining Wall-</u> <u>Cobblestone Face Mold</u> Redi-Rock Walls-CT Division 68A South Canal Street Plainville, CT 06062 (860) 793-6805

No other proprietary retaining walls will be allowed for this project.

This listing does not warrant that the individual walls can be designed to meet either the dimensional, structural, or geotechnical constraints at each site.

Design:

1 - <u>Design Computations</u>: It is the Contractor's responsibility for the design, detailing any additional construction specifications required to construct the wall. The actual designer of the retaining wall shall be a qualified Professional Engineer licensed in the State of Connecticut.

2 - <u>Designer's Liability Insurance</u>: The Designer shall secure and maintain at no direct cost to the State, a Professional Liability Insurance Policy for errors and omissions in the minimum amount of Five Hundred Thousand Dollars (\$500,000). The designer may, at his election, obtain a policy containing a maximum One Hundred Twenty Five Thousand Dollars (\$125,000) deductible clause, but if he should obtain a policy containing such a clause, the designer shall be liable to the extent of the deductible amount. The Designer shall obtain the appropriate and proper endorsement to its Professional Liability Policy to cover the indemnification clause in this contract as the same relates to negligent acts, errors or omissions in the work performed by the Designer. The Designer shall continue this liability insurance coverage for a period of three years from the date of the acceptance of the work by the agency head as evidenced by a certificate of acceptance issued to the contractor or for three years after the termination of the contract, whichever is earlier, subject to the continued commercial availability of such insurance.

The designer shall supply the certificate of this insurance to the Engineer prior to the start of construction of the wall. The designer's insurance company shall be licensed in the State of Connecticut.

3 - <u>Preliminary Submissions</u>: Prior to the start of fabrication or construction, the Contractor shall submit to the Engineer a design package, which shall include, but not be limited to the following:

a. Detailed Plans:

Plan sheets shall be approximately 24" x 36"

Stamped by a licensed Professional Engineer (Connecticut).

Full plan view of the wall drawn to scale. The plan view must reflect the horizontal alignment and offset from the horizontal control line to the face of the wall. Beginning and ending stations, all utilities, signs, lights, etc. that affect the construction along with all property lines and easement lines adjacent to the wall shall be shown.

Full elevation view of the wall drawn to scale. Elevation views should indicate the elevation at the top and bottom of walls, horizontal and vertical break points, and the location of finished grade.

Typical cross sections drawn to scale including all appurtenances. Detailed cross section should be provided at significant reinforcement transitions such as wall ends.

Details of all wall components and their connections such as the length, size and type of soil reinforcement and where any changes occur; facing details; connections; etc.

Certified test reports indicating the connection strength versus normal load relationship for the block-soil reinforcement connection to be used.

Drainage details for embankment backfill including attachment to outlets shown on contract drawings where applicable.

Details of any roadway drainage pipe projecting through the wall, or any attachments to the wall. Details of the treatment of drainage swales or ditches shown on the contract drawings.

Design parameters used along with AASHTO references.

Material designations for all materials to be used.

Detailed construction methods including a quality control plan. Construction quality control plans should include monitoring and testing frequencies (e,g, for setting batter and maintaining horizontal and vertical control). Construction restraints should also be listed in the details. Specific requirements for construction around obstructions should be included.

Details of installation of protective fencing where required.

Details of Architectural Treatment where required.

Details of Temporary Earth Retaining System(s) where required.

Details of wall treatment where the wall abuts other structures.

Treatment at underground utilities where required.

b. <u>Design Computations:</u>

Stamped by a licensed Professional Engineer (Connecticut).

Computations shall clearly refer to the applicable AASHTO provisions as stated in the Notes on the Contract Drawings.

Documentation of computer programs including all design parameters.

c. <u>Construction Specifications:</u>

Construction methods specific to the proprietary retaining wall chosen. These specifications should include construction limitations including vertical clearance, right-of-way limits, etc. Submittal requirements for materials such as certification, quality, and acceptance/rejection criteria should be included. Details on connection of modular units and connection of reinforcements such that assurance of uniform stress transfer should be included.

Any requirements not stated herein.

The submissions for proprietary retaining walls shall be treated as working drawings according to Section 1.05 amended as follows:

a. Six sets of each submission shall be supplied to the State

b. The Contractor shall allow 21 days for the review of each submission. If subsequent submissions are required as a result of the review process, 21 days shall be allowed for review of these submissions. No extensions in contract time will be allowed for the review of these submissions.

4 - <u>Final Submissions</u>: Once a proprietary retaining wall design has been reviewed and accepted by the Department, the Contractor shall submit the final plans. The final submission shall include one set of full size (approximately 24" x 36") mylar sheets and five sets of full size blue line copies.

The final submission shall be made within 14 days of acceptance by the State. No work shall be preformed on the retaining wall until the final submission has been received by the Department.

Acceptance of the final design shall not relieve the Contractor of his responsibility under the contract for the successful completion of the work.

The actual designer of the proprietary retaining wall is responsible for the review of any shop drawings prepared for the fabrication of the wall. One set of full size blue line copies of all approved shop drawings shall be submitted to the Department's permanent records.

5 - General Design Requirements:

a. All designs for proprietary walls and temporary earth retaining systems shall conform to the latest edition of the American Association of State Highway and Transportation Officials (AASHTO) Standard Specifications for Highway Bridges and later interims published except as noted otherwise herein:

b. The wall design shall follow the general dimensions of the wall envelope shown in the contract plans.

c. The top of the concrete leveling pad shall be located at or below the theoretical leveling pad elevation. The minimum wall embedment shall be two feet as measured to the top of the leveling pad or as shown on the plans.

d. If footing steps are required, they shall be kept below the minimum embedment depth. Footing steps in addition to those shown on the plans will be permitted at no additional cost to the State.

e. The wall shall be designed to be within all property lines and easement lines shown on the contract drawings. If additional work areas are necessary for the construction of the proprietary retaining wall, the Contractor shall be responsible for obtaining the rights from the affected property owners. Copies of these rights shall be forwarded to the Department.

f. The top of the wall shall be at or above the top of the wall elevations shown on the plans. The top of the wall may be level or sloped to meet the top of the wall line noted.

g. Cast-in-place concrete will not be an acceptable replacement for areas noted by the wall envelope, except for minor grouting of pipe penetrations.

h. The mechanical wall height for the purposes of design calculations shall be from the top of the leveling pad to the top of the potential failure surface where the failure surface intercepts the ground surface.

i. The minimum length of internal soil reinforcement shall be as specified in AASHTO 5.8.1, except for the minimum eight (8.0') foot length requirement.

j. If there are specific surcharges acting on the wall, they shall also be accounted for. The minimum equivalent fluid pressure used to design the wall shall be 33 lbs./ft² per linear foot of wall.

k. The maximum allowable bearing capacity of the soil shall be assumed to be 4 ksf unless otherwise shown on the plans. If additional soils information is required by the designer, it must be obtained by the Contractor and will not be reimbursed by the State.

l. For limit state allowable stress computations of extensible reinforcements, the combined factor of safety for construction damage and environmental/aging effects shall not be less than 1.75.

Materials: Materials shall conform to the following requirements and those not listed below shall be as prescribed within the <u>Standard Specifications for Roads</u>, <u>Bridges and Incidental</u> <u>Construction</u>, including supplemental specifications and applicable special provisions.

1 - Facing Block: The facing block can be precast or drycast concrete and shall be the color specified on the plans. The block shall meet the following requirements:

- a. Drycast Concrete:
 - i. The minimum compressive strength of the block shall be 4000 psi measured at 28 days.
 - ii. The maximum water absorption shall be less than five percent.

The Contractor shall submit to the Engineer a certified test report confirming the compressive strength and water absorption conform to the requirements of ASTM C-140.

- b. Precast Concrete: Shall conform to the requirements of Section M.03 and as follows:
 - i. The minimum compressive strength of the block shall be 4000 psi measured at 28 days.
 - ii. All precast concrete components shall be air-entrained composed of portland cement, fine and coarse aggregates, admixtures and water. The air-entraining feature may be obtained by the use of either air-entraining portland cement or an approved air-entraining admixture. The entrained-air content shall be not less than four percent or more than seven percent.

2 - <u>Geosynthetic Soil Reinforcement</u>: The minimum strength of the geosynthetic soil reinforcement shall be based on experimental data. The Contractor shall submit to the Engineer a certified test report confirming the strength of the material when tested according to the methods specified in ASTM D5262 and extrapolated according to ASTM D2837 as outlined in AASHTO Article 5.8.7.2.

3 – <u>Metallic Soil Reinforcement</u>: All soil reinforcement and structural connectors shall be hot dipped galvanized according to the requirements of ASTM A123 (AASHTO M-111). The minimum thickness of the galvanizing shall be based on the service life requirements in the AASHTO Specifications.

Steel strip reinforcement shall be hot rolled to the required shape and dimensions. The steel shall conform to AASHTO M223 (ASTM A572) Grade 65 unless otherwise specified.

Welded wire fabric reinforcement shall be shop fabricated from cold-drawn wire of the sizes and spacings shown on the plans. The wire shall conform to the requirements of ASTM A82, fabricated fabric shall conform to the requirements of ASTM A185.

4 - <u>Metal Connectors</u>: All metal hardware shall be hot dipped galvanized according to the requirements of ASTM A123 (AASHTO M-111). The minimum thickness of the galvanizing shall be based on the service life requirements in the AASHTO Specifications.

5 - <u>Backfill Material</u>: The material for backfill shall be Pervious Structure Backfill conforming to the requirements of Articles M.02.05 and M.02.06.

6 - <u>Facing Sealer</u>: The face of all exposed drycast block shall be coated with clear Penetrating Sealer Protective Compound conforming to the requirements of Article M.03.01-11.
Construction Methods: All construction methods for items not listed below shall be in accordance with the detailed requirements prescribed for the construction of the several contract items entering into the completed structure as specified in the <u>Standard Specifications for Roads</u>, <u>Bridges</u>, and Incidental Construction.

1 - <u>Installation</u>: The foundation for the structure shall be graded level for a width equal to or exceeding the length of the soil reinforcements, or as shown on the plans. If rock is encountered in the excavation, it shall removed to provide a level area equal to or exceeding the length of the soil reinforcements, but not greater than the pay limits shown on the plans.

Prior to wall construction, the foundation, if not in rock, shall be compacted as directed by the Engineer. Any foundation soils found to be unsuitable shall be removed and replaced.

At each foundation level, an unreinforced concrete leveling pad shall be provided as shown on the plans. The leveling pad shall have nominal dimensions of 6 inch thickness and 24 inch width, and shall be cast using minimum 2,000 psi 28-day compressive strength concrete. The leveling pad shall be cast to the design elevations as shown on the plans. Allowable elevation tolerances are +0.01 foot (1/8 inch), and -0.02 foot (1/4 inch), from the design elevation.

The materials for the wall shall be handled carefully and installed in accordance with manufacturer's recommendations and specifications. Special care shall be taken in setting the bottom course of blocks to true line and grade.

All blocks above the first course shall interlock with the lower courses by means of connecting pins. Vertical joints shall be staggered with each successive course as shown on the working drawings. Vertical tolerances and horizontal alignment tolerances measured from the face line shown on the plans shall not exceed ½ inch when measured along a 8-foot straightedge. The overall tolerance of the wall from top to bottom shall not exceed ½ inch per eight feet of wall height or one inch total, whichever is the lesser, measured from the face line shown on the plans. A bond breaker shall be placed between the blocks and any adjacent cast-in-place concrete.

2 - <u>Backfilling</u>: Backfill placement shall closely follow erection of each course of panels. Backfill shall be placed in such a manner as to avoid any damage or disturbance to the wall materials or misalignment of the facing panels. Any wall materials which become damaged or disturbed during backfill placement shall be either removed and replaced at the Contractor's expense or corrected, as directed by the Engineer. Any backfill material placed within the reinforced soil mass which does not meet the requirements of this specification shall be corrected or removed and replaced at the Contractor's expense.

Backfill shall be compacted to 95 percent of the maximum density as determined by AASHTO T-99, Method C or D (with oversize correction, as outlined in Note 7).

The moisture content of the backfill material prior to and during compaction shall be uniform throughout each layer. Backfill material shall have a placement moisture content less than or equal to the optimum moisture content. Backfill material with a placement moisture content in excess of the optimum moisture content shall be removed and reworked until the moisture content is uniform and acceptable throughout the entire lift. The optimum moisture content shall be determined in accordance with AASHTO T-99, Method C or D (with oversize correction, as outlined in Note 7).

If 30 percent or more of the backfill material is greater than 19 mm in size, AASHTO T-99 is not applicable. For such a material, the acceptance criterion for control of compaction shall be either a minimum of 70 percent of the relative density of the material as determined by a method specification provided by the wall supplier, based on a test compaction section, which defines the type of equipment, lift thickness, number of passes of the specified equipment, and placement moisture content.

The maximum lift thickness after compaction shall not exceed 10 inches, regardless of the vertical spacing between layers of soil reinforcements. The Contractor shall decrease this lift thickness, if necessary, to obtain the specified density. Prior to placement of the soil reinforcements, the backfill elevation at the face shall be level with the connection after compaction. From a point approximately three feet behind the back face of the panels to the free end of the soil reinforcements the backfill shall be two inches above the attachment device elevation unless otherwise shown on the plans.

Compaction within three feet of the back face of the panels shall be achieved by at least three passes of a lightweight mechanical tamper, roller or vibratory system. The specified lift thickness shall be adjusted as warranted by the type of compaction equipment actually used. Care shall be exercised in the compaction process to avoid misalignment of the panels or damage to the attachment devices. Heavy compaction equipment shall not be used to compact backfill within three feet of the wall face.

At the end of each day's operation, the Contractor shall slope the last level of backfill away from the wall facing to direct runoff of rainwater away from the wall face. The Contractor shall control and divert runoff at the ends of the wall such that erosion or washout of the wall section does not occur. In addition, the Contractor shall not allow surface runoff from adjacent areas to enter the wall construction site.

3 - <u>Face Sealer</u>: After the wall has been erected, the entire exposed face of the wall shall be coated with Penetrating Sealer Protective Compound. The application of the sealer shall conform to the requirements Article 8.18.03.

Several samples of the dry cast block shall be sealed prior to sealing the actual wall to ensure that the sealer will not discolor the block. If the sealer does discolor the block, the Contractor shall change to another approved supplier of sealer.

Method of Measurement: This work will be paid for on a lump sum basis and will not be measured for payment.

