

## **TABLE OF CONTENTS OF 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.

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**AUGUST 30, 2017**

**STATE PROJECT NO. 102-356**

**REHABILITATION OF BRIDGE NO. 00722  
ON WEST ROCKS ROAD OVER ROUTE 15**

Town of Norwalk  
Federal Aid Project No. N/A

The State of Connecticut, Department of Transportation, Standard Specifications for Roads, Bridges, Facilities and Incidental Construction, Form 817, 2016, as revised by the Supplemental Specifications dated January 2017 (otherwise referred to collectively as "ConnDOT Form 817") is hereby made part of this contract, as modified by the Special Provisions contained herein. Form 817 is available at the following DOT website link <http://www.ct.gov/dot/cwp/view.asp?a=3609&q=430362>. The current edition of the State of Connecticut Department of Transportation's "Construction Contract Bidding and Award Manual" ("Manual"), is hereby made part of this contract. If the provisions of this Manual conflict with provisions of other Department documents (not including statutes or regulations), the provisions of the Manual will govern. The Manual is available at the following DOT website link <http://www.ct.gov/dot/cwp/view.asp?a=2288&q=259258>. The Special Provisions relate in particular to the Rehabilitation of Bridge No. 00722 on West Rocks Road over Route 15 in the Town of Norwalk.

**CONTRACT TIME AND LIQUIDATED DAMAGES**

In order to minimize the hazard, cost and inconvenience to the traveling public and pollution of the environment, it is necessary to limit the time of construction work, which interferes with traffic as specified in Article 1.08.04 of the Special Provisions.

There will be two assessments for liquidated damages and they will be addressed in the following manner:

1. For this contract, an assessment per day for liquidated damages, at a rate of **Two Thousand Dollars (\$2,000.00)** per day shall be applied to each calendar day the work runs in excess of the **Two Hundred Eighty Seven (287)** allowed calendar days for the contract.
2. For this contract, an assessment per hour for liquidated damages shall be applied to each hour, or any portion thereof, in which the Contractor interferes with normal traffic operations during the restricted hours given in Article 1.08.04 of the Special Provisions. The liquidated damages shall be as shown in the following tables

entitled "Liquidated Damages Per Hour" for each hour, or any portion thereof, in which the Contractor interferes with normal traffic operations during the restricted hours.

For the purpose of administering this contract, normal traffic operations are considered interfered with when:

1. Any portion of the travel lanes or shoulders is occupied by any personnel, equipment, materials, or supplies including signs.
2. The transition between the planes of pavement surfaces is at a rate of one inch in less than fifteen feet longitudinally.

**LIQUIDATED DAMAGES PER HOUR**

SPN: 102-356

Project No. 102-356 Route 15 Northbound 2 Through Lane Section		
If Working Periods Extends Into	A.M. 1 Lane Closure	P.M. 1 Lane Closure
1st Hour of Restrictive Period	\$ 500	\$ 15,000
2 <sup>nd</sup> Hour of Restrictive Period	\$ 500	\$ 50,000
3rd Hour or any Subsequent Hour of Restrictive Period	\$ 500	\$ 80,000
Project No. 102-356 Route 15 Southbound 2 Through Lane Section		
If Working Periods Extends Into	A.M. 1 Lane Closure	P.M. 1 Lane Closure
1st Hour of Restrictive Period	\$ 35,000	\$ 500
2 <sup>nd</sup> Hour of Restrictive Period	\$ 70,000	\$ 500
3rd Hour or any Subsequent Hour of Restrictive Period	\$ 80,000	\$ 1,000

The above liquidated damages apply to those hours shown on the Limitation of Operations charts designated with a “2” or “E”.

For each hour shown on the Limitation of Operations charts designated with an “E”, liquidated damages of \$500 shall apply for each hour, or part thereof, if all available shoulder widths are not available to traffic.

Liquidated damages in the amount of \$500 shall apply for each hour, or part thereof, that the Contractor interferes with existing traffic operations on any ramps during the non-allowable hours.

## **MILESTONE INCENTIVE AND MILESTONE LIQUIDATED DAMAGES PROVISIONS**

In order to minimize the hazard, cost and inconvenience to the traveling public, pollution of the environment and detriment to area businesses, it is necessary to limit the time of construction work interfering with traffic as specified in Article 1.08.04 of the Special Provisions.

A milestone incentive payment and the assessment of milestone liquidated damages are bound to the full completion, including written approval by the Engineer, of the bulleted tasks that follow and which precede the milestone, along with all work incidental thereto. The milestone is to be completed within a consecutive ninety-one (91) day closure timeframe of West Rocks Road at Bridge 00722 from May 29, 2018 (the Milestone Start Date) through August 27, 2018 (the Milestone Completion Date) in which Bridge 00722 will be closed to vehicular and pedestrian traffic and a corresponding approximate four (4) mile detour will be in effect. The Contractor will receive an incentive payment if the start of road closure is delayed until June 15, 2018 (the Milestone Start Date) and all listed tasks and milestone are completed by August 27, 2018 (the Milestone Completion Date). The Contractor will be assessed liquidated damages if the listed tasks and milestone are not completed on or before August 27, 2018 (the Milestone Completion Date). The potential incentive payment and potential assessment of liquidated damages are further detailed below.

The milestone tasks to be completed include:

- The closure of West Rocks Road at Bridge 00722 as put in effect by the installation (and subsequent uncovering, if applicable) of the signs shown on the Detour Plan **[the closure timeframe begins]**
- Replacement of bridge superstructure including:
  - Removal of existing bridge deck
  - Removal of existing frames
  - Reconstruction of abutments
  - Installation of bearings
  - Installation of new girders, crossframes, diaphragms, and utility supports
  - Construction of new concrete deck, parapets, and ornamental band
  - Construction of sidewalk on bridge
  - Installation of and diversion of water to permanent water main
- Installation of reproduced ornamental metal railing
- Construction of approach slabs
- Construction of end blocks and modification of wingwall curb
- Install membrane waterproofing and pave
- Installation of two-tube rail
- Installation of R-B 350 metal beam rail along West Rocks Road
- Installation of chain-link fence
- Removal of all signs pertaining to the closure of West Rocks Road, as shown on the Detour Plan

- **MILESTONE: Reopening of West Rocks Road to normal traffic operations [the closure timeframe ends]**, exclusive of temporary alternating one-way traffic operations, as may be specified within the contract and that may be necessary to complete the project.

**Prior to beginning work on the project, and in order to eliminate possible delays, the Contractor shall furnish to the Engineer for approval a Critical Path Method (CPM) schedule that details all of the day-to-day operations necessary to complete the above tasks within the May 29, 2018 (the Milestone Start Date) or June 15, 2018 (the Milestone Incentive Start Date) through August 27, 2018 (the Milestone Completion date) detour timeframe.** The schedule shall include:

- activity descriptions, activity durations and interdependence between activities, where applicable. The activities are to be described so that the work is readily identifiable and the progress on each activity can be readily measured and monitored during the noted timeframe.
- the anticipated number of shifts, the hours per shift, and the anticipated number of personnel staffed per shift
- anticipated submittal and approval dates
- anticipated material delivery dates

Accompanying the CPM schedule shall be the following, as applicable.

- description of any special resources, including backup equivalent resources
- Contingency plans for mechanical failure
- M&PT plans

The Contractor must confirm with the Engineer and Municipality that the proposed closure date of West Rocks Road is on schedule at least four weeks prior to the closure.

#### Milestone Incentive Payment Terms and Conditions

If the Contractor completes the above-listed tasks and corresponding milestone, as accepted by the Engineer, within seventy-four (74) days of the closure timeframe beginning June 15, 2018 (the Milestone Incentive Start Date) and ending August 27, 2018 (the Milestone Completion Date), the Contractor shall receive a Lump Sum payment of **\$100,000 (One Hundred Thousand Dollars)**, which shall be paid under Item #0108100A-Lump Sum Incentive Payment (Estimated Cost).

The Contractor and other parties involved in the Project must anticipate that Project delays may occur and may arise from any one of various kinds of events and circumstances prior to or during the Contract period, including, but not limited to, the deletion of Contract work, the issuing of construction orders, the execution of supplemental agreements, the discovery of differing site conditions, the adding of extra work to the Contract, the emergence of right-of-way conflicts, problems with the obtaining or the terms of permits, action or inaction by persons or entities working on the project or by third parties, delays in the process of reviewing or approving shop drawings, expansion of the physical limits of the Project, the effects of weather conditions on Project activities, the occurrence of weekends or holidays, the suspension of any Project operation, or other events, forces or factors that affect highway construction work. Such events, forces or factors, and the Project delays, disruptions, inefficiencies or any other detrimental effects caused by them, are to be deemed to have been anticipated and contemplated



by the parties in entering into this Contract, and **shall not extend or constitute cause for extending any Milestone Completion Date for the purpose of determining whether or not any milestone incentive payment is due to the Contractor.**

Further, any and all costs or detrimental effects incurred by the Contractor in accelerating its work in an attempt to meet the Milestone Completion Date, regardless of the effects of any delay, disruption, inefficiency or other detrimental effect of the kinds of events, forces or factors referred to above, shall be solely the Contractor's responsibility, and may not be used as the basis for any claim by the Contractor for additional compensation.

#### Milestone Liquidated Damages Terms and Conditions

If the Contractor fails to complete, as accepted by the Engineer, the above-listed tasks and corresponding milestone on or before the August 27, 2018 Milestone Completion Date, or by an adjusted Date, if the adjustment was warranted as defined below, the Contractor will be assessed a liquidated damage charge of **\$11,600 (Eleven Thousand Six Hundred Dollars)** on the first minute of the day following the Milestone Completion Date, and shall be assessed additional liquidated damage charges at the rate of \$11,600 (Eleven Thousand Six Hundred Dollars) per day thereafter until the tasks and corresponding milestone are complete and accepted by the Engineer. The maximum assessment of Milestone Liquidated Damages shall not be capped and shall be considered separate from any Liquidated Damages assessed to the Contractor for failure to complete the project on time per Section 1.08.09 of the Form 817 Standard Specifications.

The Contractor is directed to follow the procedures of Section 1.08.08 of the Form 817 Standard Specifications for any request presented to the Engineer for an adjustment of the Milestone Completion Date for any unforeseeable causes noted in Section 1.08.08 that have resulted in the need for an adjusted date.

## **NOTICE TO CONTRACTOR - PRE-BID QUESTIONS AND ANSWERS**

Questions pertaining to DOT advertised construction projects must be presented through the CTDOT Pre-Bid Q and A Website. The Department cannot guarantee that all questions will be answered prior to the bid date. **PLEASE NOTE - at 9:00 am Monday (i.e. typical Wednesday Bid Opening) the project(s) being bid will be closed for questions, at which time questions can no longer be submitted through the Q and A Website.**

**Answers may be provided by the Department up to 12:00 noon, the day before the bid. At this time, the Q and A for those projects will be considered final, unless otherwise stated and/or the bid is postponed to a future date and time to allow for further questions and answers to be posted.**

If a question needs to be asked the day before the bid date, please contact the Contracts Unit staff and email your question to [dotcontracts@ct.gov](mailto:dotcontracts@ct.gov) immediately.

Contractors must identify their company name, contact person, contact email address and phone number when asking a question. The email address and phone number will not be made public.

The questions and answers (if any) located on the Q and A Website are hereby made part of the bid/contract solicitation documents (located on the State Contracting Portal), and resulting contract for the subject project(s). It is the bidder's responsibility to monitor, review, and become familiar with the questions and answers, as with all bid requirements and contract documents, prior to bidding. By signing the bid proposal and resulting contract, the bidder acknowledges receipt of, and agrees to the incorporation of the final list of Q and A, into the contract document.

Contractors will not be permitted to file a future claim based on lack of receipt, or knowledge of the questions and answers associated with a project. All bidding requirements and project information, including but not limited to contract plans, specifications, addenda, Q and A, Notice to Contractors, etc., are made public on the State Contracting Portal and/or the CTDOT website.

## **NOTICE TO CONTRACTOR – COORDINATION WITH UTILITIES**

The Contractor is herein notified that utility relocations are part of the project and close coordination with all utilities involved will be required for this project.

Utility pole relocations are required for poles carrying Eversource, Cablevision and The Southern New England Telephone.

The plan sheets are intended to show proposed work and utility installations to be done by the various utility companies both before, during and/or after the life of this contract but not depict all work to be done. In addition to the work indicated on these plans, the utility companies may make adjustment to or remove their installations other than those indicated on the plans or may install facilities not indicated. It is the Contractor's responsibilities to make himself/herself aware of the proposed utility work, anticipated utility schedule, the effect the work will have on the construction schedule and coordinate with the utility company schedule.

The following representatives shall be contacted by the Contractor to coordinate all work pertaining to the water main protection and support systems, and overhead utilities:

Mr. Dominick M. DiGangi, P.E., Esq.  
First District Water Department  
General Manager  
12 New Canaan Avenue – P.O. Box 27  
Norwalk, CT 06852-0027  
Phone: (203) 847-7387  
Email: [Ddigangi@firstdistrictwater.org](mailto:Ddigangi@firstdistrictwater.org)

Mr. Craig McLeod  
Cablevision of Litchfield, Inc.  
Director – HFC Infrastructure & Fiber  
622 Torrington Road  
Litchfield, CT 06759  
Phone: 732-243-6277  
Email: [cmcleod@cablevision.com](mailto:cmcleod@cablevision.com)

Ms. Jan Possidente-Russo  
The Southern New England Telephone Company dba Frontier Communications of  
Connecticut  
Manager – Conduit Construction Group  
1441 North Colony Road  
Meriden, CT 06450  
Phone: 203-383-6645  
Email: [jan.possidente-russo@ftr.com](mailto:jan.possidente-russo@ftr.com)

Mr. Mark E. Bonjuklian  
Eversource Energy – Electric Distribution  
Supervisor – Construction Engineering  
626 Glenbrook Road  
Stamford, CT 06906  
Phone: 203-352-5412  
Email: mark.bonjuklian@eversource.com

The Contractor shall hold a meeting after award of the project, prior to construction, with all parties that have utility facilities within the limits of the contract. Any additional contacts can be found on the CTDOT Utilities Section webpage:

<http://www.ct.gov/dot/cwp/view.asp?a=3196&q=300826>

## **NOTICE TO CONTRACTOR – DEPARTMENT’S ARCHITECTURAL HISTORIAN**

The Contractor is hereby notified that the Department of Transportation’s “National Register Specialist, Architectural Historian”, herein referenced as the “Department’s Architectural Historian”, shall be permitted to evaluate the work performed on this project and shall be provided with the same level of access to the work as that provided to the Department’s inspection staff.

The Department’s Architectural Historian will have project involvement including, but not limited to, the following:

- Recommend areas on the bridge as acceptable trial panels for the demonstration of cleaning methods.
- Recommend areas on the bridges from which the Contractor is to take core samples
- Evaluate and recommend approval of mock-ups that demonstrate the expertise of Contractor personnel with respect to the application and finishing techniques of concrete repair material
- Evaluate and recommend approval of mock-ups for matching of color, texture, and finish repair materials to historic concrete
- Review and recommend approval of proposed concrete mixes submitted by the Contractor in accordance with the “Class ‘S’ Concrete for Historic Bridges” and “Class ‘C’ Concrete – Replicated” special provisions.
- Assist the Engineer in determining what color-match sample is the best match for a given repair location
- Assist the Engineer and/or Designer with general issues that arise concerning the preservation/restoration of the bridges

## **NOTICE TO CONTRACTOR – HAZARDOUS MATERIALS INVESTIGATIONS**

Limited hazardous materials site investigations have been conducted at Bridge No. 00722, West Rocks Road over Route 15, in Norwalk, Connecticut. The scope of inspections were limited to the representative components projected for impact.

Results of the survey identified lead paint to be present on the structural steel/metal/railing bridge components of Bridge No. 00722. No detectable amounts of lead in paint were identified on the concrete walls/abutments.

Results obtained from TCLP waste stream sampling and analysis for leachable lead from the paint on the structural steel/metal bridge/railing components characterized the paint waste stream at Bridge No. 00722 as CTDEEP/RCRA hazardous waste. Since there were no detectable amounts of lead in paint identified on the concrete walls/abutments, any paint waste stream generated would be non-hazardous, non-RCRA lead waste.

All steel and metal generated from work tasks (painted or not) shall be segregated and recycled as scrap metal at a scrap metal recycling facility. The recycling of scrap metal (regardless of lead paint concentration) is exempt from USEPA RCRA and CTDEEP Hazardous Waste Regulation.

At Bridge No. 00722, grey rubbery expansion joint caulking on the abutments, turrets and beneath deck were sampled and found to contain no detectable amounts of asbestos.

No bird/pigeon guano accumulations were observed in accessible areas of the bridge.

The Contractor is hereby notified that these hazardous materials requiring special management or disposal procedures will be encountered during various construction activities conducted within the project limits. The Contractor will be required to implement appropriate health and safety measures for all construction activities impacting these materials. These measures shall include, but are not limited to, air monitoring, engineering controls, personal protective equipment and decontamination, equipment decontamination and personnel training. **WORKER HEALTH AND SAFETY PROTOCOLS WHICH ADDRESS POTENTIAL AND/OR ACTUAL RISK OF EXPOSURE TO SITE SPECIFIC HAZARDS ARE SOLELY THE RESPONSIBILITY OF THE CONTRACTOR.**

The Department, as Generator, will provide an authorized representative to sign all manifests and waste profile documentation required by disposal facilities for disposal of hazardous materials.

The Sections which shall be reviewed by the Contractor include, but are not limited to, the following:

- Item No. 0020903A – Lead Compliance for Miscellaneous Exterior Tasks

The Contractor is alerted to the fact that a Department environmental consultant may be on site for abatement and related activities, to collect environmental samples (if necessary), and to observe site conditions for the State.

Information pertaining to the results of the limited hazardous materials investigation discussed can be found in the document listed below. This document shall be available for review at the Office of Contracts, 2800 Berlin Turnpike, Newington, Connecticut.

- HazMat Inspection Letter, Bridge No. 00722, West Rocks Road over Route 15, Norwalk, CT, June 21, 2017.

## **NOTICE TO CONTRACTOR – HISTORICAL GUIDELINES FOR THE MERRITT PARKWAY BRIDGES**

### Informational Overview: Historical Significance of the Merritt Parkway Bridges

The Merritt Parkway and its bridges were named to the National Register of Historic Places in 1991. One of the outcomes of this designation was the development of the “Merritt Parkway Bridge Restoration Guide” completed in 2002 as part of the “Conservation and Restoration Plan” for the Parkway. The “Guide” provides a “Restoration Philosophy” for the bridges, as well as an “Existing Conditions Evaluation”, and “Restoration Guidelines”. The Restoration Guidelines include Intent, Criteria, and Priority for Restoration, Materials and Restoration Techniques, and Guideline Specifications. The Guideline Specifications, and the Merritt Parkway Bridge Restoration Guide as a whole, were used to develop the cleaning, testing, graffiti removal, and concrete repair and restoration specifications of this project.

The rehabilitation language of the Guide was in part developed based on the Secretary of the Interior’s “Standards for Rehabilitation” which state:

1. A property shall be used for its historic purpose or be placed in a new use that requires minimal change to the defining characteristics of the building and its site and environment.
2. The historic character of a property shall be retained and preserved. The removal of historic materials or alteration of features and spaces that characterize a property shall be avoided.
3. Each property shall be recognized as a physical record of its time, place, and use. Changes that create a false sense of historical development, such as adding conjectural features or architectural elements from other buildings, shall not be undertaken.
4. Most properties change over time; those changes that have acquired historic significance in their own right shall be retained and preserved.
5. Distinctive features, finishes, and construction techniques or examples of craftsmanship that characterize a property shall be preserved.
6. Deteriorated historic features shall be repaired rather than replaced. Where the severity of deterioration requires replacement of a distinctive feature, the new feature shall match the old in design, color, texture, and other visual qualities and, where possible, materials. Replacement of missing features shall be substantiated by documentary, physical, or pictorial evidence.
7. Chemical or physical treatments, such as sandblasting, that cause damage to historic materials shall not be used. The surface cleaning of structures, if appropriate, shall be undertaken using the gentlest means possible.
8. Significant archeological resources affected by a project shall be protected and preserved. If such resources must be disturbed, mitigation measures shall be undertaken.



9. New additions, exterior alterations, or related new construction shall not destroy historic materials that characterize the property. The new work shall be differentiated from the old and shall be compatible with the massing, size, scale, and architectural features to protect the historic integrity of the property and its environment.

10. New additions and adjacent or related new construction shall be undertaken in such a manner that if removed in the future, the essential form and integrity of the historic property and its environment would be unimpaired.

## **NOTICE TO CONTRACTOR – REPLACEMENT AND PROTECTION OF UTILITIES**

Existing or relocated utilities shall be maintained and protected during construction. The Contractor shall verify the location of underground and overhead utilities within the project limits. Construction work within the vicinity of utilities shall be performed in accordance with current safety regulations.

Representatives of the various utility companies shall be allowed access to the work, by the Contractor. Refer to Notice to Contractor – Coordination with Utilities for contact information for each utility.

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 the information shown on the plans or contained elsewhere in the specifications.

In order to notify utility companies, the number 1-800-922-4455 (Call Before You Dig), in accordance with Section 16-345 of the Regulations of the Department of Utility Control, must be called at least forty-eight (48) hours prior to the start of excavation. This notification will enable the utility companies to mark out their facilities in the field.

The Contractor shall enter the location prior to closure of the roadway and relocation and support the existing water main in accordance with Special Provisions. All work to replace the existing water main shall be coordinated with First Taxing District Water Department.

The Contractor shall be liable for all damages or claims received or sustained by any persons, corporations or property in consequence of damage to the existing utilities, their appurtenances, or other facilities cause directly or indirectly by the operations of the Contract. The Contractor shall have a contingency plan in place should the Utilities fail due to the Contractor's operations.

The Contractor shall consider in his bid any inconvenience and work required for this condition. The work to repair or replace any damage caused by the Contractor's operations will be made solely at the Contractor's expense.

The Contractor shall support and protect the new temporary 6-inch high density polyethylene water main, and provide First Taxing District Water Department support system design plans and calculations to review and approve prior to construction. The proposed temporary water main support is a structure that spans the Merritt Parkway with a minimum vertical clearance of 16'-6" from the top of roadway. Once approved, a stamped copy shall be provided to the State.

The Contractor shall support and protect the new permanent 12-inch high density polyethylene water main, as shown on the plans.

**NOTICE TO CONTRACTOR – USE OF STATE POLICE OFFICERS**

The Department will reimburse services of State Police Officers as a direct payment to the Department of Emergency Services and Public Protection. Payment for State Police Officers utilized by the Contractor for its convenience, not approved by the Engineer, is the responsibility of the Contractor. No separate payment item for State Police Officers is included in this contract.

Any costs associated with coordination and scheduling of State Police Officers will be included under the cost of Item No. 0971001A – Maintenance and Protection of Traffic.

## **NOTICE TO CONTRACTOR – SUBMITTALS**

It is recommended that the Contractor develop and submit all Working Drawings and Shop Drawings to the Department for review and approval a minimum of three (3) months prior to the closure of West Rocks Road to avoid any delay in construction. Where submittals are noted within the special provisions to be forwarded, “Bridge Designer” and “Department’s Architectural Historian” addresses are as follows:

For submittals to the “Bridge Designer”, send to:

Ms. Mary Baker  
Principal Engineer – Bridge Design, Rm 3313  
Department of Transportation  
P.O. Box 317546  
2800 Berlin Turnpike  
Newington, CT 06131-7546

Send email correspondence to Mr. Sarwat A. Basha at: Sarwat.Basha@ct.gov

For submittals to the “Department’s Architectural Historian”, send to:

Mr. Mark McMillan  
Architectural Historian, Preservation Specialist  
Office of Environmental Planning  
Department of Transportation  
P.O. Box 317546  
2800 Berlin Turnpike,  
Newington, CT 06131-7546

Send email correspondence to: Mark.McMillan@ct.gov

## **NOTICE TO CONTRACTOR – UTILITY GENERATED SCHEDULE**

The attached project specific utility work schedules were provided to the Connecticut Department of Transportation (Department) by the utility companies regarding their identified work on this project.

The utility scheduling information is provided to assist the Contractor in scheduling its activities. However, the Department does not ensure its accuracy and Section 1.05.06 of the Standard Specifications still is in force.

The utility scheduling information shall be incorporated into the Contractor's pre-award schedule in accordance with the Department's Bidding and Award Manual and Section 1.05.08 of the Contract.

After award, the Contractor shall conduct a utility coordination meeting or meetings to obtain contemporaneous scheduling information from the utilities prior to submitting its baseline schedule to the Department in accordance with Section 1.05.08 of the Contract.

The Contractor shall incorporate the contemporaneous utility scheduling information into its baseline schedule submittal. The baseline schedule shall include Contractor predecessor and successor activities to the utility work in such detail as acceptable to the Engineer.

<b>UTILITY WORK SCHEDULE</b> Rev 3/2015			
CTDOT Project Number:	102-356	Town:	NORWALK
Project Description: REHABILITATION OF BRIDGE 00722- WEST ROCKS RD			
CTDOT Utilities Engineer:		Xiuyun Cai	
Phone:	860-594-3269	Email:	Xiuyun.Cai@ct.gov
Utility Company:		Eversource Energy (Electric)	
Prepared By:		Date Prepared: 2/23/2017	
Phone:	(203) 352-5409	Email:	robert.mercurrio@eversource.com
Scope of Work			
<p>The following is a description of all utility work planned to be completed in conjunction with the CTDOT project. The narrative describes all work to be carried out by the utility or its contractor, including temporary and permanent work required by the project as well as any additional utility infrastructure work the utility intends on performing within the project limits during the construction of the project.</p>			
<p>Stage 1: Eversource shall relocate its facilities (poles, electric wires..etc) to the west side of Bridge 00722, as agreed on by CDOT. Eversource's electrical lines shall be a minimum of 30' away from the face of the Bridge, crossing RT 15 with over head lines from south to north, during the rehabilitation of this Bridge.</p> <p style="text-align: right;">Stage 2 :</p> <p>Eversource shall relocate its facilities back over the Bridge, crossing the Bridge diagonally, as mandated by CDOT.</p>			
Special Considerations and Constraints			
<p>The following describes the limiting factors that must be planned for in the scheduling and performance of the utility work. For example, restrictions on cut-overs, outages, limitations on customer service interruptions (e.g. nights, weekends, holidays), seasonal and environmental shutdown periods, long lead material procurements, etc..</p>			
<p>CDOT has agreed to do the tree trimming, sufficient to run 3 phase electrical lines for temporary and permanent relocation. Install / removal of lines over head on route 15 will require special shut down of RT 15 at night, 3 week notification to State Police is required.</p>			

**UTILITY WORK SCHEDULE** Rev 3/2015

CTDOT Project Number: **102-356 TEMP RELOC#**  
 Utility Company: **EVERSOURCE ENERGY**  
 Prepared By: **ROB MERCURIO** Total Working Days: **55**

**Schedule**

The following schedule identifies each major activity of utility work in sequential order to be performed by the utility or its contractor. The location of each activity of work is identified by the baseline stationing on the CTDOT plans. All activities identify the predecessor activity which must be completed before a utility work activity may progress. The duration provided is the number of working days required to complete the utility work activity based on historical information and production rates.

Location (Station to Station)	Description of Utility Work Activity	Predecessor Activity	Duration (working days)
TEMP RELOCATION	ORDER MAT'L , BIDDING PROCESS AND SCHEDULING	NOTICE TO PROCEED FROM CDOT	28
TEMP RELOCATION	SET POLES /ANCHORS/PUSH BRACE	1.) AREA TO BE MARKED OUT BY CDOT. I.E. CURBLINES, STATIONS & POLE LOCATIONS. 2.)ORDER MAT'L , BIDDING PROCESS AND SCHEDULING.	5
TEMP RELOCATION	INSTALL NEW CONDUCTOR / SHIFT & RECONNECT STREET LIGHTS.	1.) CDOT TO TREE TRIM. 2.) SET POLES /ANCHORS/PUSH BRACE . 3.) POLICE SHUT DOWN OF ROUTE 15	18
TEMP RELOCATION	REMOVE OLD POLES / REMOVE CONDUCTOR	ALL UTILITIES SHIFTED OFF OF POLES / CONDUCTOR INSTALLED AND ENERGIZED	4

**UTILITY WORK SCHEDULE** Rev 3/2015

CTDOT Project Number: **102-356 TEMP RELOC**  
 Utility Company: **EVERSOURCE ENERGY**  
 Prepared By: **ROB MERCURIO** Total Working Days: **54**

**Schedule**

The following schedule identifies each major activity of utility work in sequential order to be performed by the utility or its contractor. The location of each activity of work is identified by the baseline stationing on the CTDOT plans. All activities identify the predecessor activity which must be completed before a utility work activity may progress. The duration provided is the number of working days required to complete the utility work activity based on historical information and production rates.

Location (Station to Station)	Description of Utility Work Activity	Predecessor Activity	Duration (working days)
PERM RELOCATION	ORDER MAT'L , BIDDING PROCESS AND SCHEDULING	FORMAL CDOT NOTIFICATION TO RELOCATE POLE OVER REHABED BRIDGE.	25
PERM RELOCATION	SET POLES /ANCHORs	ORDER MAT'L , BIDDING PROCESS AND SCHEDULING.	5
PERM RELOCATION	INSTALL NEW CONDUCTOR / SHIFT & RECONNECT STREET LIGHTS.	1.) CDOT TO TREE TRIM. 2.) SET POLES /ANCHORs	6
PERM RELOCATION	REMOVE OLD POLES / REMOVE CONDUCTOR	1.) INSTALL NEW CONDUCTOR / SHIFT & RECONNECT STREET LIGHTS. 2.) POLICE SHUT DOWN OF ROUTE 15	18



rev. 5/20/2013		UTILITY WORK SCHEDULE	
CTDOT Project Number:	102-356	Town:	Norwalk
Project Description:	Facility Relocation for Bridge Rehabilitation		
CTDOT Utilities Engineer:	Xiuyun Cai		
Phone:	860-594-33269	Email:	Xiuyun.Cai@ct.gov
Utility Company:	Frontier Communications		
Prepared By:	Rob Recupero	Date Prepared:	2/1/2017
Phone:	203-378-9022	Email:	robert.d.recupero@ftr.com
Scope of Work			
<p>The following is a description of all utility work planned to be completed in conjunction with the CTDOT project. The narrative describes all work to be carried out by the utility or its contractor, including temporary and permanent work required by the project as well as any additional utility infrastructure work the utility intends on performing within the project limits during the construction of the project.</p>			
<p><b>TEMPORARY RELOCATIONS (STAGE 1)</b>                      P13160 Thru P1190 Place 2 10M Strands to Temporary Poles for Relocation                      P13160 to New P13161, Pole#Temp, P12206, P14565, P1190 Place 2-10M Down Guys Each Location                      P13160 Thru P1190 Shift BKTA-600 to Temporary Poles for Relocation                      P13160 Thru P1190 Shift Innerduct and Fiber-024 to Temp Poles for Relocation                      P13160 Thru P1190 Remove Old Strand From Original Locations</p> <p><b>PERMANENT RELOCATIONS (STAGE 2)</b>                      P13160 Thru P1190 Place 2 10M Strands to Permanent Poles for Relocation                      P13160 to P13161, New P12206, to P1190 Place 2-10M Down Guys Each Location                      P13160 Thru P1190 Shift BKTA-600 to Permanent Poles for Relocation                      P13160 Thru P1190 Shift Innerduct and Fiber-024 to Permanent Poles for Relocation                      P13160 Thru P1190 Remove Old Strand and Down Guys From Temporary Locations                      P12206 Cut Out Slack BKTA-600, Replace Terminal, Recon Drop Wires to P14565</p>			
Special Considerations and Constraints			
<p>The following describes the limiting factors that must be planned for in the scheduling and performance of the utility work. For example, restrictions on cut-overs, outages, limitations on customer service interruptions (e.g. nights, weekends, holidays), seasonal and environmental shutdown periods, long lead material procurements, etc..</p>			
<p>Frontier requires final grade to be within 1' before poles/anchors are set.                      Frontier requires necessary road markings (edge of curb, sidewalk etc) to be marked in field prior to pole/anchor placement                      These plans are based on plans provided. Actual conditions may require changes to proposed changes and work schedule. All schedules are based on the availability of work crews, delays may occur due to customer demand. Contractor to provide two week lead time for each occurrence. If Frontier forces are delayed for reasons other than their own and have to pull off the job site, another 2 week lead time is required.</p>			

UTILITY WORK SCHEDULE			
CTDOT Project Number:		102-356	
Utility Company:		Frontier Communications	
Prepared By:		Rob Recupero	
		Total Calendar Days:	27
Schedule			
The following schedule identifies each major activity of utility work in sequential order to be performed by the utility or its contractor. The location of each activity of work is identified by the baseline stationing on the CTDOT plans. All activities identify the predecessor activity which must be completed before a utility work activity may progress. The duration provided is the number of calendar days required to complete the utility work activity based on historical information and production rates.			
Location (Station to Station)	Description of Utility Work Activity	Predecessor Activity	Duration (calendar days)
P13160 TO P1190	P13160 to P1190 PLACE 2-10M STRANDS TO TEMPORARY POLES FOR RELOCATION	POLES PLACED. POWER, CATV, CLEC, ON NEW POLES.	3
P13160 TO P1190	PLACE 2-10M DOWN GUYS AT POLES 13160, 1190, 14565, P#TEMP, TEMP POLES 12206, 13161	POLES PLACED. POWER, CATV, CLEC, ON NEW POLES.	2
P13160 TO P1190	SHIFT BKTA-600 TO TEMPORARY POLES	POLES PLACED. POWER, CATV, CLEC, ON NEW POLES.	3
P13160 TO P1190	SHIFT FIBER-024 AND INNERDUCT TO TEMPORARY POLES	POLES PLACED. POWER, CATV, CLEC, ON NEW POLES.	3
P13160 TO P1190	REMOVE OLD STRAND FROM ORIGINAL LOCATIONS	POLES PLACED. POWER, CATV, CLEC, ON NEW POLES.	1
P13160 TO P1190	PLACE 2-10M STRANDS TO PERMANENT POLES	POLES PLACED. POWER, CATV, CLEC, ON NEW POLES.	3
P13160 TO P1190	P13160 TO NEW POLES 13161, 12206, TO P1190 PLACE 2-10M DOWN GUYS EACH LOCATION	POLES PLACED. POWER, CATV, CLEC, ON NEW POLES.	2
P13160 TO P1190	SHIFT BKTA-600 TO PERMANENT POLES	POLES PLACED. POWER, CATV, CLEC, ON NEW POLES.	3
P13160 TO P1190	SHIFT FIBER-024 AND INNERDUCT TO PERMANENT POLES	POLES PLACED. POWER, CATV, CLEC, ON NEW POLES.	3
P13160 TO P1190	REMOVE OLD STRAND AND DOWN GUYS FROM TEMPORARY LOCATIONS	POLES PLACED. POWER, CATV, CLEC, ON NEW POLES.	1
P13160 TO P1190	CUT OUT SLACK BKTA-600, REPLACE TERMINAL, RECON DROPS TO P14565	POLES PLACED. POWER, CATV, CLEC, ON NEW POLES.	3



<b>UTILITY WORK SCHEDULE Rev 08 02 2016</b>			
CTDOT Project Number:	102-356	Town:	Norwalk
Project Description: Rehabilitation of Bridge# 00722 West Rocks Rd over Rte 15 Merritt Pkwy			
CTDOT Utilities Engineer: Xiuyun Cai			
Phone:	8605943269	Email:	xiuyun.cai@ct.gov
Utility Company: Optimum			
Prepared By:	Dave Stofko	Date Prepared:	
Phone:	(203) 696-4768	Email:	dstofko@cablevision.com
<b>Scope of Work</b>			
<p>The following is a description of all utility work planned to be completed in conjunction with the CTDOT project. The narrative describes all work to be carried out by the utility or its contractor, including temporary and permanent work required by the project as well as any additional utility infrastructure work the utility intends on performing within the project limits during the construction of the project.</p>			
<p>Optimum will be relocating it's strand &amp; fiber cables to the West side of the bridge for Phase 1 (temporary), this will require the rebuild of our strand along the temporary pole line, the transfer of our existing fiber cables and the wreckout of the old strand. In Phase 2 we will be returning to our original position on the East side of the bridge along the permanent pole line.</p>			
<b>Special Considerations and Constraints</b>			
<p>The following describes the limiting factors that must be planned for in the scheduling and performance of the utility work. For example, restrictions on cut-overs, outages, limitations on customer service interruptions (e.g. nights, weekends, holidays), seasonal and environmental shutdown periods, long lead material procurements, etc..</p>			
<p>Any time frame given as a Start Time or Duration of Work can be affected by make ready work required prior to start of job, coordination with other utilities, permit applications (State &amp; Municipality, if required), changes in scope of work, inclement weather, lockdown days (e.g. holidays &amp; sporting events) and emergency situations. If placement of new fiber is required, the notification process for customers directly affected by this work cannot begin until the new fiber has been placed, cold spliced and tested; and it can take several weeks or longer for customer approval to transfer traffic to the new fiber.</p>			

UTILITY WORK SCHEDULE Rev 3/2015			
CTDOT Project Number:			
Utility Company: Optimum			
Prepared By: Dave Stofko		Total Working Days: 34	
Schedule			
The following schedule identifies each major activity of utility work in sequential order to be performed by the utility or its contractor. The location of each activity of work is identified by the baseline stationing on the CTDOT plans. All activities identify the predecessor activity which must be completed before a utility work activity may progress. The duration provided is the number of working days required to complete the utility work activity based on historical information and production rates.			
Location (Station to Station)	Description of Utility Work Activity	Predecessor Activity	Duration (working days)
50+00 - 55+00	Install strand along temporary pole line.	Power has relocated and all utilities (if any) above Optimum are clear.	2
50+00 - 55+00	Move fibers from existing pole line to temporary		14
50+00 - 55+00	Wreck out of old strand		1
50+00 - 55+00	Install strand along permanent pole line.		2
50+00 - 55+00	Move fibers from temporary pole line to permanent		14
50+00 - 55+00	Wreck out of old strand		1

## **NOTICE TO CONTRACTOR – EQUIPMENT OPERATION AND PROTECTION**

All trucks using any road designated as a Parkway must be equipped with two (2) amber strobe type flashers, visible from the rear only and with two (2) reflectorized slow moving vehicle triangles 14”Hx16”W mounted on the rear of the truck. The lights must show the full overall width of the vehicle and each shall be mounted on a hinged or telescoping post, so that the center of the light will not be less than 10 ft. above the ground when in an operating position. This signal system shall be in operation continuously while the vehicle is on the Parkway travelway.

During the course of the project and in accordance with Section 14-298-237(b) of the State Traffic Commission Regulations, the Contractor’s trucks and equipment may be authorized by the Engineer to travel over the portions of the Parkway from which they are normally excluded. However, it must be noted that no authorization will be given until;

- 1) The Contractor has contacted the Department’s Oversize/Overweight Permit Section at (860) 594-2880 and verified that the structures on the Parkway that he is planning to traverse with his equipment have sufficient vertical clearance and/or weight carrying capacity.
- 2) Each vehicle has been inspected by the Engineer and found to conform to the specifications herein.

Each driver of such equipment shall be given instructions by the Contractor concerning the manner of operation while on the Parkway. All vehicles shall be limited in travel between the nearest interchange and the work site.

The Engineer reserves the right to revoke authorization if the Contractor fails to abide by the regulations herein prescribed. The Contractor will not be permitted to park equipment on the median strip and will not be permitted to cross the median strip without specific permission of the Engineer.

**NOTICE TO CONTRACTOR – GLOBAL POSITIONING SYSTEM (GPS)  
COORDINATES FOR SIGNS**

The Contractor shall obtain and provide to the Engineer sign installation data, including Global Positioning System (GPS) latitude and longitude coordinates, for all new State owned and maintained signs. The Engineer shall forward the sign data to the Division of Traffic Engineering for upload into the Highway Sign Inventory and Maintenance Management Program (SIMS). Contact Mr. Barry A. Schilling at (860) 594-2769 of the Division of Traffic Engineering regarding any SIMS or GPS questions. Refer to the special provision for Section 12.00 General Clauses For Highway Signing.

**NOTICE TO CONTRACTOR - CONSTRUCTION CONTRACTOR**  
**DIGITAL SUBMISSIONS**

Upon execution of the Contract, the Contractor acknowledges and agrees that contractual submittals for this Project shall be submitted and handled through a system of paperless electronic means as outlined in the special provision for Section 1.05 herein.

Shop drawings, working drawings, and product data shall be created, digitally signed and delivered by the Contractor in accordance with the Department's [Contractor Digital Submission Manual](#) (CDSM). The Department and the Contractor shall use Bentley System's "ProjectWise Deliverables Management" to deliver and track such submittals. Other deliverables that are required by other special provisions shall be similarly submitted.

Access credentials will be provided by the Department. Contact information and routing details, such as email addresses, will also be provided.

The Department shall not be held responsible for delays, lack of processing or response to submittals that do not follow the specified guidelines in the CDSM.



**NOTICE TO CONTRACTOR – MINIMUM CONCRETE COMPRESSIVE STRENGTH**

The concrete strength or allowable design stress specified in the General Notes is for design purposes only. The minimum compressive strength of concrete in constructed components shall comply with the requirements of Section 6.01 Concrete for Structures.

**NOTICE TO CONTRACTOR – USE OF STATE POLICE OFFICERS**

The Department will reimburse services of State Police Officers as a direct payment to the Department of Emergency Services and Public Protection. Payment for State Police Officers utilized by the Contractor for its convenience, not approved by the Engineer, is the responsibility of the Contractor. No separate payment item for State Police Officers is included in this contract.

Any costs associated with coordination and scheduling of State Police Officers will be included under the cost of Item No. 0971001A – Maintenance and Protection of Traffic.

**SECTION 1.02 – PROPOSAL REQUIREMENTS AND CONDITIONS**

**Article 1.02.04 – Examination of Plans, Specifications, Special Provisions and Site of Work:**

*Replace the third sentence of the last paragraph with:*

The Department cannot ensure a response to inquiries received later than ten (10) days prior to the original scheduled opening of the related bid.

## **SECTION 1.05 - CONTROL OF THE WORK**

*Replace Article 1.05.02 with the following:*

### **1.05.02—Contractor Submittals, Working Drawings, Shop Drawings, Product Data, Submittal Preparation and Processing - Review Timeframes, Department’s Action:**

**1. Contractor Submittals:** The plans provided by the Department show the details necessary to give a comprehensive idea of the construction contemplated under the Contract. The plans will generally show the location, character, dimensions, and details necessary to complete the Project. If the plans do not show complete details, they will show the necessary dimensions and details, which when used along with the other Contract documents, will enable the Contractor to prepare working drawings, shop drawings or product data necessary to complete the Project.

The Contractor shall prepare submittals as Portable Document Format (PDF) files. The Contractor is also required to acquire, maintain access and use the Department’s document management system for delivery of submittals. The format, digital signing requirements, delivery processes and document tracking procedures shall be performed in accordance with this specification and the [Contractor’s Digital Submission Manual](#) (CDSM).

The submittals shall be sent to the Department’s reviewer(s), sufficiently in advance of the work detailed, to allow for their review in accordance with the review periods as specified herein (including any necessary revisions, resubmittal, and final review), and acquisition of materials, without causing a delay of the Project.

**2. Working Drawings:** When required by the Contract or when ordered to do so by the Engineer, the Contractor shall prepare and submit the working drawings, signed, sealed and dated by a qualified Professional Engineer licensed to practice in the State of Connecticut, for review. The drawings shall be delivered sufficiently in advance of the work detailed, to allow for their review in accordance with the review periods specified herein (including any necessary revisions, resubmittal, and final review).

There will be no direct payment for furnishing any working drawings, procedures or supporting calculations, but the cost thereof shall be considered as included in the general cost of the work.

The Contractor shall supply to the Assistant District Engineer a certificate of insurance in accordance with 1.03.07 at the time that the working drawings for the Project are submitted.

The Contractor’s designer, who prepares the working drawings, 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 \$2,000,000 per error or omission. The Contractor’s designer may elect to obtain a policy containing a maximum \$250,000 deductible clause, but if the Contractor’s designer should obtain a policy containing such a clause, they shall be liable to the extent of at least the deductible amount. The Contractor’s designer shall obtain the appropriate and proper

endorsement of its Professional Liability Policy to cover the indemnification clause in this Contract, as the same relates to negligent acts, errors or omissions in the Project work performed by them. The Contractor's designer shall continue this liability insurance coverage for a period of

- (i) 3 years from the date of acceptance of the work by the Engineer, as evidenced by a State of Connecticut, Department of Transportation form entitled "Certificate of Acceptance of Work," issued to the Contractor; or
- (ii) 3 years after the termination of the Contract, whichever is earlier, subject to the continued commercial availability of such insurance.

**3. Shop Drawings:** When required by the Contract, or when ordered to do so by the Engineer, the Contractor shall prepare and deliver shop drawings to the Designer for review. Review timeframes and submission locations are as specified herein.

There will be no direct payment for furnishing any shop drawings, but the cost thereof shall be considered as included in the general cost of the work.

**4. Product Data:** When required by the Contract, or when ordered to do so by the Engineer, the Contractor shall prepare and deliver product data.

The Contractor shall submit the product data in a single submittal for each element or group of elements of construction.

The Contractor shall mark each copy of the product data submittal to show applicable choices and options. Where product data includes information on several products that are not required, copies shall be marked to indicate the applicable information. Product data shall include the following information and confirmation of conformance with the Contract to the extent applicable: manufacturer's printed recommendations, compliance with recognized trade association standards, compliance with recognized testing agency standards, application of testing agency labels and seals, notation of coordination requirements, Contract item number, and any other information required by the individual Contract provisions.

There will be no direct payment for furnishing any product data, but the cost thereof shall be considered as included in the general cost of the work.

**5. Submittal Preparation and Processing – Review Timeframes:** The Contractor shall allow 30 calendar days for submittal review by the Department, from the date receipt is acknowledged by the Department's reviewer. For any submittals marked with "Revise and Resubmit" or "Rejected," the Department is allowed an additional 20 calendar days for review of any resubmissions.

An extension of Contract time will not be authorized due to the Contractor's failure to transmit submittals sufficiently in advance of the work to permit processing.

The furnishing of shop drawings, working drawings or product data, or any comments or

suggestions by the Designer or Engineer concerning shop drawings, working drawings or product data, shall not relieve the Contractor of any of its responsibility for claims by the State or by third parties, as per 1.07.10.

The furnishing of the shop drawings, working drawings and product data shall not serve to relieve the Contractor of any part of its responsibility for the safety or the successful completion of the Project construction.

**6. Department's Action:** The Designer or Engineer will review each submittal, mark each with a self-explanatory action stamp, and return the stamped submittal promptly to the Contractor. The Contractor shall not proceed with the part of the Project covered by the submittal until the submittal is marked "No Exceptions Noted" or "Exceptions as Noted" by the Designer or Engineer. The Contractor shall retain sole responsibility for compliance with all Contract requirements. The stamp will be marked as follows to indicate the action taken:

- a. If submittals are marked "No Exceptions Noted," the Designer or Engineer has not observed any statement or feature that appears to deviate from the Contract requirements. This disposition is contingent on being able to execute any manufacturer's written warranty in compliance with the Contract provisions.
- b. If submittals are marked "Exceptions as Noted" the considerations or changes noted by the Department's Action are necessary for the submittal to comply with Contract requirements. The Contractor shall review the required changes and inform the Designer or Engineer if they feel the changes violate a provision of the Contract or would lessen the warranty coverage.
- c. If submittals are marked "Revise and Resubmit," the Contractor shall revise the submittals to address the deficiencies or provide additional information as noted by the Designer or Engineer. The Contractor shall allow an additional review period as specified in 1.05.02-5.
- d. If submittals are marked "Rejected," the Contractor shall prepare and submit a new submittal in accordance with the Designer's or Engineer's notations. The resubmissions require an additional review and determination by the Designer or Engineer. The Contractor shall allow an additional review period as specified in 1.05.02-5.

## **SECTION 1.08 - PROSECUTION AND PROGRESS**

### **Article 1.08.04 - Limitation of Operations - Add 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 the described traffic operations on all project roadways as follows:

#### **Route 15**

On the following State observed Legal Holidays:

New Year's Day  
Good Friday, Easter\*  
Memorial Day  
Independence Day  
Labor Day  
Thanksgiving Day\*\*  
Christmas Day

The following restrictions also apply:

On the day before and the day after any of the above Legal Holidays.

On the Friday, Saturday, and Sunday immediately preceding any of the above Holidays celebrated on a Monday.

On the Saturday, Sunday, and Monday immediately following any of the above Holidays celebrated on a Friday.

\* From 6:00 a.m. the Thursday before the Holiday to 8:00 p.m. the Monday after the Holiday.

\*\* From 6:00 a.m. the Wednesday before the Holiday to 8:00 p.m. the Monday after the Holiday.

#### During all other times

The Contractor shall maintain and protect traffic as shown on the accompanying "Limitation of Operations" charts, which dictate the minimum number of lanes that must remain open for each day of the week.

Subject to the review and approval of the Engineer, the Contractor may be allowed to halt Route 15 traffic for a period not to exceed 10 minutes to perform contract work. The Contractor shall submit a plan for such activity and an explanation of the hardship requiring the traffic stoppage. The duration of the traffic stoppages shall be kept to an absolute minimum and such stoppages shall only be allowed between 12:01 a.m. and 5:00 a.m. on all non-Holiday days.

**Limitation of Operations Chart  
Minimum Number of Lanes to Remain Open**

Route: Merritt Parkway Northbound Location: West Rocks Road Overpass Number of Through Lanes: 2								Route: Merritt Parkway Southbound Location: West Rocks Road Overpass Number of Through Lanes: 2							
Hour Beginning	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Hour Beginning	Mon	Tue	Wed	Thu	Fri	Sat	Sun
Mid	1	1	1	1	1	1	1	Mid	1	1	1	1	1	1	1
1 AM	1	1	1	1	1	1	1	1 AM	1	1	1	1	1	1	1
2 AM	1	1	1	1	1	1	1	2 AM	1	1	1	1	1	1	1
3 AM	1	1	1	1	1	1	1	3 AM	1	1	1	1	1	1	1
4 AM	1	1	1	1	1	1	1	4 AM	1	1	1	1	1	1	1
5 AM	1	1	1	1	1	1	1	5 AM	2	2	2	2	2	1	1
6 AM	E	E	E	E	E	1	1	6 AM	E	E	E	E	E	1	1
7 AM	E	E	E	E	E	1	1	7 AM	E	E	E	E	E	1	1
8 AM	E	E	E	E	E	1	1	8 AM	E	E	E	E	E	1	1
9 AM	2	2	2	2	2	2	1	9 AM	2	2	2	2	2	2	2
10 AM	2	2	2	2	2	2	2	10 AM	2	2	2	2	2	2	2
11 AM	2	2	2	2	2	2	2	11 AM	2	2	2	2	2	2	2
Noon	2	2	2	2	2	2	2	Noon	2	2	2	2	2	2	2
1 PM	2	2	2	2	2	2	2	1 PM	2	2	2	2	2	2	2
2 PM	2	2	2	2	2	2	2	2 PM	2	2	2	2	2	2	2
3 PM	E	E	E	E	E	2	2	3 PM	E	E	E	E	E	2	2
4 PM	E	E	E	E	E	2	2	4 PM	E	E	E	E	E	2	2
5 PM	E	E	E	E	E	2	2	5 PM	E	E	E	E	E	2	2
6 PM	2	2	2	2	2	2	2	6 PM	2	2	2	2	2	2	2
7 PM	2	2	2	2	2	2	2	7 PM	1	1	1	1	2	2	2
8 PM	1	1	1	2	2	1	1	8 PM	1	1	1	1	1	1	2
9 PM	1	1	1	1	1	1	1	9 PM	1	1	1	1	1	1	2
10 PM	1	1	1	1	1	1	1	10 PM	1	1	1	1	1	1	2
11 PM	1	1	1	1	1	1	1	11 PM	1	1	1	1	1	1	1

**On Holidays and within Holiday Periods, all Hours shall be 'E.'**



**West Rocks Road**

Monday through Friday between 6:00 a.m. and 9:00 a.m. & between 3:00 p.m. and 6:00 p.m.  
Saturday and Sunday between 10:00 a.m. and 6:00 p.m.

The Contractor will be allowed to close West Rocks Road and detour traffic as shown on the Detour Plan contained in the Contract plans. The detour will be allowed for one continuous period of 13 weeks from May 29<sup>th</sup>, 2018 through August 27<sup>th</sup>, 2018 for the purpose of replacing the structure. The Contractor shall notify the Engineer at least 14 days in advance of the start of the West Rocks Road closure.

**All Other Roadways**

Monday through Friday between 6:00 a.m. and 9:00 a.m. & between 3:00 p.m. and 6:00 p.m.  
Saturday and Sunday between 10:00 a.m. and 6:00 p.m.

**Additional Lane Closure Restrictions**

It is anticipated that work on adjacent projects will be ongoing simultaneously with this project. The Contractor shall be aware of those projects and anticipate that coordination will be required to maintain proper traffic flow at all times on all project roadways, in a manner consistent with these specifications and acceptable to the Engineer.

The Contractor will not be allowed to perform any work that will interfere with traffic operations on a roadway when traffic operations are being restricted on that same roadway, unless there is at least a one mile clear area length where the entire roadway is open to traffic or the closures have been coordinated and are acceptable to the Engineer. The one mile clear area length shall be measured from the end of the first work area to the beginning of the signing pattern for the next work area.

**Night Work Restrictions**

Except for the installation of new girders and the removal of existing steel frames, the Contractor will not be allowed to perform any work on Town roadways within the project limits as follows:

Sunday through Monday between 8:00 p.m. and 7:00 a.m.  
Weekdays between 8:00 p.m. and 7:00 a.m.  
Friday through Saturday between 8:00 p.m. and 8:00 a.m.  
Saturday through Sunday between 8:00 p.m. and 9:00 a.m.

## **SECTION 1.10 - ENVIRONMENTAL COMPLIANCE**

### **In Article 1.10.03--Water Pollution Control: BEST MANAGEMENT PRACTICES**

*Add the following after Required Best Management Practices Number 13:*

14. The Contractor is hereby notified that the location of the Project occurs within a public watershed, well head protection area, aquifer protection area (APA), or sole source aquifer (SSA). The Contractor is hereby notified that the location of 102-356 occurs within one of these sensitive areas. The protected areas encompass the area of contribution and recharge for the protected resource, as depicted on the graphical map. Please note that the Office of Environmental Planning will provide the graphical map to the District after the Project has been awarded as this information is considered proprietary. As a result of this location, special requirements must be followed for cleaning machinery, storage of materials, and servicing/fueling equipment.
  - a. All Contractors and their employees must be informed of the sensitive area that they are working in. No pollutants may be discharged that could have adverse effects on the public drinking water supply. Any fuel or other hazardous chemical spills must be reported immediately to the DEEP Oil and Chemical Spills Unit at (860) 424-3338, the Department of Public Health's Drinking Water Division at (860) 509-7333, and First District Water at (203) 847-7378, **no exceptions.**

When working within the Pootatuck SSA in *Newtown* or within the Pawcatuck SSA in *North Stonington* which also encompasses areas in *Sterling*, *Stonington* and *Voluntown*, Mr. Jeff Butensky from the Environmental Protection Agency (EPA) must be contacted at (617) 918-1665. Mr. Robert Adler from the EPA must also be contacted at (617) 918-1396, if a Project is near the Rhode Island state border.

- b. Contractors must adhere to specialized cleanup procedures while working within the watershed, well head protection area, APA or SSA. No cleaning of any machinery shall be performed within one hundred (100) feet of any water body within the sensitive area.
  - i. Specifically for cleanup associated with pavers, material transfer vehicles (MTV) and concrete mixers, the Contractor must move the equipment off line onto a tarp. The tarp must be in an acceptable condition so as to prevent liquids and solids from passing through to the ground beneath, when the area is used for paving operations. The cleanup area shall have oil absorbent pads placed on the tarp. The equipment shall be cleaned over

- the absorbent pads in a manner that will allow the pads to collect any liquids that are used for cleanup.
- ii. Specifically for cleanup associated with dump trucks, a liquid tight five gallon pail shall be placed at each corner of the dump body below the lower hinges to capture any materials generated during the cleanup.
- c. All materials generated during the cleanup procedures shall be removed off-site at the end of each day and disposed of in a manner consistent with all applicable laws and regulations. These materials shall not be buried outside of the roadway limits.
  - d. Servicing and fueling of equipment shall be conducted outside of a public watershed area, APA, SSA, and/or well head protection area.
    - i. If equipment cannot be serviced and refueled outside of the watershed area, well head protection area, APA, or SSA then the Contractor shall utilize the proper spoils handling areas that are identified on the plans.
    - ii. Servicing and fueling of equipment is not permitted within a 500 foot radius of a non-community well and within a 1000 foot radius of a community well.
    - iii. Any fuel and/or hazardous materials that must be kept within these sensitive areas during working hours shall be stored in an enclosed spill proof container.
    - iv. Spill containment systems must be utilized during fueling operations, and shall be manufactured by Sentry Lite Berms, Collapse-a-tainer, or approved equal. It shall have a minimum capacity of 80-gallons and shall be made of plastic or vinyl which is inert to all fuel types.
    - v. Fuel spill remediation kits shall be stored on-site so that spills may be contained and cleaned quickly.
  - e. Construction staging and laydown areas are prohibited within a watershed area, APA, SSA, and/or well head protection area. The Contractor shall submit to the Engineer the desired location of trailer(s), construction staging/laydown areas, containment systems, and sedimentation control systems for review and approval prior to the start of construction.
  - f. Millings may be re-used as asphalt material. Disposal of excess millings must be performed off-site in a manner consistent with all applicable laws and regulations. At no time can millings be dumped or buried outside of the roadway limits.

## **SECTION 4.06 - BITUMINOUS CONCRETE**

Section 4.06 is being deleted in its entirety and replaced with the following:

### **4.06.01—Description**

### **4.06.02—Materials**

### **4.06.03—Construction Methods**

### **4.06.04—Method of Measurement**

### **4.06.05—Basis of Payment**

**4.06.01—Description:** Work under this section shall include the production, delivery, placement, and compaction of an uniform textured, non-segregated, smooth bituminous concrete pavement to the grade and cross section shown on the plans.

The terms listed below as used in this specification are defined as:

Bituminous Concrete: A composite material consisting of prescribed amounts of asphalt binder, and aggregates. Asphalt binder may also contain additives engineered to modify specific properties and/or behavior of the composite material. References to bituminous concrete apply to all of its forms, such as those identified as hot-mix asphalt (HMA), or polymer-modified asphalt (PMA).

Bituminous Concrete Plant (Plant): A structure where aggregates and asphalt binder are combined in a controlled fashion into a bituminous concrete mixture suitable for forming pavements and other paved surfaces.

Course: A continuous layer (a lift or multiple lifts) of the same bituminous concrete mixture placed as part of the pavement structure.

Density Lot: The total tonnage of all bituminous concrete placed in a single lift and as defined in Article 4.06.03.

Disintegration: Erosion or fragmentation of the pavement surface which can be described as polishing, weathering-oxidizing, scaling, spalling, raveling, or formation of potholes.

Dispute Resolution: A procedure used to resolve conflicts between the Engineer and the Contractor's test results that may affect payment.

Hot Mix Asphalt (HMA): A bituminous concrete mixture typically produced at 325°F.

Job Mix Formula (JMF): A recommended aggregate gradation and asphalt binder content to achieve the required mixture properties.

Lift: An application of a bituminous concrete mixture placed and compacted to a specified thickness in a single paver pass.

Percent Within Limits (PWL): The percentage of the lot falling between the Upper Specification Limit (USL) and the Lower Specification Limit (LSL).

Polymer-Modified Asphalt (PMA): A bituminous concrete mixture containing a polymer modified asphalt binder and using a qualified warm mix technology.

Production Lot: The total tonnage of a bituminous concrete mixture from a single source that may receive an adjustment.

Production Sub Lot: Portion of the production lot typically represented by a single sample.

Quality Assurance (QA): All those planned and systematic actions necessary to provide ConnDOT the confidence that a Contractor will perform the work as specified in the Contract.

Quality Control (QC): The sum total of activities performed by the vendor (Producer, Manufacturer, and Contractor) to ensure that a product meets contract specification requirements.

Superpave: A bituminous concrete mix design used in mixtures designated as “S\*” Where “S” indicates Superpave and \* indicates the sieve related to the nominal maximum aggregate size of the mix.

Segregation: A non-uniform distribution of a bituminous concrete mixture in terms of gradation, temperature, or volumetric properties.

Warm Mix Asphalt (WMA) Technology: A qualified additive or technology that may be used to produce a bituminous concrete at reduced temperatures and/or increase workability of the mixture.

**4.06.02—Materials:** All materials shall conform to the requirements of Section M.04.

**1. Materials Supply:** The bituminous concrete mixture must be from one source of supply and originate from one Plant unless authorized by the Engineer.

**2. Recycled Materials:** Reclaimed Asphalt Pavement (RAP), Crushed Recycled Container Glass (CRCG), Recycled Asphalt Shingles (RAS), or crumb rubber (CR) from recycled tires may be incorporated in bituminous concrete mixtures in accordance with Project Specifications.

**4.06.03—Construction Methods:**

**1. Material Documentation:** All vendors producing bituminous concrete must have Plants with automated vehicle-weighting scales, storage scales, and material feeds capable of producing a delivery ticket containing the information below.

- a. "State of Connecticut" printed on ticket.
- b. Name of producer, identification of Plant, and specific storage silo if used.
- c. Date and time.
- d. Mixture Designation; Mix type and level Curb mixtures for machine-placed curbing must state "curb mix only".
- e. If WMA Technology is used, the additive name and dosage rate or water injection rate must be listed.
- f. Net weight of mixture loaded into the vehicle (When RAP and/or RAS is used the moisture content shall be excluded from mixture net weight).
- g. Gross weight (equal to the net weight plus the tare weight or the loaded scale weight).
- h. Tare weight of vehicle (Daily scale weight of the empty vehicle).
- i. Project number, purchase order number, name of Contractor (if Contractor other than Producer).
- j. Vehicle number - unique means of identification vehicle.
- k. For Batch Plants, individual aggregate, recycled materials, and virgin asphalt max/target/min weights when silos are not used.
- l. For every mixture designation the running daily total delivered and sequential load number.

The net weight of mixture loaded into the vehicle must be equal to the cumulative measured weights of its components.

The Contractor must notify the Engineer immediately if, during production, there is a malfunction of the weight recording system in the automated Plant. Manually written tickets containing all required information will be allowed for no more than one hour.

The State reserves the right to have an inspector present to monitor batching and /or weighing operations.

**2. Transportation of Mixture:** The mixture shall be transported in vehicles that are clean of all foreign material, excessive coating or cleaning agents, and, that have no gaps through which mixture might spill. Any material spilled during the loading or transportation process shall be quantified by re-weighing the vehicle. The Contractor shall load vehicles uniformly so that segregation is minimized. Loaded vehicles shall be tightly covered with waterproof covers acceptable to the Engineer. Mesh covers are prohibited. The cover must minimize air infiltration. Vehicles found not to be in conformance shall not be loaded.

Vehicles with loads of bituminous concrete being delivered to State projects must not exceed the statutory or permitted load limits referred to as gross vehicle weight (GVW). The Contractor shall furnish a list and allowable weights of all vehicles transporting mixture.

The State reserves the right to check the gross and tare weight of any vehicle. If the gross or tare weight varies from that shown on the delivery ticket by more than 0.4 percent, the Engineer will recalculate the net weight. The Contractor shall correct the discrepancy to the satisfaction of the Engineer.

If a vehicle delivers mixture to the project and the delivery ticket indicates that the vehicle is overweight, the load may not be rejected but a “Measured Weight Adjustment” will be taken in accordance with Article 4.06.04.

Vehicle body coating and cleaning agents must not have a deleterious effect on the mixture. The use of solvents or fuel oil, in any concentration, is prohibited for the coating of vehicle bodies.

For each delivery, the Engineer shall be provided a clear, legible copy of the delivery ticket.

**3. Paving Equipment:** The Contractor shall have the necessary paving and compaction equipment at the project site to perform the work. All equipment shall be in good working order and any equipment that is worn, defective or inadequate for performance of the work shall be repaired or replaced by the Contractor to the satisfaction of the Engineer. During the paving operation, the use of solvents or fuel oil, in any concentration, is prohibited as a release agent or cleaner on any paving equipment (i.e., rollers, pavers, transfer devices, etc.).

Refueling or cleaning of equipment is prohibited in any location on the project where fuel or solvents might come in contact with paved areas or areas to be paved. Solvents used in cleaning mechanical equipment or hand tools shall be stored off of areas paved or to be paved.

Pavers: Each paver shall have a receiving hopper with sufficient capacity to provide for a uniform spreading operation and a distribution system that places the mix uniformly, without segregation. The paver shall be equipped with and use a vibratory screed system with heaters or burners. The screed system shall be capable of producing a finished surface of the required evenness and texture without tearing, shoving, or gouging the mixture. Pavers with extendible screed units as part of the system shall have auger extensions and tunnel extenders as necessary. Automatic screed controls for grade and slope shall be used at all times unless otherwise authorized by the Engineer. The controls shall automatically adjust the screed to compensate for irregularities in the preceding course or existing base. The controls shall maintain the proper transverse slope and be readily adjustable, and shall operate from a fixed or moving reference such as a grade wire or floating beam.

Rollers: All rollers shall be self-propelled and designed for compaction of bituminous concrete. Roller types shall include steel-wheeled, pneumatic or a combination thereof. Rollers that operate in a dynamic mode shall have drums that use a vibratory or oscillatory system or combination of. Vibratory rollers shall be equipped with indicators for amplitude, frequency and speed settings/readouts to measure the impacts per foot during the compaction process. Oscillatory rollers shall be equipped with frequency indicators. Rollers can operate in the dynamic mode using the oscillatory system on concrete structures such as bridges and catch basins if at the lowest frequency setting.

Pneumatic tire rollers shall be equipped with wide-tread compaction tires capable of exerting an average contact pressure from 60 to 90 pounds per square inch uniformly over the surface, The Contractor shall furnish documentation to the Engineer regarding tire size; pressure and loading

to confirm that the proper contact pressure is being developed and that the loading and contact pressure is uniform for all wheels.

**Lighting:** For paving operations, which will be performed during hours of darkness, the paving equipment shall be equipped with lighting fixtures as described below, or with an approved equal. Lighting shall minimize glare to passing traffic. The lighting options and minimum number of fixtures are listed in Tables 4.06-1 and 4.06-2:

**TABLE 4.06-1: Minimum Paver Lighting**

Option	Fixture Configuration	Fixture Quantity	Requirement
1	Type A	3	Mount over screed area
	Type B (narrow) or Type C (spot)	2	Aim to auger and guideline
	Type B (wide) or Type C (flood)	2	Aim 25 feet behind paving machine
2	Type D Balloon	2	Mount over screed area

**TABLE 4.06-2: Minimum Roller Lighting**

Option	Fixture Configuration*	Fixture Quantity	Requirement
1	Type B (wide)	2	Aim 50 feet in front of and behind roller
	Type B (narrow)	2	Aim 100 feet in front of and behind roller
2	Type C (flood)	2	Aim 50 feet in front of and behind roller
	Type C (spot)	2	Aim 100 feet in front of and behind roller
3	Type D Balloon	1	Mount above the roller

\*All fixtures shall be mounted above the roller.

Type A: Fluorescent fixture shall be heavy-duty industrial type. Each fixture shall have a minimum output of 8,000 lumens. The fixtures shall be mounted horizontally, and be designed for continuous row installation.

Type B: Each floodlight fixture shall have a minimum output of 18,000 lumens.

Type C: Each fixture shall have a minimum output of 19,000 lumens.

Type D: Balloon light: Each balloon light fixture shall have a minimum output of 50,000 lumens, and emit light equally in all directions.

**Material Transfer Vehicle (MTV):** A MTV shall be used when placing a bituminous concrete surface course as indicated in the contract documents.

The MTV must be a vehicle specifically designed for the purpose of delivering the bituminous concrete mixture from the delivery vehicle to the paver. The MTV must continuously remix the bituminous concrete mixture throughout the placement process.