Basis of Payment: This work will be paid for at the contract lump sum for "EMBANKMENT WALL (SITE NO. 1)", complete in place, which price shall include all work shown within the pay limits shown on the plans for the retaining wall including but not limited to the following:

- 1. Design, detailing, and specifications for the wall.
- 2. Excavation for the wall
- 3. Design and Construction of temporary earth retaining systems for the support of the slope during construction.
- 4. Construction of the Embankment Wall, including the unreinforced concrete leveling pad.
- 5. The furnishing, placing and compacting of pervious structure backfill within the maximum payment lines.
- 6. The furnishing and placing of backfill drainage systems for the wall.
- 7. Any other work and materials shown on the plans for the construction of the wall.

The price shall also include all materials, equipment, tools and labor incidental thereto.

If bedrock or large boulders (greater than one cubic yard) are encountered in the excavation, the payment for it's removal will be made under the item "Structure Excavation - Rock".

ITEM #0906201A – ROCKFALL BARRIER

Description:

Work under this item shall consist of the installation of rockfall barrier at the locations shown on the plans or as directed by the Engineer.

Materials:

The rockfall barrier shall be medium-duty fencing such as GeoBrugg GBE 100A-R or an approved equal, installed at a height of 6 to 8 feet. The manufacturer of the system chosen shall be consulted to ensure proper selection of materials and anchorage for the site conditions. A copy of the geotechnical report is provided to aid in the evaluation.

Construction Methods:

This work shall be performed under the supervision of a Geotechnical Engineer. The rockfall barrier shall be installed in accordance with the manufacturer's recommendations.

Method of Measurement:

This work will be measured by the number of linear feet of rockfall barrier complete and accepted.

Basis of Payment:

This work will be paid for at the contract unit price per linear foot for "Rockfall Barrier" which price shall include all equipment, tools, labor, and materials incidental thereto.

ITEM NO. ITEM #0906201A DESCRIPTION ROCKFALL BARRIER UNIT L.F.

ITEM #0947207A - BICYCLE STAND

Description:

This item shall consist of the furnishing and installation of outdoor moderate security bicycle stands at locations specified on the plans or as directed by the Engineer.

Materials:

The framework material shall be 2 inch nominal schedule 40 welded seamless steel pipe, conforming to ASTM A500.

The lock retaining yoke material shall be 1/2 inch diameter hot rolled steel round bar.

The below grade sleeve material shall be 2 $\frac{1}{2}$ inch nominal schedule 40 welded seamless steel pipe, conforming to ASTM A500.

The concrete footing shall be 3,000 P.S.I. Class "A." footing shall extend 42" below grade. Top of footing to be flush w/ finish grade. Footing diameter to be verified with approved manufacturer. The finished surface shall be 10 mils minimum black thermoplastic powder coat.

The top bar of the bike stand should extend 2 feet from the top of finished grade, subgrade sleeves should be buried 2 feet minimum with interface at grade. The width of the stand and spacing of the sleeves shall be 4 feet on center.

The above specifications are based on the following: Model No. BB-2B Bike Security Racks Co., Inc. 128 Maplewood Street Watertown, MA 02472 (617) 926-3000 Sales@BikeRacks.com

Additional bicycle stand manufacturers include, but are not limited to, the following (subject to approval by the Engineer):

Model No. BRQS-101 Victor Stanley, Inc. P.O. Box 330 Dunkirk, MD 20754 (800) 368-2573 sales@victorstanley.com

Model No. 12850 CycleSafe, Inc. 5211 Cascade Rd. SE, Suite 210 Grand Rapids, Michigan 49546 (888) 954-9977

Construction Methods:

The bicycle stands shall be installed at locations indicated on the plans or as directed by the Engineer. The stands shall be plumb, level, true, neat, rigid, and in accordance with approved working drawings and these specifications.

All materials shall be inspected upon receipt ensure that the correct materials have been received and that they are in good condition. If not installing immediately, store units to avoid damage from other construction activities and elements.

Field welding shall not be allowed without prior approval. Where shop welding is required, the shop drawings will show all pertinent information and locations.

The dimensions of the completed bicycle stands shall be 4 feet wide and 2 feet tall.

If the Contractor's work results in any damage, it will be his responsibility to restore or repair the damaged items or properties to the Engineer's Satisfaction. Any costs involved will be borne solely by the Contractor.

The Contractor shall remove all excess materials and restore the work area to its original condition.

Method of Measurement:

This work will be measured for payment by the number of units completely installed as specified and accepted in place.

Basis of Payment:

This work will be paid for at the contract unit price per unit for "Bicycle Stand" which price shall include the bicycle stand unit, footing concrete and excavation, sleeve excavation, all materials, maintenance, equipment, tools, labor, and work incidental thereto.

Pay Bicycle Stand Item Unit ea.

ITEM #0949001A – WEED BARRIER FABRIC

Description:

Work under this item shall consist of the installation of weed barrier fabric at the locations shown on the plans or as directed by the Engineer.

Materials:

The weed barrier fabric shall be sturdy, durable and tear resistant non-woven cloth that blocks out sunlight while allowing air, water and nutrients to pass through, keeping the soil underneath healthy.

Construction Methods:

Add plant food and fertilizer to plants before laying the weed barrier fabric. Align the weed barrier fabric throughout the planter bed with a 6" overlap. Cut the weed barrier fabric around the plants. Secure the weed barrier fabric in place using garden stakes. Install mulch immediately after weed barrier fabric.

Method of Measurement:

This work will be measured by the number of square yards of weed barrier fabric, complete and accepted.

Basis of Payment:

This work will be paid for at the contract unit price per square yard for "Weed Barrier Fabric" which price shall include and all equipment, tools, garden stakes, labor and materials incidental thereto.

ITEM NO.	DESCRIPTION	UNIT
ITEM #0949001A	WEED BARRIER FABRIC	S.Y.

ITEM #950005A – TURF ESTABLISHMENT

Work under this item shall conform to the applicable provisions of Section 9.50 of the Standard Specifications Form 818, amended as described below:

Insert the following:

Section 9.50.02 - Materials

The seed mixture shall be low grow and meet the following requirements:

Seed shall be fresh, clean and selected from the previous year's crop; weed seed content not to exceed 1 percent; complying with applicable Federal and State seed laws; furnished and delivered premixed in unopened containers in the following proportions:

	Percent Proportion	Percent Germination Minimum	Percent Purity Minimum
Creeping Red Fescue	35	90	95
Hard Fescue	25	90	95
Chewings Fescue	25	90	95
Sheep Fescue	15	90	95
-			

Insert the following in Section 9.50.04:

The initial application of topsoil, turf establishment and erosion control matting (as required) shall be measured and paid for separately as 'Furnishing and Placing Topsoil', 'Turf Establishment' and 'Erosion Control Matting' respectively. Subsequent applications of topsoil or seeding required to establish turf in conformance with these specifications shall not be measured for additional payment.

ITEM NO.	DESCRIPTION	<u>UNIT</u>
ITEM #950005A	TURF ESTABLISHMENT	S.Y.

ITEM #0950023A – LANDSCAPE EDGING

Description:

Work under this item shall consist of the installation of landscape edging at the locations shown on the plans or as directed by the Engineer.

Materials:

The landscape edging shall be aluminum or steel with a black finish.

Construction Methods:

Excavate a wedge in the ground that will allow the landscape edging to be installed with the top $\frac{1}{2}$ " above the compacted finish grade. Anchor the landscape edging per the manufacturer's recommendation.

Method of Measurement:

This work will be measured by the number of linear feet of landscape edging, complete and accepted.

Basis of Payment:

This work will be paid for at the contract unit price per linear foot for "Landscape Edging" which price shall include and all equipment, tools, anchoring spikes, labor and materials incidental thereto.

ITEM NO. ITEM #0950023A DESCRIPTION LANDSCAPE EDGING UNIT L.F.

ITEM #0969062A - CONSTRUCTION FIELD OFFICE, MEDIUM

Description: Under the item included in the bid document, adequate weatherproof office quarters with related furnishings, materials, equipment and other services, shall be provided by the Contractor for the duration of the work, and if necessary, for a close-out period determined by the Engineer. The office, furnishings, materials, equipment, and services are for the exclusive use of Town of Simsbury forces and others who may be hired by the Town with relation to the Contract. The office quarters shall be located convenient to the work site and installed in accordance with Article 1.08.02. This office shall be separated from any office occupied by the Contractor. Ownership and liability of the office quarters shall remain with the Contractor.

Furnishings/Materials/Supplies/Equipment: All furnishings, materials, equipment and supplies shall be in like new condition for the purpose intended and require approval of the Engineer.

Office Requirements: The Contractor shall furnish the office quarters and equipment as described below:

Description \ Office Size	Med.
Minimum Sq. Ft. of floor space with a minimum ceiling height of 7 ft.	400
Minimum number of exterior entrances.	2
Minimum number of parking spaces.	7

Office Layout: The office shall have a minimum square footage as indicated in the table above.

<u>Tie-downs and Skirting:</u> Modular offices shall be tied-down and fully skirted to ground level.

<u>Lavatory Facilities</u>: For field offices sizes Small and Medium the Contractor shall furnish a toilet facility at a location convenient to the field office for use by Town personnel and such assistants as they may engage. For all facilities the Contractor shall supply lavatory and sanitary supplies as required.

<u>Windows and Entrances</u>: The windows shall be of a type that will open and close conveniently, shall be sufficient in number and size to provide adequate light and ventilation, and shall be fitted with locking devices, blinds and screens. The entrances shall be secure, screened, and fitted with a lock for which four keys shall be furnished. All keys to the construction field office shall be furnished to the Town and will be kept in their possession while Town personnel are using the office. Any access to the entrance ways shall meet applicable building codes, with appropriate handrails. Stairways shall be ADA/ABA compliant and have non-skid tread surfaces.

<u>Lighting:</u> The Contractor shall equip the office interior with electric lighting that provides a minimum illumination level of 100 foot-candles at desk level height, and electric outlets for each desk and drafting table. The Contractor shall also provide exterior lighting that provides a minimum illumination level of 2 foot-candles throughout the parking area and for a minimum distance of 10 ft. on each side of the field office.

<u>Parking Facility</u>: The Contractor shall provide a parking area, adjacent to the field office, of sufficient size to accommodate the number of vehicles indicated in the table above. If a paved parking area is not readily available, the Contractor shall construct a parking area and driveway consisting of a minimum of 6 inches of processed aggregate base graded to drain. The base material will be extended to the office entrance.

<u>Field Office Security:</u> Physical Barrier Devices - This shall consist of physical means to prevent entry, such as: 1) All windows shall be barred or security screens installed; 2) All field office doors shall be equipped with dead bolt locks and regular day operated door locks; and 3) Other devices as directed by the Engineer to suit existing conditions.

<u>Electric Service</u>: The field office shall be equipped with an electric service panel, wiring, outlets, etc., to serve the electrical requirements of the field office, including: lighting, general outlets, computer outlets, calculators etc., and meet the following minimum specifications:

- A. 120/240 volt, 1 phase, 3 wire
- B. Ampacity necessary to serve all equipment. Service shall be a minimum 100 amp dedicated to the construction field office.
- C. The electrical panel shall include a main circuit breaker and branch circuit breakers of the size and quantity required.
- D. Additional 120 volt, single phase, 20 amp, isolated ground dedicated power circuit with dual NEMA 5-20 receptacles will be installed at each desk and personal computer table (workstation) location.
- E. Additional 120 volt, single phase, 20 amp, isolated ground dedicated power circuit with dual NEMA 5-20 receptacles will be installed, for use by the Telephone Company.
- F. Additional 120-volt circuits and duplex outlets as required meeting National Electric Code requirements.
- G. One exterior (outside) wall mounted GFI receptacle, duplex, isolated ground, 120 volt, straight blade.
- H. After work is complete and prior to energizing, the Town's electrical inspector must be contacted.

<u>Heating</u>, <u>Ventilation and Air Conditioning (HVAC)</u>: The field office shall be equipped with sufficient heating, air conditioning and ventilation equipment to maintain a temperature range of 68°-80° Fahrenheit within the field office.

<u>Telephone Service</u>: The Contractor shall provide telephone service with unlimited nation-wide calling plan. For a Medium field office this shall consist of the installation of two (2) telephone lines: one (1) line for phone/voice service and one (1) line dedicated for the facsimile machine. The Contractor shall pay all charges.

<u>Data Communications Facility Wiring:</u> The Contractor shall supply cables to connect the Wi-Fi printer to the Contractor supplied internet router and to workstations/devices as needed.