The use of a MTV will be subject to the requirements stated in Article 1.07.05- Load Restrictions. The Engineer may limit the use of the vehicle if it is determined that the use of the MTV may damage highway components, utilities, or bridges. The Contractor shall submit to the Engineer at time of pre-construction the following information:

- The make and model of the MTV.
- The individual axle weights and axle spacing for each piece of paving equipment (haul vehicle, MTV and paver).
- A working drawing showing the axle spacing in combination with all pieces of equipment that will comprise the paving echelon.

**4. Test Section:** The Engineer may require the Contractor to place a test section whenever the requirements of this specification or Section M.04 are not met.

The Contractor shall submit the quantity of mixture to be placed and the location of the test section for review and approval by the Engineer. The same equipment used in the construction of a passing test section shall be used throughout production.

If a test section fails to meet specifications, the Contractor shall stop production, make necessary adjustments to the job mix formula, Plant operations, or procedures for placement and compaction. The Contractor shall construct test sections, as allowed by the Engineer, until all the required specifications are met. All test sections shall also be subject to removal as set forth in Article 1.06.04.

**5. Transitions for Roadway Surface:** Transitions shall be formed at any point on the roadway where the pavement surface deviates, vertically, from the uniform longitudinal profile as specified on the plans. Whether formed by milling or by bituminous concrete mixture, all transition lengths shall conform to the criteria below unless otherwise specified.

Permanent Transitions: Defined as any gradual change in pavement elevation that remains as a permanent part of the work.

A transition shall be constructed no closer than 75 feet from either side of a bridge expansion joint or parapet. All permanent transitions, leading and trailing, shall meet the following length requirements:

- a) Posted speed limit is greater than 35 MPH: 30 feet per inch of elevation change.
- b) Posted speed limit is 35 MPH or less: 15 feet per inch of elevation change.

In areas where it is impractical to use the above described permanent transition lengths the use of a shorter permanent transition length may be permitted when approved by the Engineer.

**Temporary Transitions:** A temporary transition is defined as a transition that does not remain a permanent part of the work. All temporary transitions shall meet the following length requirements:

- a) Posted speed limit is greater than 50 MPH
  - (1) Leading Transitions = 15 feet per inch of vertical change (thickness)
  - (2) Trailing Transitions = 6 feet per inch of vertical change (thickness)
- b) Posted speed limit is 40, 45, or 50 MPH
  - (1) Leading and Trailing = 4 feet per inch of vertical change (thickness)
- c) Posted speed limit is 35 MPH or less
  - (1) Leading and Trailing = 3 feet per inch of vertical change (thickness)

**Note:** Any temporary transition to be in-place over the winter shutdown period or during extended periods of inactivity (more than 14 calendar days) shall conform to the greater than 50 MPH requirements shown above.

**6. Spreading and Finishing of Mixture:** Prior to the placement of the mixture, the underlying base course shall be brought to the plan grade and cross section within the allowable tolerance.

Immediately before placing a bituminous concrete lift, a uniform coating of tack coat shall be applied to all existing underlying pavement surfaces and on the exposed surface of a wedge joint. Such surfaces shall be clean and dry. Sweeping or other means acceptable to the Engineer shall be used.

The mixture shall not be placed whenever the surface is wet or frozen.

The Engineer may verify the mixture temperature by means of a probe or infrared type of thermometer. The Engineer may reject the load based on readings from a probe type thermometer and the specify temperature in the quality control plan (QCP) for placement.

**Tack Coat Application:** The tack coat shall be applied by a pressurized spray system that results in uniform overlapping coverage at an application rate of 0.03 to 0.05 gallons per square yard for a non-milled surface and an application rate of 0.05 to 0.07 gallons per square yard for a milled surface. For areas where both milled and un-milled surfaces occur, the tack coat shall be an application rate of 0.03 to 0.05 gallons per square yard. The Engineer must approve the equipment and the method of measurement prior to use. The material for tack coat shall not be heated in excess of 160°F and shall not be further diluted.

Tack coat shall be allowed sufficient time to break prior to any paving equipment or haul vehicles driving on it.

The Contractor may request to omit the tack coat application between bituminous concrete layers that have not been exposed to traffic and are placed during the same work shift. Requests to omit tack coat application on the exposed surface of a wedge joint will not be considered.

**Placement:** The mixture shall be placed and compacted to provide a smooth, dense surface with a uniform texture and no segregation at the specified thickness and dimensions indicated in the plans and specifications.

When unforeseen weather conditions prevent further placement of the mixture, the Engineer is not obligated to accept or place the bituminous concrete mixture that is in transit from the Plant.

In advance of paving, traffic control requirements shall be set up, maintained throughout placement, and shall not be removed until all associated work including density testing is completed.

The Contractor shall inspect the newly placed pavement for defects in the mixture or placement before rolling is started. Any deviation from standard crown or section shall be immediately remedied by placing additional mixture or removing surplus mixture. Such defects shall be corrected to the satisfaction of the Engineer.

Where it is impractical due to physical limitations to operate the paving equipment, the Engineer may permit the use of other methods or equipment. Where hand spreading is permitted, the mixture shall be placed by means of suitable shovels and other tools, and in a uniformly loose layer at a thickness that will result in a completed pavement meeting the designed grade and elevation.

**Placement Tolerances:** Each lift of bituminous concrete placed at a specified thickness shall meet the following requirements for thickness and area. Any pavement exceeding these limits shall be subject to an adjustment or removal. Lift tolerances will not relieve the Contractor from meeting the final designed grade. Lifts of specified non-uniform thickness, i.e. wedge or shim course, shall not be subject to thickness and area adjustments.

- a) Thickness- Where the average thickness of the lift exceeds that shown on the plans beyond the tolerances shown in Table 4.06-3, the Engineer will calculate the thickness adjustment in accordance with Article 4.06.04.

**TABLE 4.06-3: Thickness Tolerances**

<b>Mixture Designation</b>	<b>Lift Tolerance</b>
S1	+/- 3/8 inch
S0.25, S0.375, S0.5	+/- 1/4 inch

Where the thickness of the lift of mixture is less than that shown on the plans beyond the tolerances shown in Table 4.06-3, the Contractor, with the approval of the Engineer, shall take corrective action in accordance with this specification.

- b) Area- Where the width of the lift exceeds that shown on the plans by more than the specified thickness, the Engineer will calculate the area adjustment in accordance with Article 4.06.04.

- c) Delivered Weight of Mixture - When the delivery ticket shows that the vehicle exceeds the allowable gross weight for the vehicle type, the Engineer will calculate the weight adjustment in accordance with Article 4.06.04.

Transverse Joints: All transverse joints shall be formed by saw-cutting to expose the full thickness of the lift. Tack coat shall be applied to the sawn face immediately prior to additional mixture being placed.

Compaction: The Contractor shall compact the mixture to meet the density requirements as stated in Article 4.06.03 and eliminate all roller marks without displacement, shoving, cracking, or aggregate breakage.

When placing a lift with a specified thickness less than one and one-half (1 ½) inches, or a wedge course, the Contractor shall provide a minimum rolling pattern as determined by the development of a compaction curve. The procedure to be used shall be documented in the Contractor's QCP for placement and demonstrated on the first day of placement.

The use of the vibratory system on concrete structures is prohibited. When approved by the Engineer, the Contractor may operate a roller using an oscillatory system at the lowest frequency setting.

If the Engineer determines that the use of compaction equipment in the dynamic mode may damage highway components, utilities, or adjacent property, the Contractor shall provide alternate compaction equipment. The Engineer may allow the Contractor to operate rollers in the dynamic mode using the oscillatory system at the lowest frequency setting.

Rollers operating in the dynamic mode shall be shut off when changing directions.

These allowances will not relieve the Contractor from meeting pavement compaction requirements.

Surface Requirements:

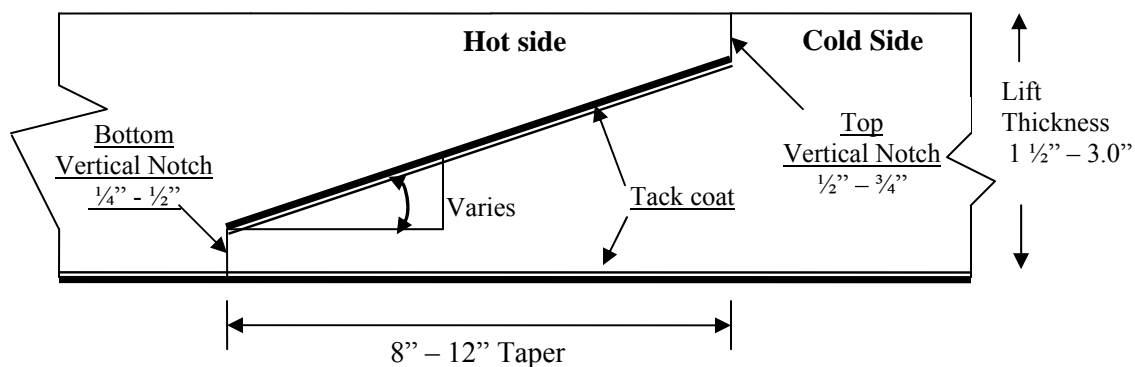
Each lift of the surface course shall not vary more than ¼ inch from a Contractor-supplied 10 foot straightedge. For all other lifts, the tolerance shall be ⅜ inch. Such tolerance will apply to all paved areas.

Any surface that exhibits these characteristics or exceeds these tolerances shall be corrected by the Contractor at its own expense.

**7. Longitudinal Joint Construction Methods:** The Contractor shall use Method I- Notched Wedge Joint (see Figure 4.06-1) when constructing longitudinal joints where lift thicknesses are between 1½ and 3 inches. S1.0 mixtures shall be excluded from using Method I. Method II Butt Joint (see Figure 4.06-2) shall be used for lifts less than 1½ inches or greater than or equal to 3 inches. During placement of multiple lifts, the longitudinal joint shall be constructed in such a

manner that it is located at least 6 inches from the joint in the lift immediately below. The joint in the final lift shall be at the centerline or at lane lines. Each longitudinal joint shall maintain a consistent offset from the centerline of the roadway along its entire length. The difference in elevation between the two faces of any completed longitudinal joint shall not exceed  $\frac{1}{4}$  inch in any location.

**Method I - Notched Wedge Joint:**



**FIGURE 4.06-1: Notched Wedge Joint**

A notched wedge joint shall be constructed as shown in Figure 4.06-1 using a device that is attached to the paver screed and is capable of independently adjusting the top and bottom vertical notches. The device shall have an integrated vibratory system.

The taper portion of the wedge joint must be placed over the longitudinal joint in the lift immediately below. The top vertical notch must be located at the centerline or lane line in the final lift. The requirement for paving full width “curb to curb” as described in Method II may be waived if addressed in the QC plan and approved by the Engineer.

The taper portion of the wedge joint shall be evenly compacted using equipment other than the paver or notch wedge joint device.

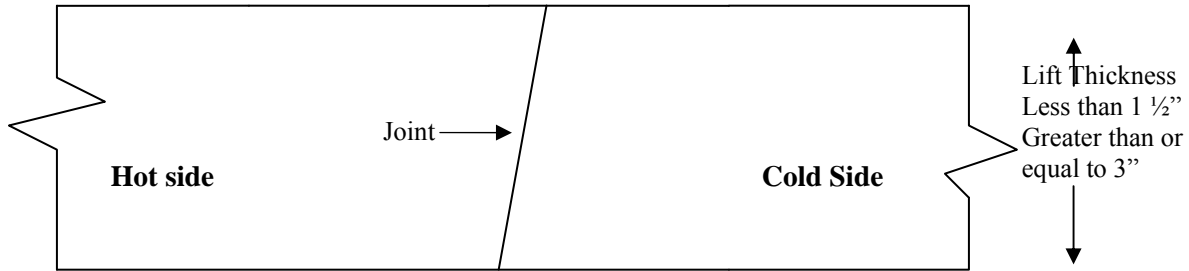
The taper portion of the wedge joint shall not be exposed to traffic for more than 5 calendar days.

Any exposed wedge joint must be located to allow for the free draining of water from the road surface.

The Engineer reserves the right to define the paving limits when using a wedge joint that will be exposed to traffic.

If Method I, Notched Wedge Joint cannot be used on lifts between 1.5 and 3 inches, Method III Butt Joint may be substituted according to the requirements below for “Method III – Butt Joint with Hot Pour Rubberized Asphalt Treatment.”

**Method II - Butt Joint:**

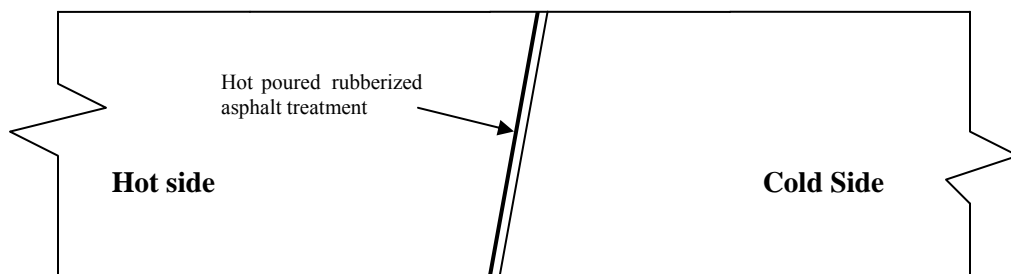


**FIGURE 4.06-2: Butt Joint**

When adjoining passes are placed, the Contractor shall utilize equipment that creates a near vertical edge (refer to Figure 4.06-2). The completing pass (hot side) shall have sufficient mixture so that the compacted thickness is not less than the previous pass (cold side). The end gate on the paver should be set so there is an overlap onto the cold side of the joint.

The Contractor shall not allow any butt joint to be incomplete at the end of a work shift unless otherwise allowed by the Engineer. When using this method, the Contractor is not allowed to leave a vertical edge exposed at the end of a work shift and must complete paving of the roadway full width “curb to curb.”

**Method III- Butt Joint with Hot Poured Rubberized Asphalt Treatment:** If Method I Wedge Joint cannot be used due to physical constraints in certain limited locations; the contractor may submit a request in writing for approval by the Engineer, to utilize Method III Butt Joint as a substitution in those locations. There shall be no additional measurement or payment made when the Method III Butt Joint is substituted for the Method I Notched Wedge Joint. When required by the contract or approved by the Engineer, Method III (see Figure 4.06-3) shall be used.



**FIGURE 4.06-3: Butt Joint with Hot Poured Rubberized Asphalt Treatment**

All of the requirements of Method II must be met with Method III. In addition, the longitudinal vertical edge must be treated with a rubberized joint seal material meeting the requirements of ASTM D 6690, Type 2. The joint sealant shall be placed on the face of the “cold side” of the butt joint as shown above prior to placing the “hot side” of the butt joint. The joint seal material shall be applied in accordance with the manufacturer’s recommendation so as to provide a uniform coverage and avoid excess bleeding onto the newly placed pavement.

**8. Contractor Quality Control (QC) Requirements:** The Contractor shall be responsible for maintaining adequate quality control procedures throughout the production and placement operations. Therefore, the Contractor must ensure that the materials, mixture and work provided by Subcontractors, Suppliers and Producers also meet contract specification requirements.

This effort must be documented in Quality Control Plans and address the actions, inspection, or sampling and testing necessary to keep the production and placement operations in control, to determine when an operation has gone out of control and to respond to correct the situation in a timely fashion.

The Standard QCP for production shall consist of the quality control program specific to the production facility.

There are three components to the QCP for placement: a Standard QCP, a Project Summary Sheet that details project specific information, and if applicable a separate Extended Season Paving Plan as required in Section 9 “Temperature and Seasonal Requirements”.

The Standard QCP for both production and placement shall be submitted to the Department for approval each calendar year and at a minimum of 30 days prior to production or placement.

Production or placement shall not occur until all QCP components have been approved by the Engineer.

Each QCP shall include the name and qualifications of a Quality Control Manager (QCM). The QCM shall be responsible for the administration of the QCP, and any modifications that may become necessary. The QCM shall have the ability to direct all Contractor personnel on the project during paving operations. All Contractor sampling, inspection and test reports shall be reviewed and signed by the QCM prior to submittal to the Engineer. The QCPs shall also include the name and qualifications of any outside testing laboratory performing any QC functions on behalf of the Contractor.

Approval of the QCP does not relieve the Contractor of its responsibility to comply with the project specifications. The Contractor may modify the QCPs as work progresses and must document the changes in writing prior to resuming operations. These changes include but are not limited to changes in quality control procedures or personnel. The Department reserves the right to deny significant changes to the QCPs.

QCP for Production: Refer to Section M.04.03-1.

QCP for Placement: The Standard QCP, Project Summary Sheet, and Extended Season Paving Plan shall conform to the format provided by the Engineer. The format is available at [http://www.ct.gov/dot/lib/dot/documents/dconstruction/pat/qcp\\_outline\\_hma\\_placement.pdf](http://www.ct.gov/dot/lib/dot/documents/dconstruction/pat/qcp_outline_hma_placement.pdf).

The Contractor shall perform all quality control sampling and testing, provide inspection, and exercise management control to ensure that placement conforms to the requirements as outlined in its QCP during all phases of the work. The Contractor shall document these activities for each day of placement.

The Contractor shall submit complete field density testing and inspection records to the Engineer within 48 hours in a manner acceptable to the Engineer.

The Contractor may obtain one (1) mat core and one (1) joint core per day for process control, provided this process is detailed in the QCP. The results of these process control cores shall not be used to dispute the Department determinations from the acceptance cores. The Contractor shall submit the location of each process control core to the Engineer for approval prior to taking the core. The core holes shall be filled to the same requirements described in sub-article 4.06.03-10.

**9. Temperature and Seasonal Requirements:** Paving, including placement of temporary pavements, shall be divided into two seasons, “In-Season” and “Extended-Season”. In-Season paving occurs from May 1 – October 14, and Extended Season paving occurs from October 15-April 30. The following requirements shall apply unless otherwise authorized or directed by the Engineer:

- Mixtures shall not be placed when the air or sub base temperature is less than 40°F regardless of the season.
- Should paving operations be scheduled during the Extended Season, the Contractor must submit an Extended Season Paving Plan for the project that addresses minimum delivered mix temperature considering WMA, PMA or other additives, maximum paver speed, enhanced rolling patterns and the method to balance mixture delivery and placement operations. Paving during Extended Season shall not commence until the Engineer has approved the plan.

**10. Obtaining Bituminous Concrete Cores:** This Section describes the methodology and sampling frequency the Contractor shall use to obtain pavement cores.

Coring shall be performed on each lift specified to a thickness of one and one-half (1 ½) inches or more within 5 days of placement. The Contractor shall extract cores (4 or 6 inch diameter for S0.25, S0.375 and S0.5 mixtures 6 inch diameter for S1.0 mixtures) from locations determined



by the Engineer. The Engineer must witness the extraction, labeling of cores and filling of the core holes.

A density lot will be complete when the full designed paving width and length of the lot has been placed and shall include all longitudinal joints between the curb lines. HMA S1 mixes are excluded from the longitudinal joint density requirements.

A standard density lot is the quantity of material placed within the defined area exclusive of any structures. A combo density lot is the quantity of material placed within the defined area inclusive of structures less than or equal to 500 feet long. A bridge density lot is the quantity of material placed on a structure larger than 500 feet in length.

Prior to paving, the type and number of lot (s) shall be determined by the Engineer. The number of cores per lot shall be determined in accordance to Tables 4.06-4, 4.06-5A and 4.06-5B. Noncontiguous areas such as highway ramps may be combined to create one lot. Combined areas should be set up to target a 2000 ton lot size. The longitudinal locations of mat cores within a lot containing multiple paving passes will be determined using the total distance covered by the paver. The locations of the joint cores will be determined using the total length of longitudinal joints within the lot.

Sampling is in accordance with the following tables:

**TABLE 4.06-4: Bridge Density Lot(s)**

Length of Each Structure (Feet)	No. of Mat Cores	No. of Joint Cores
≤ 500'	See Table 4.06-5(A or B)	See Table 4.06-5(A or B)
501' – 1500'	3	3
1501' – 2500'	4	4
2501' and greater	5	5

All material placed on structures less than or equal to 500 feet in length shall be included as part of a standard lot as follows:

**TABLE 4.06-5A: Standard and Combo Density Lot(s) ≥ 500 Tons**

Lot Type	No. of Mat Cores		No. of Joint Cores		Target Lot Size (Tons)
Standard Lot / Without Bridge (s)	4		4		2000
Combo Lot / Lot With Bridge(s) <sup>(1)</sup>	4 plus	1 per structure (≤ 300')	4 plus	1 per structure (≤ 300')	2000
		2 per structure (301' – 500')		2 per structure (301' – 500')	

**TABLE 4.06-5B: Standard and Combo Density Lot < 500 Tons**

Lot Type	No. of Mat Cores		No. of Joint Cores	
Standard Lot / Without Bridge (s)	3		3	
Combo Lot / Lot With Bridge(s) <sup>(1)</sup>	2 plus	1 per structure	2 plus	1 per structure

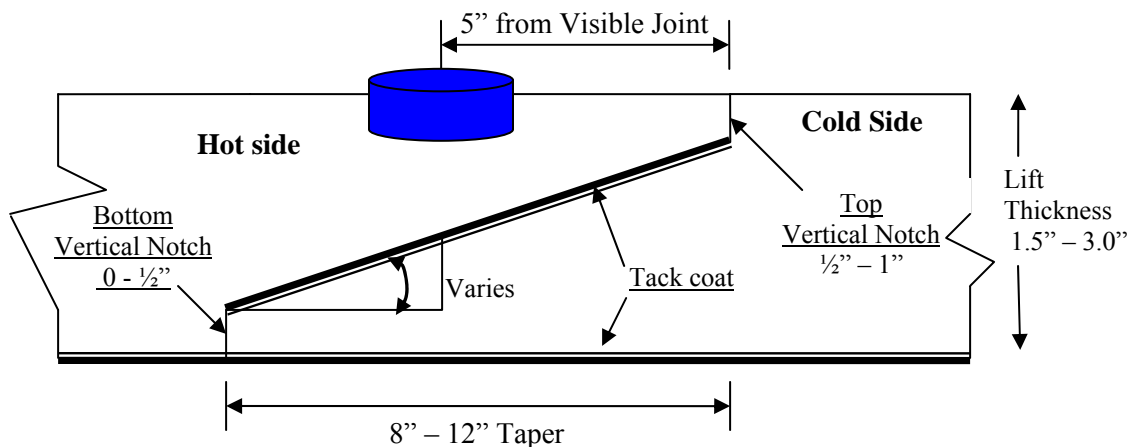
Note:

<sup>(1)</sup> If a combo lot mat or joint core location randomly falls on a structure, the core is to be obtained on the structure in addition to the core(s) required on the structure.

After the lift has been compacted and cooled, the Contractor shall cut cores to a depth equal to or greater than the lift thickness and remove them without damaging the lift(s) to be tested. Any core that is damaged or obviously defective while being obtained will be replaced with a new core from a location within 2 feet measured in a longitudinal direction.

A mat core shall not be located any closer than one foot from the edge of a paver pass. If a random number locates a core less than one foot from any edge, the location will be adjusted by the Engineer so that the outer edge of the core is one foot from the edge of the paver pass.

Method I, Notched Wedge Joint cores shall be taken so that the center of the core is 5 inches from the visible joint on the hot mat side (Figure 4.06-5).

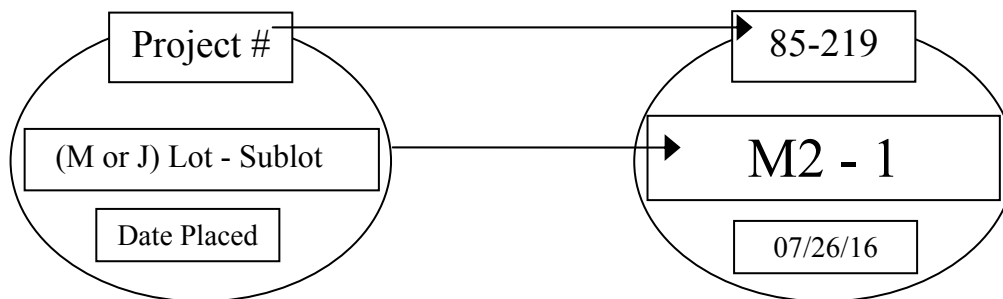


**FIGURE 4.06-5: Notched Wedge Joint Cores**

When Method II or Method III Butt Joint is utilized, cores shall be taken from the hot side so the edge of the core is within 1 inch of the longitudinal joint.

The cores shall be labeled by the Contractor with the project number, date placed, lot number and sub-lot number. The core's label shall, include "M" for a mat core and "J" for a joint core. A mat core from the second lot and first sub-lot shall be labeled "M2 - 1" (Figure 4.06-4). The Engineer shall fill out a MAT-109 to accompany the cores. The Contractor shall deliver the

cores and MAT-109 to the Department's Central Lab. The Contractor shall use a container approved by the Engineer. The container shall have a lid capable of being locked shut and tamper proof. The Contractor shall use foam, bubble wrap, or another suitable material to prevent the cores from being damaged during handling and transportation. Once the cores and MAT-109 are in the container the Engineer will secure the lid using a security seal. The security seal's identification number must be documented on the MAT-109. Central Lab personnel will break the security seal and take possession of the cores.



**FIGURE 4.06-4: Labeling of Cores**

Each core hole shall be filled within four hours upon core extraction. Prior to being filled, the hole shall be prepared by removing any free water and applying tack coat using a brush or other means to uniformly cover the cut surface. The core hole shall be filled using a bituminous concrete mixture at a minimum temperature of 240°F containing the same or smaller nominal maximum aggregate size and compacted with a hand compactor or other mechanical means to the maximum compaction possible. The bituminous concrete shall be compacted to 1/8 inch above the finished pavement.

**11. Acceptance Sampling and Testing:** Sampling and testing shall be performed at a frequency not less than the minimum frequency specified in Section M.04 and sub-article 4.06.03-10.

Sampling shall be performed in accordance with ASTM D 3665, or a statistically based procedure of stratified random sampling approved by the Engineer.

Plant Material Acceptance: The Contractor shall provide the required sampling and testing during all phases of the work in accordance with Section M.04. The Department will verify the Contractor's acceptance test results. Should any test results exceed the specified tolerances in the Department's current QA Program for Materials, the Contractor test results for a subject lot or sub lot may be replaced with the Department's results for the purpose of calculating adjustments. The verification procedure is included in the Department's current QA Program for Materials.

Density Acceptance: The Engineer will perform all acceptance testing in accordance with AASHTO T 331. The density of each core will be determined using the daily production's

average maximum theoretical specific gravity (Gmm) established during the testing of the parent material at the Plant. When there was no testing of the parent material or any Gmm exceeds the specified tolerances in the Department's current QA Program for Materials, the Engineer will determine the maximum theoretical density value to be used for density calculations.

**12. Density Dispute Resolution Process:** The Contractor and Engineer will work in partnership to avoid potential conflicts and to resolve any differences that may arise during quality control or acceptance testing for density. Both parties will review their sampling and testing procedures and results and share their findings. If the Contractor disputes the Engineer's test results, the Contractor must submit in writing a request to initiate the Dispute Resolution Process within 7 calendar days of the notification of the test results. No request for dispute resolution will be allowed unless the Contractor provides quality control results within the timeframe described in sub-article 4.06.03-9 supporting its position. No request for Dispute Resolution will be allowed for a Density Lot in which any core was not taken within the required 5 calendar days of placement. Should the dispute not be resolved through evaluation of existing testing data or procedures, the Engineer may authorize the Contractor to obtain a new set of core samples per disputed lot. The core samples must be extracted no later than 14 calendar days from the date of Engineer's authorization.

The number and location (mat, joint, or structure) of the cores taken for dispute resolution must reflect the number and location of the original cores. The location of each core shall be randomly located within the respective original sub lot. All such cores shall be extracted and the core hole filled using the procedure outlined in Article 4.06.03. The dispute resolution results shall be added to the original results and averaged for determining the final in-place density value.

**13. Corrective Work Procedure:**

If pavement placed by the Contractor does not meet the specifications, and the Engineer requires its replacement or correction, the Contractor shall:

- a) Propose a corrective procedure to the Engineer for review and approval prior to any corrective work commencing. The proposal shall include:
  - Limits of pavement to be replaced or corrected, indicating stationing or other landmarks that are readily distinguishable.
  - Proposed work schedule.
  - Construction method and sequence of operations.
  - Methods of maintenance and protection of traffic.
  - Material sources.
  - Names and telephone numbers of supervising personnel.
- b) Any corrective courses placed as the final wearing surface shall match the specified lift thickness after compaction.

**14. Protection of the Work:** The Contractor shall protect all sections of the newly finished pavement from damage that may occur as a result of the Contractor's operations for the duration of the Project.

**15. Cut Bituminous Concrete Pavement:** Work under this item shall consist of making a straight-line cut in the pavement to the lines delineated on the plans or as directed by the Engineer. The cut shall provide a straight, clean, vertical face with no cracking, tearing or breakage along the cut edge.

**4.06.04—Method of Measurement:**

**1. HMA S\* or PMA S\*:** The quantity of bituminous concrete measured for payment will be determined by the documented net weight in tons accepted by the Engineer in accordance with this specification and Section M.04.

**2. Adjustments:** Adjustments may be applied to bituminous concrete quantities and will be measured for payment using the following formulas:

**Yield Factor** for Adjustment Calculation = 0.0575 Tons/SY/inch

**Actual Area** = [(Measured Length (ft)) x (Avg. of width measurements (ft))]

**Actual Thickness (t)** = Total tons delivered / [Actual Area (SY) x 0.0575 Tons/SY/inch]

- a) Area: If the average width exceeds the allowable tolerance, an adjustment will be made using the following formula. The tolerance for width is equal to the specified thickness (in.) of the lift being placed.

**Tons Adjusted for Area (T<sub>A</sub>)** = [(L x W<sub>adj</sub>)/9] x (t) x 0.0575 Tons/SY/inch = (-) Tons

Where: L = Length (ft)

(t) = Actual thickness (inches)

W<sub>adj</sub> = (Designed width (ft) + tolerance /12) - Measured Width)

- b) Thickness: If the actual average thickness is less than the allowable tolerance, the Contractor shall submit a repair procedure to the Engineer for approval. If the actual thickness exceeds the allowable tolerance, an adjustment will be made using the following formula:

**Tons Adjusted for Thickness (T<sub>T</sub>)** = A x t<sub>adj</sub> x 0.0575 = (-) Tons

Where: A = Area = {[L x (Designed width + tolerance (lift thickness)/12)] / 9}

t<sub>adj</sub> = Adjusted thickness = [(Dt + tolerance) - Actual thickness]

Dt = Designed thickness (inches)

- c) Weight: If the quantity of bituminous concrete representing the mixture delivered to the project is in excess of the allowable gross vehicle weight (GVW) for each vehicle, an adjustment will be made using the following formula:

$$\text{Tons Adjusted for Weight (T}_w) = \text{GVW} - \text{DGW} = (-) \text{Tons}$$

Where: DGW = Delivered gross weight as shown on the delivery ticket or measured on a certified scale.

- d) Mixture Adjustment: The quantity of bituminous concrete representing the production lot at the Plant will be adjusted as follow:

- i. Non-PWL Production Lot (less than 3500 tons):

The adjustment values in Table 4.06-6 and 4.06-7 shall be calculated for each sub lot based on the Air Void (AV) and Asphalt Binder Content (PB) test results for that sub lot. The total adjustment for each day's production (lot) will be computed using tables and the following formulas:

$$\text{Tons Adjusted for Superpave Design (T}_{SD}) = [(\text{AdjAV}_t + \text{AdjPB}_t) / 100] \times \text{Tons}$$

$$\text{Percent Adjustment for Air Voids} = \text{AdjAV}_t = [\text{AdjAV}_1 + \text{AdjAV}_2 + \text{AdjAV}_i + \dots + \text{AdjAV}_n] / n$$

Where: AdjAV<sub>t</sub> = Total percent air void adjustment value for the lot

AdjAV<sub>i</sub> = Adjustment value from Table 4.06-7 resulting from each sub lot or the average of the adjustment values resulting from multiple tests within a sub lot, as approved by the Engineer.

n = number of sub lots based on Table M.04.03-2

**TABLE 4.06-6: Adjustment Values for Air Voids**

Adjustment Value (AdjAV <sub>i</sub> ) (%)	S0.25, S0.375, S0.5, S1 Air Voids (AV)
+2.5	3.8 - 4.2
+3.125*(AV-3)	3.0 - 3.7
-3.125*(AV-5)	4.3 - 5.0
20*(AV-3)	2.3 - 2.9
-20*(AV-5)	5.1 - 5.7
-20.0	≤ 2.2 or ≥ 5.8

$$\text{Percent Adjustment for Asphalt Binder} = \text{AdjPB}_t = [(\text{AdjPB}_1 + \text{AdjPB}_2 + \text{AdjPB}_i + \dots + \text{AdjPB}_n) / n]$$

Where: AdjPB<sub>t</sub> = Total percent asphalt binder adjustment value for the lot

AdjPB<sub>i</sub> = Adjustment value from Table 4.06-7 resulting from each sub lot

n = number of binder tests in a production lot

**TABLE 4.06-7: Adjustment Values for Binder Content**

<b>Adjustment Value (AdjAV<sub>i</sub>) (%)</b>	<b><u>S0.25, S0.375, S0.5, S1</u> Pb</b>
0.0	JMF Pb ± 0.3
- 10.0	≤ JMF Pb - 0.4 or ≥ JMF Pb + 0.4

ii. PWL Production Lot (3500 tons or more):

For each lot, the adjustment values shall be calculated based on PWL for AV, VMA and PB test results. The lot will be considered as being normally distributed and all applicable equations in AASHTO R9 and AASHTO R42 Appendix X4 will apply.

Only one test result will be considered for each sub lot. The specification limits are listed in Section M.04.