<u>Additional Equipment, Facilities and Services:</u> The Contractor shall provide at the field Office at least the following to the satisfaction of the Engineer:

		Offic	e Size	
Furnishing Description		Med.	Large	Extra
Furnishing Description				Large
		Qua	ntity	
Office desk (2.5 ft. x 5 ft.) with drawers, locks, and matching desk				
chair that have pneumatic seat height adjustment and dual	1	3	5	8
wheel casters on the base.				
Standard secretarial type desk and matching desk chair that has				
pneumatic seat height adjustment and dual wheel casters on the	-	-	-	1
base.				
Personal computer tables (4 ft. x 2.5 ft.).	2	3	5	8
Drafting type tables (3 ft. x 6 ft.) and supported by wall brackets				
and legs; and matching drafters stool that have pneumatic seat	1	1	1	2
height adjustment, seat back and dual wheel casters on the base.				
Conference table, 3 ft. x 12 ft.	-	-	-	1
Table – 3 ft. x 6 ft.	-	-	-	1
Office Chairs.	2	4	8	20
Mail slot bin – legal size.	-	-	1	1
Non-fire resistant cabinet.	-	-	2	4
Fire resistant cabinet (legal size/4 drawer), locking.	1	1	2	3
Storage racks to hold 3 ft. x 5 ft. display charts.	-	-	1	2
Vertical plan racks for 2 sets of 2 ft. x 3 ft. plans for each rack.	1	1	2	2
Double door supply cabinet with 4 shelves and a lock – 6 ft. x 4 ft.	-	-	1	2
Case of cardboard banker boxes (Min 10 boxes/case)	1	1	2	3
Open bookcase – 3 shelves – 3 ft. long.	-	-	2	2
White Dry-Erase Board, 36" x 48"min. with markers and eraser.	1	1	1	1
Interior partitions – 6 ft. x 6 ft., soundproof type, portable and			E	E
freestanding.	-	-	D	σ
Coat rack with 20 coat capacity.	-	-	-	1
Wastebaskets - 30 gal., including plastic waste bags.	1	1	1	2

Wastebaskets - 5 gal., including plastic waste bags.	1	3	6	10
Electric wall clock.	-	-	-	2
Telephone.	1	1	1	-
Full size stapler 20 (sheet capacity, with staples)	1	2	5	8
Desktop tape dispensers (with Tape)	1	2	5	8
8 Outlet Power Strip with Surge Protection	3	4	6	9
Business telephone system for three lines with ten handsets,	-	-	-	1
Mini refrigerator 2.2 of min	1	1	1	1
With reingerator - 3.2 c.t. min.	1	1	1	T
water shall be supplied by the Contractor for the duration of the project.	1	1	1	1
Microwave, 1.2 c.f. , 1000W min.	1	1	1	1
Fire extinguishers - provide and install type and *number to meet applicable State and local codes for size of office indicated, including a fire extinguisher suitable for use on a computer terminal fire.	*	*	*	*
Electric pencil sharpeners.	1	2	2	2
Small Multi-Function Laser Printer/Copier/Scanner/Fax combination unit, network capable, as specified below under <u>Computer Related Hardware and Software</u> .	1	1		
Large Multi-Function Laser Printer/Copier/Scanner/Fax combination unit, network capable, as specified below under <u>Computer Related Hardware and Software</u> .			1	1
Field Office Wi-Fi Connection as specified below under <u>Computer</u> <u>Related Hardware and Software</u>	1	1	1	1
Wi-Fi Printer as specified below under <u>Computer Related</u> <u>Hardware and Software.</u>	1	1	1	1
Video Projector as specified below under <u>Computer Related</u> <u>Hardware and Software</u> .	-	-	-	1
Smart Board as specified below under <u>Computer Related</u> <u>Hardware and Software</u> .	-	-	-	1
Infrared Thermometer, including annual third party certified calibration, case, and cleaning wipes.	1	1	1	2
First Aid Kit	1	1	1	1
Flip Phones as specified under <u>Computer Related Hardware and</u> Software.	-	-	-	-
Smart Phones as specified under <u>Computer Related Hardware</u> and Software.	-	-	-	-

The furnishings and equipment required herein shall remain the property of the Contractor. Any supplies required to maintain or operate the above listed equipment or furnishings shall be provided by the Contractor for the duration of the project.

<u>Computer Related Hardware and Software:</u> The Engineer will supply by its own means the actual Personal Computers for its inspection staff. The Contractor shall supply the Field Office Wi-Fi Connection, Wi-Fi Printer, Multifunction Laser Printer/Copier/Scanner/Fax, as well as associated hardware and software, must meet the requirements of this specification.

Within 10 calendar days after the signing of the Contract but before ordering/purchasing the Wi-Fi Printer (separate from the Multifunction Laser Printer/Copier/Scanner/Fax), Field Office Wi-Fi, Multifunction Laser Printer/Copier/Scanner/Fax, as well as associated hardware, the Contractor must submit a copy of their proposed order(s) with catalog cuts and specifications to the Engineer for review and approval. The Wi-Fi Printer and Wi-Fi Router will be reviewed by the Engineer. The Contractor shall not purchase the hardware, software, or services until the Engineer informs them that the proposed equipment, software, and services are approved. The Contractor will be solely responsible for the costs of any hardware, software, or services purchased without approval.

The Contractor and/or their internet service provider shall be responsible for the installation and setup of the field office Wi-Fi, Wi-Fi printer, and the configuration of the wireless router as directed by the Engineer. Installation will be coordinated with the Engineer and Project personnel.

After the approval of the hardware and software, the Contractor shall contact the Engineer, a minimum of 2 working days in advance of the proposed delivery or installation of the Field Office Wi-Fi Connection, Wi-Fi Printer, Multifunction Laser Printer/Copier/Scanner/Fax, Video Projectors and Smart Board(s), as well as associated hardware, software, supplies, and support documentation.

The Contractor shall provide all supplies, paper, maintenance, service and repairs (including labor and parts) for the Wi-Fi printers, copiers, field office Wi-Fi, fax machines and other equipment and facilities required by this specification for the duration of the Contract. All repairs must be performed with-in 48 hours. If the repairs require more than a 48 hours then an equal or better replacement must be provided.

Once the Contract has been completed, the hardware and software will remain the property of the Contractor.

<u>First Aid Kit:</u> The Contractor shall supply a first aid kit adequate for the number of personnel expected based on the size of the field office specified and shall keep the first aid kit stocked for the duration that the field office is in service.

<u>Insurance Policy</u>: The Contractor shall provide a separate insurance policy, with no deductible, in the minimum amount of five thousand dollars (\$5,000) in order to insure all Town-owned data equipment and supplies used in the office against all losses. The Contractor shall be named insured on that policy, and the Engineer shall be an additional named insured on the policy. These losses shall include,

but not be limited to: theft, fire, and physical damage. The Engineer will be responsible for all maintenance costs of their computer hardware. In the event of loss, the Contractor shall provide replacement equipment in accordance with current inspection firm specifications, within seven days of notice of the loss. If the Contractor is unable to provide the required replacement equipment within seven days, the Engineer may provide replacement equipment and deduct the cost of the equipment from monies due or which may become due the Contractor under the Contract or under any other contract. The Contractor's financial liability under this paragraph shall be limited to the amount of the insurance coverage required by this paragraph. If the cost of equipment replacement required by this paragraph should exceed the required amount of the insurance coverage, the Town will reimburse the Contractor for replacement costs exceeding the amount of the required coverage.

<u>Maintenance</u>: During the occupancy by the Engineer, the Contractor shall maintain all facilities and furnishings provided under the above requirements, and shall maintain and keep the office quarters clean through the use of weekly professional cleaning to include, but not limited to, washing & waxing floors, cleaning restrooms, removal of trash, etc. Exterior areas shall be mowed and clean of debris. A trash receptacle (dumpster) with weekly pickup (trash removal) shall be provided. Snow removal, sanding and salting of all parking, walkway, and entrance ways areas shall be accomplished during a storm if on a workday during work hours, immediately after a storm and prior to the start of a workday.

Method of Measurement: The furnishing and maintenance of the construction field office will be measured for payment by the number of calendar months that the office is in place and in operation, rounded up to the nearest month.

There will not be any price adjustment due to any change in the minimum computer related hardware and software requirements.

Basis of Payment: The furnishing and maintenance of the Construction Field Office will be paid for at the Contract unit price per month for "Construction Field Office, (Medium)," which price shall include all material, equipment, labor, service contracts, licenses, software, repair or replacement of hardware and software, related supplies, utility services, parking area, external illumination, trash removal, snow and ice removal, and work incidental thereto, as well as any other costs to provide requirements of this specified this specification.

Pay Item Construction Field Office, (Medium) <u>Pay Unit</u> Month

ITEM #0971001A – MAINTENANCE AND PROTECTION OF TRAFFIC

Article 9.71.01 – Description *is supplemented by the following:*

The Contractor shall maintain and protect traffic as described by the following and as limited in the special provision for Section 1.08 - Prosecution and Progress:

Route 189

The Contractor shall maintain and protect the minimum number of through lanes on a paved travel path not less than 12 feet in width per lane during the hours dictated in the special provision for Article 1.08.04 – Limitation of Operations.

The Contractor will be permitted to halt traffic during the allowable periods. If more than one 10 minute period is required, then the Contractor shall allow all stored vehicles to proceed through the work area prior to the next stoppage.

Route 315 (Elm Street) and Mountain Road

The Contractor shall maintain and protect a minimum of 1 lane of traffic in each direction with each lane on a paved travel path not less than 11 feet in width, with the following exception:

• During the allowable periods and when the Contractor is actively working, the Contractor will be permitted to maintain and protect at least an alternating one-way traffic operation on a paved travel path not less than 11 feet in width and no more than 300 feet in length, unless specified elsewhere in the Contract. There shall be no more than one alternating one-way traffic operation within the Project limits without prior approval of the Engineer.

Commercial and Residential Driveways

The Contractor shall maintain access to and egress from all commercial and residential driveways throughout the Project limits. The Contractor will be permitted to temporarily close affected driveways while actively working with coordination and permission from the owner or proprietor.

Intermediate Term Sidewalk Closures

The Contractor shall maintain and protect existing pedestrian accommodations, or a minimum of 4 feet in width, on all existing sidewalks, sidewalk ramps, and access to pedestrian pushbuttons, with the following exception:

• During the allowable periods and when the Contractor is actively constructing pedestrian amenities or installing signal equipment, the Contractor will be allowed to close pedestrian sidewalks and sidewalk ramps and restrict access to pedestrian pushbuttons for no more than a continuous 48 hour period of time.

No more than two corners of an intersection may be closed for an intermediate term sidewalk closure at any time. Where all four corners of an intersection have sidewalks and sidewalk ramps, diagonal corners shall not be closed at the same time.

During the intermediate term sidewalk closure, all approaches to the sidewalk shall be blocked by Construction Barricade Detectable with Sidewalk Closed signs. The Contractor shall ensure that traffic control signals with pedestrian phases where access to the pushbuttons cannot be provided are revised at the start of the closure to automatically activate the pedestrian phase every signal cycle.

Intermediate term sidewalk closures may be extended to 72 hours with prior approval of the Engineer.

Article 9.71.03 - Construction Methods is supplemented as follows:

General

Unpaved travel paths will only be permitted for areas requiring full depth and full width reconstruction. The unpaved section shall be the full width of the road and shall be perpendicular to the travel lanes. The Contractor will be allowed to maintain traffic on processed aggregate for a duration not to exceed 10 calendar days and opposing traffic lane dividers shall be used as a centerline.

The Contractor is required to delineate any raised structures within the travel lanes, so that the structures are visible day and night, unless there are specific Contract plans and provisions to temporarily lower these structures prior to the completion of work.

The Contractor shall schedule operations so that pavement removal and roadway resurfacing shall be completed full width across a roadway or bridge section by the end of a work shift, or as directed by the Engineer.

When the installation of all intermediate courses of bituminous concrete pavement is completed for the entire roadway, the Contractor shall then install the final course of bituminous concrete pavement.

When the Contractor is excavating adjacent to the roadway, the Contractor shall provide a 3 foot shoulder between the work area and travel lanes, with traffic drums spaced every 50 feet. At the end of the work shift if the vertical drop-off exceeds 3 inches, the Contractor shall provide a temporary bituminous concrete traversable slope of 4:1 or flatter that is acceptable to the Engineer.

The Contractor, during the course of any active overhead construction work, shall close the lanes directly below the work area for the entire length of time overhead work is being undertaken.

At no time shall an overhead sign be left partially removed or installed.

When an existing sign is to be relocated or replaced, the work shall be completed during the same work shift.

The field installation of a signing pattern shall constitute interference with existing traffic operations and shall not be allowed, except during the allowable periods.

On limited-access highways, construction vehicles entering travel lanes shall not be allowed without a lane closure. The lane closure shall be of sufficient length to allow vehicles to enter or exit the work area at the posted speed limit, in order to merge with existing traffic.

Existing Signing

The Contractor shall maintain all existing overhead and side-mounted signs within the Project limits throughout the duration of the Project. The Contractor shall temporarily relocate signs and sign supports as many times as deemed necessary, and shall install temporary sign supports if necessary and as directed by the Engineer.

Requirements for Winter

The Contractor shall schedule a meeting with representatives of the Department, including the offices of Maintenance and Traffic, and the Towns to determine any interim traffic control measures the Contractor shall accomplish prior to winter to provide safety to motorists and permit adequate snow removal procedures. This meeting shall be held prior to October 31 of each year and will include, but not be limited to, discussion of the status and schedule of the following items: lane and shoulder widths, pavement restoration, traffic signal work, pavement markings, and signing.

Signing Patterns

The Contractor shall erect and maintain all signing patterns in accordance with the traffic control plans contained herein. Proper distances between advance warning signs and proper taper lengths are mandatory.

NOTES FOR TRAFFIC CONTROL PLANS

- 1. IF A TRAFFIC STOPPAGE OCCURS IN ADVANCE OF SIGN (A), THEN AN ADDITIONAL SIGN (A) SHALL BE INSTALLED IN ADVANCE OF THE STOPPAGE.
- 2. SIGNS (A), (A), AND (D) SHOULD BE OMITTED WHEN THESE SIGNS HAVE ALREADY BEEN INSTALLED TO DESIGNATE A LARGER WORK ZONE THAN THE WORK ZONE THAT IS ENCOMPASSED ON THIS PLAN.
- 3. SEE TABLE 1 FOR ADJUSTMENT OF TAPERS IF NECESSARY.
- 4. IF THIS PLAN REMAINS IN CONTINUOUS OPERATION FOR MORE THAN 36 HOURS, THEN TRAFFIC DRUMS SHALL BE USED IN PLACE OF TRAFFIC CONES.
- 5. ANY LEGAL SPEED LIMIT SIGNS WITHIN THE LIMITS OF A ROADWAY / LANE CLOSURE AREA SHALL BE COVERED WITH AN OPAQUE MATERIAL WHILE THE CLOSURE IS IN EFFECT, AND UNCOVERED WHEN THE ROADWAY / LANE CLOSURE IS RE-OPENED TO ALL LANES OF TRAFFIC.
- 6. IF THIS PLAN REMAINS IN CONTINUOUS OPERATION FOR MORE THAN 36 HOURS, THEN ANY EXISTING CONFLICTING PAVEMENT MARKINGS SHALL BE ERADICATED OR COVERED, AND TEMPORARY PAVEMENT MARKINGS THAT DELINEATE THE PROPER TRAVELPATHS SHALL BE INSTALLED.
- 7. DISTANCES BETWEEN SIGNS IN THE ADVANCE WARNING AREA MAY BE REDUCED TO 100' ON LOW-SPEED URBAN ROADS (SPEED LIMIT < 40 MPH).
- 8. IF THIS PLAN IS TO REMAIN IN OPERATION DURING THE HOURS OF DARKNESS, INSTALL BARRICADE WARNING LIGHTS - HIGH INTENSITY ON ALL POST-MOUNTED DIAMOND SIGNS IN THE ADVANCE WARNING AREA.
- 9. A CHANGEABLE MESSAGE SIGN SHALL BE INSTALLED ONE HALF TO ONE MILE IN ADVANCE OF THE LANE CLOSURE TAPER.
- 10 SIGN (P) SHALL BE MOUNTED A MINIMUM OF 7 FEET FROM THE PAVEMENT SURFACE TO THE BOTTOM OF THE SIGN.