For AV, PB and voids in mineral aggregate (VMA), the individual material quality characteristic adjustment (Adj) will be calculated as follow:

For PWL between 50 and 90%:  $Adj(AV_t \text{ or } PB_t \text{ or } VMA_t) = (55 + 0.5 \text{ PWL}) - 100$

For PWL at and above 90%:  $Adj(AV_t \text{ or } PB_t \text{ or } VMA_t) = (77.5 + 0.25 \text{ PWL}) - 100$

Where:

AdjAV<sub>t</sub> = Total percent AV adjustment value for the lot

AdjPB<sub>t</sub> = Total percent PB adjustment value for the lot

AdjVMA<sub>t</sub> = Total percent VMA adjustment value for the lot

Lots with PWL less than 50% in any of the three individual material quality characteristics will be evaluated under 1.06.04.

The total adjustment for each production lot will be computed using the following formula:

$$\text{Tons Adjusted for Superpave Design (T}_{SD}) = [(0.5AdjAV_t + 0.25AdjPB_t + 0.25AdjVMA_t) / 100] \times \text{Tons}$$

iii. Partial Lots:

Lots with less than 4 sublots will be combined with the prior lot. If there is no prior lot with equivalent material or if the last test result of the prior lot is over 30 calendar days old, the adjustment will be calculated as indicated in 4.06.04-2.d.i.

Lots with 4 or more sublots will be calculated as indicated in 4.06.04-2.d.ii.

- e) **Density Adjustment:** The quantity of bituminous concrete measured for payment in a lift of pavement specified to be 1½ inches or greater may be adjusted for density. Separate density adjustments will be made for each lot and will not be combined to establish one density adjustment. The final lot quantity shall be the difference between the total payable tons for the project and the sum of the previous lots. If either the Mat or Joint adjustment value is “remove and replace”, the density lot shall be removed and replaced (curb to curb).

No positive adjustment will be applied to a Density Lot in which any core was not taken within the required 5 calendar days of placement.

**Tons Adjusted for Density ( $T_D$ )** =  $[\{(PA_M \times .50) + (PA_J \times .50)\} / 100] \times$  Density Lot Tons

Where:  $T_D$  = Total tons adjusted for density for each lot

$PA_M$  = Mat density percent adjustment from Table 4.06-9

$PA_J$  = Joint density percent adjustment from Table 4.06-10

**TABLE 4.06-9: Adjustment Values for Pavement Mat density**

Average Core Result Percent Mat Density	Percent Adjustment (Bridge and Non-Bridge) <sup>(1)(2)</sup>
97.1 - 100	-1.667*(ACRPD-98.5)
94.5 – 97.0	+2.5
93.5 – 94.4	+2.5*(ACRPD-93.5)
92.0 – 93.4	0
90.0 – 91.9	-5*(92-ACRPD)
88.0 – 89.9	-10*(91-ACRPD)
87.0 – 87.9	-30
86.9 or less	Remove and Replace (curb to curb)



**TABLE 4.06-10: Adjustment Values for Pavement Joint Density**

<b>Average Core Result Percent Joint Density</b>	<b>Percent Adjustment (Bridge and Non-Bridge) <sup>(1)(2)</sup></b>
97.1 – 100	-1.667*(ACRPD-98.5)
93.5 – 97.0	+2.5
92.0 – 93.4	+1.667*(ACRPD-92)
91.0 – 91.9	0
89.0 – 90.9	-7.5*(91-ACRPD)
88.0 – 88.9	-15*(90-ACRPD)
87.0 – 87.9	-30
86.9 or less	Remove and Replace (curb to curb)

<sup>(1)</sup> ACRPD = Average Core Result Percent Density

<sup>(2)</sup> All Percent Adjustments to be rounded to the second decimal place. For example, 1.667 is to be rounded to 1.67.

**3. Transitions for Roadway Surface:** The installation of permanent transitions shall be measured under the appropriate item used in the formation of the transition.

The quantity of material used for the installation of temporary transitions shall be measured for payment under the appropriate item used in the formation of the transition. The installation and removal of a bond breaker, and the removal and disposal of any temporary transition formed by milling or with bituminous concrete pavement is not measured for payment.

**4. Cut Bituminous Concrete Pavement:** The quantity of bituminous concrete pavement cut will be measured in accordance with Article 2.02.04.

**5. Material for Tack Coat:** The quantity of tack coat will be measured for payment by the number of gallons furnished and applied on the Project and approved by the Engineer. No tack coat material shall be included that is placed in excess of the tolerance described in Article 4.06.03.

- a. Container Method- Material furnished in a container will be measured to the nearest ½ gallon. The volume will be determined by either measuring the volume in the original container by a method approved by the Engineer or using a separate graduated container capable of measuring the volume to the nearest ½ gallon. The container in which the material is furnished must include the description of material, including lot number or batch number and manufacturer or product source.

b. Vehicle Method-

i. Measured by Weight: The number of gallons furnished will be determined by weighing the material on calibrated scales furnished by the Contractor. To convert weight to gallons, one of the following formulas will be used:

$$\text{Tack Coat (gallons at } 60^{\circ}\text{F)} = \frac{\text{Measured Weight (pounds)}}{\text{Weight per gallon at } 60^{\circ}\text{F}}$$

$$\text{Tack Coat (gallons at } 60^{\circ}\text{F)} = \frac{0.996 \times \text{Measured Weight (pounds)}}{\text{Weight per gallon at } 77^{\circ}\text{F}}$$

ii. Measured by automated metering system on the delivery vehicle:

Tack Coat (gallons at 60°F) = Factor (from Table 4.06-11) multiplied by the measured gallons.

**TABLE 4.06-11: Factor to Convert Volume of Tack Coat to 60°F**

Tack Coat Application Temperature (°F)	Factor	Tack Coat Application Temperature (°F)	Factor
75	0.996	120	0.985
80	0.995	125	0.984
85	0.994	130	0.983
90	0.993	135	0.982
95	0.991	140	0.980
100	0.990	145	0.979
105	0.989	150	0.978
110	0.988	155	0.977
115	0.986	160	0.976

**6. Material Transfer Vehicle (MTV):** The furnishing and use of a MTV will be measured separately for payment based on the actual number of surface course tons delivered to a paver using the MTV.

**4.06.05—Basis of Payment:**

**1. HMA S\* or PMA S\*:** The furnishing and placing of bituminous concrete will be paid for at the Contract unit price per ton for “HMA S\*” or “PMA S\*”.

- All costs associated with providing illumination of the work area are included in the general cost of the work.
- All costs associated with cleaning the surface to be paved, including mechanical sweeping, are included in the general cost of the work. All costs associated with constructing longitudinal joints are included in the general cost of the work.

- All costs associated with obtaining cores for acceptance testing and dispute resolution are included in the general cost of the work.

**2. Bituminous Concrete Adjustment Costs:** The adjustment will be calculated using the formulas shown below if all of the measured adjustments in Article 4.06.04 are not equal to zero. A positive or negative adjustment will be applied to monies due the Contractor.

**Production Lot:**  $[T_T + T_A + T_W + T_{SD}] \times \text{Unit Price} = \text{Est. (P)}$

**Density Lot:**  $T_D \times \text{Unit Price} = \text{Est. (D)}$

Where: Unit Price = Contract unit price per ton per type of mixture

$T_*$  = Total tons of each adjustment calculated in Article 4.06.04

Est. ( ) = Pay Unit represented in dollars representing incentive or disincentive.

The Bituminous Concrete Adjustment Cost item if included in the bid proposal or estimate is not to be altered by the Contractor.

**3. Transitions for Roadway Surface:** The installation of permanent transitions shall be paid under the appropriate item used in the formation of the transition. The quantity of material used for the installation of temporary transitions shall be paid under the appropriate pay item used in the formation of the transition. The installation and removal of a bond breaker, and the removal and disposal of any temporary transition formed by milling or with bituminous concrete pavement is included in the general cost of the work.

**4.** The cutting of bituminous concrete pavement will be paid in accordance with Article 2.02.05.

**5.** Material for tack coat will be paid for at the Contract unit price per gallon at 60°F for "Material for Tack Coat".

**6.** The Material Transfer Vehicle (MTV) will be paid at the Contract unit price per ton for a "Material Transfer Vehicle".

<u>Pay Item*</u>	<u>Pay Unit*</u>
HMA S*	ton
PMA S*	ton
Bituminous Concrete Adjustment Cost	est.
Material for Tack Coat	gal.
Material Transfer Vehicle	ton

\*For contracts administered by the State of Connecticut, Department of Administrative Services, the pay items and pay units are as shown in contract award price schedule.

**SECTION 9.49 – FURNISHING, PLANTING AND MULCHING TREES, SHRUBS, VINES AND GROUND COVER PLANTS**

*Amend this section as follows:*

**Article 9.49.03 – Construction Methods:** *After the second sentence, add the following:*

All work in Section 9.49 shall be performed under the direct supervision of the Landscape Designer or Landscape Architect. Herbicides and pesticides shall only be applied by those individuals who possess a current Connecticut Commercial Operator Certificate, and any company applying herbicides or pesticides on State property shall be registered with the Connecticut Department of Environmental Protection.

Additionally, all work under Section 9.49 shall be performed in accordance with the latest edition of the American National Standards Institute (ANSI) “American National Standard for Tree Care Operations,” ANSI A300 (Part 6).

**7 – Setting Plants:** *After the second sentence, add the following:*

No plant will be accepted if it is installed with the bottom of the trunk flare below the finished soil grade.

**10 - Watering:** *After the first sentence, add the following:*

Watering shall occur as deemed necessary by the Contractor and must occur when directed by the Engineer or Landscape Designer.

**15 - Establishment Period:** *Delete the entire subarticle, and replace with the following:*

Acceptance of all work under Section 9.49 for full payment in accordance with Article 9.49.05 shall be conditional on the successful completion of a 2-Year Establishment Period, as determined by the Engineer. The 2-Year Establishment Period shall consist of a period of two full calendar years that will begin only after all plant materials specified in the contract have been planted and all initial planting operations have been accepted.

For the duration of this plant Establishment Period, the Contractor shall use all currently accepted horticultural practices necessary to keep all plant material installed in a healthy, vigorous growing condition and ensure their successful long-term establishment, as directed by the Engineer or Landscape Designer. During this entire period, the Contractor shall water, cultivate and prune the plants as needed or directed. He shall also repair, replace or readjust guy wires, stakes, posts and flagging, reshape plant saucers, repair washouts and gullies, replace lost wood chip mulch, and keep all planting sites free from weeds as may be required as needed or ordered by the Engineer or Landscape Designer.

All dead, dying or rejected plant material shall be promptly removed from the project during the Establishment Period. All removed plants shall be replaced by the Contractor in kind, quantity and size as originally specified in the contract with live, healthy specimens selected and planted in accordance with these specifications during the specified planting season. Replacement plant material and installation methods shall comply with all the requirements specified for the original material.

A 1-Year Inspection of all plant material will be conducted at the end of the first calendar year of the Establishment Period. A 2-Year Inspection of all plant material will be conducted at the end of the Establishment Period, 2 full calendar years after all plant materials specified in the contract have been planted.

At both the 1-Year and 2-Year Inspections, which will include the Contractor, the Engineer and the Landscape Designer, the acceptability of the plant establishment throughout the Project site will be determined. At both Inspections, an inventory of losses and rejected materials will be made, and necessary corrective and clean up measures will be determined. All dead, dying, or rejected plant material, as determined by the Engineer, shall be promptly removed from the project. All removed plants shall be replaced by the Contractor in kind, quantity and size as originally specified in the contract with live, healthy specimens selected and planted in accordance with these specifications during the specified planting season. Replacement plant material and installation methods shall comply with all the requirements specified for the original material.

After the Contractor has completed all required corrective measures identified at the 2-Year Inspection, the Engineer or Landscape Designer will inspect the plant establishment for final acceptance.

A final Project inspection will be held in accordance with Article 1.08.12. Any further work to be done shall be in accordance with Article 1.08.13 before the Project will be accepted.

**Article 9.49.05 – Basis of Payment:**

**1 - Planting:** *Delete the entire subarticle and replace with the following:*

Payment for this work will be made at a percentage of the contract unit price each for the kind and size of plant and method of planting, as applicable, in accordance with the following schedule:

**(a) Initial Payment:** Payment up to but not exceeding 85% of the contract unit price for each plant will be made for plant material satisfactorily furnished and planted, complete and in place, and accepted by the Engineer.

**(b) Payment for Successful Completion of Year 1 of Establishment Period:** Payment up to but not exceeding 7.5% of the sum of the Contract amounts for all work performed under

Section 9.49 will be made at the end of the first calendar year of the Establishment Period if the requirements of Section 9.49 have been generally and continuously been met in a manner acceptable to the Engineer on the entire Project site throughout this period. These requirements include: the continuous care, protection and watering of the plants and the prompt removal and in-kind replacement of all dead and unsatisfactory plant materials. No payment will be made if the first year of the Establishment Period was unacceptable due to noncompliance with any of these requirements.

**(c) Payment for Successful Completion of Year 2 of Establishment Period:** Payment up to but not exceeding 7.5% of the sum of the Contract amounts for all work performed under Section 9.49 will be made at the end of the second calendar year of the Establishment Period if the requirements of Section 9.49 have been generally and continuously been met in a manner acceptable to the Engineer on the entire Project site throughout this period. These requirements include: the continuous care, protection and watering of the plants and the prompt removal and in-kind replacement of all dead and unsatisfactory plant materials. No payment will be made if the second year of the Establishment Period was unacceptable due to noncompliance with any of these requirements.

## **SECTION 12.00 – GENERAL CLAUSES FOR HIGHWAY SIGNING**

### **Description:**

Work under this item shall conform to the requirements of Section 12.00 supplemented as follows:

### **12.00.06 – Data Labels:**

For the purpose of developing and maintaining a highway sign inventory and for the purpose of sampling and testing reflective sheeting, the Contractor shall affix a Data Label(s) to the back of each State owned and maintained sign face-extruded aluminum sign and sign face-sheet aluminum sign in the vicinity of the lower left hand corner or quadrant. Data Labels shall be 2 (two) separate 5 (five) inch by 3 (three) inch (125mm by 75mm), non-reflective weatherproof films with black copy on a yellow background having a pressure sensitive adhesive backing.

A “Fabrication” Data Label is to include information about the sign fabricator, date of fabrication and the sheeting manufacturer - type. An “Installation” Data Label is to include The State Project Number or Maintenance Permit Number that installed the sign and date of installation.

The cost of the data labels coded and in place on the sign shall be included in the unit cost of the respective sign material. Payment for the respective quantities of each sign face-extruded aluminum sign and each sign face-sheet aluminum sign may be withheld until all Data Label(s) have been installed to the satisfaction of the Engineer.

The Data Label designs, with additional notes relative to design requirements are attached herewith.

### **12.00.07 – Global Positioning System (GPS) coordinates for signs:**

The Contractor shall obtain and provide to the Engineer sign installation data, including Global Positioning System (GPS) latitude and longitude coordinates, for all new permanent State owned and maintained signs (temporary and construction signs are not to be included) installed in the project. The Engineer shall forward the sign data to the Division of Traffic Engineering. The horizontal datum is to be set to the State Plane Coordinate System, North American Datum of 1983 (NAD83) in feet. The minimum tolerance must be within 10 feet. The format of the GPS information shall be provided in a Microsoft Office compatible spreadsheet (Excel) file with data for each sign. The record for each sign installed is to be compatible with the anticipated CTDOT Sign Inventory and Management System (CTSIMS). The following format shall be used. However, the data fields noted by “#” are not required for the project submission. These entries will be completed as part of the Traffic Engineering CTSIMS data upload.

The cost of this work shall be included in the cost of the respective sign face – sheet aluminum and sign face – extruded aluminum items. The receipt of this electronic database must be received and accepted by the Engineer prior to final payment for items involving permanent highway signing. The electronic database information shall detail information regarding the sign actually installed by the project.

Field Number	Type	size	Description
1	text	20	Record Number (starting at 1...)
2	text	20	Sign Catalog Number
# 3	text	10	Size Height
# 4	text	10	Size Width
5	text	25	Legend
# 6	text	10	Background Color
# 7	text	10	Copy Color
8	Link	25	Material (see acceptable categories)
9	text	30	Comments if any
# 10	text	20	MUTCD Type
11	text	15	Town
12	text	5	Route
13	text	5	Route direction
# 14	text	10	Highway Log Mileage
15	text	15	Latitude
16	text	15	Longitude
17	text	25	Mounting Type
18	text	25	Reflective Sheeting Type
19	date	25	Date Installed
20	text	10	Number of Posts
21	text	255	Sheeting Manufacturer name and address
22	text	15	State Project Number (or)
23	text	15	Encroachment Permit number.
24	Graphic	*	Sign Picture Graphic.

\* Graphics provided shall be representative of the sign supplied and be in color. Graphic formats shall be either JPG or TIFF and provided with a recommended pixel density of 800 x 600. The graphic shall be inserted in the supplied media in field 24 for each sign.



**DATA LABELS**  
 NON REFLECTIVE, WEATHERPROOF FILM  
 BLACK COPY, YELLOW BACKGROUND

<b>CONN DOT</b>											
<b>SIGN FACE DATA LABEL</b>											
<b>Fabricator:</b> (Insert NAME or State)											
<b>Sheeting Manufacturer - Type</b> (Insert NAME - TYPE)											
<b>Date Fabricated - Month / Year</b>											
J	F	M	A	M	J	J	A	S	O	N	D
12	13	14	15	16	17	18	19	20	21	22	23

<b>CONN DOT</b>											
<b>SIGN FACE DATA LABEL</b>											
<b>Installed By:</b>											
<b>Project No.:</b> (Insert 000-0000 or State)											
<b>Permit No.:</b> (Insert D_-000000)											
<b>Date Installed - Month / Year</b>											
J	F	M	A	M	J	J	A	S	O	N	D
12	13	14	15	16	17	18	19	20	21	22	23

Data Labels To Be 5 Inch By 3 Inch Each (125mm x 75mm) With Face Designs As Shown Above.

All Copy Ink Must Be Durable And Not Fade, Discolor, Or Smudge.

All Variable Legends To Be Included At Label Fabrication.

Only One "Installed By" Permit Or Project Number Should Be Provided.

Sign Fabrication And / Or Installation By State Forces, Insert "State."

The Month And Year Of Fabrication And Installation May Be Punched Or Marked Out

The Back Of The Data Label Must Contain A Pre-coated Pressure-Sensitive Adhesive Covered By A Removable Liner.

At Application, The Liner Must Be removable Without Soaking In Water Or Other Solvents.

The Adhesive Must Form A Durable Bond To Surfaces That Are Smooth, Clean, Corrosion-Free And Weather Resistant.

Completed Data Labels Must Not Discolor, Crack, Craze, Blister, Delaminate, Peel, Chalk, Or Lose Adhesion When Subjected To Temperatures From -30 Degrees to 200 Degrees Fahrenheit.

## **SECTION M.04 BITUMINOUS CONCRETE MATERIALS**

Section M.04 is being deleted in its entirety and replaced with the following:

### **M.04.01—Bituminous Concrete Materials and Facilities**

### **M.04.02—Mix Design and Job Mix Formula (JMF)**

### **M.04.03—Production Requirements**

**M.04.01—Bituminous Concrete Materials and Facilities:** Each source of component material, Plant and laboratory used to produce and test bituminous concrete must be qualified on an annual basis by the Engineer. AASHTO or ASTM Standards noted with an (M) have been modified and are detailed in Table M.04.03-6.

Aggregates from multiple sources of supply must not be blended or stored in the same stockpile.

#### **1. Coarse Aggregate:**

All coarse aggregate shall meet the requirements listed in Section M.01.

#### **2. Fine Aggregate:**

All fine aggregate shall meet the requirements listed in Section M.01

#### **3. Mineral Filler:**

Mineral filler shall conform to the requirements of AASHTO M 17.

#### **4. Performance Graded (PG) Asphalt Binder:**

##### **a. General:**

i. PG asphalt binder shall be uniformly mixed and blended and be free of contaminants such as fuel oils and other solvents. Binder shall be properly heated and stored to prevent damage or separation.

ii. The binder shall meet the requirements of AASHTO M 332 and shall be graded or verified in accordance with AASHTO R 29. The Contractor shall submit a Certified Test Report and bill of lading representing each delivery in accordance with AASHTO R 26(M). The Certified Test Report must also indicate the binder specific gravity at 77°F; rotational viscosity at 275°F and 329°F and the mixing and compaction viscosity-temperature chart for each shipment.

iii. The Contractor shall submit the name(s) of personnel responsible for receipt, inspection, and record keeping of PG binder. Contractor plant personnel shall document specific storage tank(s) where binder will be transferred and stored until used, and provide binder samples to the Engineer upon request. The person(s) shall assure that each shipment is accompanied by a statement certifying that the transport vehicle was inspected before loading and was found acceptable for the material

shipped, and, that the binder is free of contamination from any residual material, along with two (2) copies of the bill of lading.

iv. The blending or combining of PG binders in one storage tank at the Plant from different suppliers, grades, or additive percentages is prohibited.

b. Basis of Approval:

The request for approval of the source of supply shall list the location where the material will be manufactured, and the handling and storage methods, along with necessary certification in accordance with AASHTO R 26(M). Only suppliers/refineries that have an approved "Quality Control Plan for Performance Graded Binders" formatted in accordance with AASHTO R 26(M) may supply PG binders to Department projects.

c. Standard Performance Grade (PG) Binder:

i. Standard PG binder shall be defined as "Neat". Neat PG binders shall be free from modification with: fillers, extenders, reinforcing agents, adhesion promoters, thermoplastic polymers, acid modification and other additives such as re-refined motor oil, and shall indicate such information on each bill of lading and certified test report.

ii. The standard asphalt binder grade shall be PG 64S-22.

d. Modified Performance Grade (PG) Binder:

The modified asphalt binder shall be Performance Grade PG 64E-22 asphalt modified solely with a Styrene-Butadiene-Styrene (SBS) polymer. The polymer modifier shall be added at either the refinery or terminal and delivered to the bituminous concrete production facility as homogenous blend. The stability of the modified binder shall be verified in accordance with ASTM D7173 using the Dynamic Shear Rheometer (DSR). The DSR  $G^*/\sin(\delta)$  results from the top and bottom sections of the ASTM D7173 test shall not differ by more than 10%. The results of ASTM D7173 shall be included on the Certified Test Report. The binder shall meet the requirements of AASHTO M 332 (including Appendix X1) and AASHTO R 29.

e. Warm Mix Additive or Technology:

i. The warm mix additive or technology must be listed on the North East Asphalt User Producer Group (NEAUPG) Qualified Warm Mix Asphalt (WMA) Technologies List at the time of bid, which may be accessed online at <http://www.neaupg.uconn.edu>.

ii. The warm mix additive shall be blended with the asphalt binder in accordance with the manufacturer's recommendations.

iii. The blended binder shall meet the requirements of AASHTO M 332 and shall be graded or verified in accordance with AASHTO R 29 for the specified binder grade. The Contractor shall submit a Certified Test Report showing the results of the testing demonstrating the binder grade. In addition, it must include the grade of the virgin

binder, the brand name of the warm mix additive, the manufacturer's suggested rate for the WMA additive, the water injection rate (when applicable) and the WMA Technology manufacturer's recommended mixing and compaction temperature ranges.

## 5. Emulsified Asphalts:

### a. General:

- i. The emulsified asphalt shall meet the requirements of AASHTO M 140 or AASHTO M 208 as applicable.
- ii. The emulsified asphalts shall be free of contaminants such as fuel oils and other solvents.
- iii. The blending at mixing plants of emulsified asphalts from different suppliers is prohibited.

### b. Basis of Approval

- i. The request for approval of the source of supply shall list the location where the material is manufactured, the handling and storage methods, and certifications in accordance with AASHTO PP 71. Only suppliers that have an approved "Quality Control Plan for Emulsified Asphalt" formatted in accordance with AASHTO PP 71 and submit monthly split samples per grade to the Engineer may supply emulsified asphalt to Department projects.
- ii. Each shipment of emulsified asphalt delivered to the project site shall be accompanied with the corresponding Certified Test Report listing Saybolt viscosity, residue by evaporation, penetration of residue, and weight per gallon at 77°F and Material Certificate.
- iii. Anionic emulsified asphalts shall conform to the requirements of AASHTO M-140. Materials used for tack coat shall not be diluted and meet grade RS-1 or RS-1H. When ambient temperatures are 80°F and rising, grade SS-1 or SS-1H may be substituted if permitted by the Engineer.
- iv. Cationic emulsified asphalt shall conform to the requirements of AASHTO M-208. Materials used for tack coat shall not be diluted and meet grade CRS-1. The settlement and demulsibility test will not be performed unless deemed necessary by the Engineer. When ambient temperatures are 80°F and rising, grade CSS-1 or CSS-1h may be substituted if permitted by the Engineer.

**6. Reclaimed Asphalt Pavement (RAP):**

- a. General: RAP is a material obtained from the cold milling or removal and processing of bituminous concrete pavement. RAP material shall be crushed to 100% passing the ½ inch sieve and free from contaminants such as joint compound, wood, plastic, and metals.
- b. Basis of Approval: The RAP material will be accepted on the basis of one of the following criteria:
  - i. When the source of all RAP material is from pavements previously constructed on Department projects, the Contractor shall provide a Materials Certificate listing the detailed locations and lengths of those pavements and that the RAP is only from those locations listed.
  - ii. When the RAP material source or quality is not known, the Contractor shall request for approval to the Engineer at least 30 calendar days prior to the start of the paving operation. The request shall include a Material Certificate and applicable test results stating that the RAP consists of aggregates that meet the specification requirements of sub articles M.04.01-1 through 3, and, that the binder in the RAP is substantially free of solvents, tars and other contaminants. The Contractor is prohibited from using unapproved material on Department projects and shall take necessary action to prevent contamination of approved RAP stockpiles. Stockpiles of unapproved material shall remain separate from all other RAP materials at all times. The request for approval shall include the following:
    - 1. A 50-pound sample of the RAP to be incorporated into the recycled mixture.
    - 2. A 25-pound sample of the extracted aggregate from the RAP.

**7. Crushed Recycled Container Glass (CRCG):**

- a. Requirements: The Contractor may propose to use clean and environmentally-acceptable CRCG in an amount not greater than 5% by weight of total aggregate.
- b. Basis of Approval: The Contractor shall submit to the Engineer a request to use CRCG. The request shall state that the CRCG contains no more than 1% by weight of contaminants such as paper, plastic and metal and conform to the following gradation:

<b>CRCG Grading Requirements</b>	
<u>Sieve Size</u>	<u>Percent Passing</u>
3/8-inch	100
No. 4	35-100
No. 200	0.0-10.0

The Contractor shall submit a Materials Certificate to the Engineer stating that the CRCG complies with all the applicable requirements in this specification.

## 8. Joint Seal Material:

- a. Requirements: Joint seal material must meet the requirements of ASTM D 6690 – Type 2. The Contractor shall submit a Material Certificate in accordance with Article 1.06.07 certifying that the joint seal material meets the requirements of this specification.

## 9. Recycled Asphalt Shingles (RAS)

- a. Requirements: RAS shall consist of processed asphalt roofing shingles from post-consumer asphalt shingles or from manufactured shingle waste. The RAS material under consideration for use in bituminous concrete mixtures must be certified as being asbestos free and shall be entirely free of whole, intact nails. The RAS material shall meet the requirements of AASHTO MP 23.

The producer shall test the RAS material to determine the asphalt content and the gradation of the RAS material. The producer shall take necessary action to prevent contamination of RAS stockpiles.

The Contractor shall submit a Materials Certificate to the Engineer stating that the RAS complies with all the applicable requirements in this specification.

## 10. Plant Requirements:

- a. General: The Plant producing bituminous concrete shall comply with AASHTO M 156.
- b. Storage Silos: The Contractor may use silos for short-term storage with the approval of the Engineer. A silo must have heated cones and an unheated silo cylinder if it does not contain a separate internal heating system. When multiple silos are filled, the Contractor shall discharge one silo at a time. Simultaneous discharge of multiple silos for the same Project is not permitted.

<u>Type of silo cylinder</u>	<u>Maximum storage time for all classes (hr)</u>	
	HMA	WMA/PMA
Open Surge	4	Mfg Recommendations*
Unheated – Non-insulated	8	Mfg Recommendations*
Unheated – Insulated	18	Mfg Recommendations*
Heated – No inert gas	TBD by the Engineer	

\*Not to exceed HMA limits

- c. Documentation System: The mixing plant documentation system shall include equipment for accurately proportioning the components of the mixture by weight and in the proper order, controlling the cycle sequence and timing the mixing operations. Recording equipment shall monitor the batching sequence of each component of the

mixture and produce a printed record of these operations on each Plant ticket, as specified herein.

If recycled materials are used, the Plant tickets shall include their dry weight, percentage and daily moisture content.

If a WMA Technology is added at the Plant, the Plant tickets shall include the actual dosage rate.

For drum Plants, the Plant ticket shall be produced at 5 minute intervals and maintained by the vendor for a period of three years after the completion of the project.

For batch Plants, the Plant ticket shall be produced for each batch and maintained by the vendor for a period of three years after the completion of the project. In addition, an asterisk (\*) shall be automatically printed next to any individual batch weight(s) exceeding the following tolerances:

Each Aggregate Component	±1.5% of individual or cumulative target weight for each bin
Mineral Filler	±0.5% of the total batch
Bituminous Material	±0.1% of the total batch
Zero Return (Aggregate)	±0.5% of the total batch
Zero Return (Bituminous Material)	±0.1% of the total batch

The entire batching and mixing interlock cut-off circuits shall interrupt and stop the automatic batching operations when an error exceeding the acceptable tolerance occurs in proportioning.

The scales shall not be manually adjusted during the printing process. In addition, the system shall be interlocked to allow printing only when the scale has come to a complete rest. A unique printed character (m) shall automatically be printed on the ticket when the automatic batching sequence is interrupted or switched to auto-manual or full manual during proportioning.

- d. Aggregates: Aggregate stockpiles shall be managed to prevent segregation and cross contamination. For drum plants only, the percent moisture content at a minimum prior to production and half way through production shall be determined.
- e. Mixture: The dry and wet mix times shall be sufficient to provide a uniform mixture and a minimum particle coating of 95% as determined by AASHTO T 195(M) .

Bituminous concrete mixtures shall contain no more than 0.5% moisture when tested in accordance with AASHTO T 329.

- f. RAP: RAP moisture content shall be determined a minimum of twice daily (prior to production and halfway through production).
- g. Asphalt Binder: A binder log shall be submitted to the Department's Central Lab on a monthly basis.
- h. Warm mix additive: For mechanically foamed WMA, the water injection rate shall be monitored during production and not exceed 2.0% by total weight of binder. For additive added at the Plant, the dosage rate shall be monitored during production.
- i. Plant Laboratory: The Contractor shall maintain a laboratory at the production facility to test bituminous concrete mixtures during production. The laboratory shall have a minimum of 300 square feet, have a potable water source and drainage in accordance with the CT Department of Public Health Drinking Water Division, and be equipped with all necessary testing equipment as well as with a PC, printer, and telephone with a dedicated hard-wired phone line. In addition, the PC shall have internet connection and a functioning web browser with unrestricted access to <https://ctmail.ct.gov>. This equipment shall be maintained in working order at all times and be made available for use by the Engineer.

The laboratory shall be equipped with a heating system capable of maintaining a minimum temperature of 65°F. It shall be clean and free of all materials and equipment not associated with the laboratory. Sufficient light and ventilation must be provided. During summer months, adequate cooling or ventilation must be provided so the indoor air temperature shall not exceed the ambient outdoor temperature.

The laboratory testing apparatus, supplies, and safety equipment shall be capable of performing all tests in their entirety that are referenced in AASHTO R 35 and AASHTO M 323. The Contractor shall ensure that the Laboratory is adequately supplied at all times during the course of the project with all necessary testing supplies and equipment.

The Contractor shall maintain a list of laboratory equipment used in the acceptance testing processes including but not limited to, balances, scales, manometer/vacuum gauge, thermometers, gyratory compactor, clearly showing calibration and/or inspection dates, in accordance with AASHTO R 18. The Contractor shall notify the Engineer if any modifications are made to the equipment within the laboratory. The Contractor shall take immediate action to replace, repair, and/or recalibrate any piece of equipment that is out of calibration, malfunctioning, or not in operation.

#### **M.04.02—Mix Design and Job Mix Formula (JMF)**

##### **1. Curb Mix:**

- a. Requirements: The Contractor shall use bituminous concrete that meets the requirements of Table M.04.02-1. RAP may be used in 5% increments by weight up to 30%.



- b. Basis of Approval: Annually, an approved JMF based on a mix design for curb mix must be on file with the Engineer prior to use. .  
Any change in component source of supply or consensus properties must be approved by the Engineer. A revised JMF shall be submitted prior to use.

**TABLE M.04.02 – 1:  
Control Points for Curb Mix Mixtures**

<b>Notes:</b> (a) Compaction Parameter 50gyration $N_{des}$ . (b) The percent passing the #200 sieve shall not exceed the percentage of bituminous asphalt binder.		
Mix	Curb Mix	Production Tolerances from JMF target
Grade of PG Binder content %	PG 64S-22 6.5 - 9.0	0.4
Sieve Size		
# 200	3.0 – 8.0 (b)	2.0
# 50	10 - 30	4
# 30	20 - 40	5
# 8	40 - 70	6
# 4	65 - 87	7
1/4"		
3/8 "	95 - 100	8
1/2 "	100	8
3/4"		8
1"		
2"		
Additionally, the fraction of material retained between any two consecutive sieves shall not be less than 4%		
Mixture Temperature		
Binder	325°F maximum	
Aggregate	280-350° F	
Mixtures	265-325° F	
Mixture Properties		
Air Voids (VA) %	0 – 4.0 (a)	

**2. Superpave Design Method – S0.25, S0.375, S0.5, and S1**

- a. Requirements: All designated mixes shall be designed using the Superpave mix design method in accordance with AASHTO R 35. A JMF based on the mix design shall meet the requirements of Tables M.04.02-2 through Table M.04.02-5. Each JMF must be submitted no less than seven (7) days prior to production and must be approved by the Engineer prior to use. All approved JMFs expire at the end of the calendar year.

All aggregate component consensus properties and tensile strength ratio (TSR) specimens shall be tested at an AASHTO Materials Reference Laboratory (AMRL) by NETTCP certified technicians.