TABLE 1 - MINIMUM TAPER LENGTHS

POSTED SPEED LIMIT	MINIMUM TAPER LENGTH FOR
(MILES PER HOUR)	A SINGLE LANE CLOSURE
30 OR LESS	180' (55m)
35	250' (75m)
40	320' (100m)
45	540' (165m)
50	600' (180m)
55	660' (200m)
65	780' (240m)

METRIC CONVERSION CHART (1" = 25mm)

ENGLISH	METRIC	ENGLIS	H METRIC	ENGLIS	H METRIC
12"	300mm	42"	1050mm	72"	1800mm
18"	450mm	48"	1200mm	78"	1950mm
24"	600mm	54"	1350mm	84"	2100mm
30"	750mm	60"	1500mm	90"	2250mm
36"	900mm	66"	1650mm	96"	2400mm

CONNECTICUT DEPARTMENT OF TRANSPORTATION BUREAU OF ENGINEERING & CONSTRUCTION NOTES

CONSTRUCTION TRAFFIC CONTROL PLAN

SCALE: NONE

APPROVED Chilles S. L.J. Charles S. Harlow 2012.06.05 15:50:35-04:00 PRINCIPAL ENGINEER





CONNECTICUT DEPARTMENT OF TRANSPORTATION BUREAU OF ENGINEERING & CONSTRUCTION

APPROVED Chills S. LL Charles S. Harlow 2012.06.05 15:55:45-04'00' PRINCIPAL ENGINEER



BUREAU OF ENGINEERING & CONSTRUCTION

PRINCIPAL ENGINEER











Article 9.71.05 – Basis of Payment is supplemented by the following:

The contract lump sum price for "Maintenance and Protection of Traffic" shall include furnishing and installing all construction signs, sign supports, temporary fencing, barricades, barricade warning lights, traffic drums, and traffic cones that may be necessary to maintain traffic through the various construction zones.

The contract lump sum price for "Maintenance and Protection of Traffic" shall also include temporarily relocating existing signs and sign supports as many times as deemed necessary and furnishing, installing, and removing temporary sign supports and foundations if necessary during construction of the project.

The contract lump sum price for "Maintenance and Protection of Traffic" shall also include furnishing, installing, and removing the material for the temporary traversable slope in those areas where a longitudinal dropdown exists and to maintain access to adjoining properties.

If there is no method for payment for the temporary transition in those areas where a transverse dropdown exists, then the contract lump sum price for the "Maintenance and Protection of Traffic" shall also include furnishing, installing, and removing the material for the temporary transitions and touchdowns.

The contract lump sum price for "Maintenance and Protection of Traffic" shall also include all costs associated with developing, obtaining approval for, and implementing any and all required traffic control plans for the various project roadways.

ITEM NO.	DESCRIPTION	<u>UNIT</u>
ITEM # 0971001A	MAINTENANCE AND PROTECTION OF TRAFFIC	LS

ITEM #1002291A - MODIFICATION OF TRAFFIC CONTROL FOUNDATION

Description:

This item shall consist of modifying the existing traffic controller foundation at intersection #128-233 Route 189 (Hartford Avenue) at Route 315 (Elm Street) as shown on the plans or as directed by the Engineer and in conformity with these special provisions.

Materials:

Concrete replacement shall be Class "A" concrete conforming to Section M.03 and for Rigid Metal Conduit, Article M.15.09.

Concrete bonding compound shall be of an approved type as directed by the Engineer.

Construction Methods:

All work shall be in accordance with the following procedure or as directed by the Engineer.

a) Remove concrete foundation by cutting, chiseling or any other method approved by the Engineer as required to install new conduit sweeps.

b) Position new conduit sweeps, and apply an approved concrete bonding compound on the exposed concrete surfaces as recommended by the manufacturer.

c) Forms shall be positioned so that all existing exposed foundation at grade level or above will be matched. All work shall be in accordance with Section 6.01.

d) Allow concrete to cure and backfill as indicated on the details.

When all conduits, existing and new, are used, one additional 50mm (2") rigid metal conduit sweep shall be installed as a spare. Existing conduits that will be abandoned shall be cut and capped approximately two feet from the foundation.

Surfaces, new and existing, of a foundation which is modified, shall be "Grout Clean-Down Finish" as described in Section 6.01.

Where a foundation is modified within or adjacent to a concrete sidewalk, unless otherwise directed by the Engineer, the entire section of sidewalk shall be replaced in accordance with Section 9.21.

Method of Measurement:

The work for this item shall be measured for payment by the number of foundations modified.

Basis of Payment:

This work will be paid for at the contract unit price each for "Modification Of Traffic Control Foundation", which price shall include all costs for cutting of bases, bonding compound, forms, concrete, conduit sweeps, and all fittings, material, equipment, labor and tools incidental thereto.

All concrete sidewalk replaced due to foundation modification shall be paid for at the contract unit price for "Concrete Sidewalk".

Pay ItemPayModification of Traffic Control FoundationI

<u>Pay Unit</u> Ea.

ITEM#1008908A - CLEAN EXISTING CONDUIT

Description:

Clean existing conduit as required, as shown on the plans or as directed by the Engineer to remove dirt and debris to facilitate the installation of new cable.

Construction Methods:

Where cable is to be installed in existing conduit the conduit may have to be cleared prior to the installation. Cleaning will only be necessary if the new cable cannot be easily installed in the existing conduit. By field inspection, and with the concurrence of the Engineer, determine the sections of conduit that require cleaning.

Remove all existing cable from conduit. Install temporary cable elsewhere, as necessary, to maintain normal signalization complete with vehicle & pedestrian detection, EVPS, and coordination. Clean the conduit by one of the following methods:

- 1) Rodding.
- 2) A high pressure jet spray, or air pressure.
- 3) By pulling a mandrel or ball through the conduit.

Submit in writing the anticipated method of cleaning the conduit to the Engineer for approval prior to cleaning any conduit.

If the conduit is found damaged to any extent that the cleaning process will not clear the obstruction, it will be the judgment of the Engineer whether to replace the entire conduit run or excavate and replace only the damaged section.

If the existing conduit is found to be missing hardware such as bonding bushings and bond wire, the missing material shall be provided and installed under this item prior to installation of the cable.

Method of Measurement:

This work shall be measured from termination point to termination point. This work shall be measured for payment on actual number of linear feet (meters)..

Basis of Payment:

The work under the Item "Clean Existing Conduit" shall be paid for at the contract unit price per linear foot (meters), which price shall include all material, tools, equipment, labor, and work incidental thereto. Work pertaining to temporary operation shall be paid for under Item 1108xxxA - Temporary Signalization (Site X). Replacement of any damaged conduit shall be paid for under the applicable conduit item.

Pay ItemPay UnitClean Existing Conduit1.f. (m)

ITEM#1010060A – CLEAN EXISTING CONCRETE HANDHOLE

DESCRIPTION:

Clean all debris from an existing concrete handhole where shown on the plans or as directed.

MATERIAL:

Insulated Bonding Bushings: Specification Grade Threaded Malleable Iron or Steel Galvanized UL listed Bonding Wire: M.15.13 Grout: M.03.05

CONSTRUCTION METHODS:

Remove to a level even with the bottom of the handhole all sand, silt and other debris. Remove any material that is accessible from the ends of conduit. Additional conduit cleaning will be paid for under Item 1008908A-Clean Existing Conduit. Place approximately 4" (100) of ³/₄" (19) crushed stone in bottom of handhole using care not to allow crushed stone to enter conduits. Grout around conduits to prevent future entrance of dirt and silt. Properly dispose all removed debris. Inspect bonding bushings. Tighten loose bushings. Secure loose bond connections. Install new bonding bushings on spare conduits and bond to other conduits.

METHOD OF MEASUREMENT:

This work will be measured for payment by the number of concrete handholes cleaned, complete and accepted.

BASES OF PAYMENT:

This work will be paid for at the contract unit price each for "Clean Existing Concrete Handhole", which price shall include the removal and disposal of debris from handhole and associated conduit, crushed stone, grout, bonding bushings, bonding wire, and all equipment and work incidental thereto.

<u>Pay Item</u>	<u>Pay Unit</u>
Clean Existing Concrete Handhole	Each (Ea)

ITEM #1105180A - 1 WAY, 1 SECTION BI-COLORED ARROW

Article 11.05.03 – Construction Methods:

Add the following paragraph:

Circular indications that have an identification mark (such as an arrow) on the top of the lens shall be installed with that mark at the 12 o-clock position.

Article M.16.06 - Traffic Signals

Sub Article 3 - Housing:

In the last sentence of the third paragraph, between the words "housing" and "shall" add "and all internal hardware".

Add the following after the last paragraph:

Each section of the housing shall be provided with a removable visor. The visor shall be the cap type, unless otherwise noted on the plan. The visor shall be a minimum .05 inch thick. The visor shall be the twist on type and secured to the signal by four equidistant flat tabs screwed to the signal head. The visor shall fit snugly against the door and shall not permit any perceptible filtration of light between the door and visor.

Sub Article 4 - Brackets:

Remove the second paragraph.

Replace the last paragraph with the following:

When indicated on the plans, a backplate constructed of 5052-H32 aluminum alloy sheet between 0.050-in to 0.065-in thickness meeting the requirements of ASTM B209 shall be attached to the signal head housing. The front surface of backplate per MUTCD shall have a dull black finish to minimize light reflection and to increase contrast between the signal indication and its background.

Backplates shall be 5" wide and louvered.

Install a 2" wide fluorescent yellow retroreflective strip (Type XI sheeting) along the perimeter of the face of the backplate.

Delete Sub Article 5 - Optical Unit and Sub Article 6 – Lamp Socket and replace with the following:

Optical Unit, Light Emitting Diode:

(a) General:

Only Optical Units that meet the requirements contained herein, supplied by the manufacturers noted below or approved equal, will be accepted. Final review of model numbers will be done at the time of the product data submittals.

Dialight	Leotek
1501 Foute 34 South	726 South Hillview Drive
Farmingdale, NJ 07727	Milpitas, CA 95035

The materials for Light Emitting Diode (LED), Optical Unit, circular and arrow, shall meet the following requirements:

- The ITE Performance Specification for Vehicle Traffic Control Signal Heads Light Emitting Diode (LED) Circular Signal Supplement for circular indications dated June 27, 2005.
- The ITE Performance Specification for Vehicle Traffic Control Signal Heads Light Emitting Diode (LED) Vehicle Arrow Traffic Signal Supplement for arrow indications dated July 1, 2007.
- Military grade connectors.
- Circular indications shall have a 20 year design life conformal coated driver board
- Solid connection between driver board and LED light engine for enhanced corrosion resistance
- Robust solder joints on the back of the printed circuit board.
- The optical unit for circular indications shall exceed ITE mandated light intensity for over 15 years. Specific model numbers ITE compliant listed with ETL Intertek
- Sealed against dust and moisture intrusion per Mil-Std-810F Method 506.4, Procedure 1 Rain and Blowing Rain.
- LED unit shall have an incandescent appearance, not pixelated, when illuminated.
- Non-electrolytic capacitors to prevent failure from drying out
- The LED unit shall have a manufacturer-provided warranty of 15 years from the date of delivery
- The LED unit for bi-colored arrow indications shall have a manufacturer-provided warranty of 60 months from the date of delivery

Section 4, Adjustable Traffic Signals and General Housing sections of the **Department of Transportation Functional Specifications for Traffic Control Equipment, current edition governs.** Where the Department of Transportation Functional Specifications conflict with this Special Provision or the 2005/2007 ITE Performance Specifications, this Special Provision and the 2005/2007 ITE Performance Specifications shall govern.

The Optical Unit shall have an Incandescent look and be made up of a smooth surfaced outer shell. The Optical Unit shall have multiple LED light sources, a filtered power supply and a back cover, assembled into a sealed unit. The Optical Unit shall be certified as meeting the current ITE Specifications by Intertek Testing Services, Inc. (ITSNA, formerly ETL) or another organization currently recognized by the Occupational Safety and Health Administration (OSHA) as a Nationally Recognized Testing Laboratory. The Optical Unit shall perform to the requirements of the ITE Specification for a minimum of 15 years. The Optical Unit for bi-colored arrow indications shall perform to the requirements of the ITE Specification for a minimum of 60 months.

The Arrow Optical Unit shall be "Omni-Directional" so that it may be oriented in any configuration without degradation of performance.

(b) Electrical Requirement:

Operating voltage:

• 80 to 135 Volts AC with cutoff voltage (no visible indication) below 35Volts AC.

Power requirements:

- Circular Indications: 12 inch no more than 13 Watts
- Circular Indications: 8 inch no more than 7 Watts
- Arrows Indications: 12 inch no more than 13 Watts

Power Supply:

- Fused and filtered to provide excess current protection and over voltage protection from electrical surges and transient voltages.
- (c) Photometric Requirement:

Beam Color:

• Meet current ITE Specifications

(d) Mechanical Requirements:

Diameter:

• The Circular Optical Unit shall fit into standard 12 inch or 8 inch housing. The Arrow Optical Unit shall fit 12 inch housings only.

Enclosure:

- Clear lens cover for all Red, Yellow and Green Circular Optical Units.
- Incandescent appearance, not pixelated, when illuminated.
- For Arrow Optical Units the arrow indication segment of the lens shall be clear.
- Enclosure sealed and waterproofed to eliminate dirt contamination and be suitable for installation in all weather conditions.
- Clearly mark on the housing the following information:
 - o Manufacturer & model number
 - Date of manufacture
- The model number shall end with the number of LEDs used to comprise the unit as the last digits of the model number. For example, if the unit is comprised of 3 LEDs and the model is x12y, then the new model number shall read x12y3.

Operating temperature:

• Meet current ITE Specifications

Wiring: L.E.D. lamps shall have color coded 16 AWG wires for identification of heads as follows:

RED LED Lamps	RED with WHITE neutral
YELLOW LED Lamps	YELLOW with WHITE neutral
GREEN LED Lamps	GREEN or BROWN with WHITE neutral
RED LED ARROWS	RED/WHITE with WHITE neutral
YELLOW LED ARROWS	YELLOW/WHITE with WHITE neutral
GREEN LED ARROWS	GREEN/WHITE or BROWN/WHITE with WHITE neutral
GREEN/YELLOW LED ARROWS	GREEN/WHITE or BROWN/WHITE, YELLOW/WHITE, with WHITE neutral

- Wires shall be terminated with a Block Spade, 6-8 stud/ 16-14 wire size.
- All Circular Optical Units shall be supplied with a minimum 40 inch long pigtail and all Arrow Optical Units shall be supplied with a minimum 60 inch long pigtail.

Delete Sub Article 8 – Dual Color Fiber Optic Section

ITEM#1106003A- 1 WAY PEDESTRIAN SIGNAL PEDESTAL MOUNTED

Section 11.06.02 Pedestrian Signal, Materials

Section M.16.07 C. Optical Unit

Delete 2. LED: and replace with the following:

General

- Meet requirements of current MUTCD Section 4E.
- Meet current ITE specifications for Pedestrian Traffic Control Signal Indications (PTCSI) Part 2: Light Emitting Diode (LED).
- Meet CT DOT, 2008 2010 Functional Specifications for Traffic Control Equipment; Section 5D, LED Pedestrian Signal with Countdown Timer.
- Meet EPA Energy Star® requirements for LED Pedestrian Signal Modules.

Operational

• Countdown display only during the flashing Pedestrian Clearance (Ped Clr) Interval. Timer goes blank at end of flashing ped clr even if countdown has not reached zero.

Physical

- Sealed optical module to prevent entrance of moisture and dust.
- Self-contained optical module, including necessary power supplies.
- Designed to securely fit into standard housing without the use of special tools or modifications to the housing.
- Identification information on module: manufacturer's name, model number, serial number, and date code.

Optical

- Multiple LED sources; capable of partial loss of LED's without loss of symbol or countdown message.
- Two complete self contained optical systems. One to display the walking person symbol (walk) and the hand symbol (don't walk). One to display the countdown timer digits.
- Visual Image similar to incandescent display; smooth, non-pixilated.
- Symbol and countdown digit size as shown on the plan.
- Solid hand/person symbol; outline display not allowed.
- Overlaid hand/person symbols and countdown digits arranged side by side.
- Countdown digit display color: Portland Orange in accordance with ITE requirements.
- Countdown digits comprised of two seven segments, each in a figure 8 pattern.
- Photometric Requirements: Luminance, Uniformity, and Distribution in accordance with ITE requirements.
- Color Uniformity in accordance with ITE requirements.

• Blank-Out design; symbols and digits illegible even in direct sunlight when not illuminated.

Electrical

- Operating voltage: 89 VAC to 135 VAC.
- Low Voltage Turn-Off: 35 VAC.
- Turn-On and Turn-Off times in accordance with ITE specifications.
- Combined Hand Countdown Digits wattage: ≥ 20 Watts.
- Input impedance at 60 Hertz sufficient to satisfy Malfunction Management Unit (MMU) requirements.
- Two separate power supplies. One to power the walking person symbol. One to power the hand symbol and the countdown digits.
- Meet Federal Communication Commission (FCC) regulations concerning electronic noise.
- Filtered and protected against electrical transients and surges.

Warrantee

• Five years from date ownership is accepted.

ITEM #1107011A - ACCESSIBLE PEDESTRIAN SIGNAL AND DETECTOR (TYPE A)

Description:

Furnish and install an Accessible Pedestrian Signal and Detector (APS&D). The APS&D provides audio and tactile information to augment the visual pedestrian signal.

<u>Type A</u> provides a low frequency percussive tone or a speech message during the walk interval and is used where there is an exclusive or a concurrent pedestrian phase.

Material:

A. General:

- Conform to applicable sections of the current MUTCD Chapter 4E, Pedestrian Control Features as specified herein.
- All features fully operational when the traffic signal is in colors mode.
- All features non-operational when the traffic signal is in flash mode.
- Interchangeable with a non-accessible type pedestrian pushbutton with no modifications to the Controller Assembly (CA) or Controller Unit.
- Audible transducer integral with the APS&D housing, adjacent to the pushbutton.
- Operation programming method: Either or combination of:
 - Mechanically by dip switches or circuit board jumpers
 - Infrared remote-control hand-held device

B. Electrical:

- Metallic components either grounded or insulated to preclude an electrical hazard to pedestrians under all weather conditions.
- All features powered by the 110VAC Walk signal and the 110VAC Don't Walk signal so that additional conductors from the CA are not needed.

C. Audible Pushbutton Locator Tone

- Frequency: repeating tone at one (1) second intervals
- Tone duration: ≤ 0.15 seconds
- Volume:
- Minimum setting of zero
- Manually adjustable initial setting
- Automatically adjusted after initial setting. Volume increased in response to a temporary increase in ambient noise and subsequently decreased with a decrease in ambient noise.
- Maximum volume: 100 dBA which is the approximate sound pressure of a gasoline powered lawn mower nearby.
- Automatic volume adjustment independent of other APS&Ds at the intersection.
- May be disabled without affecting operation of other features.
- Silent only during walk interval. Active all other times.

D. Vibrotactile Arrow Pushbutton

- Pushbutton contained in a circular assembly which fits inside the housing and is attached to the housing with 4 screws.
- Actuation of pushbutton acknowledged by confirmation light.
- Actuation of pushbutton initiates speech message "Wait".
- ADA compliant: Size: ≥ 2.0 " (50) diameter, Actuation force: ≤ 5 ft-lb (22.2 N)
- Shape: Circular, raised slightly above housing so that it may be actuated with the back of a hand

- Tamper-proof, vandal-proof, weatherproof, freeze-proof, impact-resistant design and construction.
- Operation: Vibrates only during the walk interval (when the walk indication is displayed).
- Tactile Arrow:
 - $_{\circ}\,$ Attached to surface of the button assembly by a tamper proof method.
 - Raised slightly above surface of pushbutton, minimum 0.125" (0.3)
 - Size: Length $\geq 1.5^{\circ}$ (38), Height $\geq 1.0^{\circ}$ (25)
 - Color: Sharp contrast to background color of pushbutton and housing

E. Audible Walk Interval

- 1. General:
 - Operation independent of other APS&Ds at intersection.
 - Active only during the walk interval (when the walk indication is displayed).
 - Volume:
 - Minimum setting of zero
 - Manually adjustable initial setting
 - Automatically adjusted after initial setting. Volume increased in response to a temporary increase in ambient noise and subsequently decreased with a decrease in ambient noise.
 - Automatic volume adjustment independent of other APS&Ds at the intersection.
 - Maximum volume: 100 dBA which is the approximate sound pressure of a gasoline powered lawn mower nearby.
 - Duration:
 - Default method: Automatically set by the duration of the visual walk signal display.
 - When selected: Manually set when rest-in-walk is used for a concurrent pedestrian movement.
 - Audible sounds that mimic any bird call are not allowed.
- 2. Percussive Tone where called for on the signal plan:
 - Repeating tone at eight (8) to ten (10) ticks per second.
 - Tone frequency: Multiple frequencies with a dominant component at 880 Hz which creates a "tick tick tick..." sound.
- 3. Speech Message where called for on the signal plan:
 - Clearly enunciate the name of the travel way to be crossed and the message that the walk signal is on for that crossing.. See signal plan for specific message.
- F. Pushbutton Housing/Sign Frame/Sign
 - One piece die cast aluminum meeting requirements of ASTM B85.
 - Sign frame designed to accept 9" x 15" (230 x 380) four-hole advisory sign.
 - Flat back to facilitate surface mount.
 - Available brackets to either pedestal top-mount or pole side-mount on pole diameter range of 3¹/₂" (89) to 15" (380).
 - Available brackets to allow mounting two (2) APS&Ds to the same 3½" (89) pole, facing ≥ 60 degrees apart, at the same height.
 - Available extension bracket of a size indicated on the plan -18" maximum.
 - Wire entrance through the rear.
 - Stainless steel mounting hardware.
 - Sign: CT DOT Sign No. 31-0856
Construction Methods:

Install the APS&D according to the manufacturer's instructions. Position the APS&D so the plane of the sign face is parallel to the crossing (sign is facing perpendicular) and the arrow is pointing in the same direction as the crossing, not necessarily at the ramp. Notify the Engineer if there is any discrepancy or ambiguity between the plans and field conditions that prevent placement of the APS&D as shown on the plan. Set the minimum sound levels of the locator tone and the audible walk indication when there is little or no ambient noise as in night time operation. Set the volume of audible walk indications and pushbutton locator tones to a maximum of 5dBA louder than ambient sound. The locator tone should be audible 6' to 12' (1.8 m to 3.6 m) from the pushbutton or to the building line, whichever is less. Confirm the volume of both audible walk indication and the an increase in ambient sound and subsequently decreases when the ambient noise decreases.

If programming method is remote, by an infrared hand-held device, provide one device and operation manual for each intersection where APS&D is installed.

Method of Measurement:

This work is measured by the number of APS&Ds of the type specified, installed, tested, fully operational, and accepted.

Basis of Payment:

Payment for this work is based on the installation, inspection, successful completion of the 30 day test period, and final acceptance of the Accessible Pedestrian Signal and Detector of the type specified. Payment includes the sign, mounting brackets for adjacent buttons on the same structure, extension brackets, all necessary cable, all incidental materials, labor, tools, and equipment necessary to complete the installation. Payment also includes the warrantee, installation manual, and operation manual.

If programming method is remote by an infrared hand-held device, the total bid price of all APS&Ds includes one remote programming device and accompanying operation manual for each intersection where APS&D is installed.

Pay Unit Each

Pay Item	
Accessible Pedestrian Signal and Detector	(Type A)

ITEM #1108163A - MODIFY EXISTING CONTROLLER

This item shall consist of modifying the existing traffic controller assembly at Intersection #128-233 to provide the revised operation as shown on the plans or as directed by the Engineer. The modification shall include, but not be limited to, revisions to the timing and sequence, cabinet wiring, coordination, pre-emption, field wiring and cabinet wiring diagrams.

MATERIAL

The material for this work shall conform to the requirements of the current edition of the Connecticut Department of Transportation Functional Specifications for Traffic Control Equipment. The material shall be compatible with the existing equipment. Any material in question shall be approved prior to installation by the Engineer or the Department of Transportation Signal Lab, 280 West Street, Rocky Hill. Contact Mr. Don Assard at (860) 258-0346 or Mr. Mark Zampini at (860) 258-0349 for approval.

CONSTRUCTION METHODS

All revisions to the cabinet wiring shall be neat and orderly. All additional wiring shall be from terminal to terminal. Splices will not be allowed. All changes, additions and deletions shall be documented, dated and drawn on the reproducible original or a reproducible copy of the original cabinet wiring diagram. Five paper copies shall be furnished to the Engineer upon completion of the revision and a digital PDF copy to DOT.trafficelectrical@ct.gov.

METHOD OF MEASUREMENT

This item will be measured for payment as an "Each" item.

BASIS OF PAYMENT

This item will be paid for at the contract price each, for "Modify Existing Controller" which price shall include all necessary load switches, relays, components, hardware, tools, equipment, engineering and labor required to modify the existing controller as shown on the plan. This price shall also include five updated cabinet wiring diagrams.

<u>Pay Item</u> Modify Existing Controller <u>Pay Unit</u> Ea.

ITEM #1111201A - TEMPORARY DETECTION (Site No. 1)

Description:

Provide a Temporary Detection (TD) system at signalized intersections throughout the duration of construction, as noted on the contract plans or directed by the Engineer. TD is intended to provide an efficient traffic-responsive operation which will reduce unused time for motorists travelling through the intersection. A TD system shall consist of all material, such as pedestrian pushbutton, accessible pedestrian signal, conduit, handholes, cable, messenger, sawcut, loop amplifier, microwave detector, Video Image Detection System (VIDS), Self-Powered Vehicle Detector (SPVD), and any additional components needed to achieve an actuated traffic signal operation.

Materials:

Material used for TD is either owned by the Contractor and in good working condition, or existing material that will be removed upon completion of the contract. Approval by the Engineer is needed prior to using existing material that will be incorporated into the permanent installation. New material that will become part of the permanent installation is not included or paid for under TD.

Construction Methods:

The work for this item includes furnishing, installation, relocating, realigning, and maintaining the necessary detection systems as to provide vehicle and pedestrian detection during each phase of construction. If not shown on the plan, program the TD modes (pulse or presence) as the existing detectors or as directed by the Engineer. If the TD method is not specified elsewhere in the Contract, (loops, SPVD, microwave, VIDS, pushbutton, or other) it may be the Contractor's choice. The method chosen for TD must be indicated on the TD Plan submission.

The traffic signal plan-of-record, if not in the controller cabinet will be provided upon request. Ensure the controller phase mode (recall, lock, non-lock) and phase timing are correct for the TD. Adjust these settings as needed or as directed by the Engineer.

At least 30 days prior to implementation of each phase of construction submit a TD proposal to the Engineer for approval. Submit the TD proposal at the same time as the Temporary Signalization plan. Indicate the following information for each intersection approach:

- Phase Mode
- Temporary Detection Method
- Area of Detection
- Detector Mode

Submit the proposed temporary phase timing settings and the TD installation schedule with the TD proposal. See the example below.