All bituminous concrete mixes shall be tested for stripping susceptibility by performing the tensile strength ratio (TSR) test procedure in accordance with AASHTO T 283(M) at a minimum every 36 months. The compacted specimens may be fabricated at the Plant and then tested at an AMRL accredited facility. TSR specimens, and corresponding JMF shall be submitted with each test report.

i. Superpave Mixtures with RAP: RAP may be used with the following conditions:

- RAP amounts up to 15% may be used with no binder grade modification.
- RAP amounts up to 20% may be used provided a new JMF is approved by the Engineer. The JMF submittal shall include the grade of virgin binder added. The JMF shall be accompanied by a blending chart and supporting test results in accordance with AASHTO M 323 Appendix X1, or by testing that shows the combined binder (recovered binder from the RAP, virgin binder at the mix design proportions, warm mix asphalt additive and any other modifier if used) meets the requirements of the specified binder grade.
- Two representative samples of RAP shall be obtained. Each sample shall be split and one split sample shall be tested for binder content in accordance with AASHTO T 164 and the other in accordance AASHTO T 308.
- RAP material shall not be used with any other recycling option.

ii. Superpave Mixtures with RAS: RAS may be used solely in HMA S1 mixtures with the following conditions:

- RAS amounts up to 3% may be used.
- RAS total binder replacement up to 15% may be used with no binder grade modification.
- RAS total binder replacement up to 20% may be used provided a new JMF is approved by the Engineer. The JMF submittal shall include the grade of virgin binder added. The JMF shall be accompanied by a blending chart and supporting test results in accordance to AASHTO M 323 appendix X1 or by testing that shows the combined binder (recovered binder from the RAP, virgin binder at the mix design proportions, warm mix asphalt additive and any other modifier if used) meets the requirements of the specified binder grade.
- Superpave Mixtures with RAS shall meet AASHTO PP 78 design considerations. The RAS asphalt binder availability factor (F) used in AASHTO PP 78 shall be 0.85.

iii. Superpave Mixtures with CRCG: CRCG may be used solely in HMA S1 mixtures. One percent of hydrated lime, or other accepted non-stripping agent, shall be added to all mixtures containing CRCG. CRCG material shall not be used with any other recycling option.

- b. Basis of Approval: The following information must be included with the JMF submittal:
- Gradation, consensus properties and specific gravities of the aggregate, RAP or RAS.
  - Average asphalt content of the RAP or RAS by AASHTO T 164.
  - Source of RAP or RAS, and percentage to be used.
  - Warm mix Technology, manufacturer's recommended additive rate and tolerances and manufacturer recommended mixing and compaction temperatures.
  - TSR test report and anti-strip manufacturer and recommended dosage rate if applicable.
  - Mixing and compaction temperature ranges for the mix with and without the warm-mix technology incorporated.
  - JMF ignition oven correction factor by AASHTO T 308.

With each JMF submittal, the following samples shall be submitted to the Division of Materials Testing:

- 4 - one quart cans of PG binder, with corresponding Safety Data Sheet (SDS)
- 1 - 50 lbs bag of RAP
- 2 - 50 lbs bag of plant blended virgin aggregate

A JMF may not be approved if any of the properties of the aggregate components or mix do not meet the verification tolerances as described in the Department's current QA Program for Materials, Acceptance and Assurance Testing Policies and Procedures.

Any material based on a JMF, once approved, shall only be acceptable for use when it is produced by the designated plant, it utilizes the same components, and the production of material continues to meet all criteria as specified herein, and component aggregates are maintained within the tolerances shown in Table M.04.02-2. A new JMF must be submitted to the Engineer for approval whenever a new component source is proposed.

Only one mix with one JMF will be approved for production at any one time. Switching between approved JMF mixes with different component percentages or sources of supply is prohibited.

- c. Mix Status: Each facility will have each type of mixture rated based on the results of the previous year's production. Mix Status will be provided to each bituminous concrete producer annually prior to the beginning of the paving season.

The rating criteria are based on compliance with Air Voids and Voids in Mineral Aggregate (VMA) as indicated in Table M.04.03-4 and are calculated as follows:

Criteria A: Percentage of acceptance test results with compliant air voids.

Criteria B: The average of the percentage of acceptance test results with compliant VMA, and percentage of acceptance test results with compliant air voids.

The final rating assigned will be the lower of the rating obtained with Criteria A or B.

Mix status is defined as:

“A” – Approved:

Assigned to each mixture type from a production facility with a current rating of 70% or greater, or to each mixture type completing a successful PPT.

“PPT” – Pre-Production Trial:

Temporarily assigned to each mixture type from a production facility when:

1. there are no compliant acceptance production test results submitted to the Department from the previous year;
2. there is a source change in one or more aggregate components
3. there is a component percentage change of more than 5% by weight;
4. there is a change in RAP percentage;
5. the mixture has a rating of less than 70% from the previous season;
6. a new JMF not previously submitted.

Bituminous concrete mixtures with a “PPT” status cannot be used on Department projects. Testing shall be performed by the Producer with NETTCP certified personnel on material under this status. Test results must confirm that specifications requirements in Table M.04.02-2 and Table M.04.02-5 are met before material can be used. One of the following methods must be used to verify the test results:

Option A: Schedule a day when a Department Inspector can be at the facility to witness testing or,

Option B: When the Contractor or their representative performs testing without being witnessed by an Inspector, the Contractor shall submit the test results and a split sample including 2 gyratory molds, 5,000 grams of boxed bituminous concrete, and 5,000 grams of cooled loose bituminous concrete for verification testing and approval.

Option C: When the Contractor or their representative performs testing without being witnessed by a Department Inspector, the Engineer may verify the mix in the Contractor’s laboratory.

Witnessing or verifying by the Department of compliant test results will change the mix’s status to an “A”.

The differences between the Department’s test results and the Contractor’s must be within the “C” tolerances included in the Department’s QA Program for Materials, Acceptance and Assurance Testing Policies and Procedures in order to be verified.

“U” – Not Approved:

Status assigned to a type of mixture that does not have an approved JMF. . Bituminous concrete mixtures with a “U” status cannot be used on Department projects.

**TABLE M.04.02– 2: Superpave Mixture Design Criteria**

<i>Notes:</i> <sup>(1)</sup> For all mixtures using a WMA technology, the mix temperature shall meet PG binder and WMA manufacturer's recommendations.								
Sieve	S0.25		S0.375		S0.5		S1	
	CONTROL POINTS		CONTROL POINTS		CONTROL POINTS		CONTROL POINTS	
inches	Min (%)	Max (%)	Min (%)	Max (%)	Min (%)	Max (%)	Min (%)	Max (%)
2.0	-	-	-	-	-	-	-	-
1.5	-	-	-	-	-	-	100	-
1.0	-	-	-	-	-	-	90	100
3/4	-	-	-	-	100	-	-	90
1/2	100	-	100	-	90	100	-	-
3/8	97	100	90	100	-	90	-	-
#4	75	90	-	75	-	-	-	-
#8	32	67	32	67	28	58	19	45
#16	-	-	-	-	-	-	-	-
#30	-	-	-	-	-	-	-	-
#50	-	-	-	-	-	-	-	-
#100	-	-	-	-	-	-	-	-
#200	2.0	10.0	2.0	10.0	2.0	10.0	1.0	7.0
VMA (%)	16.5 ± 1		16.0 ± 1		15.0 ± 1		13.0 ± 1	
VA (%)	4.0 ± 1		4.0 ± 1		4.0 ± 1		4.0 ± 1	
Gse	JMF value		JMF value		JMF value		JMF value	
Gmm	JMF ± 0.030		JMF ± 0.030		JMF ± 0.030		JMF ± 0.030	
Dust / binder	0.6 – 1.2		0.6 – 1.2		0.6 – 1.2		0.6 – 1.2	
Mix Temp <sup>(1)</sup>	265 – 325°F		265 – 325°F		265 – 325°F		265 – 325°F	
TSR	≥ 80%		≥ 80%		≥ 80%		≥ 80%	
T-283 Stripping	Minimal, as determined by the Engineer							

**TABLE M.04.02–3: Superpave Consensus Properties Requirements for Combined Aggregate**

Notes: (1) 95/90 denotes that a minimum of 95% of the coarse aggregate, by mass, shall have one fractured face and that a minimum of 90% shall have two fractured faces.. (2) Criteria presented as maximum Percent by mass of flat and elongated particles of materials retained on the #4 sieve, determined at 5:1 ratio.					
Traffic Level	Design ESALs (80 kN), Millions	Coarse Aggregate Angularity <sup>(1)</sup> ASTM D 5821, Minimum %	Fine Aggregate Angularity AASHTO T 304, Method A Minimum %	Flat and Elongated Particles <sup>(2)</sup> ASTM D 4791, Maximum %	Sand Equivalent AASHTO T 176, Minimum %
1	< 0.3	55/- -	40	10	40
2	0.3 to < 3.0	75/- -	40	10	40
3	≥ 3.0	95/90	45	10	45

**TABLE M.04.02– 4: Superpave Traffic Levels and Design Volumetric Properties**

Traffic Level	Design ESALs (million)	Number of Gyration by Superpave Gyrotory Compactor			Percent Density of Gmm from HMA/WMA specimen			Voids Filled with Asphalt (VFA) Based on Nominal mix size – inch			
		Nini	Ndes	Nmax	Nini	Ndes	Nmax	0.25	0.375	0.5	1
1	< 0.3	6	50	75	≤ 91.5	96.0	≤ 98.0	70 - 80	70 - 80	70 - 80	67 - 80
2	0.3 to < 3.0	7	75	115	≤ 90.5	96.0	≤ 98.0	65 - 78	65 - 78	65 - 78	65 - 78
3	≥ 3.0	8	100	160	≤ 90.0	96.0	≤ 98.0	65 – 77	73 - 76	65 - 75	65 - 75

**TABLE M.04.02– 5:  
Superpave Minimum Binder Content by Mix Type and Level**

<b>Mix Type</b>	<b>Level</b>	<b>Binder Content Minimum</b>
S0.25	1	5.70
S0.25	2	5.60
S0.25	3	5.50
S0.375	1	5.70
S0.375	2	5.60
S0.375	3	5.50
S0.5	1	5.10
S0.5	2	5.00
S0.5	3	4.90
S1	1	4.60
S1	2	4.50
S1	3	4.40

**M.04.03— Production Requirements:**

**1. Standard Quality Control Plan (QCP) for Production:**

The QCP for production shall describe the organization and procedures which the Contractor shall use to administer quality control. The QCP shall include the procedures used to control the production process, to determine when immediate changes to the processes are needed, and to implement the required changes. The QCP must detail the inspection, sampling and testing protocols to be used, and the frequency for each.

Control Chart(s) shall be developed and maintained for critical aspect(s) of the production process as determined by the Contractor. The control chart(s) shall identify the material property, applicable upper and lower control limits, and be updated with current test data. As a minimum, the following quality characteristics shall be included in the control charts: percent passing #4 sieve, percent passing #200 sieve, binder content, air voids, Gmm and VMA. The control chart(s) shall be used as part of the quality control system to document variability of the bituminous concrete production process. The control chart(s) shall be submitted to the Engineer the first day of each month.

The QCP shall also include the name and qualifications of a Quality Control Manager. The Quality Control Manager shall be responsible for the administration of the QCP, including compliance with the plan and any plan modifications.

The Contractor shall submit complete production testing records to the Engineer within 24 hours in a manner acceptable to the Engineer.

The QCP shall also include the name and qualifications of any outside testing laboratory performing any QC functions on behalf of the Contractor. The QCP must also include a list of sampling & testing methods and frequencies used during production, and the names of all Quality Control personnel and their duties.

Approval of the QCP does not imply any warranty by the Engineer that adherence to the plan will result in production of bituminous concrete that complies with these specifications. The Contractor shall submit any changes to the QCP as work progresses.

## **2. Acceptance Requirements:**

### **i. General:**

Acceptance samples shall be obtained from the hauling vehicles and tested by the Contractor at the Plant.

The Contractor shall submit all acceptance tests results to the Engineer within 24 hours or prior to the next day's production. All acceptance test specimens and supporting documentation must be retained by the Contractor and may be disposed of with the approval of the Engineer. All quality control specimens shall be clearly labeled and separated from the acceptance specimens.

Contractor personnel performing acceptance sampling and testing must be present at the facility prior to, during, and until completion of production, and be certified as a NETTCP HMA Plant Technician or Interim HMA Plant Technician and be in good standing. Production of material for use on State projects must be suspended by the Contractor if such personnel are not present. Technicians found by the Engineer to be non-compliant with NETTCP policies and procedures or Department policies may be removed by the Engineer from participating in the acceptance testing process for Department projects until their actions can be reviewed.

Anytime during production that testing equipment becomes defective or inoperable, production can continue for a maximum of 1 hour. The Contractor shall obtain box sample(s) in accordance with Table M.04.03-2 to satisfy the daily acceptance testing requirement for the quantity shipped to the project. The box sample(s) shall be tested once the equipment issue has been resolved to the satisfaction of the Engineer. Production beyond 1 hour may be considered by the Engineer. Production will not be permitted beyond that day until the subject equipment issue has been resolved.

Verification testing will be performed by the Engineer in accordance with the Department's QA Program for Materials.

Should the Department be unable to verify the Contractor's acceptance test result(s) due to a failure of the Contractor to retain acceptance test specimens or supporting documentation, the Contractor shall review its quality control plan, determine the cause of the nonconformance and



respond in writing within 24 hours to the Engineer describing the corrective action taken. In addition, the Contractor must provide supporting documentation or test results to validate the subject acceptance test result(s). The Engineer may invalidate any adjustments for material corresponding to the subject acceptance test(s). Failure of the Contractor to adequately address quality control issues at a facility may result in suspension of production for Department projects at that facility.

**ii. Curb Mix Acceptance Sampling and Testing Procedures:**

Curb Mix shall be tested in accordance to Table M.04.03-1 by the Contractor at a frequency of one test per every 250 tons of cumulative production, regardless of the day of production.

**TABLE M.04.03 – 1: Curb Mix Acceptance Test Procedures**

Protocol	Reference	Description
1	AASHTO T 30(M)	Mechanical Analysis of Extracted Aggregate
2	AASHTO T 168	Sampling of Bituminous Concrete
3	AASHTO T 308	Binder content by Ignition Oven method (adjusted for aggregate correction factor)
4	AASHTO T 209(M) <sup>(2)</sup>	Theoretical Maximum Specific Gravity and Density of Bituminous Paving Mixtures
5	AASHTO T 312 <sup>(2)</sup>	<sup>(1)</sup> Superpave Gyration molds compacted to N <sub>des</sub>
6	AASHTO T 329	Moisture Content of Hot-Mix Asphalt (HMA) by Oven Method

**Notes:** <sup>(1)</sup> One set equals two six-inch molds. Molds to be compacted to 50 gyrations  
<sup>(2)</sup> Once per year or when requested by the Engineer

a. Determination of Off-Test Status:

- i. Curb Mix is considered “off test” when the test results indicate that any single value for bitumen content or gradation are not within the tolerances shown in Table M.04.02-1. If the mix is “off test”, the Contractor must take immediate actions to correct the deficiency and a new acceptance sample shall be tested on the same day or the following day of production.
- ii. When multiple silos are located at one site, mixture supplied to one project is considered as coming from one source for the purpose of applying the “off test” status.
- iii. The Engineer may cease supply from the plant when test results from three consecutive samples are not within the JMF tolerances or the test results from two consecutive samples not within the control points indicated in Table M.04.02-1 regardless of production date.

b. JMF revisions

- i. If a test indicates that the bitumen content or gradation are outside the tolerances, the Contractor may make a single JMF revision as allowed by the Engineer prior to any additional testing. Consecutive test results outside the requirements of Table M.04.02-1 JMF tolerances may result in rejection of the mixture.
- ii. Any modification to the JMF shall not exceed 50% of the JMF tolerances indicated in Table M.04.02-1 for any given component of the mixture without approval of the Engineer. When such an adjustment is made to the bitumen, the corresponding production percentage of bitumen shall be revised accordingly.

**iii. Superpave Mix Acceptance:**

a. Sampling and Testing Procedures

Production Lot: The Lot will be defined as one of the following types:

- Non-PWL Production Lot for total estimated project quantities per mixture less than 3500 tons: All mixture placed during a single continuous paving operation.
- PWL Production Lot for total estimated project quantities per mixture of 3500 tons or more: Each 3500 tons of mixture produced within 30 calendar days.

Production Sub Lot:

- For Non-PWL: As defined in Table M.04.03 – 2
- For PWL: 500 tons (the last Sub Lot may be less than 500 tons)

Partial Production Lots (For PWL only): A Lot with less than 3500 tons due to:

- completion of the Course
- a Job Mix Formula revision due to changes in:
  - o cold feed percentages over 5%
  - o target combined gradation over 5%
  - o target binder over 0.15%
  - o any component specific gravity
- a Lot spanning 30 calendar days

The acceptance sample(s) location(s) shall be selected using stratified – random sampling in accordance with ASTM D 3665 based on:

- the total daily estimated tons of production for non-PWL lots, or
- the total lot size for PWL lots.

One acceptance sample shall be obtained and tested per Sub Lot. The Engineer may direct that additional acceptance samples be obtained. For non-PWL lots, one acceptance test shall always be performed in the last sub-lot based on actual tons of material produced.

For Non-PWL lots, quantities of the same mixture per plant may be combined daily for multiple State projects to determine the number of sub lots.

The payment adjustment will be calculated as described in 4.06.

**TABLE M.04.03 – 2:  
Superpave Acceptance Testing Frequency per Type/Level/Plant for Non-PWL lots**

Daily quantity produced in tons (lot)	Number of Sub Lots/Tests
0 to 150	0, Unless requested by the Engineer
151 to 500	1
501 to 1,000	2
1,001 to 2,000	3
2,001 or greater	1 per 500 tons or portions thereof

The following test procedures shall be used for acceptance:

**TABLE M.04.03– 3: Superpave Acceptance Testing Procedures**

Protocol	Procedure	Description
1	AASHTO T 168	Sampling of bituminous concrete
2	AASHTO R 47	Reducing samples to testing size
3	AASHTO T 308	Binder content by ignition oven method (adjusted for aggregate correction factor)
4	AASHTO T 30(M)	Gradation of extracted aggregate for bituminous concrete mixture
5	AASHTO T 312	<sup>(1)</sup> Superpave gyratory molds compacted to $N_{des}$
6	AASHTO T 166	<sup>(2)</sup> Bulk specific gravity of bituminous concrete
7	AASHTO R 35	<sup>(2)</sup> Air voids, VMA
8	AASHTO T 209(M)	Maximum specific gravity of bituminous concrete (average of two tests)
9	AASHTO T 329	Moisture content of bituminous concrete

**Notes:** <sup>(1)</sup> One set equals two six-inch molds. Molds to be compacted to  $N_{max}$  for PPTs and to  $N_{des}$  for production testing. The first subplot of the year will be compacted to  $N_{max}$

<sup>(2)</sup> Average value of one set of six-inch molds.

If the average ignition oven corrected binder content differs by 0.3% or more from the average of the Plant ticket binder content in five (5) consecutive tests regardless of the production date (moving average), the Contractor shall immediately investigate, determine an assignable cause and correct the issue. When two consecutive moving average differences are 0.3% or more and no assignable cause has been established, the Engineer may require a new ignition oven aggregate correction factor to be performed or to adjust the current factor by the average of the differences between the corrected binder content and production Plant ticket for the last five (5) acceptance results.

The test specimen must be placed in an ignition oven for testing in accordance with AASHTO T 308 within thirty minutes of being obtained from the hauling vehicle and the test shall start immediately after.

The Contractor shall perform TSR testing within 30 days after the start of production for all design levels of HMA- and PMA- S0.5 plant-produced mixtures, in accordance with AASHTO T 283(M). The TSR test shall be performed at an AMRL certified laboratory by NETTCP certified technicians. The compacted specimens may be fabricated at the Plant and then tested at an AMRL accredited facility. The test results and specimens shall be submitted to the Engineer for review. Superpave mixtures that require anti-strip additives (either liquid or mineral) shall continue to meet all requirements specified herein for binder and bituminous concrete. The Contractor shall submit the name, manufacturer, percent used, technical datasheet and SDS for the anti-strip additive (if applicable) to the Engineer.

b. Determination of Off-Test Status:

- i. Superpave mixes shall be considered “*off test*” when any Control Point Sieve, binder content, VA, VMA, or Gmm value is outside of the limits specified in Table M.04.03-4 or the target binder content at the Plant is below the minimum binder content stated in Table M.04.02-5. Note that further testing of samples or portions of samples not initially tested for this purpose cannot be used to change the status.
- ii. Any time the bituminous concrete mixture is considered Off-test:
  1. The Contractor shall notify the Engineer when the Plant is “*off test*” for any mix design that is delivered to the project in any production day. When multiple silos are located at one site, mixture supplied to one project is considered as coming from one source for the purpose of applying the “*off test*” determination.
  2. The Contractor must take immediate actions to correct the deficiency, minimize “*off test*” production to the project, and obtain an additional Process Control (PC) test after any corrective action to verify production is in conformance to the specifications. A PC test will not be used for acceptance and is solely for the use of the Contractor in its quality control process.

c. Cessation of Supply for Superpave Mixtures in non-PWL lots:

A mixture shall not be used on Department’s projects when it is “off test” for:

- i. four (4) consecutive tests in any combination of VA, VMA or Gmm, regardless of date of production, or,
- ii. two (2) consecutive tests in the Control Point sieves in one production shift.

As a result of cessation of supply, the mix status will be changed to PPT.

d. JMF revisions:

JMF revisions are only permitted prior to or after a production shift. A JMF revision is effective from the time it was submitted and is not retroactive to the previous test(s).

JMF revisions shall be justified by a documented trend of test results.

Revisions to aggregate and RAP specific gravities are only permitted when testing is performed at an AMRL certified laboratory by NETTCP certified technicians.

A JMF revision is required when the Plant target RAP and/or bin percentage deviates by more than 5% and/or the Plant target binder content deviates by more than 0.15% from the active JMF.

**TABLE M.04.03– 4: Superpave Mixture Production Requirements**

*Notes:* (1) 300°F minimum after October 15. (2) JMF tolerances shall be defined as the limits for production compliance. (3) For all mixtures with WMA technology, changes to the minimum aggregate temperature will require Engineer’s approval. (4) For PMA and mixtures with WMA technology, the mix temperature shall meet manufacturer’s recommendations. In addition, for all mixtures with WMA technology, the maximum mix temperature shall not exceed 325°F.(5) 0.4 for PWL lots (6) 1.3 for PWL lots (7) 1.2 for PWL lots

Sieve	S0.25		S0.375		S0.5		S1		Tolerances
	CONTROL POINTS		CONTROL POINTS		CONTROL POINTS		CONTROL POINTS		From JMF Targets <sup>(2)</sup>
	Min(%)	Max(%)	Min(%)	Max(%)	Min(%)	Max(%)	Min(%)	Max(%)	±Tol
1.5	-	-	-	-	-	-	100	-	
1.0	-	-	-	-	-	-	90	100	
3/4	-	-	-	-	100	-	-	90	
1/2	100	-	100	-	90	100	-	-	
3/8	97	100	90	100	-	90	-	-	
#4	75	90	-	75	-	-	-	-	
#8	32	67	32	67	28	58	19	45	
#16	-	-	-	-	-	-	-	-	
#200	2.0	10.0	2.0	10.0	2.0	10.0	1.0	7.0	
Pb	JMF value		JMF value		JMF value		JMF value		0.3 <sup>(5)</sup>
VMA (%)	16.5		16.0		15.0		13.0		1.0 <sup>(6)</sup>
VA (%)	4.0		4.0		4.0		4.0		1.0 <sup>(7)</sup>
Gmm	JMF value		JMF value		JMF value		JMF value		0.030
Agg. Temp <sup>(3)</sup>	280 – 350F		280 – 350F		280 – 350F		280 – 350F		
Mix Temp <sup>(4)</sup>	265 – 325 F <sup>(1)</sup>		265 – 325 F <sup>(1)</sup>		265 – 325 F <sup>(1)</sup>		265 – 325 F <sup>(1)</sup>		
Prod. TSR	N/A		N/A		≥80%		N/A		
T-283 Stripping	N/A		N/A		Minimal as determined by the Engineer		N/A		

**TABLE M.04.03– 5:  
Superpave Traffic Levels and Design Volumetric Properties**

Traffic Level	Design ESALs	Number of Gyration by Superpave Gyratory Compactor	
	(million)	Nini	Ndes
1	< 0.3	6	50
2	0.3 to < 3.0	7	75
3	≥3.0	8	100

**TABLE M.04.03-6:  
Modifications to Standard AASHTO and ASTM Test Specifications and Procedures**

AASHTO Standard Method of Test	
Reference	Modification
<b>T 30</b>	Section 7.2 thru 7.4 Samples are not routinely washed for production testing
<b>T 168</b>	<p>Samples are taken at one point in the pile. Samples from a hauling vehicle are taken from only one point instead of three as specified.</p> <p>Selection of Samples: Sampling is equally important as the testing, and the sampler shall use every precaution to obtain samples that are truly representative of the bituminous mixture.</p> <p>Box Samples: In order to enhance the rate of processing samples taken in the field by construction or maintenance personnel the samples will be tested in the order received and data processed to be determine conformance to material specifications and to prioritize inspections by laboratory personnel.</p>
<b>T 195</b>	Section 4.3 only one truck load of mixture is sampled. Samples are taken from opposite sides of the load.
<b>T 209</b>	<p>Section 7.2 The average of two bowls is used proportionally in order to satisfy minimum mass requirements.</p> <p>8.3 Omit Pycnometer method.</p>
<b>T 283</b>	When foaming technology is used, the material used for the fabrication of the specimens shall be cooled to room temperature, and then reheated to the manufactures recommended compaction temperature prior to fabrication of the specimens.

<b>AASHTO Standard Recommended Practices</b>	
<b>Reference</b>	<b>Modification</b>
<b>R 26</b>	<p>All laboratory technician(s) responsible for testing PG-binders be certified or Interim Qualified by the New England Transportation Technician Certification Program (NETTCP) as a PG Asphalt Binder Lab Technician.</p> <p>All laboratories testing binders for the Department are required to be accredited by the AASHTO Materials Reference Laboratory (AMRL).</p> <p>Sources interested in being approved to supply PG-binders to the Department by use of an “in-line blending system,” must record properties of blended material, and additives used.</p> <p>Each source of supply of PG-binder must indicate that the binders contain no additives used to modify or enhance their performance properties. Binders that are manufactured using additives, modifiers, extenders etc., shall disclose the type of additive, percentage and any handling specifications/limitations required.</p> <p>All AASHTO M 320 references shall be replaced with AASHTO M 332.</p> <p>Once a month, one split sample and test results for each asphalt binder grade and each lot shall be submitted by the PG binder supplier to the Department’s Central Lab. Material remaining in a certified lot shall be re-certified no later than 30 days after initial certification. Each April and September, the PG binder supplier shall submit test results for two (2) BBR tests at two (2) different temperatures in accordance with AASHTO R 29.</p>



## **SMALL CONTRACTOR AND SMALL CONTRACTOR MINORITY BUSINESS ENTERPRISES (SET-ASIDE)**

March, 2001

NOTE: Certain of the requirements and procedures stated in this "Special Provision" are applicable prior to the execution of the Contract.

### **I. GENERAL**

- A. The Contractor shall cooperate with the Connecticut Department of Transportation (CONNDOT) in implementing the required contract obligations concerning "Small Contractor" and "Small Contractor Minority Business Enterprise" use on this Contract in accordance with Section 4a-60g of the Connecticut General Statutes as revised. References, throughout this "Special Provision", to "Small Contractors" are also implied references to "Small Contractor Minority Business Enterprises" as both relate to Section IIA of these provisions. The Contractor shall also cooperate with CONNDOT in reviewing the Contractor's activities relating to this provision. This "Special Provision" is in addition to all other equal opportunity employment requirements of this Contract.
- B. For the purpose of this "Special Provision", the "Small Contractor(s)" and "Minority Business Enterprise(s)" named to satisfy the set-aside requirement must be certified by the Department of Administrative Services, Business Connections/ Set-Aside Unit [(860) 713-5236 [www.das.state.ct.us/busopp.htm](http://www.das.state.ct.us/busopp.htm)] as a "Small Contractor" and "Minority Business Enterprises" as defined by Section 4a-60g Subsections (1) and (3) of the Connecticut General Statutes as revised and is subject to approval by CONNDOT to do the work for which it is nominated pursuant to the criteria stipulated in Section IIC-3.
- C. Contractors who allow work which they have designated for "Small Contractor" participation in the pre-award submission required under Section IIC to be performed by other than the approved "Small Contractor" organization and prior to concurrence by CONNDOT, will not be paid for the value of the work performed by organizations other than the "Small Contractor" designated.
- D. If the Contractor is unable to achieve the specified contract goals for "Small Contractor" participation, the Contractor shall submit written documentation to CONNDOT's Manager of Construction Operations indicating his/her good faith efforts to satisfy goal requirements. Documentation is to include but not be limited to the following:

1. A detailed statement of the efforts made to select additional subcontract opportunities for work to be performed by each "Small Contractor" in order to increase the likelihood of achieving the stated goal.
  2. A detailed statement, including documentation of the efforts made to contact and solicit contracts with each "Small Contractor", including the names, addresses, dates and telephone numbers of each "Small Contractor" contacted, and a description of the information provided to each "Small Contractor" regarding the scope of services and anticipated time schedule of items proposed to be subcontracted and the nature of response from firms contacted.
  3. For each "Small Contractor" that placed a subcontract quotation which the Contractor considered not to be acceptable, provide a detailed statement of the reasons for this conclusion.
  4. Documents to support contacts made with CONNDOT requesting assistance in satisfying the contract specified or adjusted "Small Contractor" dollar requirements.
  5. Document other special efforts undertaken by the Contractor to meet the defined goal.
- E. Failure of the Contractor to have at least the specified dollar amount of this contract performed by "Small Contractor" as required in Section IIA of this "Special Provision" will result in the reduction in contract payment to the Contractor by an amount equivalent to that determined by subtracting from the specific dollar amount required in Section IIA, the dollar payments for the work actually performed by each "Small Contractor". The deficiency in "Small Contractor" achievement, will therefore, be deducted from the final contract payment. However, in instances where the Contractor can adequately document or substantiate its good faith efforts made to meet the specified or adjusted dollar amount to the satisfaction of CONNDOT, no reduction in payments will be imposed.
- F. All records must be retained for a period of three (3) years following completion of the contract and shall be available at reasonable times and places for inspection by authorized representatives of CONNDOT.
- G. Nothing contained herein, is intended to relieve any contractor or subcontractor or material supplier or manufacturer from compliance with all applicable Federal and State legislation or provisions concerning equal employment opportunity, affirmative action, nondiscrimination and related subjects during the term of this Contract.

## II. SPECIFIC REQUIREMENTS

In order to increase the participation of "Small Contractors", CONNDOT requires the following:

- A. Not less than **Twenty Five Percent (25%)** of the **final** value of this Contract shall be subcontracted to and performed by, and/or supplied by, manufactured by and paid to "Small Contractors" and/or "Small Contractors Minority Business Enterprises".

*If the above percentage is zero (0%) AND an asterisk (\*) has been entered in the adjacent brackets [     ], this Contract is 100% solely set-aside for participation by "Small Contractors" and/or "Small Contractors Minority Business Enterprises".*

- B. The Contractor shall assure that each "Small Contractor" will have an equitable opportunity to compete under this "Special Provision", particularly by arranging solicitations, time for the preparation of Quotes, Scope of Work, and Delivery Schedules so as to facilitate the participation of each "Small Contractor".
- C. The Contractor shall provide to CONNDOT's Manager of Contracts within Seven (7) days after the bid opening the following items:
1. An affidavit (Exhibit I) completed by each named "Small Contractor" subcontractor listing a description of the work and indicating the dollar amount of all contract(s) and/or subcontract(s) that have been awarded to him/her for the current State Fiscal Year (July 1 - June 30) does not exceed the Fiscal Year limit of \$10,000,000.00.
  2. A certification of work to be subcontracted (Exhibit II) signed by both the Contractor and the "Small Contractor" listing the work items and the dollar value of the items that the nominated "Small Contractor" is to perform on the project to achieve the minimum percentage indicated in Section IIA above.
  3. A certification of past experience (Exhibit III) indicating the scope of work the nominated "Small Contractor" has performed on all projects, public and private, for the past two (2) years.
  4. In instances where a change from the originally approved named "Small Contractor" (see Section IB) is proposed, the Contractor is required to submit, in a reasonable and expeditious manner, a revised submission, comprised of the documentation required in Section IIC, Paragraphs 1, 2 and 3 and Section E together with documentation to substantiate and

justify the change, (i.e., documentation to provide a basis for the change) to CONNDOT's Manager of Construction Operations for its review and approval prior to the implementation of the change. The Contractor must demonstrate that the originally named "Small Contractor" is unable to perform in conformity to specifications, or unwilling to perform, or is in default of its contract, or is overextended on other jobs. The Contractor's ability to negotiate a more advantageous contract with another "Small Contractor" is not a valid basis for change. Documentation shall include a letter of release from the originally named "Small Contractor" indicating the reason(s) for the release.

- D. After the Contractor signs the Contract, the Contractor will be required to meet with CONNDOT's Manager of Construction Operations or his/her designee to review the following:
1. What is expected with respect to the "Small Contractor" set aside requirements.
  2. Failure to comply with and meet the requirement can and will result in monetary deductions from payment.
  3. Each quarter after the start of the "Small Contractor" the Contractor shall submit a report to CONNDOT's Manager of Construction Operations indicating the work done by, and the dollars paid to each "Small Contractor" to date.
  4. What is required when a request to sublet to a "Small Contractor" is submitted.
- E. The Contractor shall submit to CONNDOT's Manager of Construction Operations all requests for subcontractor approvals on standard forms provided by the Department.

If the request for approval is for a "Small Contractor" subcontractor for the purpose of meeting the contract required "Small Contractor" percentage stipulated in Section IIA, a copy of the legal contract between the Contractor and the "Small Contractor" subcontractor must also be submitted at the same time. Any subsequent amendments or modifications of the contract between the Contractor and the "Small Contractor" subcontractor must also be submitted to CONNDOT's Manager of Construction Operations with an explanation of the change(s). The contract must show items of work to be performed, unit prices and, if a partial item, the work involved by both parties.