Example Proposed Temporary Detection and Timing

Anni	Approach Phase			Phase Mode		TD Mathad		Area	of Det	ection	Det Mo
R t 1	$\frac{\mathbf{R}_{f}}{\mathbf{R}_{f}} = \frac{1}{100} \frac{\mathbf{R}_{f}}{\mathbf{R}_{f}} = \frac{1}{100} \frac{\mathbf{R}_{f}}{\mathbf{R}_{f}}$		Min Decall					from Ct	ton Rar	Proson	
$\frac{Rt}{Rt} A$	5 <u>5 7</u>	3	2	Min Roca	 11		SPVD	150' from Stop Bar		ton Rar	Γιεςεπα Ρυίςο
Rt Rt	341		<u>-</u> 4	Lock		М	icrowave	30' f	rom Sta	op Bar	Pulse
Rt.	341		4	Lock		Pu	ishbutton	At SE & SW corners		SW SS	n/a
emporar	y Ph	ase Tir	ning S	ettings:							
Phas	e	Min	Ped	Ped Clr	Ez	xt	Max 1	Max2	Yel	Red	
2		20	0	0	6	5	45	60	4	1	
4		14	7	9	3	3	27	35	3	1	
rppi	Is wear and a second constraints15 WB1ft Turn		Non-Lock) Method	Area	ot Det	ection	L Det Mo	
D/ 1		n	1		de	11) Method	Area	of Det	ection	Det Moo
<i>Rt.</i> 1. <i>Left</i> <i>Rt</i> 1	5 WI Turi 4 FI	B n B	1 2	Non-Loc Min Reco		11	<u>D Method</u> VIDS	Area 5' in Beh	of Det front ind Sto from St	to 10' b Bar	Presence
Rt. 1. Left Rt. 1	5 WI Turi 4 El	B n B	1 2 3	Non-Loc Non Loc	k ll	<u>II</u> <u>I</u>	VIDS Existing Loop	Area 5' in Beh 150' j	ind Sto	to 10' p Bar top Bar	Det Moo Presenc Pulse
<i>Rt. 1.</i> <i>Left</i> <i>Rt. 1</i> <i>Ped 1</i> <i>Rt. 1</i>	5 W Turi 4 El Phas	B m B C C C C C C C C C C C C C C C C C	1 2 3 6	Non-Loc Min Reca Non-Loc Min Reca		II I Pu	VIDS Existing Loop	Area 5' in Beh 150' j At	of Det front i ind Sto from St all cor from St	to 10' p Bar top Bar top Bar ners	Det Moo Presence Pulse n/a Prasance
<i>Rt. 1.</i> <i>Left</i> <i>Rt. 1</i> <i>Ped 1</i> <i>Rt. 1</i> <i>Rt. 1</i>	5 WI Turi 4 El Phas 4 WI 97	B m B B	1 2 3 6 4	Non-Loc Min Reca Non-Loc Min Reca Lock		II Pu Lo	VIDS Existing Loop shbutton VIDS pop, Pre- formed	Area 5' in Beh 150' j Att 150' j 20' ft	of Det ind Sto from St all cort from St rom Sto	to 10' p Bar top Bar top Bar ners top Bar op Bar	Det Moo Presence Pulse n/a Presence Pulse
Rt. 1 Left Rt. 1 Ped 1 Rt. 1 Rt. 1 Rt. 1 Rt. 1 Rt. 1	5 WI Turi 4 El Phas 4 WI 97	B n 3 e B B ase Tir	I I 2 3 3 6 4 1	Non-Loc Min Reca Non-Loc Min Reca Lock		E Pu	O Method VIDS Existing Loop ishbutton VIDS oop, Pre-formed	Area 5' in Beh 150' j At 150' j 20' fi	of Det ind Sto from St all cort from St rom Sto	to 10' p Bar top Bar top Bar ners top Bar op Bar	Det Moo Presence Pulse n/a Presence Pulse
Rt. 1 Left Rt. 1 Ped 1 Rt. 1 Rt. 1 Rt. Phas	5 WI Turi 4 EI Phas 4 WI 97	B m B C C C C C C C C C C C C C C C C C	I I 2 3 6 4 ning S Ped	Non-Loc Min Reca Non-Loc Min Reca Lock ettings: Ped Clr		11 Pu La	Nethod VIDS Existing Loop shbutton VIDS pop, Pre- formed	Area 5' in Beh 150' j At 150' j 20' fi	of Det front i ind Sto from St all cort from St from Sta	to 10' p Bar top Bar mers top Bar op Bar	Det Moo Presence Pulse n/a Presence Pulse
Rt. 1 Left Rt. 1 Ped 1 Rt. 1 Rt. Phas 1	5 WI Turr 4 EI Phas 4 WI 97 97	B B B ase Tir Min 5	I I 2 3 6 4 1 2 3 6 4 4 Ped 0	Non-Loc Min Reca Non-Loc Min Reca Lock ettings: Ped Clr 0	k k k k ull Ex 2	III Pu La j	Method VIDS Existing Loop ishbutton VIDS pop, Pre-formed Max 1 12	Area 5' in Beh 150' j At 150' j 20' fi Max2 18	of Det front i ind Sto from St from St from Sta Yel 3	ection to 10' p Bar top Bar ners top Bar p Bar Red 1	Det Moo Presence Pulse n/a Presence Pulse
Rt. 1. Left Rt. 1 Ped I Rt. 1 Rt. 1 Rt. Phas 1 2 &	5 WI Turn 4 EI Phas 97 97 97	B B C C C C C C C C C C C C C	I I 2 3 6 4 1 1 2 3 6 4 1 1 2 3 6 4 1 1 2 1 3 6 4 1 9 1 0 0	Non-Loc Min Reca Non-Loc Min Reca Lock ettings: Ped Clr 0 4	de de k	II Pu La xt 2 4	Method VIDS Existing Loop ushbutton VIDS pop, Pre-formed Max 1 12 26	Area 5' in Beh 150' j At 150' j 20' fi Max2 18 36	ron Store from Store from Store from Store from Store from Store Yel 3 4	ection to 10' p Bar top Bar op Bar op Bar op Bar 1 1 1	Det Moo Presence Pulse n/a Presence Pulse
Rt. 1 Left Rt. 1 Ped 1 Rt. 1 Rt. 1 Rt. 1 Ptas 1 2 & 3	5 WI Turn 4 EI Phas 7 Phas 97 97 97	B B B - B - B - Min - 5 - 24 -	I I 2 3 6 4 4 9 Ped 0 0 0 7 7	Non-Loc Min Reca Non-Loc Min Reca Lock ettings: Ped Clr 0 4 9	de k k	III Pu La J xxt 2 4	Method VIDS Existing Loop ishbutton VIDS oop, Pre-formed Max 1 12 26 16	Area 5' in Beh 150' j 20' ft 20' ft Max2 18 36 16	of Det front i ind Sto from St from St from Sta from Sta 4 4	ection to 10' p Bar top Bar ners top Bar p Bar Red 1 1 1	Det Moo Presence N/a Presence Pulse

When at any time during construction the existing vehicle or pushbutton detection becomes damaged, removed, or disconnected, install TD to actuate the affected approaches. Install and make TD operational prior to removing existing detection. TD must be operational throughout all construction phases.

Provide a list of telephone numbers of personnel who will be responsible for the TD to the Engineer. If the TD malfunctions or is damaged, notify the Engineer and place the associated phase on max recall. Respond to TD malfunctions by having a qualified representative at the site within three (3) hours. Restore detection to the condition prior to the malfunction within twenty-four (24) hours.

If the Engineer determines that the nature of a malfunction requires immediate attention and the Contractor does not respond within three (3) hours following the initial contact, then an alternative maintenance service will be called to restore TD. Expenses incurred by the State for alternative service will be deducted from monies due to the Contractor with a minimum deduction of \$500.00 for each service call. The alternate maintenance service may be the traffic signal owner or another qualified Contractor.

TD shall be terminated when the detection is no longer required. This may be either when the temporary signal is taken out of service or when the permanent detectors are in place and fully operational.

Any material and equipment supplied by the Contractor specifically for TD shall remain the Contractor's property. Existing material not designated as scrap or salvage shall become the property of the Contractor. Return and deliver to the owner all existing equipment used as TD that is removed and designated as salvage.

Method of Measurement:

Temporary Signalization (TS) shall be measured for payment as follows:

Fifty percent (50%) will be paid when Temporary Detection is initially set up, approved, and becomes fully operational.

Fifty percent (50%) will be paid when Temporary Detection terminates and all temporary equipment is removed to the satisfaction of the Engineer.

Basis of Payment:

This work will be paid at the contract Lump Sum price for "Temporary Detection (Site No.)". The price includes furnishing, installing, relocating, realigning, maintaining, and removing, the necessary detection systems and all incidental material, labor, tools, and equipment. This price also includes any detector mode setting changes, timing or program modifications to the controller that are associated with TD. All Contractor supplied material that will remain the Contractor's property will be included in the contract Lump Sum price for "Temporary Detection (Site No.)." Any items installed for TD that will become part of the permanent installation will not be paid for under this item but are paid for under the bid item for that work.

Pay ItemPay UnitTemporary Detection (Site No.)L. S.

ITEM #1111401A LOOP VEHICLE DETECTOR ITEM #1111451A - LOOP DETECTOR SAWCUT

Replace Section 11.11, LOOP VEHICLE DETECTOR AND SAWCUT, with the following:

11.11.01 – Description:

1. Furnish and install a loop vehicle detector amplifier.

2. Sawcut pavement. Furnish and install loop detector wire in sawcut.

11.11.02 – Materials:

Article M.16.12

M.16.12 - LOOP VEHICLE DETECTOR AND SAWCUT

- 1. Loop Vehicle Detector:
 - Comply with National Electrical Manufacturers Association (NEMA) standards, Section 6.5, Inductive Loop Detectors.
 - Comply with the current CT DOT Functional Specifications for Traffic Control Equipment, Section 3 B, Loop Vehicle Detector with Delay/Extend Option.

2. Sawcut:

- (a) Wire in sawcut:
 - International Municipal Signal Association (IMSA) Specification 51-7, single conductor cross-linked polyethylene insulation inside polyethylene tube.
 - # 14 AWG

(b) Sealant:

- (1) Polyester Resin Compound
 - Two part polyester which to cure, requires a liquid hardener.
 - Use of a respirator not necessary when applied in an open air environment.
 - Cure time dependent on amount of hardener mixed.
 - Flow characteristics to guarantee encapsulation of loop wires.
 - Viscosity: 4000 CPS to 7000 CPS at 77 degrees Fahrenheit (25° C).
 - Form a tack-free skin within 25 minutes and full-cure within 60 minutes at 77 degrees Fahrenheit (25° C).
 - When cured, resist effects of weather, vehicular abrasion, motor oil, gasoline, antifreeze, brake fluid, de-icing chemicals, salt, acid, hydrocarbons, and normal roadway encounters.
 - When cured, maintain physical characteristics throughout the ambient temperature ranges experienced within the State of Connecticut.
 - When cured, bonds (adheres) to all types of road surfaces.
 - Weight per Gallon (3.8 l): 11 lbs ± 1 lb (5kg \pm .45kg)
 - Show no visible signs of shrinkage after curing.
 - 12 month shelf life of unopened containers when stored under manufacturers specified conditions.
 - Cured testing requirements:
 - Gel time at 77 degrees F (25° C): 15 20 minutes, ASTM C881, D-2471
 - Shore D Hardness at 24 hours: 55-78, ASTM D-2240
 - Tensile Strength: > 1000 psi (6895 kPa), ASTM D-638
 - Elongation: 18 20 %, ASTM D-638

- Adhesion to steel: 700 900 psi (4826 6205 kPa), ASTM D-3163
- Absorption of water, sodium chloride, oil, and gasoline: < 0.2%, ASTM D-570
- Include in the Certificate of Compliance:
 - Manufacturer's confirmation of the uncured and cured physical properties stated above.
 - Material Safety Data Sheet (MSDS) stating sealant may be applied without a respirator in an open air environment.
- Designed to allow clean-up without the use of solvent that is harmful to the workers and the environment.
- (2) Elasotmeric Urethane Compound:
 - One part urethane which to cure, does not require a reactor initiator, or a source of thermal energy prior to or during its installation.
 - Use of a respirator not necessary when applied in an open air environment.
 - Cure only in the presence of moisture.
 - Flow characteristics to guarantee encapsulation of loop wires.
 - Viscosity such that it does not run out of the sawcut in sloped pavement during installation; 5000 CPS to 85,000 CPS.
 - Form a tack-free skin within 24 hours and 0.125 inch (0.33mm) cure within 30 hours at 75 degrees Fahrenheit (24° C).
 - When cured, resist effects of weather, vehicular abrasion, motor oil, gasoline, antifreeze, brake fluid, de-icing chemicals, salt, acid, hydrocarbons, and normal roadway encounters.
 - When cured, maintain physical characteristics throughout the ambient temperature ranges experienced within the State of Connecticut.
 - Show no visible signs of shrinkage after curing.
 - Shelf life when stored under manufacturers specified conditions:
 - Caulk type cartridges: minimum 9 months
 - Five gallon containers: minimum 12 months
 - Designed for application when the pavement surface temperature is between 40 and 100 degrees Fahrenheit (4° and 38° C).
 - Uncured testing requirements:
 - Weight/Gallon: ASTM D-1875
 - Determination of Non-volatile Content: ASTM D-2834
 - Viscosity: ASTM D-1048B
 - Tack-free Time: ASTM D-1640
 - Cured testing requirements:
 - Hardness: ASTM D-2240
 - Tensile Strength & Elongation: ASTM D-412A
 - Include in the Certificate of Compliance:
 - Manufacturer's confirmation of the uncured and cured physical properties stated above.
 - Material Safety Data Sheet (MSDS) stating sealant may be applied without a respirator in an open air environment.
 - Designed to allow clean-up without the use of solvent that is harmful to the workers and the environment.

3. Miscellaneous:

- (a) Liquidtight Flexible Nonmetallic Conduit
 - UL listed for direct burial
 - UL 1660
 - Smooth polyvinyl chloride inner surface
- (b) Water Resistant Pressure Type Wire Connector
 - Ul listed for direct burial and wet locations
 - UL 486D

11.11.03 - Construction methods:

1. Loop Vehicle Detector

- Shelf-mount the detector amplifier in the controller cabinet.
- Terminate the harness conductors with crimped spade connectors. Connect conductors to appropriate terminals, eg, black wire to 110vac, white wire to 110vac neutral.
- Tie loop harness and conductors to controller cabinet wiring harness. Leave enough slack in loop harness so that amplifier may be moved around on cabinet shelf; ± 2 feet (0.6 meter) slack.
- Attach a loop identification tag to the harness. Record pertinent detector information on the tag with indelible ink. See example below.
 - <u>Loop No.:</u> **D4**
 - Phase Call: *Shase 4*
 - Field Location: Rt. 411(West St.)
 - o <u>Eastbound, Left Lane</u>
 - o Detector No.: 4
 - o Cabinet Terminals: 234, 235

2. Loop Detector Sawcut

- Loop size, number of turns, and location is shown on the intersection plan.
- Do not cut through a patched trench, damaged or poor quality pavement without the approval of the Engineer.
- Wet-cut pavement with a power saw using a diamond blade ³/₈ inch (9.5mm) wide. Dry-cut is not allowed.
- Ensure slot depth is between 1 ³/₄ inch to 2.0 inch (45mm to 50mm).
- Overlap corners to ensure full depth of cut.
- To prevent wire kinking and insulation damage, chamfer inside of corners that are ≤ 120 degrees.
- Clean all cutting residue and moisture from slot with oil-free compressed air. Ensure slot is dry before inserting wire and sealing sawcut.
- Cut home-run, from loop to curb or edge-of-road, as shown on the typical installation sheet.
- To prevent cross-talk and minimize electrical interference, twist home-run wires, from edge of road to handhole, with at least 5 turns per foot (16 turns per meter). Tape together twisted home-run wires at 2 foot (0.6 meter) ± intervals.
- In new or resurfaced pavement, install loops in the wearing course. If the wearing course is not scheduled for immediate placement (within 24 hours) after the base course, provide temporary detection when directed by the Engineer. Temporary detection may be sawcut loops, preformed loops, microwave sensor, video, or other method approved by the Engineer.
- Splice(s) not allowed anywhere in loop wire either in loop or in home-run.
- Ensure wires are held in place at bottom of slot by inserting at 2 foot (0.6 m) intervals, 1 inch sections of foam backer rod or wedges formed from 1 inch (25mm) sections of the polyethylene tubing. Loop detectors with wires that have floated to the top of the sealant will not be accepted.
- To create a uniform magnetic field in the detection zone, wind adjacent loops in opposite directions.
- Use **polyester compound** as the sealant unless another type is allowed by the Engineer.
- Mix hardening agent into polyester resin with a power mixer or in an application machine designed for this type of sealant in accordance with the manufacturer's instructions.
- Apply the loop sealant in accordance with the manufacturer's instructions and the typical installation sheet. Do not apply sealant when pavement temperature is outside the manufacturers recommended application range.
- Solder splice the loop wires to the lead-in cable and install water resistant connector as shown on the typical installation sheet.
- Test the loop circuit resistance, inductance, and amplifier power-interruption as shown on the typical installation sheet. Document all test results.
- 3. Damaged, Patched, or Excessively Worn Pavement

- Where the existing pavement is damaged, patched or excessively worn and is found to be not suitable for reliable loop detection, notify the Engineer.
- When directed by the Engineer, remove and replace an area of pavement to allow the proper installation of the loop.
- Remove a minimum of 3 inches (75mm) depth.
- Comply with the applicable construction methods of Section 2.02 Roadway Excavation, Formation Of Embankment and Disposal of Surplus Material, and Section 4.06 Bituminous Concrete, such as:
 - \circ Cut Bituminous Concrete
 - Material for Tack Coat
 - o Bituminous Concrete Class 1

4. Re-surface/Overlay Project

- Prior to disconnecting the existing loop confirm that the amplifier is operating properly and is programmed according to plan. Document loop operation. Report any discrepancies and malfunctions to Engineer.
- Remove all abandoned sawcut home-run wire from handhole.
- Sawcut new loop according to plan.
- Solder splice new loop wires to the existing lead-in cable and install new water resistant twist connectors as shown on the typical installation sheet. Do not re-use the removed connectors.
- Test the loop circuit resistance and inductance. Document results.
- Ensure the existing loop amplifier has re-tuned to the new loop and is operating according to plan.

11.11.04 – Method of Measurement:

1. Loop Vehicle Detector is measured by the number of installed, operating, tested, and accepted vehicle detector amplifiers of the type specified.

2. Loop Detector Sawcut is measured by the number of linear feet (meters) of installed, tested, operating, and accepted sawcut only where there is loop wire. Over-cuts at corners that do not contain wire are not measured.

11.11.05 – Basis of Payment:

1. Loop Vehicle Detector is paid at the contract unit price each of the type specified.

2. Loop Detector Sawcut is paid at the contract unit price per linear foot (meter). The price includes sawcut, loop wire, sealant, liquidtight flexible nonmetallic conduit, duct seal, water resistant splice connectors, testing, incidental material, equipment, and labor.

Pay Item	Pay Unit
Loop Vehicle Detector	ea. (ea.)
Loop Detector Sawcut	l.f. (m)

ITEM #1118012A REMOVAL AND/OR RELOCATION OF TRAFFIC SIGNAL EQUIPMENT

Section 11.18: Replace the entire section with the following:

11.18.01 – Description:

Remove all abandoned traffic signal equipment. Restore the affected area. Where indicated on the plans remove and reinstall existing traffic signal equipment to the location(s) shown.

Lead paint is presumed present on the painted surface of all cabinets and structures located within project limits. Any activities performed by the contractor that results in a painted surface being impacted or altered, shall be performed in accordance OSHA Lead in Construction Standard 29CFR 1926.62, or the painted surface shall be tested prior to any paint being disturbed by a qualified third party hired by the contractor to confirm that no lead is present.

11.18.02 – Materials:

The related sections of the following specifications apply to all incidental and additional material required for the proper relocation of existing equipment and the restoration of any area affected by this work.

- Division III, "Materials Section" of the Standard Specifications.
- Current Supplemental Specifications to the Standard Specifications.
- Applicable Special Provisions to the Standard Specifications.
- Current Department of Transportation, Functional Specifications for Traffic Control Equipment.

Article 11.18.03 - Construction Methods:

Schedule/coordinate the removal and/or relocation of existing traffic signal equipment with the installation of new equipment to maintain uninterrupted traffic signal control. This includes but is not limited to vehicle signals and detectors, pedestrian signals and pushbuttons, co-ordination, and pre-emption.

Abandoned Equipment

The contract traffic signal plan usually does not show existing equipment that will be abandoned. Consult the existing traffic signal plan for the location of abandoned material especially messenger strand, conduit risers, and handholes that are a distance from the intersection. A copy of the existing plan is usually in the existing controller cabinet. If not, a plan is available from the Division of Traffic Engineering upon request.

Unless shown on the plans it is not necessary to remove abandoned conduit in-trench and conduit under-roadway

When a traffic signal support strand, rigid metal conduit, down guy, or other traffic signal equipment is attached to a utility pole, secure from the pole custodian permission to work on the

REV.09-19

pole. All applicable Public Utility Regulatory Authority (PURA) regulations and utility company requirements govern. Keep utility company apprised of the schedule and the nature of the work. Remove all abandoned hardware, conduit risers, and down guys, Remove anchor rods, to 6" (150mm) below grade.

When underground material is removed, backfill the excavation with clean fill material. Compact the fill to eliminate settling. Remove entirely the following material: pedestal foundation; controller foundation; handhole; pressure sensitive vehicle detector complete with concrete base. Unless otherwise shown on the plan, remove steel pole and mast arm foundation to a depth of 2 feet (600mm) below grade. Restore the excavated area to a grade and condition compatible with the surrounding area.

- If in an unpaved area apply topsoil and establish turf in accordance with Section 9.44 and Section 9.50 of the Standard Specifications.
- If in pavement or sidewalk, restore the excavated area in compliance with the applicable Sections of Division II, "Construction Details" of the Standard Specifications.

Relocated Equipment

In the presence of the Engineer, verify the condition of all material that will be relocated and reused at the site. Carefully remove all material, fittings, and attachments in a manner to safeguard parts from damage or loss. Replace at no additional cost, all material which becomes damaged or lost during removal, storage, or reinstallation.

Scrap Equipment

Scrap Material	Stock No.	Value
Pedestrian Pushbutton and Sign	N/A	

All material not listed as salvage becomes the property of the Contractor; which assumes all liabilities associated with material's final disposition.

Article 11.18.04 – Method of Measurement:

This work will be measured as a Lump Sum.

Article 11.18.05 – Basis of Payment:

This work will be paid for at the contract lump sum price for "Removal and/or Relocation of Traffic Signal Equipment" which price shall include relocating signal equipment and associated hardware, all equipment, material, tools and labor incidental thereto. This price shall also include removing, loading, transporting, and unloading of signal equipment/materials designated for salvage and all equipment, material, tools and labor incidental thereto. This price shall also include removing

and disposing of traffic signal equipment not to be salvaged and all equipment, material, tools and labor incidental thereto.

Payment is at the contract lump sum price for "Removal and/or Relocation of Traffic Signal Equipment" inclusive of all labor, vehicle usage, storage, and incidental material necessary for the complete removal of abandoned equipment/material and/or relocation of existing traffic signal equipment/material. Payment will also include the necessary labor, equipment, and material for the complete restoration of all affected areas.

A credit will be calculated and deducted from monies due the Contractor equal to the listed value of salvage material not returned or that has been damaged and deemed unsalvageable due to the Contractor's operations.

Pay Item	Pay Unit
Removal and/or Relocation of Traffic Signal Equipment	L.S. (L.S.)

ITEM NO. 1118051A - TEMPORARY SIGNALIZATION (SITE NO. 1)

Description:

Work under this item shall consist of providing Temporary Signalization (TS) at the intersections shown on the plans

1. Existing Signalized Intersection: The Contractor shall keep each traffic signal completely operational at all times during construction through the use of existing signal equipment, temporary signal equipment, new signal equipment, or any combination thereof once TS has started as noted in the section labeled "Duration."

2. Unsignalized Intersection: The Contractor shall provide TS during construction activities and convert the temporary condition to a permanent traffic signal upon project completion. The Contractor shall furnish, install, maintain, and relocate equipment to provide a complete temporary traffic signal, including but not limited to the necessary support structures, electrical connection and disconnection (if required) and energy supply, vehicle and pedestrian indications, vehicle and pedestrian detection (paid for under Item #11112XXA – Temporary Detection {Site No. X}), pavement markings, and signing.

Materials:

- Pertinent articles of the Standard Specifications
- Supplemental Specifications and Special Provisions contained in this contract

Construction Methods: The Contractor shall perform a Preliminary Inspection and submit a Temporary Signalization (TS) Plan as described herein. No physical work will be allowed at any location until the requirements of the Preliminary Inspection and Temporary Signalization (TS) Plan have been met.

1. <u>Preliminary Inspection</u>

Prior to beginning any physical work, the Contractor shall meet with the Engineer and a representative from the DOT Electrical Maintenance Office (Town representative for a Town owned signal), to inspect and document (for the Engineer's concurrence) the existing traffic signal's physical and operational condition prior to implementing any Temporary Signalization (TS.) The inspection shall include, but not be limited to, the condition of the following:

- Controller Assembly (CA)
- Controller Unit (CU)
- Detection Equipment
- Pre-emption Equipment
- Coordination Equipment
- Vehicle and Pedestrian Signals
- Vehicle and Pedestrian Detectors
- Emergency Vehicle Pre-emption System (EVPS) *
- Interconnect Cable and Splice Enclosures
- Support Structures
- Handholes, Conduit and Cable

It may be necessary to repair or replace equipment that is missing, damaged, or malfunctioning. The Contractor shall prepare a list of items for replacement or repair. If authorized by the Engineer, this work will be considered "Extra Work" under Article 1.09.04.

* At a State owned signal the EVPS equipment is usually owned by the municipality. The Engineer will notify the municipality of the inspection schedule and information relating to its EVPS equipment as required.

The Preliminary Inspection meeting shall also include discussion of potential utility conflicts according to the *Utilities* section under *TS Plan* below.

2. <u>Temporary Signalization (TS) Plan</u>

At least 30 days prior to implementation of each stage, the Contractor shall submit a 1:40 (1:500 metric) scale TS plan in pdf format for each location to the Engineer for review and comment. This TS Plan shall include, but not be limited to the following:

- Survey Ties
- Dimensions of Lanes, Shoulders, and Islands
- Slope Limits
- Clearing and Grubbing Limits
- Signal Phasing and Timing
- Location of Signal Appurtenances such as Supports, Signal Heads, Pedestrian Push buttons, Pedestrian Signals
- Location of Signing and Pavement Markings (stop bars, lane lines, etc.)
- Location, method, and mode of Temporary Detection
- Location of utilities and potential conflicts

Review of the TS plan does not relieve the Contractor of ensuring the TS meets the requirements of the MUTCD. The existing traffic signal plan of record for State-owned traffic signals is available from the Division of Traffic Engineering upon request. The Contractor may request existing traffic signal plans for Town-owned traffic signals from the Town.

It is acceptable to use the existing traffic signal plan as the TS plan by marking up the existing plan to show any needed changes.

The Contractor shall not implement the TS plan until all review comments have been addressed.

The TS Plan shall also address the following elements:

Earthwork

The Contractor shall perform the necessary clearing and grubbing and the grading of slopes required for the installation, maintenance, and removal of the TS equipment. Upon termination of the TS, the Contractor shall restore the affected area to its prior condition and to the satisfaction of the Engineer.

Maintenance and Protection of Traffic

The Contractor shall furnish, install, maintain, relocate, and remove signal-related signing (lane-use, signal ahead, NTOR, etc.), and pavement markings, as needed.

The Contractor shall install, relocate, or remove, equipment in a manner to cause no hazard to pedestrians, traffic or property. The Contractor shall maintain traffic as specified in the Special Provisions "Prosecution and Progress" and "Maintenance and Protection of Traffic" in the Contract.

Utilities

The Contractor shall verify that proposed temporary and/or relocated signal equipment will not conflict with proposed project utility relocations. The Contractor shall ensure that temporary span/temporary poles will not restrict the ability to shift utility cables off of the poles.

The Contractor shall coordinate its TS activities with all utility companies in the project area to ensure that the proposed temporary and/or relocated signal equipment will not be in conflict with existing utilities. The Contractor shall coordinate any utility work that may be needed prior to the Contractor implementing the TS plan.

Electrical Service and Telephone Service at Existing Signalized Intersections

The Contractor shall be responsible for relocating and changing any electrical service or telephone service source if required. Any arrangements with these companies and costs associated with any relocation or change shall be paid for by the Contractor. The Contractor shall ensure that the party previously responsible for the monthly payment of service shall continue to be responsible for that payment during TS.

Electrical Service for TS at Unsignalized Intersections

The Contractor shall be responsible for providing electrical service for TS at unsignalized intersections. All charges and all arrangements with the power company, including service requests, scheduling, and monthly bills in accordance with Section 10.00.12 and Section 10.00.13 of the Standard Specifications shall be the responsibility of the Contractor. The Contractor shall remove the service or leave the service if it will become permanent as shown on the plans or as directed by the Engineer.

Temporary Signalization

The Contractor shall furnish, install, maintain, relocate, and remove existing, temporary, and proposed traffic signal equipment and all necessary hardware; modifications to or furnishing of a new CA; and reprogramming of the CU phasing and timing; and any other incidentals related to this TS, as many times as necessary for each stage/phase of construction to maintain and protect traffic and pedestrian movements as shown on the plans or as directed by the Engineer.

Inspection

When requested by the Engineer, the TS will be subject to a field review by a representative of the Division of Traffic Engineering and/or the Town, The Contractor shall revise the TS as needed to address comments.

Detection

The Contractor shall provide vehicle detection on the existing, temporary, and/or new roadway alignment for all intersection approaches that have existing detection, detection in the final condition as shown on the signal plan, or as directed by the Engineer. The Contractor shall keep existing pedestrian pushbuttons accessible and operational at all times during TS. Temporary Detection is described and is paid for under Item # 11112XXA - Temporary Detection (Site No. X)

Emergency Vehicle Pre-emption System (EVPS)

The Contractor shall furnish, install, maintain, relocate, and remove the equipment necessary to keep the existing EVPS operational as shown on the plan. The Contractor shall not disconnect or alter the EVPS without the knowledge and concurrence of the Engineer and the EVPS owner. The Contractor shall schedule all EVPS relocations so that the system is out of service only when the Contractor is actively working. The Contractor shall ensure EVPS is returned to service and is completely operational at the end of the work day and shall keep the EVPS owner apprised of all changes to the EVPS.