In addition, the following documents are to be attached:

- (1) A statement explaining any method or arrangement for renting equipment. If rental is from a Contractor, a copy of Rental Agreement must be submitted.
- (2) A statement addressing any special arrangements for manpower.
- (3) A statement addressing who will purchase material.

F. Contractors subcontracting with a "Small Contractor" to perform work or services as required by this "Special Provision" shall not terminate such firms without advising CONNDOT, in writing, and providing adequate documentation to substantiate the reasons for termination if the designated "Small Contractor" firm has not started or completed the work or the services for which it has been contracted to perform.

G. Material Suppliers or Manufacturers

If the Contractor elects to utilize a "Small Contractor" supplier or manufacturer to satisfy a portion or all of the specified dollar requirements, the Contractor must provide the Department with:

1. An executed Affidavit Small Contractor (Set-Aside) Connecticut Department of Transportation Affidavit Supplier or Manufacturer (sample attached), and
2. Substantiation of payments made to the supplier or manufacturer for materials used on the project.

Brokers and packagers shall not be regarded as material Suppliers or manufacturer.

H. Non-Manufacturing or Non-Supplier "Small Contractor" Credit

Contractors may count towards its "Small Contractor" goals the following expenditures with "Small Contractor" firms that are not manufacturers or suppliers:

1. Reasonable fees or commissions charged for providing a bona fide service such as professional, technical, consultant or managerial services and assistance in the procurement of essential personnel, facilities, equipment, material or supplies necessary for the performance of the contract provided that the fee or commission is determined by the Department of Transportation to be reasonable and consistent with fees customarily allowed for similar services.

2. The fees charged for delivery of materials and supplies required on a job site (but not the cost of the materials and supplies themselves) when the hauler, trucker, or delivery service is not also the manufacturer of or a regular dealer in the materials and supplies, provided that the fee is determined by the Department of Transportation to be reasonable and not excessive as compared with fees customarily allowed for similar services.
3. The fees or commissions charged for providing any bonds or insurance specifically required for the performance of the Contract, provided that the fee or commission is determined by the Department of Transportation to be reasonable and not excessive as compared with fees customarily allowed for similar services.

### III. **BROKERING**

For the purpose of this "Special Provision", a "Broker" is one who acts as an agent for others in negotiating contracts, purchases, sales, etc., in return for a fee or commission. Brokering of work by a "Small Contractor" is not allowed and is a contract violation.

### IV. **PRE-AWARD WAIVERS:**

If the Contractor's submission of the "Small Contractor" listing, as required by Section IIC indicates that it is unable, by subcontracting to obtain commitments which at least equal the amount required by Section IIA, it may request, in writing, a waiver of up to 50% of the amount required by Section IIA. To obtain such a waiver, the Contractor must submit a completed "Application for Waiver of Small Contractor Minority Business Enterprise Goals" to CONNDOT's Manager of Contracts which must also contain the following documentation:

1. Information described in Section ID.
2. For each "Small Contractor" contacted but unavailable, a statement from each "Small Contractor" confirming its unavailability.

Upon receipt of the submission requesting a waiver, the CONNDOT's Manager of Contracts shall submit the documentation to the Director of the Office of Contract Compliance who shall review it for completeness. After completion of the Director of Contract Compliance's review, she/he should write a narrative of his/her findings of the application for a waiver, which is to include his/her recommendation. The Director of Contract Compliance shall submit the written narrative to the Chairperson of the DBE Screening Committee at least five (5) working days before the scheduled meeting. The Contractor shall be invited to attend the meeting and present his/her position. The DBE Screening Committee shall render a decision on the waiver request within five (5)

working days after the meeting. The DBE Screening Committee's decision shall be final. Waiver applications are available from the CONNDOT Manager of Contracts.

SMALL CONTRACTOR/\*MINORITY BUSINESS ENTERPRISE
(\* Delete if not Applicable)
SET-ASIDE PROGRAM
(QUALIFICATION AFFIDAVIT)

PROJECT(s) \_\_\_\_\_
(INCLUDING TOWN & DESCRIPTION)

STATE OF \_\_\_\_\_ CONNECTICUT \_\_\_\_\_

COUNTY OF \_\_\_\_\_

I \_\_\_\_\_, ACTING IN BEHALF

OF \_\_\_\_\_, DO HEREBY CERTIFY

PERSON FIRM OR ORGANIZATION

AND AFFIRM THAT THE INFORMATION SET FORTH BELOW IS TRUE AND ACCURATE TO THE BEST OF MY KNOWLEDGE. AS OF THIS DATE \_\_\_\_\_ THE LIST OF SMALL CONTRACTOR SET-ASIDE PROGRAM - CONTRACTS AND/OR SUBCONTRACTS AWARDED DURING THE CURRENT FISCAL YEAR ( JULY 1 - JUNE 30) 20 \_\_\_\_\_ IS AS FOLLOWS:

Table with 5 columns: Col. 1 TOWN AND PROJECT NUMBER, Col. 2 STATE AGENCY WHICH AWARDED CONTRACT, Col. 3 CONTRACT AMOUNT AWARDED UNDER THIS PROGRAM, Col. 4 AMOUNT OF WORK SUBCONTRACTED FROM OTHER FIRMS UNDER THIS PROGRAM, Col. 5 TOTAL AMOUNT OF ALL WORK UNDER THIS PROGRAM Col. 3 Plus Col. 4. Includes a 'TOTALS' row at the bottom.

NAME OF PERSON, FIRM OR ORGANIZATION

(FIRM SEAL)

SIGNATURE & TITLE OF OFFICIAL

SWORN TO AND SUBSCRIBED BEFORE ME BY \_\_\_\_\_

WHO IS PERSONALLY KNOWN TO ME, THIS \_\_\_\_\_ DAY OF \_\_\_\_\_, 20 \_\_\_\_\_

(NOTARY PUBLIC)

MY COMMISSION EXPIRES \_\_\_\_\_ SEAL

PLEASE NOTE THAT ALL THE WORK AWARDED OR SUBCONTRACTED TO YOUR FIRM UNDER THE SET-ASIDE PROGRAM IN A FISCAL YEAR (JULY 1-JUNE 30) INCLUDING THIS PROJECT, CANNOT BE MORE THAN \$10,000,000.00





EXHIBIT III CERTIFICATION  
PAST CONSTRUCTION EXPERIENCE

Mar. 01

SMALL CONTRACTOR / \* MINORITY BUSINESS ENTERPRISES \* Delete if not applicable

PLEASE LIST ALL CONSTRUCTION PROJECTS YOUR ORGANIZATION HAS WORKED ON IN THE PAST TWO FISCAL YEARS

PROJECT LOCATION NUMBER AND DESCRIPTION APPLICABLE	CONTRACT AMOUNT	IF WORK PERFORMED AS PRIME GIVE OWNERS NAME IF WORK PERFORMED AS SUBCONTRACTOR GIVE CONTRACTORS NAME	START DATE	ACTUAL OR ESTIMATED COMPLETION DATE	NAME AND PHONE OF OWNER OR PRIME CONTRACTOR AS

SIGNED BY: \_\_\_\_\_  
 SMALL BUSINESS CONTRACTOR  
 \*MINORITY BUSINESS ENTERPRISES  
 D.O.T. PROJECT NO. \_\_\_\_\_  
 \* Delete if not applicable

MARCH, 2001

**SMALL CONTRACTOR/SMALL CONTRACTOR MINORITY BUSINESS ENTERPRISE  
(MBE) (SET-ASIDE) CONNECTICUT DEPARTMENT OF TRANSPORTATION  
AFFIDAVIT – SUPPLIER OR MANUFACTURER**

This affidavit must be completed by the State Contractor's designated Small Contractor/ Small Contractor Minority Business Enterprise (MBE), notarized and attached to the contractor's request to utilize a Small Contractor/Small Contractor Minority Business Enterprise (MBE) supplier or manufacturer as a credit towards its Small Contractor/Small Contractor Minority Business Enterprise (MBE) contract requirement; failure to do so will result in not receiving credit towards the contract Small Contractor/Small Contractor Minority Business Enterprise (MBE) requirement.

State Project No. \_\_\_\_\_  
Federal Aid Project No. \_\_\_\_\_  
Description of Project \_\_\_\_\_

I, \_\_\_\_\_, acting in behalf of \_\_\_\_\_  
(Name of person signing Affidavit) (Small Contractor/Small Contractor MBE contractor person,  
\_\_\_\_\_ of which I am the \_\_\_\_\_ affirm that \_\_\_\_\_  
firm, association or certify and corporation) (Title of Person) (Small  
Contractor/Small Contractor MBE person, firm, association or corporation)  
\_\_\_\_\_ is a certified Small Contractor/Small  
Contractor Minority Business Enterprise, as defined by Section 4a-60g of the Connecticut General  
Statutes, as revised.

I further certify and affirm that \_\_\_\_\_  
(Small Contractor/Small Contractor MBE person, firm, association or corporation)  
will assume the actual and contractual responsibility for the provision of the materials and/or supplies  
sought by \_\_\_\_\_. If a manufacturer, I produce goods from raw  
(State Contractor)  
materials or substantially alter them before resale, or if a supplier, I perform a commercially useful  
function in the supply process.

I understand that false statements made herein are punishable at Law (Sec. 53a-157, CGS, as revised).

\_\_\_\_\_  
(Name of Small Contractor/Small Contractor MBE person, firm, association or corporation)

\_\_\_\_\_  
(Signature and Title of Official making the Affidavit)

Subscribed and sworn to before me, the \_\_\_\_\_ day of \_\_\_\_\_ 200\_\_\_\_\_.

\_\_\_\_\_  
Notary Public (Commissioner of the Superior Court)

My Commission Expires \_\_\_\_\_

**CERTIFICATE OF CORPORATION**

I, \_\_\_\_\_, certify that I am the \_\_\_\_\_  
(Official) of the Corporation named in the foregoing instrument; that I have been duly authorized to affix  
the seal of the Corporation to such papers as require the seal; that \_\_\_\_\_, who  
signed said instrument on behalf of the Corporation, was then \_\_\_\_\_ of  
said corporation; that said instrument was duly signed for and in behalf of said Corporation by authority  
of its governing body and is within the scope of its corporation powers.

\_\_\_\_\_  
(Signature of Person Certifying)

\_\_\_\_\_  
(Date)

(Corporate Seal)

## **ITEM #0020903A – LEAD COMPLIANCE FOR MISCELLANEOUS EXTERIOR TASKS**

### **Description:**

Work under this item shall include the special handling measures and work practices required for miscellaneous exterior tasks that impact materials containing or covered by lead paint. Lead paint includes paint found to contain **any** detectable amount of lead by Atomic Absorption Spectrophotometry (AAS) or X-Ray Fluorescence (XRF). Examples of typical miscellaneous exterior tasks includes; work impacting signs, guiderails, minor bridge rehabilitation, catenary structures, canopy structures, spot/localized paint removal, etc.

All activities shall be performed in accordance with the OSHA Lead in Construction Regulations (29 CFR 1926.62), the USEPA RCRA Hazardous Waste Regulations (40 CFR Parts 260 through 274), and the CTDEEP Hazardous Waste Regulations (RCSA 22a-209-1 and 22a-449(c)).

All activities shall be performed by individuals with appropriate levels of OSHA lead awareness and hazard communication training and shall supervised by the Contractors Competent Person on the job site at all times. The Contractors Competent Person is one who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them.

Deviations from these Specifications require the written approval of the Engineer.

### **Materials:**

All materials shall be delivered to the job site in the original packages, containers, or bundles bearing the name of the manufacturer, the brand name and product technical description, with MSDS sheets as applicable.

No damaged or deteriorating materials shall be used. If material becomes contaminated with lead, the material shall be decontaminated or disposed of as lead-containing waste material. The cost to decontaminate and dispose of this material shall be at the expense of the Contractor.

The following material requirements are to be met if to be used during the work:

Fire retardant polyethylene sheet shall be in roll size to minimize the frequency of joints, with factory label indicating minimum six (6) mil thickness.

Polyethylene disposable bags shall be minimum six (6) mils thick.

Tape (or equivalent) product capable of sealing joints in adjacent polyethylene sheets and for the attachment of polyethylene sheets to finished or unfinished surfaces must be capable of adhering under both dry and wet conditions.

Cleaning Agents and detergent shall be lead specific, such as TriSodium Phosphate (TSP).

Chemical strippers and chemical neutralizers shall be compatible with the substrate as well as with each other. Such chemical stripper shall contain less than 50% Volatile Organic Compounds (VOCs) by weight in accordance with RCSA 22a-174-40 Table 40-1.

Labels and warning signs shall conform to 29 CFR 1926.62, 40 CFR 260 through 274 and 49 CFR 172 as appropriate.

Air filtration devices and vacuum units shall be equipped with High-Efficiency Particulate Air (HEPA) filters.

### **Construction Methods:**

#### **(1) Pre-Abatement Submittals and Notices**

A. Prior to the start of **any** work on a contiguous per site basis that will generate hazardous lead waste above conditionally exempt small quantities (greater than 100 kg/month or greater than 1000 kg at any time), the Contractor shall obtain from the Engineer on a contiguous per site basis a temporary EPA Hazardous Waste Generators ID number, unless otherwise directed by the Engineer. Temporary EPA ID numbers are good for six months from the date they are issued and can be extended once, for a maximum of six months and can't be used for longer than one year. The Contractor will be responsible for notifying the Engineer when an extension is needed.

B. Fifteen (15) working days prior to beginning work that impacts lead paint, the Contractor shall submit the following to the Engineer:

1. Work plan for work impacting lead paint including engineering controls, methods of containment of debris and work practices to be employed, as needed, to minimize employee exposure and prevent the spread of lead contamination outside the Regulated Area.
2. Copies of all employee certificates, dated within the previous twelve (12) months, relating to OSHA lead awareness and hazard communication training and training in the use of lead-safe work practices. SSPC training programs may be accepted as meeting these requirements if it can be demonstrated that such training addressed all required topics.

This information shall be updated and resubmitted annually, or as information changes, for the duration of the activities impacting lead to verify continued compliance.

3. Name and qualifications of Contractor's OSHA Competent Person under 29 CFR 1926.62.
4. Documentation from the Contractor, typed on company letterhead and signed by the Contractor, certifying that all employees listed therein have received the following:
  - a. medical monitoring within the previous twelve (12) months, as required in 29 CFR 1926.62;
  - b. biological monitoring within the previous six (6) months, as required in 29 CFR 1926.62;
  - c. respirator fit testing within the previous twelve (12) months, as required in 29 CFR 1910.134 (for those who don a tight-fitting face piece respirator)

This information shall be updated and resubmitted annually, or as information changes, for the duration of the activities impacting lead to verify continued compliance.

5. Names of the proposed non-hazardous, non-RCRA lead paint waste disposal facility (CTDEEP-permitted Solid Waste landfill).
6. Names of the proposed scrap metal recycling facilities. The Contractor shall submit to the Engineer all documentation necessary to demonstrate the selected facility is able to accept lead-painted scrap metal.
7. Names of the proposed hazardous waste disposal facility (selected from the Department approved list provided herein), and copies of each facilities acceptance criteria and sampling frequency requirements.
8. Copies of the proposed hazardous waste transporters current USDOT Certificate of Registration for Hazardous Materials Transport, and the proposed transporters current Hazardous Waste Transporter Permits for the State of Connecticut and the waste destination State.
9. Negative exposure assessments conducted within the previous 12 months documenting that employee exposure to lead for each task is below the OSHA Action Level of  $30 \mu\text{g}/\text{m}^3$ . If a negative exposure assessment has not been conducted, the Contractor shall submit its air monitoring program for the work tasks as part of the Work Plan. Until a negative exposure assessment is developed for each task impacting lead paint, the Contractor shall ensure that all workers and authorized persons entering the Regulated Area wear protective clothing and respirators in accordance with OSHA 29 CFR 1926.62.

No activity shall commence until all required submittals have been received and found acceptable to the Engineer. Those employees added to the Contractor's original list will be

allowed to perform work only upon submittal of acceptable documentation to, and review by, the Engineer.

Contractor shall provide the Engineer with a minimum of 48 hours notice in advance of scheduling, changing or canceling work activities.

## **(2) Lead Abatement Provisions**

### **A. General Requirements:**

All employees of the Contractor who perform work impacting lead paint shall be properly trained to perform such duties. In addition, the Contractor shall instruct all workers in all aspects of personnel protection, work procedures, emergency evacuation procedures and use of equipment including procedures unique to this project.

Contractor shall provide all labor, materials, tools, equipment, services, testing, and incidentals which are necessary or required to perform the work in accordance with applicable governmental regulations, industry standards and codes, and these Specifications.

Prior to beginning work, the Engineer and Contractor shall perform a visual survey of each work area and review conditions.

As necessary, the Contractor shall:

Shut down and lock out electrical power, including all receptacles and light fixtures, where feasible. The use or isolation of electrical power will be coordinated with all other ongoing uses of electrical power at the site.

If adequate electrical supply is not available at the site, the Contractor shall supply temporary power. Such temporary power shall be sufficient to provide adequate lighting and power the Contractor's equipment. The Contractor is responsible for proper connection and installation of electrical wiring and shall ensure safe installation of electrical equipment in compliance with applicable electrical codes and OSHA requirements.

If water is not available at the site for the Contractor's use, the Contractor shall supply sufficient water for each shift to operate the wash facility/decontamination shower units in addition to the water needed at the work area.

The Engineer may provide a Project Monitor to monitor compliance of the Contractor and protect the interests of the Department. In such cases, no activity impacting lead paint shall be performed until the Project Monitor is on-site. Where no Project Monitor will be provided, Contractor shall proceed at the direction of the Engineer. Environmental sampling, including ambient air sampling, TCLP waste stream sampling, and dust wipe sampling, will be conducted by the State as it deems necessary throughout the project. Air monitoring to comply with the Contractor's obligations under OSHA remains solely responsibility of the Contractor.



If at any time, procedures for engineering, work practice, administrative controls or other topics are anticipated to deviate from those documented in the submitted and accepted Lead Work Plan, the Contractor shall submit a modification of its existing plan for review and acceptance by the Engineer prior to implementing the change.

If air samples collected outside of the Regulated Area during activities impacting lead paint indicate airborne lead concentrations greater than original background levels or  $30 \mu\text{g}/\text{m}^3$ , whichever is larger, or if at any time visible emissions of lead paint extend out from the Regulated Area, an examination of the Regulated Area shall be conducted and the cause of such emissions corrected. Cleanup of surfaces outside the Regulated Area using HEPA vacuum equipment or wet cleaning techniques shall be done prior to resuming work.

Work outside the initial designated area(s) will not be paid for by the Engineer. The Contractor will be responsible for all costs incurred from these activities including repair of any damage.

#### B. Regulated Area

The Contractor shall establish a Regulated Area through the use of appropriate barrier tape or other means to control unauthorized access into the area where activities impacting lead paint are occurring. Warning signs meeting the requirements of 29 CFR 1926.62 shall be posted at all approaches to Regulated Areas. These signs shall read:

DANGER  
LEAD WORK AREA  
MAY DAMAGE FERTILITY OR THE UNBORN CHILD  
CAUSES DAMAGE TO THE CENTRAL NERVOUS SYSTEM  
DO NOT EAT, DRINK, OR SMOKE IN THIS AREA

The Contractor shall implement appropriate engineering controls such as poly drop cloths, local exhaust ventilation, wet dust suppression methods, etc. as necessary, and as approved by the Engineer, to prevent the spread of lead contamination beyond the Regulated Area in accordance with the Contractor's approved work plan. Should the previously submitted work plan prove to be insufficient to contain the contamination, the Contractor shall modify its plan and submit it for review by the Engineer.

#### C. Wash Facilities:

The Contractor shall provide handwash facilities in compliance with 29 CFR 1926.51(f) and 29 CFR 1926.62 regardless of airborne lead exposure.

If employee exposure to airborne lead exceeds the OSHA Permissible Exposure Limit of 50 micrograms per cubic meter ( $\mu\text{g}/\text{m}^3$ ), shower rooms must be provided. The Shower Room shall be of sufficient capacity to accommodate the number of workers. One shower stall shall be provided for each eight (8) workers. Showers shall be equipped with hot and cold or warm

running water. Shower water shall be collected and filtered using best available technology and disposed of in accordance with all Federal, State and local laws, regulations and ordinances.

#### D. Personal Protection:

The Contractor shall initially determine if any employee performing construction tasks impacting lead paint may be exposed to lead at or above the OSHA Action Level of  $30 \mu\text{g}/\text{m}^3$ . Assessments shall be based on initial air monitoring results as well as other relevant information. The Contractor may rely on historical air monitoring data obtained within the past 12 months under workplace conditions closely resembling the process, type of material, control methods, work practices and environmental conditions used and prevailing in the Contractor's current operations to satisfy the exposure assessment requirements. Monitoring shall continue as specified in the OSHA standard until a negative exposure assessment is developed.

Until a negative exposure assessment is developed for each task impacting lead paint, the Contractor shall ensure that all workers and authorized person entering the Regulated Area wear protective clothing and respirators in accordance with OSHA 29 CFR 1926.62. Protective clothing shall include impervious coveralls with elastic wrists and ankles, head covering, gloves and foot coverings. Sufficient quantities shall be provided to last throughout the duration of the project.

Protective clothing provided by the Contractor and used during chemical removal operations shall be impervious to caustic materials. Gloves provided by the Contractor and used during chemical removal shall be of neoprene composition with glove extenders.

Respiratory protective equipment shall be provided and selection shall conform to 42 CFR Part 84, 29 CFR Part 1910.134, and 29 CFR Part 1926.62. A formal respiratory protection program must be implemented in accordance with 29 CFR Part 1926.62 and Part 1910.134.

#### E. Air Monitoring Requirements

The Contractor shall:

1. Provide air monitoring equipment including sample filter cassettes of the type and quantity required to properly monitor operations and personnel exposure surveillance throughout the duration of the project.
2. Conduct initial exposure monitoring to determine if any employee performing construction tasks impacting lead paint may be exposed to lead at or above the OSHA Action Level of 30 micrograms per cubic meter. Monitoring shall continue as specified in the OSHA standard until a negative exposure assessment is developed.
3. Conduct personnel exposure assessment air sampling, as necessary, to assure that workers are using appropriate respiratory protection in accordance with OSHA Standard 1926.62. Documentation of air sampling results must be recorded at the

work site within twenty-four (24) hours and shall be available for review until the job is complete.

#### F. Lead Abatement Procedures

The Contractor's Competent Person shall be at the job site at all times during work impacting lead.

Work impacting lead paint shall not begin until authorized by the Engineer, following a pre-work visual inspection by the Project Monitor or Engineer to verify existing conditions.

Any activity impacting lead painted surfaces shall be performed in a manner which minimizes the spread of lead dust contamination and generation of airborne lead.

**The Contractor shall conduct exposure assessments for all tasks which impact lead paint in accordance with 29 CFR 1926.62(d) and shall implement appropriate personal protective equipment until negative exposure assessments are developed.**

**All work impacting the materials identified below shall be conducted within an established Regulated Area with a remote wash facility/decontamination system in accordance with "C. Wash Facilities" and the OSHA Lead in Construction Standard. In accordance with 29 CFR 1926.62, engineering controls and work practices shall be utilized to prevent the spread of lead dust and debris beyond the Regulated Area and limit the generation of airborne lead. All wastes containing lead paint shall be properly contained and secured for storage, transportation and disposal.**

The Contractor shall ensure proper entry and exit procedures for workers and authorized persons who enter and leave the Regulated Area. All workers and authorized persons shall leave the Regulated Area and proceed directly to the wash or shower facilities where they will HEPA vacuum gross debris from work suit, remove and dispose of work suit, wash and dry face and hands, and vacuum clothes. Lead chips and dust must not be removed by blowing or shaking of clothing. Wash water shall be collected, filtered, and disposed of in accordance with Federal, State and local water discharge standards. Any permit required for such discharge shall be the responsibility of the Contractor.

No one shall eat, drink, smoke, chew gum or tobacco, or apply cosmetics while in the Regulated Area.

Data from the limited lead testing performed by the Engineer is documented in the reports listed in the "Notice to Contractor – Hazardous Materials Investigations" or is presented herein. Under no circumstances shall this information be the sole means used by the Contractor for determining the extent of lead painted materials. The Contractor shall be responsible for verification of all field conditions affecting performance of the work as described in these Specifications in accordance with OSHA, USEPA, USDOT and CTDEEP standards. Compliance with the applicable requirements is solely the responsibility of the Contractor.

The following details the extent of each phase of operation designated for this project. Phase areas may be combined or divided at the direction of the Engineer. Proceed through the sequencing of the work phases under the direction of the Engineer.

**Bridge No. 00722, West Rocks Road over Route 15, Norwalk**

- Detectable amounts of lead were identified on the painted metal surfaces of Bridge No. 00722.
- No detectable amounts of lead were identified in the painted concrete walls/abutments of Bridge No. 00722.

Girders, Cross Beams, Beam Ends, Bearings, Rockers, Pipes, Pipe Supports, Diaphragms, Connection plates, etc.	Metal	Silver/Grey	23% by weight
Railing	Metal	Silver/Grey	10.3-12.8 mg/cm <sup>2</sup>
Walls/Abutments	Concrete	Tan/Beige	0.0 mg/cm <sup>2</sup> ND<0.10% by weight

- TCLP waste stream sampling/analysis of the paint associated with the structural steel/metal bridge/railing component surfaces characterized the paint waste as RCRA/CTDEEP hazardous waste.

Paint debris (structural/metal bridge components)	270 mg/l
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- Since there were no detectable amounts of lead in paint identified on the concrete walls/abutments, any paint waste stream generated would be non-hazardous, non-RCRA lead waste.

While conducting work to the bridge, where it is necessary to impact the lead painted surfaces, the Contractor shall either:

- a. Remove the paint to be impacted prior to impacting the substrate in accordance with OSHA Lead in Construction Standard 29CFR 1926.62, or
- b. Impact the substrate using mechanical means with the paint in place in accordance with OSHA Lead in Construction Standard 29CFR 1926.62.

The Contractor shall submit a Work Plan to ConnDOT outlining the exact procedures that will be used to perform the work, contain the spread of lead debris and protect the

**employees performing the required renovation work impacting the lead paint. No work shall be started by the Contractor until the Work Plan is approved by the Engineer.**

**All work impacting the lead paint materials shall be conducted within an established Regulated Area with a remote wash facility/decontamination system in accordance with “C. Wash Facilities” and the OSHA Lead in Construction Standard. In accordance with 29 CFR 1926.62, engineering controls and work practices shall be utilized to prevent the spread of lead dust and debris beyond the Regulated Area and limit the generation of airborne lead. All wastes containing lead paint shall be properly contained and secured for storage, transportation and disposal.**

**The Engineer has characterized the paint waste stream associated with the structural steel/metal bridge/railing components at Bridge No. 00722 as RCRA hazardous waste. If the paint is removed from the metal bridge surfaces, the paint shall be handled and disposed of in accordance with USEPA/CTDEEP Hazardous Waste Regulations as described under this Item 0020903A.**

**All steel and metal components generated from the miscellaneous exterior work tasks (painted or not) shall be segregated and recycled as scrap metal. The recycling of scrap metal (regardless of lead paint concentration) is exempt from USEPA RCRA and CTDEEP Hazardous Waste Regulation.**

Should lead contamination be discovered outside of the Regulated Area, the Contractor shall immediately stop all work in the Regulated Area, eliminate causes of such contamination and take steps to decontaminate non-work areas.

Special Requirements:

1. Demolition/Renovation:
  - a. Demolish/renovate in a manner which minimizes the spread of lead contamination and generation of lead dust.
  - b. Implement dust suppression controls, such as misters, local exhaust ventilation, etc. to minimize the generation of airborne lead dust.
  - c. Segregate work areas from non-work areas through the use of barrier tape, drop cloths, etc.
  - d. Clean up immediately after renovation/demolition has been completed
2. Chemical Removal:
  - a. Apply chemical stripper in quantities and for durations specified by manufacturer.

- b. Where necessary, scrape lead paint from surface down to required level of removal (i.e. stabilized surface, bare substrate with no trace of residual pigment, etc.). Use sanding, hand scraping, and dental picks to supplement chemical methods as necessary.
  - c. Apply neutralizer compatible with substrate and chemical agent to substrate following removal in accordance with manufacturer's instructions.
  - d. Protect adjacent surfaces from damage from chemical removal.
  - e. Maintain a portable eyewash station in the work area.
  - f. Wear respirators that will protect workers from chemical vapors.
  - g. Do not apply caustic agents to aluminum surfaces.
3. Mechanical Paint Removal:
- a. Provide sanders, grinders, rotary wire brushes, or needle gun removers equipped with a HEPA filtered vacuum dust collection system. Cowling on the dust collection system for orbital-type tools must be capable of maintaining a continuous tight seal with the surface being abated. Cowling on the dust collection system for reciprocating-type tools shall promote an effective vacuum flow of loosened dust and debris. Inflexible cowlings may be used on flat surfaces only. Flexible contoured cowlings are required for curved or irregular surfaces.
  - b. Provide HEPA vacuums that are high performance designed to provide maximum static lift and maximum vacuum system flow at the actual operating vacuum condition with the shroud in use. The HEPA vacuum shall be equipped with a pivoting vacuum head.
  - c. Remove lead paint from surface down to required level of removal (i.e. stabilized surface, bare substrate with no trace of residual pigment, etc.). Use chemical methods, hand scraping, and dental picks to supplement abrasive removal methods as necessary.
  - d. Protect adjacent surfaces from damage from abrasive removal techniques.
  - e. "Sandblasting" type removal techniques shall not be allowed.
4. Component Removal/Replacement:
- a. Wet down components which are to be removed to reduce the amount of dust generated during the removal process.

- b. Remove components utilizing hand tools, and follow appropriate safety procedures during removal. Remove the components by approved methods which will provide the least disturbance to the substrate material. Do not damage adjacent surfaces.
- c. Clean up immediately after component removals have been completed. Remove any dust located behind the component removed.

#### G. Prohibited Removal Methods:

The use of heat guns in excess of 700 degrees Fahrenheit to remove lead paint is prohibited.

The use of sand, steel grit, air, CO<sub>2</sub>, baking soda, or any other blasting media to remove lead or lead paint without the use of a HEPA ventilated contained negative pressure enclosure is prohibited.

Power/pressure washing shall not be used to remove lead paint.

Compressed air shall not be utilized to remove lead paint.

Chemical strippers containing Methylene Chloride are prohibited. Any chemical stripping may be prohibited on a project by project basis.

Power tool assisted grinding, sanding, cutting, or wire brushing of lead paint without the use of cowled HEPA vacuum dust collection systems is prohibited.

Lead paint burning, busting of rivets painted with lead paint, welding of materials painted with lead paint, and torch cutting of materials painted with lead paint is prohibited. Where cutting, welding, busting, or torch cutting of materials is required, lead paint in the affected area must be removed first.

Chemical stripping of coatings from bridge components is generally prohibited unless specifically allowed on a project by project basis.

#### H. Clean-up and Visual Inspection:

The Contractor shall remove and containerize all lead waste material and visible accumulations of debris, paint chips and associated items.

During clean-up the Contractor shall utilize rags and sponges wetted with lead-specific detergent and water as well as HEPA filtered vacuum equipment.

The Engineer will conduct a visual inspection of the work areas in order to document that all surfaces have been maintained as free as practicable of accumulations of lead in accordance with

29 CFR 1926.62(h). If visible accumulations of waste, debris, lead paint chips or dust are found in the work area, the Contractor shall repeat the cleaning, at the Contractor's expense, until the area is in compliance. The visual inspection will detect incomplete work, damage caused by the abatement activity, and inadequate clean up of the work site.

I. Post-Work Regulated Area Deregulation:

Following an acceptable visual inspection, any engineering controls implemented may be removed.

A final visual inspection of the work area shall be conducted by the Competent Person and the Project Monitor or Engineer to ensure that all visible accumulations of suspect materials have been removed and that no equipment or materials associated with the lead paint removal remain. If this final visual inspection is acceptable, the Contractor will reopen the Regulated Area and remove all signage.

The Contractor shall restore all work areas and auxiliary areas utilized during work to conditions equal to or better than original. Any damage caused during the performance of the work activity shall be repaired by the Contractor at no additional expense to the State.

J. Waste Disposal/Recycling:

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Metallic debris shall be segregated and recycled as scrap metal at an approved metal recycling facility.

Concrete, brick, etc. coated with any amount of lead paint cannot be crushed, recycled or buried on-site to minimize waste disposal unless tested and found to meet the RSR GA/Residential standards.

Hazardous lead debris shall be disposed of as described under this Item 0020903A.

The Contractor shall comply with the latest requirements of the USEPA RCRA Hazardous Waste Regulations 40 CFR 260-274 and the DEEP Hazardous/Solid Waste Management Standards 22a-449(c).

**Hazardous lead debris shall be transported from the Project by a licensed hazardous waste transporter approved by the Department and disposed of at an EPA-permitted and Department-approved hazardous waste landfill within 90 days from the date of generation.**

The Contractor must use one or more of the following Department-approved disposal facilities for the disposal of hazardous waste:



Clean Earth of North Jersey, Inc., (CENJ) 115 Jacobus Avenue, South Kearny, NJ 07105 Phone: (973) 344-4004; Fax: (973) 344-8652	Clean Harbors Environmental Services, Inc. 2247 South Highway 71, Kimball, NE 69145 Phone: (308) 235-8212; Fax: (308) 235-4307
Clean Harbors of Braintree, Inc. 1 Hill Avenue, Braintree, MA 02184 Phone: (781) 380-7134; Fax: (781) 380-7193	Cycle Chem (General Chemical Corp.) 217 South First Street, Elizabeth, NJ 07206 Phone: (908) 355-5800; Fax (908) 355-0562
EnviroSafe Corporation Northeast (former Jones Environmental Services (NE), Inc.) 263 Howard Street, Lowell, MA 01852 Phone: (978) 453-7772; Fax: (978) 453-7775	Environmental Quality Detroit, Inc. 1923 Frederick Street, Detroit, MI 48211 Phone: (800) 495-6059; Fax: (313) 923-3375
Republic Environmental Systems 2869 Sandstone Drive, Hatfield, PA 19440 Phone: (215) 822-8995; Fax: (215) 997-1293	Northland Environmental, Inc. (PSC Environmental Systems) 275 Allens Avenue, Providence, RI 02905 Phone: (401) 781-6340; Fax: (401) 781-9710
Environmental Quality Company: Wayne Disposal Facility 49350 North I-94 Service Drive Belleville, MI 48111 Phone: (800) 592-5489; Fax: (800) 592-5329	

No facility may be substituted for the one(s) designated in the Contractor's submittal without the Engineer's prior approval. If the material cannot be accepted by any of the Contractor's designated facilities, the Department will supply the Contractor with the name(s) of other acceptable facilities.

**Prior to the generation of any hazardous waste**, the Contractor shall notify the Engineer of its selected hazardous waste transporter and disposal facility. The Contractor must submit to the Engineer (1) the transporter's current US DOT Certificate of Registration and (2) the transporter's current Hazardous Waste Transporter Permits for the State of Connecticut, the hazardous waste destination state and any other applicable states. The Engineer will then obtain on a contiguous per site basis a temporary EPA Generators ID number for the site that he will forward to the Contractor. Any changes in transporter or facility shall be immediately forwarded to the Engineer for review.

Handling, storage, transportation and disposal of hazardous waste materials generated as a result of execution of this project shall comply with all Federal, State and Local regulations including the USEPA RCRA Hazardous Waste Regulations (40 CFR Parts 260-271), the CTDEEP Hazardous Waste Regulations (22a-209 and 22a-449(c)), and the USDOT Hazardous Materials Regulations (49 CFR Part 171-180).

All debris shall be contained and collected daily or more frequently as directed by the Engineer, due to debris buildup. Debris shall be removed by HEPA vacuum collection. Such debris and paint chips shall be stored in leak-proof storage containers in the secured storage site, or as directed by the Engineer. The storage containers and storage locations shall be reviewed by the Engineer and shall be located in areas not subject to ponding. Storage containers shall be placed

on pallets and closed and covered with tarps at all times except during placement, sampling and disposal of the debris.

Hazardous waste materials are to be properly packed and labeled for transport by the Contractor in accordance with EPA, CTDEEP and USDOT regulations. The disposal of debris characterized as hazardous waste shall be completed within 90 calendar days of the date on which it began to be accumulated in the lined containers. Storage of containers shall be in accordance with current DEEP/EPA procedures.

The Contractor shall label hazardous waste storage containers with a 6-inch square, yellow, weatherproof, Hazardous Waste sticker in accordance with USDOT regulations.

Materials other than direct paint related debris which are incidental to the paint removal work activities (tarps, poly, plywood, PPE, gloves, decontamination materials, etc.) which may be contaminated with lead, shall be stored separately from the direct paint debris, and shall be sampled by the Engineer for waste disposal characterization testing. Such materials characterized as hazardous shall be handled/disposed of as described herein.

Direct paint related debris materials not previously sampled and characterized for disposal, which may be originally presumed to be hazardous waste, shall also be stored separately and sampled by the Engineer for ultimate waste disposal characterization testing and handled/disposed of based on that testing.

Project construction waste materials unrelated to the paint removal operations shall NOT be combined/stored with paint debris waste and/or incidental paint removal materials as they are not lead contaminated and shall NOT be disposed of as hazardous waste. The Engineer's on-site Inspectors shall conduct inspections to verify materials remain segregated.

The Contractor shall obtain and complete all paperwork necessary to arrange for material disposal, including disposal facility waste profile sheets. It is solely the Contractor's responsibility to co-ordinate the disposal of hazardous materials with its selected treatment/recycling/disposal facility(s). Upon receipt of the final approval from the facility, the Contractor shall arrange for the loading, transport and treatment/recycling/disposal of the materials in accordance with all Federal and State regulations. **No claim will be considered based on the failure of the Contractor's disposal facility(s) to meet the Contractor's production rate or for the Contractor's failure to select sufficient facilities to meet its production rate.**

The Contractor shall process the hazardous waste such that the material conforms with the requirements of the selected treatment/disposal facility, including but not limited to specified size and dimension. Refusal on the part of the treatment/disposal facility to accept said material solely on the basis of non-conformance of the material to the facility's physical requirements is the responsibility of the Contractor and no claim for extra work shall be accepted for reprocessing of said materials to meet these requirements.

All DOT shipping documents, including the Uniform Hazardous Waste Manifests utilized to accompany the transportation of the hazardous waste material shall be prepared by the Contractor and reviewed/signed by an authorized agent representing ConnDOT, as Generator, for each load of hazardous material that is packed to leave the site. The Contractor shall not sign manifests on behalf of the State as Generator. The Contractor shall forward the appropriate original copies of all manifests to the Engineer the same day the material leaves the Project site.

Materials not related to lead paint removal and/or characterized as non-hazardous waste shall NOT be shipped for hazardous waste disposal in accordance with USEPA RCRA hazardous waste minimization requirements.

A load-specific certificate of disposal, signed by the authorized agent representing the waste disposal facility, shall be obtained by the Contractor and promptly delivered to the Engineer for each load.

In addition to all pertinent Federal, State and local laws or regulatory agency policies, the Contractor shall adhere to the following precautions during the transport of hazardous materials off-site:

- All vehicles departing the site are to be properly logged to show the vehicle identification, driver's name, time of departure, destination, and approximate volume, and contents of materials carried. Vehicles shall display the proper USDOT placards for the type and quantity of waste;
- No materials shall leave the site unless a disposal facility willing to accept all of the material being transported has agreed to accept the type and quantity of waste;
- Documentation must be maintained indicating that all applicable laws have been satisfied and that the materials have been successfully transported and received at the disposal facility; and,
- The Contractor shall segregate the waste streams (i.e. concrete, wood, etc.) as directed by the receiving disposal facility.

Any spillage of debris during disposal operations during loading, transport and unloading shall be cleaned up in accordance with EPA 40 CFR 265 Subparts C & D, at the Contractor's expense.

The Contractor is liable for any fines, costs or remediation costs incurred as a result of their failure to be in compliance with this Item and all Federal, State and Local laws.

#### K. Project Closeout Data:

Provide the Engineer, within thirty (30) days of completion of the project site work, a compliance package; which shall include, but not be limited to, the following:

1. Competent persons (supervisor) job log;

2. OSHA-compliant personnel air sampling data;
3. Completed waste shipment papers for scrap metal recycling.
4. Copies of completed Hazardous Waste Manifests (signed by authorized disposal facility representative).

**Method of Measurement:**

The completed work shall be paid as a lump sum. This item will include all noted services, equipment, facilities, testing and other associated work for up to three (3) ConnDOT project representatives. Services provided to any ConnDOT project representatives in excess of three (3) representatives will be measured for payment in accordance with Article 1.09.04 – “Extra and Cost-Plus Work.”

**Basis of Payment:**

The lump sum price bid for this item shall include: services, materials, equipment, all permits, notifications, submittals, personal air sampling, personal protection equipment, temporary enclosures, incidentals, fees and labor incidental to activities impacting lead removal, treatment and handling of lead contaminated materials, and the transport and disposal of any hazardous lead waste.

Final payment will not be made until all project closeout data submittals have been completed and provided to the Engineer. Once the completed package has been received in its entirety and accepted by the Engineer, final payment will be made to the Contractor.

<u>Pay Item</u>	<u>Pay Unit</u>
Lead Compliance for Miscellaneous Exterior Tasks	Lump Sum

END OF SECTION

**ITEM #0108100A - LUMP SUM INCENTIVE PAYMENT (ESTIMATED COST)**

**Description:** Under this item, the Contractor will receive a Lump Sum Incentive Payment earned in accordance with the MILESTONE INCENTIVE AND MILESTONE LIQUIDATED DAMAGES PROVISIONS included in this Contract.

**Basis of Payment:** The “Lump Sum Incentive Payment” will be calculated using the method indicated in the MILESTONE INCENTIVE AND MILESTONE LIQUIDATED DAMAGES PROVISIONS.

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 payment 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 this Contract.

<u>Pay Item</u>	<u>Pay Unit</u>
Lump Sum Incentive Payment (Estimated Cost)	est.

**ITEM #0406275A - FINE MILLING OF BITUMINOUS CONCRETE (0 TO 4 INCHES)**

**Description:** This work shall consist of the milling, removal, and disposal of existing bituminous concrete pavement.

**Construction Methods:** The Contractor shall remove the bituminous concrete material using means acceptable to the Engineer. The pavement surface shall be removed to the line, grade, and existing or typical cross-section shown on the plans or as directed by the Engineer.

The bituminous concrete material shall be disposed of offsite by the Contractor at an approved disposal facility unless otherwise stated in the Contract.

Any milled surface, or portion thereof, that is exposed to traffic shall be paved within five (5) calendar days unless otherwise stated in the plans or Contract.

The equipment for milling the pavement surface shall be designed and built for milling bituminous concrete pavements. It shall be self propelled with sufficient power, traction, and stability to maintain depth and slope and shall be capable of removing the existing bituminous concrete pavement.

The milling machine shall be equipped with a built-in automatic grade averaging control system that can control the longitudinal profile and the transverse cross-slope to produce the specified results. The longitudinal controls shall be capable of operating from any longitudinal grade reference, including string line, contact ski (30 feet minimum), non-contact ski (20 feet minimum), or mobile string line (30 feet minimum). The transverse controls shall have an automatic system for controlling cross-slope at a given rate. The Engineer may waive the requirement for automatic grade or slope controls where the situation warrants such action.

The machine shall be able to provide a 0 to 4 inch deep cut in one pass. The rotary drum of the machine shall use carbide or diamond tipped tools spaced not more than  $\frac{5}{16}$  inch apart. The forward speed of the milling machine shall be limited to no more than 45 feet/minute. The tools on the revolving cutting drum must be continually maintained and shall be replaced as warranted to provide a uniform pavement texture.

The machine shall be equipped with an integral pickup and conveying device to immediately remove material being milled from the surface of the roadway and discharge the millings into a truck, all in one operation. The machine shall also be equipped with a means of effectively limiting the amount of dust escaping from the milling and removal operation.

When milling smaller areas or areas where it is impractical to use the above described equipment, the use of a lesser equipped milling machine may be permitted when approved by the Engineer.

Protection shall be provided around existing catch basin inlets, manholes, utility valve boxes, and any similar structures. Any damage to such structures as a result of the milling operation is the Contractor's responsibility and shall be repaired at the Contractor's expense.

To prevent the infiltration of milled material into the storm drainage system, the Contractor shall take special care to prevent the milled material from falling into the inlet openings or inlet grates. Any milled material that has fallen into inlet openings or inlet grates shall be removed at the Contractor's expense.

**Surface Tolerance:** The milled surface shall provide a satisfactory riding surface with a uniform textured appearance. The milled surface shall be free from gouges, longitudinal grooves and ridges, oil film, and other imperfections that are a result of defective equipment, improper use of equipment, or poor workmanship. The Contractor, under the direction of the Inspector, shall perform random spot-checks with a Contractor supplied ten-foot straightedge to verify surface tolerances at a minimum of five (5) locations per day. The variation of the top of two ridges from the testing edge of the straightedge, between any two ridge contact points, shall not exceed ¼ inch. The variation of the top of any ridge to the bottom of the groove adjacent to that ridge shall not exceed ¼ inch. Any unsatisfactory surfaces produced are the responsibility of the Contractor and shall be corrected at the Contractor's expense and to the satisfaction of the Engineer.

The depth of removal will be verified by taking measurements every 250 feet per each pass of the milling machine, or as directed by the Engineer. These depth measurements shall be used to monitor the average depth of removal.

Where a surface delamination between bituminous concrete layers or a surface delamination of bituminous concrete on Portland cement concrete causes a non-uniform texture to occur, the depth of milling shall be adjusted in small increments to a maximum of +/- ½ inch to eliminate the condition.

When removing bituminous concrete pavement entirely from an underlying Portland cement concrete pavement, all of the bituminous concrete pavement shall be removed leaving a uniform surface of Portland cement concrete, unless otherwise directed by the Engineer.

Any unsatisfactory surfaces produced by the milling operation are the Contractor's responsibility and shall be corrected at the Contractor's expense and to the satisfaction of the Engineer.

No vertical faces, transverse or longitudinal, shall be left exposed to traffic unless the requirements below are met. This shall include roadway structures (catch basins, manholes, utility valve boxes, etc.). If any vertical face is formed in an area exposed to traffic, a temporary paved transition shall be established according to the requirements shown on the plans. If the milling machine is used to form a temporary transition, the length of the temporary transition shall conform to Special Provision Section 4.06 –Bituminous Concrete, "Transitions for Roadway Surface," the requirements shown on the plans, or as directed by the Engineer. At all

permanent limits of removal, a clean vertical face shall be established by saw cutting prior to paving.

Roadway structures shall not have a vertical face of greater than one (1) inch exposed to traffic as a result of milling. All structures within the roadway that are exposed to traffic and greater than one (1) inch above the milled surface shall receive a transition meeting the following requirements:

For roadways with a posted speed limit of 35 mph or less\*:

1. Round structures with a vertical face of greater than 1 inch to 2.5 inches shall be transitioned with a hard rubber tapered protection ring of the appropriate inside diameter designed specifically to protect roadway structures.
2. Round structures with a vertical face greater than 2.5 inches shall receive a transition of bituminous concrete formed at a minimum 24 to 1 (24:1) taper in all directions.
3. All rectangular structures with a vertical face greater than 1 inch shall receive a transition of bituminous concrete formed at a minimum 24 to 1 (24:1) taper in all directions.

\*Bituminous concrete tapers at a minimum 24 to 1 (24:1) taper in all directions may be substituted for the protection rings if approved by the Engineer.

For roadways with a posted speed limit of 40, 45 or 50 mph:

1. All structures shall receive a transition of bituminous concrete formed at a minimum 36 to 1 (36:1) taper in the direction of travel. Direction of travel includes both the leading and trailing side of a structure. The minimum taper shall be 24 to 1 (24:1) in all other directions.

For roadways with a posted speed limit of greater than 50 mph:

1. All structures shall receive a transition of bituminous concrete formed at a minimum 60 to 1 (60:1) taper in the direction of travel. Direction of travel includes both the leading and trailing side of a structure. The minimum taper shall be 24 to 1 (24:1) in all other directions.

All roadway structure edges and bituminous concrete tapers shall be clearly marked with fluorescent paint. The paint shall be maintained throughout the exposure to traffic.

The milling operation shall proceed in accordance with the requirements of the "Maintenance and Protection of Traffic" and "Prosecution and Progress" specifications, or other Contract requirements. The more stringent specification shall apply.

Prior to opening an area which has been milled to traffic, the pavement shall be thoroughly swept with a sweeper truck. The sweeper truck shall be equipped with a water tank and be capable of removing the millings and loose debris from the surface. The sweeper truck shall operate at a forward speed that allows for the maximum pickup of millings from the roadway



surface. Other sweeping equipment may be provided in lieu of the sweeper truck where acceptable by the Engineer.

Any milled area that will not be exposed to live traffic for a minimum of 48 hours prior to paving shall require a vacuum sweeper truck in addition to, or in lieu of, mechanical sweeping. The vacuum sweeper truck shall have sufficient power and capacity to completely remove all millings from the roadway surface including any fine particles within the texture of the milled surface. Vacuum sweeper truck hose attachments shall be used to clean around pavement structures or areas that cannot be reached effectively by the main vacuum. Compressed air may be used in lieu of vacuum attachments if approved by the Engineer.

**Method of Measurement:** This work will be measured for payment by the number of square yards of area from which the milling of asphalt has been completed and the work accepted. No area deductions will be made for minor unmilled areas such as catch basin inlets, manholes, utility boxes and any similar structures.

**Basis of Payment:** This work will be paid for at the Contract unit price per square yard for “Fine Milling of Bituminous Concrete (0 to 4 Inches).” This price shall include all equipment, tools, labor, and materials incidental thereto.

No additional payments will be made for multiple passes with the milling machine to remove the bituminous surface.

No separate payments will be made for cleaning the pavement prior to paving; providing protection and doing handwork removal of bituminous concrete around catch basin inlets, manholes, utility valve boxes and any similar structures; repairing surface defects as a result of the Contractors negligence; providing protection to underground utilities from the vibration of the milling operation; removal of any temporary milled or paved transition; removal and disposal of millings; furnishing a sweeper truck and sweeping after milling. The costs for these items shall be included in the Contract unit price.

Pay Item	Pay Unit
Fine Milling of Bituminous Concrete (0 to 4 Inches)	s.y.

## **ITEM #0503001A – REMOVAL OF SUPERSTRUCTURE**

*Section 5.03 of the Standard Specifications is amended as follows:*

### **5.03.01—Description:** *Add the following:*

Work under this item shall consist of the removal and satisfactory disposal of the bridge superstructure. The items to be removed and disposed of shall include, but not be limited to, existing steel frames, existing concrete deck slab, parapets, curbs, metal bridge rail, bituminous concrete wearing surface and existing water main as shown on the plans or as directed by the Engineer. The work also includes the installation and removal of a temporary debris shield.

### **5.03.03—Construction Methods:** *Add the following:*

1. **Removal of Superstructure:** All work shall proceed as directed by and to the satisfaction of the Engineer in accordance with the details shown on the plans and the requirements of the Special Provisions “Maintenance and Protection of Traffic” and “Prosecution and Progress”. Adequate measures shall be taken by the Contractor to prevent any debris, concrete chips, tools and/or materials from dropping onto the roadway below the structure. All debris shall be promptly swept up and removed from the site.

Minimum vertical clearance for the debris shield shall measure no less than 12’-0” from top of roadway.

Testing for lead based paint has been conducted at the subject site and indicates the presence of lead on the steel frame members. The results of such testing are included in a Report entitled “HazMat Inspection Letter, Bridge No. 00772, West Rocks Road over Route 15, Norwalk, CT, June 21, 2017”, and is available for review at the Division of Contract Administration of ConnDOT, 2800 Berlin Turnpike, Newington, CT.

Material that is not specified for salvage shall become the property of the Contractor and shall be removed and disposed of by him. Material designated to be salvaged shall be removed, delivered and off-loaded by the Contractor at a location specified by the Engineer. Material designated for salvage shall be removed by methods that shall not cause damage to the salvaged material. The removal shall not result in damage to any permanent construction (new or existing) or to adjoining property. If any damage does occur, it shall be repaired by the Contractor, to the satisfaction of the Engineer, at no additional expense to the State.

The Contractor shall prepare and submit to the Engineer for review, working drawings, computations and written procedures for the removal of the existing superstructure including support of a temporary debris shield in accordance with Article 1.05.02. Acceptance of the Contractor’s plans shall not be considered as relieving the Contractor of

any responsibility. The minimum clearance for the temporary debris shield and the support shall be no less than 12 feet 0 inches from the top of roadway.

- 2. Utilities: The Contractor is cautioned regarding the presence of a water main within the bridge deck. The Contractor is advised that the water main must be temporarily relocated prior to demolition; The Contractor is advised that no service interruption resulting from his operations will be allowed, except for that which is required for the completion of the relocation, and shall make every effort to protect utilities from damage of any nature. The Contractor shall be held solely responsible for any damage resulting from his operations or negligence. No work will be allowed in the vicinity of any utility line until the Contractor receives approval of his proposed protection method from both the Engineer and the respective utility company.

**5.03.04—Method of Measurement:** *Delete the entire Article and replace with the following:*

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

**5.03.05—Basis of Payment:** *Delete the second, third, and fourth paragraphs and replace with the following:*

This work will be paid for at the contract lump sum price for “Removal of Superstructure” which price shall include removal and disposal of all superstructure material including steel frames, bituminous concrete wearing surface, concrete deck slab, parapets, curbs, metal bridge rail, design, installation and removal of a temporary debris shield and all equipment, tools and labor incidental thereto.

The Contractor shall submit to the Department a schedule of payment values for review and comment prior to payment.

Removal of concrete abutments and wingwall curbs shall be paid under item “Removal of Existing Masonry”.

<u>Pay Item</u>	<u>Pay Unit</u>
Removal of Superstructure	l.s.

## **ITEM #0503250A - CLEAN HISTORIC CONCRETE BRIDGE (SITE NO. 1)**

**Description:** The work includes the cleaning of exposed concrete surfaces of historic bridges within the limits specified by the Engineer, including general and specialized cleaning to remove soil, stains, carbon deposits, biological growth, oils, plants, vines, bird guano, and all other substances specified below. Also included is the full containment, collection and proper disposal of all wash water and materials removed from the concrete surfaces during cleaning operations.

This work will include the trial demonstration by the Contractor of specific cleaning methods on selected areas of the bridge surface to demonstrate the adequacy of materials and methods to be used for cleaning each type of condition on areas of the bridge for approval by the Engineer.

The Contractor to perform this work shall demonstrate a minimum of five (5) years of successful cleaning experience in masonry restoration projects for historic structures. The Contractor shall provide names, dates, and locations of a minimum of three (3) similar historic structure projects.

This provision contains recommendations for materials which may be TOXIC. The manufacturer's literature on application techniques, appropriate protection for workers and disposal procedures for materials shall be complied with in conjunction with all Federal and State regulations. All required Federal and State permits shall be obtained prior to use and/or discharge.

### **Materials:**

#### **1. Cleaning Tools and Product Data:**

The Contractor shall submit manufacturer's technical data for each liquid cleaning product proposed to be used, including written instructions by the manufacturers for their application and use, and Safety Data Sheets (SDS). The Contractor shall include test reports and certifications substantiating product compliance with requirements.

**Recommended Products:** Products capable of removing biological and atmospheric stains in historic concrete shall be either of the following, or an approved equal:

**EnviroKlean BioKlean® (by Prosoco, Inc.)** Two part cleaner and activator system.

**Safe n' Easy Architectural Cleaner and Restorer** (by Dumond Chemicals)

#### **The use of acidic cleaners will not be permitted.**

All water used in the cleaning operation shall be potable, free of deleterious quantities of iron, alkalis, oil or other staining materials. Prior to the cleaning, a sample of the

water shall be tested by the Contractor to determine that the water will not cause staining. The Contractor shall provide a report from a water testing laboratory for approval by the Engineer. The Contractor shall provide all necessary filters at the water source to remove mineral contents that will cause staining. Do not draw water from ponds or streams.

Cleaning products shall be applied using synthetic rollers, soft-bristled brushes, or may be spray applied. The use of wire brushes or steel wool is not permitted.

Following manufactures recommendations rinsing shall be carried out carefully to avoid inadequate rinsing, which can lead to residues that may stain the cleaned surface. Masonry-washing equipment shall not generate greater than 400 psi. Water flow rates of 6-8 gallons per minute are the best water/pressure combinations. Heated water (150-180°F) may improve cleaning efficiency.

**2. Delivery, Storage and Handling:**

All materials shall be delivered to the Site in the manufacturer's original and unopened containers and packaging, bearing labels as to the type of material, brand name and manufacturer's name. Delivered materials shall be identical to tested materials.

Material shall be stored off the ground in a clean, dry location. All materials that are damaged or are otherwise unsuitable for use shall be removed from the Site.

All materials shall be handled, stored and treated in strict accordance with manufacturer's instructions, with regard to application and shelf life, spillage, clean-up, safety precautions, and protective means and methods.

**Construction Methods:**

- 1. Cleaning Program:** Prior to commencing cleaning operations, the Contractor shall submit a written cleaning procedure plan including all materials, methods, equipment, and staging for access proposed for each phase of cleaning including protection of surrounding materials during operations. The written cleaning procedure shall include all cleaning products and chemical components to be used, method of application, dilution of the application, temperature of application, length of time of surface contact, method of rinsing (*temperature, pressure, and duration*), and repetition of procedures, methodology for full collection of all water, and proper disposal of all materials. An acceptable ambient temperature range shall be listed for application of cleaning products and shall include the manufacturer's recommendations and specifications.
- 2. Protection Program:** Prior to commencing the cleaning operations, the Contractor shall submit for approval a written description of proposed materials and methods of protection for preventing damage to adjacent materials, soil, water bodies, wetlands, wells, vegetation, vehicular and pedestrian traffic, and adjacent property.

- 3. Demonstration Test Area:** Prior to commencing the cleaning operations, the Contractor shall demonstrate a trial application of the proposed cleaning method on a portion of the wingwall or abutment face, as directed by the Engineer. The surface area of the cleaning demonstration test shall be approximately six (6) by six (6) feet in area. The demonstration test area shall be cleaned using methods, materials and working pressures previously submitted and approved. The demonstration test shall be performed in the presence of the Engineer and the Department's Architectural Historian.

Where chemical poultices are tested, perform testing in the presence of the manufacturer's representative.

The production work of cleaning the bridge concrete surfaces shall not begin without approval from the Engineer of the cleaning methods, working pressures, materials, and equipment to be used. The evaluation by the Engineer of the acceptability of the Contractor's proposed cleaning method will include a seven (7) day observation period after completion of the trial cleaning demonstration for verification that the proposed cleaning method has caused no surface damage to historic concrete surfaces.

**4. Preparation:**

- a. Demonstration Test Area: Prepare test area as specified above.
- b. Cleaning Program: The cleaning program shall be submitted as specified above.
- c. Protection: All painted and unpainted metal structure, railings and decorative elements shall be protected from contact with chemical cleaners by covering with polyethylene film, waterproof masking or other proven measures, firmly fixed and sealed to the surface.

The Contractor shall comply with the cleaning product manufacturer's recommendations for protecting adjacent surfaces from exposure to their products.

Over-spray and splashing of the cleaning materials shall be prevented.

All persons, soil, surrounding vegetation and adjacent property shall be protected from injury, damage and contamination at all times during the cleaning process.

**5. General Cleaning:**

- a. Dilution of cleaning materials shall be with clean water in accordance with the manufacturer's printed instructions.

- b. Cleaning operations shall be carried out starting at the bottom and proceeding to the top of the cleaning area.
- c. Always keep surfaces wet below the area being cleaned.
- d. All bridge surfaces shall be cleaned in accordance with the cleaning procedure approved by the Engineer. The surface cleaning shall be done in strict accordance with the methods approved by the Engineer on the demonstration test area.
- e. All painted and unpainted metal structure, railings, and decorative elements shall be protected from contact with the cleaning operations by covering with polyethylene film, waterproof masking or other proven measures, firmly fixed and sealed to the surface. Any adhesive residue shall be removed from protected elements after removal of protection.

#### **6. Specialized Cleaning:**

Additional concentrated cleaning methods may be used, subject to the Engineer's approval. Detergents and other non-detrimental chemicals may be applied to the surface with fibrous, non-metallic soft bristle brushes, spray, or roller applied methods. When soil is sufficiently loosened, the concrete shall be thoroughly rinsed so that no residue remains. Poultices may also be used if approved by the Engineer.

Prior to any stain removal treatment, thoroughly wet the surface of the concrete around the stained area with clear, clean water at low pressure. Apply specialized stain removers as specified by the manufacturer and rinse thoroughly with clean, clear water at low pressures (100 – 300 psi).

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

**Basis of Payment:** This work will be paid for at the Contract lump sum price for "Clean Historic Bridge (Site No. 1)" which price shall include all equipment, tools, labor and work incidental thereto, including acquisition of required permits, containment, collection and proper disposal of all waste, wash water and other cleaning elements used. This price shall also include all work, materials, and equipment incidental to providing staging for Contractor and inspection access and debris shields as required to protect traffic from the cleaning operation.

Removal of Graffiti, where directed by the Engineer, shall be paid for under the item "Removal of Graffiti from Historic Concrete," after the bridge has been cleaned in accordance with this specification.

The removal and resetting of fence for the purpose of Contractor access at miscellaneous locations shall be included in the general cost of work for this item and shall not be measured for payment.

The Contractor shall submit to the Department a schedule of payment values for review and comment.

Pay Item	Pay Unit
Clean Historic Concrete Bridge (Site No. 1)	l.s.



## **ITEM #0520036A - ASPHALTIC PLUG EXPANSION JOINT SYSTEM**

**Description:** Work under this item shall consist of furnishing and installing an asphaltic plug expansion joint system (APJ) in conformance with ASTM D6297, as shown on the plans, and as specified herein.

Work under this item shall also consist of the removal and disposal of bituminous concrete, membrane waterproofing, existing joint components and sealing elements, cleaning and sealing median barrier joints, parapet joints, and sidewalk joints.

Work under this item excludes the removal of Portland cement concrete headers.

**Materials:** The APJ component materials shall conform to ASTM D6297 and the following:

Aggregate: The aggregate shall meet the following requirements:

- a) Loss on abrasion: The material shall show a loss on abrasion of not more than 25% using AASHTO Method T96.
- b) Soundness: The material shall not have a loss of more than 10% at the end of five cycles when tested with a magnesium sulfate solution for soundness using AASHTO Method T 104.
- c) Gradation: The aggregate shall meet the requirements of Table A below:
- d) Dust: aggregate shall not exceed 0.5% of dust passing the #200 sieve when tested in accordance with AASHTO T-11.

**Table A**

<b><u>Square Mesh Sieves</u></b>	<b>1" (25.0 mm)</b>	<b>¾" (19.0 mm)</b>	<b>½" (12.5 mm)</b>	<b>⅜" (9.5 mm)</b>	<b>No. 4 (4.75 mm)</b>
<b>% passing</b>	<b>100</b>	<b>90 - 100</b>	<b>20 - 55</b>	<b>0 - 15</b>	<b>0 - 5</b>

A sample of the aggregate shall be submitted to the Department with a Certified Test Report in accordance with Article 1.06.07 for each 20 tons of loose material or its equivalent number of bags delivered to the job site. The Certified Test report must include a gradation analysis resulting from a physical test performed on the actual material that accompanies the report.

Anti-Tacking Material: This material shall be a fine graded granular material with 100% passing the  $\frac{3}{16}$ " sieve and no more than 5% passing the #200 when tested in accordance with AASHTO T-27.

Backer Rod: All backer rods shall satisfy the requirements of ASTM D5249, Type 1.

Bridging Plate: The bridging plates shall be steel conforming to the requirements of ASTM A36 and be a minimum  $\frac{1}{4}$ " thick and 8" wide. For joint openings in excess of 3" the minimum plate dimensions shall be  $\frac{3}{8}$ " thick by 12" wide. Individual sections of plate shall

not exceed 4' in length. Steel locating pins for securing the plates shall be size 16d minimum, hot-dip galvanized, and spaced no more than 12" apart.

**Concrete Leveling Material:** Shall be a cementitious-based material that conforms to ASTM C928 Standard Specification for Packaged, Dry, Rapid-Hardening Cementitious Materials for Concrete Repair, for R3 performance requirements in Table 1 and achieve the following:

- a. Final set in 45 Minutes
- b. 2500 psi compressive strength in 24 hours
- c. 5000 psi compressive strength in 7 days

**Parapet Sealant:** The sealant used in parapet joint openings shall be a single component non-sag silicone sealant that conforms to the requirements of ASTM D5893.

**Sidewalk Sealant:** The sealant used in sidewalk joint openings shall be a rapid cure, self-leveling, cold applied, two-component silicone sealant. The silicone sealant shall conform to the requirements listed in Table B:

**Table B**

<b>Properties - As Supplied</b>	<b>Test Method</b>	<b>Requirement</b>
Extrusion Rate	ASTM C1183	200-600 grams/min
Leveling	ASTM C639	Self-Leveling
Specific Gravity	ASTM D792	1.20 to 1.40
<b>Properties - Mixed</b>	<b>Test Method</b>	<b>Requirement</b>
Tack Free Time	ASTM C679	60 min. max.
Joint Elongation – Adhesion to concrete	ASTM D5329 <sup>1,2,3</sup>	600% min
Joint Modulus @ 100% elongation	ASTM D5329 <sup>1,2,3</sup>	15 psi max
Cure Evaluation	ASTM D5893	Pass @ 5 hours

1. Specimens cured at 77±3<sup>0</sup>F and 50±5% relative humidity for 7 days
2. Specimens size: ½" wide by ½" thick by 2" long
3. Tensile Adhesion test only

The date of manufacture shall be provided with each lot. No sealant shall be used beyond its maximum shelf-life date.

The two-part silicone sealants shown in Table C are known to have met the specified requirements:

**Table C**

<b>Product</b>	<b>Supplier</b>
Dow Corning 902RCS	Dow Corning Corporation 2200 W Salzburg Road Auburn, Michigan 48611
Wabo SiliconeSeal	BASF/Watson Bowman Acme Corporation 95 Pineview Drive Amherst, New York 14228

Other two-component silicone joint sealants expressly manufactured for use with concrete that conform to the aforementioned ASTM requirements will be considered for use provided they are submitted in advance for approval to the Engineer. Other joint sealants will be considered for use only if a complete product description is submitted, as well as documentation describing at least five installations of the product. These documented installations must demonstrate that the product has performed successfully for at least three years on similar bridge expansion joint applications.

A Materials Certificate and Certified Test Report for the asphaltic binder shall be submitted by the Contractor in accordance with the requirements of Article 1.06.07 certifying that the asphaltic binder satisfies the requirements of the most current version of ASTM D6297.

A Materials Certificate for all other components of the APJ, leveling material, backer rod and sealant used in sealing parapet and sidewalk joint openings, shall be submitted by the Contractor in accordance with the requirements of Article 1.06.07

**Construction Methods:** The APJ shall be installed at the locations shown on the plans and in stages in accordance with the traffic requirements in the special provisions “Maintenance and Protection of Traffic” and “Prosecution and Progress”.

At least 30 days prior to start of the work, the Contractor shall submit to the Engineer for approval a detailed Quality Control Plan for the installation of the APJ. The submittal shall include:

- a) A list of all manufactured materials and their properties to be incorporated in the joint system, including, but not limited to the asphaltic binder, anti-tack material, backer rod, sealant, leveling material, as well as the aggregate’s source.
- b) A detailed step by step installation procedure and a list of the specific equipment to be used for the installation. The Quality Control Plan must fully comply with the specifications and address all anticipated field conditions, including periods of inclement weather.

The APJ shall not be installed when bituminous concrete overlay or joint cutout is wet. The APJ shall only be installed when the bridge superstructure surface temperature is within the limits specified in Table D and when the ambient air temperature is within the range of 45<sup>0</sup>F to 95<sup>0</sup>F.

The bridge superstructure surface temperature range is determined using the thermal movement range provided on the contract plans for the proposed APJ deck installation location and the selected APJ product.