Coordination

The Contractor shall furnish, install, maintain, relocate, and remove the equipment necessary to keep the intersection coordinated to adjacent signals as shown on the plan. The Contractor shall not disconnect the interconnect without the approval of the Engineer.

- <u>Closed Loop System</u>: If it is necessary to disconnect the communication cable, the Contractor will notify the Engineer and the Bridgeport Operation Center (BOC) or the Newington Operation Center (NOC) prior to disconnect and also after it is reconnected.
- <u>Time Base System</u>: The Contractor shall program and synchronize all Time Clock/Time Base Coordination (TC/TBC) units as necessary.

<u>Maintenance</u>

Once TS is in effect, the Contractor shall assume all maintenance responsibilities of the entire installation in accordance with Section 1.07.12 of the Standard Specifications. The Contractor shall notify the Engineer for the project records the date that Temporary Signalization begins. The Contractor shall coordinate with the Engineer to notify the following parties that maintenance responsibility has been transferred to the Contractor:

Signal Owner

CT DOT Electrical Maintenance Office or Town Representative Local Police Department The Contractor shall provide the Engineer a list of telephone numbers of personnel who will be on-call during TS and shall respond to traffic signal malfunctions by having a representative at the site within three hours from the initial contact. Any traffic signal malfunction shall be made operational according to plan within twenty-four (24) hours.

If the Engineer determines that the nature of a malfunction requires immediate attention and/or the Contractor does not respond within three (3) hours, then an alternate maintenance service will be called to repair the signal. Expenses incurred by the alternate maintenance service for each call will be deducted from monies due to the Contractor with a minimum deduction of \$1,000. The alternate maintenance service may be the owner of the signal or another qualified electrical contractor.

Duration

Temporary Signalization shall commence when the Contractor begins physical work at a particular intersection.

- a) For intersections with a State furnished controller, TS terminates when the inspection of the permanent signal is complete and operational and is accepted by the Engineer.
- b) For intersections with a Contractor furnished controller, Temporary Signalization terminates at the beginning of the 30 day test period for the permanent signal.

<u>Ownership</u>

The Contractor shall remove and deliver any existing equipment that is designated as salvage to its original owner upon completion of use. Any temporary equipment supplied by the Contractor shall be removed by the Contractor unless noted otherwise.

Method of Measurement:

Temporary Signalization (TS) shall be measured for payment as follows:

Fifty percent (50%) shall be paid when the TS for that site is operational as shown on the plan and to the satisfaction of the Engineer.

Fifty percent (50%) shall be paid upon termination of the TS as described herein.

Basis of Payment:

This work shall be paid at the contract Lump Sum price for "Temporary Signalization (Site No.)" for each site. This price includes the preliminary inspection, TS plan for each stage/phase, furnishing, installing, maintaining, relocating and revising traffic signal equipment, controller assembly modifications, controller unit program changes such as phasing and timing, removing existing, temporary, and proposed traffic signal equipment, arrangements with utility companies, towns or cities including the fees necessary for electric and telephone service, clearing and grubbing, earthwork and grading, area restoration and all necessary hardware, materials, labor, and work incidental thereto.

All material and work for signing and pavement markings is paid for under the appropriate Contract items.

All material and work necessary for vehicle and pedestrian detection for TS is paid for under item 11112XXA - Temporary Detection (Site No. X).

All Contractor supplied items that will remain the Contractor's property shall be included in the contract Lump Sum price for "Temporary Signalization."

Any items installed as part of the permanent installation will be paid for under those separate pay items in the Contract.

Pay Unit

L.S.

Pay Item]
Temporary Signalization (Site No.)	

ITEM #1206092A - RESET SIGN

DESCRIPTION

This item shall consist of resetting existing signs on new metal sign posts at locations indicated on the plans or as ordered by the Engineer.

MATERIALS

Metal sign posts shall conform to the requirements of Article M.18.14 of the Standard Specifications Form 818.

Sign mounting bolts shall conform to the requirements of Article M.18.15 of the Standard Specifications Form 818.

CONSTRUCTION METHODS

The Contractor shall remove the existing signs from existing sign posts at the locations shown on the plans or as ordered by the Engineer and store them in a safe place to prevent damage. The existing sign posts shall be removed and disposed of by the Contractor. For side-mounted sign foundations, the stub post or anchor bolts and concrete foundations shall be removed to a depth of 12 inches below finish grade. The portion of stub posts or anchor bolts and concrete removed shall be disposed of by the Contractor. Where sign support foundations existing without stub posts or anchor bolts, the Contractor will have the option of removing the concrete foundation in its entirety or remove the concrete and post to a depth of 12 inches below finished grade. Whichever option the Contractor chooses, the Contractor shall remove the excavated material from the site.

The existing signs shall be reset on the type of support designated on the plans after the support has been satisfactory installed at its proper location.

METHOD OF MEASUREMENT

Reset Sign will be paid for at the contract price for each "Reset Sign" completed and accepted.

BASIS OF PAYMENT

Payment for "Reset Sign" shall be made at the contract price for each "Reset Sign", which price shall include removing the existing signs from existing sign posts, removing and disposing the existing sign posts and foundation, new sign posts, mounting hardware, including reinforcing plates, and all materials, equipment, labor, and work incidental thereto.

<u>ITEM NO.</u> ITEM #1206092A DESCRIPTION RESET SIGN UNIT EA

<u>ITEM #1208931A – SIGN FACE – SHEET ALUMINUM (TYPE IX RETROREFLECTIVE SHEETING)</u>

Section 12.08 is supplemented and amended as follows:

12.08.01—Description:

Add the following:

This item shall also include field testing of metal sign base posts as directed by the Engineer.

12.08.03—Construction Methods:

Delete the last sentence and add the following:

Metal sign base posts shall be whole and uncut. Sign base post embedment and reveal lengths shall be as shown on the plans. The Contractor shall drive the metal sign base posts by hand tools, by mechanical means or by auguring holes. If an obstruction is encountered while driving or placing the metal sign base post, the Contractor shall notify the Engineer who will determine whether the obstruction shall be removed, the sign base post or posts relocated, or the base post installation in ledge detail shall apply. Backfill shall be thoroughly tamped after the posts have been set level and plumb.

Field Testing of Metal Sign Posts: When the sign installations are complete, the Contractor shall notify the Engineer the Project is ready for field testing. Based on the number of posts in the Project, the Engineer will select random sign base posts which shall be removed by the Contractor for inspection and measurement by the Engineer. After such inspection is completed at each base post location, the Contractor shall restore or replace such portions of the work to the condition required by the Contract. Refer to the table in 12.08.05 for the number of posts to be field tested.

12.08.04—Method of Measurement:

Add the following:

The work required to expose and measure sign base post length and embedment depth using field testing methods, and restoration of such work, will not be measured for payment and shall be included in the general cost of the work.

12.08.05—Basis of Payment:

Replace the entire Article with the following:

This work will be paid for at the Contract unit price per square foot for "Sign Face - Sheet Aluminum" of the type specified complete in place, adjusted by multiplying by the applicable Pay Factor listed in the table below. The price for this work shall include the completed sign, metal

sign post(s), span-mounted sign brackets and mast arm-mounted brackets, mounting hardware, including reinforcing plates, field testing, restoration and replacement of defective base post(s), and all materials, equipment, and work incidental thereto.

Pay Factor Scale: Work shall be considered defective whenever the base post length or base post embedment depth is less than the specified length by more than 2 inches. If the number of defects results in rejection, the Contractor shall remove and replace all metal sign base posts on the Project, at no cost to the Department.

i uniber of i obte e	o se resteu unu r	ay I accors (Basea	on roumber of Dere	
Number of				
Posts in Project				
=>	51-100	101-250	251-1000	>1000
Sample Size=>	5 Posts	10 Posts	40 Posts	60 Posts
0 Defects	1.0	1.0	1.025	1.025
1 Defect	0.9	0.95	0.975	0.983
2 Defects	Rejection	0.9	0.95	0.967
3 Defects	Rejection	Rejection	0.925	0.95
4 Defects	Rejection	Rejection	0.9	0.933
5 Defects	Rejection	Rejection	Rejection	0.917
6 Defects	Rejection	Rejection	Rejection	0.9
7 or more	Rejection	Rejection	Rejection	Rejection
Defects				

Number of Posts to be Tested and Pay Factors (Based on Number of Defects)

Note: Projects with 50 or fewer posts will not include field testing

ITEM #1208938A - PROJECT SIGN

DESCRIPTION

This item shall consist of furnishing and installing project sign at the locations shown on the plans or as ordered.

MATERIALS

SIGN PANEL: Signs should be made from suitable materials to perform effectively for a minimum of 3 years. Example of allowable materials include ³/₄" MDO-EXT-APA Plywood or 0.125-gauge sheet aluminum. The following types of materials shall not be used: mesh, non-rigid, roll-up, corrugated or waffle board types substrates, foam core and composite aluminum sign substrates.

Suitable attachments shall be provided so that the signs can be firmly attached to the sign supports without causing damage to the signs.

Signs may be painted or use non-reflective plastic sheeting. Paint shall be extremely durable, high quality, semi-gloss enamel resistant to air, sun and water. Non-reflective plastic sheeting shall be permanently adhered to the backing. The material shall withstand 3 years' vertical, south-facing exterior exposure.

- COLORS: All letters and symbols shall be blue code #0000FF, rgb (0, 0, 255), pantone 294, or approved equal. Background shall be white code #FFFFFF, rgb (255, 255, 255), or approved equal. If plywood is used for the sign panel, the back of the panel shall be painted matte black.
- TYPEFACE: Helvetica Medium
- SIGN SUPPORT: Sign panels shall be attached to vertical sign support posts. All sign supports shall have breakaway features that meet AASHTO requirements contained in the current "Standard Specifications for Structural Supports for Highway Signs, Luminaries and Traffic Signals". The breakaway features shall be structurally adequate to carry the sign panel at 60-mph wind loading. Installation shall be in accordance with the manufacturer's recommendations. A minimum 2-ft embedment depth below the ground line is required.

CONSTRUCTION METHODS

LOCATION: The signs SHALL be installed parallel to the travelway, so they are <u>NOT</u> easily viewable by drivers, as the signs are not MUTCD compliant and not intended to be roadway signs.

The lateral offset from the edge of road to the face of sign should be 6-12 feet. 12 feet is preferred where space is available for installation. When installed on a trail, the lateral offset should be 2 feet.

The bottom of the sign should be mounted 7 feet above the edge of road.

DURATION: The signs shall be erected for the life of the construction project. This means that they should be erected only after Notice to Proceed has been given to the contractor and should be removed with all other construction related signs at the end of the project considered to be the point that acceptance of the construction work is given.

METHOD OF MEASUREMENT

This work will be measured for payment as a unit installed and accepted.

BASIS OF PAYMENT

This work will be paid for at the contract unit price each for "Project Sign" complete in place, which price shall include metal sign posts, mounting hardware, including brackets, and all material, equipment, labor and work incidental thereto.

ITEM NO. ITEM #1208938A DESCRIPTION PROJECT SIGN UNIT EA

ITEM #1403501A – RESET MANHOLE (SANITARY SEWER)

Work under this item shall conform to the applicable provisions of Section 5.07 of the Standard Specifications Form 818 amended as follows:

SUB-ARTICLE 5.07.05-5 RESET UNITS

Delete the term "Reset Manhole" and insert "Reset Manhole - Sanitary Sewer."

DESCRIPTION

Add the following to Subarticle 5.07.01:

The Contractor shall reset to final grade the manhole frames and covers on the sanitary sewer, all as shown, specified or directed. Also included are furnishing and installing additional manhole riser sections, if necessary.

MATERIALS

Add the following to Subarticle 5.07.02:

BRICK UNITS - Shall conform to ASTM C-32, Grade MS

MANHOLE RISER SECTIONS - Shall conform to ASTM C-478

MANHOLE RUNGS (STEPS) - Shall be 14 inches x 10 7/8 inches forged aluminum safety rung fabricated from 6061-T6 aluminum alloy as manufactured by ALCOA, or equal; or copolymer polypropylene steps in conformance with ASTM D4101, Grade 60 steel reinforcing rod, ASTM A615, with epoxy coating, ASTM A-934/M-95. The steps shall be either Model PS-1B or PS2-PFSL as manufactured by M.A. Industries, Inc. or equal.

CONSTRUCTION METHODS

Add the following to Subarticle 5.07.03:

The Contractor shall carefully excavate the manhole frame and cover and add or delete brick masonry as necessary to reset the frame and cover to the final grade.

The present cover slab or cone section may be reused if it is not damaged. If the cover slab or cone section is damaged, it shall be replaced by the Contractor at his/her expense.

The Contractor may be required to "un-stack" the existing cone section so that riser sections can be added or deleted, where the change in grade is greater than 12 inches.

Any material damaged by the Contractor shall be repaired or replaced by the Contractor at no cost to the Town or District.

The Contractor shall adjust/lower manhole frame and cover to match the exposed aggregate or milled surface grades where necessary to provide for safe traffic operations. Prior to paving the final course, Contractor shall adjust/raise manhole frame and cover to final grades.

Where the change in grade is 3 inches or less, metal manhole extension rings shall be used to <u>raise</u> and support the existing manhole covers to the grade of the proposed roadway surface without disturbing the existing manhole frame.

METHOD OF MEASUREMENT

Add the following to Subarticle 5.07.04:

The work of resetting sanitary sewer manholes to the final grades will be measured for payment by the number of manholes (sanitary sewer) reset to grade and accepted by the Engineer. Adjustment of manhole frame and cover to match the exposed aggregate or milled surface grades shall not be measured and paid for, but shall be included in the cost for Maintenance and Protection of Traffic.

BASIS OF PAYMENT

Add the following to Subarticle 5.07.05:

The work of resetting sanitary sewer manholes to the final grades will be paid for at the contract unit price each bid for "Reset Manhole (Sanitary Sewer)" complete in place, which price shall include all labor and equipment necessary to incorporate the manhole into the work.

It shall also include the clearing, trenching, excavation and disposal of excavated materials, refilling trenches, furnishing additional material for refilling, grading, sheeting, bracing, pumping, and temporary and permanent resurfacing of disturbed areas.

The maximum 3 feet vertical adjustments shall not apply to adjusting sanitary sewer manholes, and there will be no extra compensation for adjusting the manhole in excess of 3 feet.

<u>ITEM NO.</u> ITEM #1403501A DESCRIPTIONURESET MANHOLE (SANITARY SEWER)E

<u>UNIT</u> EACH