**Table D**

<b>Installation Restrictions</b>	
<b>Designed Deck Joint Thermal Movement Range<sup>2</sup></b>	<b>Bridge Superstructure Surface Temperature<sup>1</sup></b>
0" to 1"	45° F to 95° F
1-1/8"	45° F to 90° F
1-1/4"	45° F to 80° F
1-3/8"	45° F to 70° F
1-1/2"	45° F to 65° F

- 1. The superstructure surface temperature shall be determined from the average of three or more surface temperature readings taken at different locations on the interior girder surfaces by the Contractor as directed by the Engineer. Temperature measurements of the superstructure shall be taken by the contractor with a calibrated hand held digital infrared laser-sighted thermometer on the surfaces of an interior steel girder, or interior concrete girder protected from direct sunlight. The infrared thermometer to be supplied by the Contractor for this purpose shall meet certification requirements of EN61326-1, EN61010-1, and EN60825-1 maintained by the European Committee for Electrotechnical Standardization (CENELEC). The thermometer shall have a minimum distance-to-spot ratio of 50:1 and shall have adjustable emissivity control. The thermometer shall have a minimum accuracy value of  $\pm 1\%$  of reading or  $\pm 2^{\circ}\text{F}$ , whichever is greater. The thermometer shall be used in strict accordance with the manufacturer's written directions. An additional infrared thermometer satisfying the same standards to be used in this application shall also be provided to the Engineer for quality assurance purposes.*
- 2. Linear interpolation may be used to determine an allowable surface temperature range for thermal movement ranges in between values shown in the table, as approved by the Engineer.*

Prior to installing the APJ, the Contractor shall determine the exact location of the deck joint beneath the bituminous concrete overly.

The APJ shall be installed symmetrically about the deck joint opening to the dimensions shown on the plans or as directed by the Engineer; not to exceed 24 inches measured perpendicular to the deck joint. The proposed saw cut lines shall be marked on the bituminous concrete overlay by the Contractor and approved by the Engineer, prior to saw-cutting. The saw-cuts delineating the edges of the APJ shall extend full depth of the bituminous concrete overlay.

The existing bituminous concrete overlay, waterproofing membrane and/or existing expansion joint material, within the saw cut limits shall be removed and disposed of by the Contractor to create the joint cutout.

Concrete surfaces that will support the bridging plates shall be smooth and form a plane along and across the deck joint. Rough or damaged concrete surfaces shall be repaired with a leveling compound meeting the requirements of this specification. Deteriorated concrete areas within the joint limits shall be repaired as directed by the Engineer: such repairs, when deemed necessary by the Engineer, shall be compensated for under the applicable concrete deck repair items in the Contract. The existing and repaired concrete surfaces shall provide continuous uniform support for the bridging plate and prevent the plate from rocking and deflecting.

Prior to the installation of the backer rod, all horizontal and vertical surfaces of the joint cutout shall be abrasive blast cleaned using an oil-free, compressed air supply. The entire cutout shall then be cleared of all loose blast media, dust, debris and moisture using an oil-free, hot air lance capable of producing an air stream at 3,000°F with a velocity of 3,000 feet per second.

A single backer rod, with a diameter at least 25% greater than the existing joint opening at the time of installation, shall be installed at an inch below the bridging plate in the existing deck joint opening between the concrete edges.

Asphaltic binder shall be heated to a temperature within the manufacturer's recommended application temperature range which shall be provided in the Quality Control Plan. During application, the temperature of the binder shall be maintained within this range. In no case shall the temperature of the binder go below 350° F nor exceed the manufacturer's recommended maximum heating temperature.

Asphaltic binder shall then be poured into the joint opening until it completely fills the gap above the backer rod. A thin layer of binder shall next be applied to the all horizontal and vertical surfaces of the joint cutout.

Bridging plates shall be abrasive blast-cleaned on-site prior to installation and then placed over the deck joint opening in the joint cutout. The plates shall be centered over the joint opening and secured with locating pins along its centerline. The plates shall be placed end to end, without overlap, such that the gap between plates does not exceed ¼". The plates shall extend to the gutter line and be cut to match the joint's skew angle, where concrete support exists on both sides of the joint. Within APJ installation limits, where concrete support does not exist at both sides of the joint opening (such as where a bridge deck end abuts a bituminous concrete roadway shoulder), bridging plates shall not be installed. Installed bridging plates shall not rock or deflect

in any way. After installation of bridging plates, a thin layer of asphaltic binder shall be applied to all exposed surfaces of the plates.

The remainder of the joint cutout shall then be filled with a mixture of hot asphaltic binder and aggregate prepared in accordance with the submitted Quality Control Plan and the following requirements:

- The aggregate shall be heated in a vented, rotating drum mixer by the use of a hot-compressed air lance to a temperature of between 370° F. to 380° F. This drum mixer shall be dedicated solely for the heating and, if necessary, supplemental cleaning of the aggregate. Venting of the gas and loose dust particles shall be accomplished through ¼” drilled holes spaced no more than 3” on center in any direction along the entire outside surface of the drum
- Once the aggregate has been heated, it shall then be transferred to a secondary drum mixer where it shall be fully coated with asphaltic binder. A minimum of two gallons of binder per 100lbs of stone is required.
- The temperature of the aggregate and binder shall be monitored by the contractor with a calibrated digital infrared thermometer.
- The coated aggregate shall be loosely placed in the joint cutout in lifts not to exceed 2 inches.
- Each lift shall be leveled, compacted and then flooded with hot asphaltic binder to the level of the aggregate to fill all voids in the coated aggregate layer. The surface of each lift shall be flooded until only the tips of the aggregate protrude out of the surface.
- The final lift shall be placed such that no stones shall project above the level of the adjacent overlay surface following compaction of the coated aggregate.
- Following installation of the final lift, sufficient time and material shall be provided to allow all voids in the mixture to fill. This step may be repeated as needed.
- The joint shall then be top-dressed by heating the entire area with a hot-compressed air lance and applying binder. The final joint surface must be smooth with no protruding stones and be absent of voids.
- Once top-dressed, the joint shall have an anti-tack material spread evenly over the entire surface to prevent tracking.

The Contractor shall be responsible for removing all binder material that leaks through the joint and is deposited on any bridge component, including underside of decks, headers, beams, diaphragms, bearings, abutments and piers.

Traffic shall not be permitted over the joint until it has cooled to 130° F when measured with a digital infrared thermometer. Use of water to cool the completed joint is permitted.

#### Sidewalk, parapet, and/or curb joint openings

Before placement of any sealing materials in parapets, curbs, or sidewalks, the joints shall be thoroughly cleaned of all scale, loose concrete, dirt, dust, or other foreign matter by abrasive blast cleaning. Residual dust and moisture shall then be removed by blasting with oil free

compressed air using a hot air lance. Projections of concrete into the joint space shall also be removed. The backer rod shall be installed in the joint as shown on the plans. The joint shall be clean and dry before the joint sealant is applied. Under no circumstances is the binder material to be used as a substitute for the joint sealant.

Whenever abrasive blast cleaning is performed under this specification, the Contractor shall take adequate measures to ensure that the abrasive blast cleaning will not cause damage to adjacent traffic or other facilities.

The joint sealant shall be prepared and placed in accordance with the manufacturer's instructions and with the equipment prescribed by the manufacturer. Extreme care shall be taken to ensure that the sealant is placed in accordance with the manufacturer's recommended thickness requirements.

The joint sealant shall be tooled, if required, in accordance with the manufacturer's instructions.

Primer, if required, shall be supplied by the sealant manufacturer and applied in accordance with the manufacturer's instructions.

When the sealing operations are completed, the joints shall be effectively sealed against infiltration of water. Any sealant which does not effectively seal against water shall be removed and replaced at the Contractor's expense.

Any installed joint that exhibits evidence of failure, as determined by the Engineer, such as debonding, cracking, rutting, or shoving of the APJ mixture shall be removed and replaced full-width and full-depth to a length determined by the Engineer at no additional cost to the State.

**Method of Measurement:** This work will be measured for payment by the number of cubic feet of "Asphaltic Plug Expansion Joint System" installed and accepted within approved horizontal limits. No additional measurement will be made for furnishing and installing backer rod and joint sealant in the parapets, concrete medians, curbs and/or sidewalks.

**Basis of Payment:** This work will be paid for at the contract unit price per cubic foot for "Asphaltic Plug Expansion Joint System," complete in place, which price shall include the saw-cutting, removal and disposal of bituminous concrete, membrane waterproofing, existing joint components and sealing elements, the furnishing and placement of the leveling compound, cleaning of the joint surfaces, furnishing and installing bridging plates, the furnishing and installing of the asphaltic plug joint mixture, the cost of furnishing and installing joint sealant in the parapets, concrete medians, curbs and sidewalks, and all other materials, equipment including, but not limited to, portable lighting, tools, and labor incidental thereto. No additional payment shall be made for the 12" wide bridging plates that are required for deck joint openings with widths in excess of 3".

If directed by the Engineer, additional deck repairs will be addressed and paid for under the applicable concrete deck repair items in the Contract.

## **ITEM #0601201A – CLASS “F” CONCRETE**

Section 6.01 *is supplemented and amended as follows:*

### **6.01.01—Description:** *After the first paragraph, add the following:*

This item shall also include color-matched concrete for use in historic bridges and other incidental construction as required. The concrete shall be composed of Portland cement, fine and coarse aggregate, admixtures, including pigments if necessary, and water, prepared and constructed in accordance with these specifications, at the locations and of the form dimensions shown on the plans, or as directed by the Engineer.

### **6.01.02—Materials:**

Section M.03 *is amended as follows:*

### **M.03.01—Component Materials:** *Add the following:*

The existing concrete shall be tested in accordance with the special provision “Testing and Analysis of Historic Concrete” and the color shall be determined. The color of the proposed mix design required to match the existing structure shall be achieved through the use of a combination of lighter colored cement, fine aggregate and admixtures that meet the requirements of this specification.

### **M03.01-3. Cement:** *Add the following:*

Gray and white cements shall be blended to achieve the matching historic coloration, as approved by the Engineer. Type II Portland Cement generally yields mixtures lighter in color than Type I.

Pozzolans (e.g. fly ash) are not acceptable for use as a replacement for any amount of cement.

### **M.03.01-5. Admixtures:** *Add the following:*

#### Color Pigments

The use of color pigments shall be approved by the Engineer. Dry pigments are to be synthetic mineral oxides meeting the requirements of ASTM C979, but shall only be used if concrete is mixed in a central batch plant.

### **M.03.03-1(c) Quality Control:** *Add the following:*

The Contractor shall prepare a minimum 4 foot by 4 foot mock-up to demonstrate that the proposed concrete mix will match the existing historic color and general appearance. The mock-up shall be viewed from a distance of 10 feet for color evaluation against the clean concrete it is intended to match. The visual color matching shall be done by the Department’s Architectural



Historian. Documentation shall be provided to the Engineer demonstrating the Department's Architectural Historian's approval of the proposed concrete color. The Demonstration Test Area (6 foot by 6 foot) section of the existing structure, cleaned in accordance with the special provision "Clean Historic Concrete Bridge (Site No. 1)," may be used for the visual color matching, if the cleaning operation is deemed acceptable by the Engineer. The color of the proposed concrete mix must be approved prior to any large batch production. Samples of multiple concrete mixes may be provided for review during a single visual color match inspection.

Should the Department's Architectural Historian determine that the mock-up does not match the existing concrete, additional mock-ups will be required. The Contractor shall adjust the color of the proposed concrete and prepare additional mock-ups until the Department's Architectural Historian determines that a match has been attained.

**6.01.03—Construction Methods:**

**6.01.03-1. Falsework and Forms:** *Add the following:*

Forms shall be coated with a plastic or similar film to preclude the use of form release agents.

Continuous ornament as shown on the plans shall be formed with wood forms set with wood dividers.

**6.01.05—Basis of Payment:** *Add the following:*

The price shall include blending of cements, color pigments and furnishing, placing, finishing, and curing of all mock-ups required to attain an approved color match.

## **ITEM #0601423A – CLASS “C” CONCRETE - REPLICATED**

Work under this item shall conform to the requirements of Section 6.01 supplemented and amended as follows:

### **6.01.01-Description:** *Add the following:*

Work under this item shall consist of developing a cast-in-place concrete replication mix and casting concrete for use in historic bridges for reconstruction or extension of existing cast-in-place concrete or portions thereof.

### **6.01.02-Materials:**

- 1. Concrete:** Materials shall conform to Section M.03 as modified herein below.

### **M.03.01 – Component Materials:** *Add the following:*

A mix design for “Class ‘C’ Concrete - Replicated” shall be prepared and submitted by the Contractor to the Engineer for the Department’s Architectural Historian’s approval. Approval of the submitted mix design is contingent upon verification by the Department’s Architectural Historian by visual inspection that the fine and coarse aggregates of the proposed mix design match the aggregates of the historic concrete used at the bridge as determined under the item, “Testing and Analysis of Historic Concrete”. This visual inspection shall be allowed to occur at the concrete batch plant, the aggregate source, through the furnishing by the Contractor to the Department’s Architectural Historian of aggregate samples from the aggregate source, or through any combination thereof as may be requested by the Engineer or Department’s Architectural Historian.

The mix design shall attain a 28 day compressive strength (f’c) of 3,000psi. The mix design shall replicate the color, fine and coarse aggregate size, type, and distribution of the original bridge as determined through the analysis and testing of concrete samples completed through the special provision “Testing and Analysis of Historic Concrete”.

### **M.03.01-1 – Coarse Aggregate:** *Add the following:*

The proportions of the various sizes of coarse aggregate and the type of aggregate shall be as determined in the Testing Laboratory Report (see the special provision “Testing and Analysis of Historic Concrete”)

### **M.03.01-2 – Fine Aggregate:** *Add the following:*

The proportions of the various sizes of fine aggregate and the type of aggregate shall be as determined in the Testing Laboratory Report (see the special provision “Testing and Analysis of Historic Concrete”)

**M.03.01-3 – Cement:** *Add the following:*

Cement shall be as determined in the Testing Laboratory Report (see the special provision “Testing and Analysis of Historic Concrete”). Gray and white cements may be blended to achieve the matching historic coloration, as approved by the Engineer. Type II Portland Cement generally yields mixtures lighter in color than Type I.

Should any pozzolan (e.g. fly ash) be identified in the existing concrete, it shall be omitted from the final concrete mix design and be replaced with cement.

**M.03.01-5 – Admixtures:** *add the following:*

Air-Entrainment – Air entrainment shall range between 4.5 and 7.5 percent. Air-entraining admixtures may affect the color of the repair concrete and shall be considered in the development of color-matched concrete mix designs and the possible addition of pigments.

Color Pigments

The use of color pigments shall be approved by the Engineer. Dry pigments are to be synthetic mineral oxides conforming to ASTM C979, “Standard Specification for Pigments for Integrally Colored Concrete”, but shall only be used if concrete is mixed in a central batch plant.

**6.01.03 – Construction Methods:** *Add the following:*

**6.01.03-1 – Falsework and Forms:** *Add the following:*

Forms shall be coated with a plastic or similar film to preclude the use of form release agents. Forms shall be so designed that placement access shall be allowed at the top of each respective formwork assembly for contiguous void areas.

Continuous ornament (such as dentil molding, clapboard ornamentation or other) shall be formed with wood forms set with wood dividers.

**Ornament or Reverse Molds:** *Add the following:*

Ornamental work, when so noted on the plans, shall be formed by the use of reverse plaster molds.

**6.01.03 – 16 – Construction Joints:** *Add the following:*

The limits of patching shall follow the lines of the original construction joints or design limits to make the area of repair less obtrusive.

**6.01.03-21 – Surface Finish:** *Delete the entire sub-article and add the following:*

The external surface of all concrete shall be thoroughly worked during the operation of placing by means of tools of an approved type. The working shall be such as to force all coarse aggregate from the surface and thoroughly work the mortar against the forms to produce a smooth finish free from water and air pockets, segregated materials, or honeycomb. All horizontal surfaces shall be formed by placing an excess of material in the forms and removing or striking off such excess by means of a tool of an approved type, forcing the coarse aggregate below the mortar surface.

Immediately after the forms have been removed, all voids and honeycombs on the surface shall be filled and finished to conform to the surrounding concrete surface with a mortar of fine aggregate and Portland Cement of the same materials and coloration as that of the particular concrete being treated. This work shall be performed immediately after removal of forms and before the finishing process is started.

Following the filling of voids and honeycombs, concrete surface shall be given one of the following concrete finishes, similar to adjacent existing concrete surface, as indicated on the plans, or as directed by the Engineer. Generally but not in all cases, a Rubbed surface finish as described herein will be constructed on vertical exposed surfaces, and a Brush finish will be constructed on horizontal surfaces (eg., parapet tops, railing caps, bridge seats) as described herein.

**Rubbed Finish:**

As soon as the filling of voids and honeycombs has set sufficiently to permit it, the entire surface shall be thoroughly wet with a brush and rubbed with a No. 16 carborundum stone or an abrasive of quality, bringing the surface to a paste. The rubbing shall be continued sufficiently to remove all form marks and projections, producing a smooth dense surface without pits or irregularities.

The paste formed by the rubbing may be finished by carefully striping with a clean brush, or it may be spread uniformly over the surface and allowed to reset. Following the reset of the paste, the surface shall be finished by floating with a canvas, carpet-faced or cork float or rubbed down with dry burlap.

**Brush Finish:**

After the concrete has been struck off as described above, the surface shall be thoroughly worked and floated with a wooden, canvas, or cork float, the operation to be performed by skilled and experienced concrete finishers. Before this finish has set, the

surface shall be lightly striped with a fine brush to remove the surface cement film, leaving a fine grained smooth, but sanded texture.

**Float Finish:**

After the concrete has been struck off as described above, the surfaces shall be thoroughly worked and finished with a rough carpet float or other suitable device, leaving the surface even, but distinctly sandy pebbled in texture.

**Ground or Terrazzo Finish:**

The upper surfaces of rail caps, parapets or other surfaces when indicated on the plans shall be finished by grinding with a carborundum stone, or equally good abrasive to a smooth dense, terrazzo finish.

Using a No. 16 carborundum stone or an abrasive of equal quality, the surface shall be ground dry or wet until it is smooth and individual pebbles and aggregate particle are cut and polished. The surface shall then be completely cleansed with water, the final rubbing done by means of a No. 30 stone. The finished surface shall present the texture of polished marble and shall show the various aggregate particles in polished outline.

**Tooled Finish:**

This finish, typically for panels and other like work, shall be produced by the use of pneumatic tools, bush-hammer, pick, Crandall or other approved tool. No tooling shall be done until the concrete has cured for at least fourteen (14) days but as long as needed to prevent the aggregate particles from being “picked” out of the surface. The finished surface shall show a grouping of broken aggregate particles in a matrix of mortar, each aggregate particle being in slight relief.

**Sand Blast Finish:**

This finish typically for panels and other like work, shall be produced by sand blast methods. No sand blasting shall be done until the concrete has cured for at least fourteen (14) days. The sand blasting must be done by means of approved equipment and in such a manner as to produce an even grained surface in which the mortar has been cut away, leaving the aggregate particles exposed.

**Wire Brush or Scrubbed Finish:**

This type of finish shall be produced by scrubbing the surface of “green” concrete with stiff wire or fiber brushes, using a solution of muriatic acid in the proportion

of one (1) part acid to four (4) parts water. As soon as the forms are removed, the concrete surface shall be thoroughly and evenly scrubbed as described above until the cement film or surface is completely removed and the aggregate particles are exposed, leaving an even pebbled texture, presenting an appearance grading from that of fine granite to coarse aggregate, depending on the size and grading of aggregate used.

As soon as the scrubbing has progressed sufficiently to produce the required texture, the entire surface shall be washed thoroughly with water, to which a small amount of ammonia has been added, to remove to neutralize the affects of the acid.

**After 6.01.03-24, add the following:**

**Repair Procedure:**

Portions of concrete designated on the plans to be removed as well as additional adjacent deteriorated areas shall be delineated for removal by the Contractor. The Contractor's method of delineating areas of concrete to be repaired shall not permanently mark the concrete, leave any residue after removal, or require harsh chemicals to remove. The Engineer will determine if the delineated areas accurately reflect areas of concrete to be removed. The Contractor shall not perform any repair work without prior approval of the Engineer for locations, limits and types of repairs.

After deteriorated concrete has been removed from the designated areas, the Engineer will determine the type of repair required for each area.

No bridge shall receive an application of the specified material(s), including any necessary surface preparation materials, prior to the following criteria being met:

- 1) The bridge has been cleaned in accordance with the item, "Clean Historic Concrete Bridge (Site No. )" and the cleaning has been approved by the Engineer.
- 2) Test Reports have been developed in accordance with the item, "Testing and Analysis of Historic Concrete" and have been approved by the Engineer.
- 3) The specified material mock-up, as described elsewhere within this specification, has been approved by the Engineer as a match to the existing historic concrete in color, texture, aggregate type and distribution, and finishing technique.
- 4) Graffiti removal has been performed in accordance with the item, "Removal of Graffiti from Historic Concrete" at locations approved by the Engineer.

Extreme care shall be taken where reinforcing steel is uncovered not to damage the steel or its bond in the surrounding concrete. Pneumatic tools shall not be placed in directed contact with

reinforcing steel. Maximum 15 lb size hammers shall be used for general chipping and removal. Exposed reinforcing shall remain in place except where specifically indicated for removal by direction of the Engineer. If the existing reinforcing steel is severely corroded or damaged, the Engineer shall be notified immediately. Exposed patch areas, surfaces of reinforcing steel, application of product, and surface finishing techniques shall be prepared in accordance with this special provision.

Adequate measures shall be taken by the Contractor to prevent concrete chips, tools and materials from entering into adjacent roadway lanes or dropping to areas below the structure. When using sandblasting equipment, all work shall be shielded for the protection of the public. All debris shall be promptly swept up, removed, and satisfactorily disposed of by the Contractor from the site.

The perimeter of each deteriorated area shall be delineated with a ½ inch deep saw cut or chiseled edge. When sawcutting the concrete, care shall be taken not to cut existing reinforcing. Loose, deteriorated and hollow sounding concrete shall be removed to sound concrete. The exposed surfaces shall be thoroughly sandblasted and vacuumed immediately prior to forming. Hollow areas in the existing concrete shall be completely exposed by chipping away back to sound concrete and thoroughly sandblasted and vacuumed immediately prior to forming. Exposed reinforcing steel shall be sandblasted in accordance with SSPC-SP-6, Commercial Blast Cleaning, to remove all contaminants, rust and rust scale.

Removal of unsound concrete material shall be such to facilitate uniform placement of fresh concrete; all areas of excavated voids shall slope evenly out to within 1” of the face of the concrete to preclude entrapping air and forming hollow spots in the freshly placed concrete. Within 1” of the surface, the outline shall be perpendicular to the surface.

Where the existing reinforcing steel is severely corroded or damaged, it shall be cut out and replaced with new reinforcing steel of the same size with a minimum length for lap splices as required under the tension lap splice requirements set forth under the AASHTO Standard Specifications for Highway Bridges. If larger size bars are encountered, the Contractor shall notify the Engineer. When existing steel is determined by the Engineer to have insufficient cover, it shall be either replaced or adjusted as directed.

All compressed air equipment used in cleaning shall have properly sized and designed oil separators, attached and functional, to assure the delivery of oil free air to the nozzle. The surfaces to be patched, including exposed reinforcing, shall be free of oil, solvent, grease, dirt, dust, bitumin, rust, loose particles and foreign matter.

The color of the repair material shall be matched to the clean, historic concrete of the properly cleaned bridge. Proper cleaning shall be in accordance with the special provision, “Clean Historic Concrete Bridge (Site No. 1)”.

The Engineer will determine if the repair will also require a textured finish. The Contractor will design a material that will replicate the color and texture of the clean surface of the existing concrete.

The Contractor shall prepare a minimum 4' x 4' mock-up to demonstrate that the repair material will match the existing historic concrete in color, texture, and general appearance. The mock-up will be viewed from a distance of 10 feet for color and texture evaluation against the clean concrete it is intended to match. Should the Engineer determine that the mock-up does not match the existing concrete, additional mock-ups will be required. The Contractor shall adjust the color and/or texture of the repair material and assist in the preparation of all mock-ups until the Engineer determines that a match has been attained.

The Engineer will determine if the repair shall incorporate techniques to simulate exposed aggregate, where applicable. The Contractor shall submit for approval his recommendations for simulating the exposed aggregate finish. The submission shall include:

- aggregate size, type, and distribution, using as a guide, the final "Testing Laboratory Report" for each bridge as prepared under the item, "Testing and Analysis of Historic Concrete".
- technique for exposing the aggregate in the finished patch

The mock-up shall incorporate the recommendations of the approved submission for simulating the exposed aggregate finish.

All repairs shall be performed using formwork coated with a plastic or similar film to preclude the use of form release agents. Forms and support systems shall be properly designed in accordance with M6.01.03-3. Forms shall be so designed that placement access shall be allowed at the top of each respective formwork assembly for contiguous void areas.

No bonding compounds shall be used before or during the placement of this concrete material. Concrete surfaces against which this material is to be placed shall be sound, tight, and thoroughly roughened by the removal and sandblasting procedures specified above. The exposed concrete surfaces shall be kept moist for at least twenty-four (24) hours prior to the placement of the concrete repair material.

Prior to forming up vertical surfaces, 4x4 -6 gauge reinforcing steel wire fabric conforming to the requirements of M.06.01-3 shall be installed at the proper depth to those areas greater than four (4) square feet and 3" deep or as approved by the Engineer. The fabric shall be tied to any exposed reinforcing steel or anchored to sound concrete with ¼" powder actuated anchors such as the Hilti "Gunitite Slip" or W-6 Threaded Stud and Eye-Coupling or equivalent and as approved by the Engineer.

Placement of the fresh concrete shall be in the maximum height lifts possible under the circumstances and all freshly placed concrete shall be consolidated during placement with adequately sized and effective vibrators.



Following curing and stripping of forms, the exposed faces of new concrete repairs shall be finished similarly to adjacent existing concrete surfaces, with a specific surface finish as indicated on the plans, or as directed by the Engineer, in accordance with the aforementioned requirements of this special provision.

Cured repairs shall be sounded by the Engineer to detect the presence of any hollow spots. Such spots shall be removed and replaced by the Contractor at no additional cost to the State.

**Method of Measurement:** This work will be measured for payment by the number of cubic yards used in the acceptable repairs. Where sound concrete has been unnecessarily removed, the excess material for the repair will not be measured for payment.

**Basis of Payment:** This work will be paid for at the contract unit price per yard for "Class 'C' Concrete - Replicated", complete in place. The price shall include removal of deteriorated concrete, sawcutting, cleaning and surface preparation of the repair areas, and mock-ups. It shall also include scaffolding for access, debris shields, furnishing, placing, finishing, and curing of the color-matched concrete repair. All equipment, tools, labor and incidentals necessary to complete the work shall also be included in the cost of this item.

Welded wire fabric and anchors will be paid for at the contract unit price for "Deformed Steel Bars."

<u>Pay Item</u>	<u>Pay Unit</u>
Class "C" Concrete – Replicated	c.y.

## **ITEM #0601426A – CLASS “S” CONCRETE FOR HISTORIC BRIDGES**

Work under this item shall conform to the requirements of Section 6.01 supplemented and amended as follows:

### **6.01.01—Description:** *Add the following:*

Work under this item includes removing unsound, deteriorated concrete as delineated by the Engineer, and placing a historically replicated concrete repair material to restore the deteriorated concrete to a sound and historically accurate condition.

### **Article 6.01.02-Materials:**

- 1. Concrete:** Materials shall conform to Section M.03 as modified herein below.

### **M.03.01—Component Materials:** *Add the following:*

A mix design for “Class ‘S’ Concrete for Historic Bridges” shall be prepared and submitted by the Contractor to the Engineer for the Department’s Architectural Historian’s approval. Approval of the submitted mix design is contingent upon verification by the Department’s Architectural Historian by visual inspection that the fine and coarse aggregates of the proposed mix design match the aggregates of the historic concrete used at the bridge as determined under the item, “Testing and Analysis of Historic Concrete”. This visual inspection shall be allowed to occur at the concrete batch plant, the aggregate source, through the furnishing by the Contractor to the Department’s Architectural Historian of aggregate samples from the aggregate source, or any combination thereof as may be requested by the Engineer or Department’s Architectural Historian .

The mix design shall attain a 28 day compressive strength (f’c) of 3,000psi. The mix design shall replicate the color, fine and coarse aggregates of the original bridge as determined through the analysis and testing of concrete samples completed through the special provision item “Testing and Analysis of Historic Concrete” with the exception that coarse aggregate is to be limited in size to ¾” (No.6) and an appropriate amount of superplasticizing admixture is added.

### **M.03.01-1. Coarse Aggregate:** *Add the following:*

The proportions of the various sizes of coarse aggregate and the type of aggregate shall be as determined in the Testing Laboratory Report (see the special provision “Testing and Analysis of Historic Concrete”) except that maximum size shall be limited to ¾” (No.6) in size. The maximum aggregate size is to facilitate placement of concrete around reinforcing bars in patches that have been excavated to the minimum clearance of 1” behind the bars.

**M.03.01-2. Fine Aggregate:** *Add the following:*

The proportions of the various sizes of fine aggregate and the type of aggregate shall be as determined in the Testing Laboratory Report (see the special provision “Testing and Analysis of Historic Concrete”)

**M.03.01-3. Cement:** *Add the following:*

Cement shall be as determined through in the Testing Laboratory Report (see the special provision “Testing and Analysis of Historic Concrete”). Gray and white cements may be blended to achieve the matching historic coloration, as approved by the Engineer. Type II Portland Cement generally yields mixtures lighter in color than Type I.

Should any pozzolan (e.g. fly ash) be identified in the existing concrete, it shall be omitted from the final concrete mix design and be replaced with cement.

**M.03.01-5. Admixtures:** *Add the following:*

Superplasticizing Admixtures: The superplasticizer admixture shall be a high-range water reducer (HRWR) capable of increasing the slump of the mix from approximately 2.5” to 7” upon the addition of the amount recommended by the respective manufacturer. The HRWR shall conform to ASTM C494 Type F or Type G and shall be approved by the Engineer. The use of this material shall be in strict accordance with the respective manufacture’s written instructions and procedures.

Air-Entrainment – Air entrainment shall range between 4.5 and 7.5 percent. Air-entraining admixtures may affect the color of the repair concrete and shall be considered in the development of color-matched concrete mix designs and the possible addition of pigments.

Color Pigments

The use of color pigments shall be approved by the Engineer. Dry pigments are to be synthetic mineral oxides conforming to ASTM C979, “Standard Specification for Pigments for Integrally Colored Concrete”, but shall only be used if concrete is mixed in a central batch plant.

**6.01.03—Construction Methods:** *Add the following:*

**Submittals**

**6.01.03-6. Consistency:** *Add the following:*

The concrete shall have a slump range 2-4 inches prior to the addition of the HRWR and from 6-8 inches slump after the addition of the HRWR. The addition rates of the air-entraining admixture (A.E.A.) and the HRWR will vary. Frequent field testing of the air

content and slump prior to and after addition of the HRWR will be the determining factor of actual addition rates for each admixture.

**6.01.03-7. Mixing Concrete:** *Add the following:*

For hand mixing of the concrete, the Contractor shall provide scale(s) approved by the Engineer in which cement and aggregate can be accurately weighed for the required mix proportions.

The Contractor shall also have measuring graduates marked in ounces for the proportioning of the A.E.A. and the HRWR. Do Not mix the A.E.A. and the HRWR together before adding to the mix; the resultant solution will not work. DO NOT add the A.E.A. and the HRWR at the mixer simultaneously; these admixtures must be added separately in the mixing cycle. All manufactured materials shall be stored, mixed and used in strict accordance with the written recommendations of the respective manufactures.

**6.01.03-21. Surface Finish:** *Delete the entire sub-article and add the following:*

The external surface of all concrete shall be thoroughly worked during the operation of placing by means of tools of an approved type. The working shall be such as to force all coarse aggregate from the surface and thoroughly work the mortar against the forms to produce a smooth finish free from water and air pockets, segregated materials, or honeycomb. All horizontal surfaces shall be formed by placing an excess of material in the forms and removing or striking off such excess by means of a tool of an approved type, forcing the coarse aggregate below the mortar surface.

Immediately after the forms have been removed, all voids and honeycombs on the surface shall be filled and finished to conform to the surrounding concrete surface with a mortar of fine aggregate and Portland Cement of the same materials and coloration as that of the particular concrete being treated. This work shall be performed immediately after removal of forms and before the finishing process is started.

Following the filling of voids and honeycombs, concrete surface shall be given one of the following concrete finishes, similar to adjacent existing concrete surface, as indicated on the plans, or as directed by the Engineer. Generally but not in all cases, a Rubbed surface finish as described herein will be constructed on vertical exposed surfaces, and a Brush finish will be constructed on horizontal surfaces (eg., parapet tops, railing caps, bridge seats) as described herein.

**Rubbed Finish:**

As soon as the filling of voids and honeycombs has set sufficiently to permit it, the entire surface shall be thoroughly wet with a brush and rubbed with a No. 16

carborundum stone or an abrasive of quality, bringing the surface to a paste. The rubbing shall be continued sufficiently to remove all form marks and projections, producing a smooth dense surface without pits or irregularities.

The paste formed by the rubbing may be finished by carefully striping with a clean brush, or it may be spread uniformly over the surface and allowed to reset. Following the reset of the paste, the surface shall be finished by floating with a canvas, carpet-faced or cork float or rubbed down with dry burlap.

**Brush Finish:**

After the concrete has been struck off as described above, the surface shall be thoroughly worked and floated with a wooden, canvas, or cork float, the operation to be performed by skilled and experienced concrete finishers. Before this finish has set, the surface shall be lightly striped with a fine brush to remove the surface cement film, leaving a fine grained smooth, but sanded texture.

**Float Finish:**

After the concrete has been struck off as described above, the surfaces shall be thoroughly worked and finished with a rough carpet float or other suitable device, leaving the surface even, but distinctly sandy pebbled in texture.

**Ground or Terrazzo Finish:**

The upper surfaces of rail caps, parapets or other surfaces when indicated on the plans shall be finished by grinding with a carborundum stone, or equally good abrasive to a smooth dense, terrazzo finish.

Using a No. 16 carborundum stone or an abrasive of equal quality, the surface shall be ground dry or wet until it is smooth and individual pebbles and aggregate particle are cut and polished. The surface shall then be completely cleansed with water, the final rubbing done by means of a No. 30 stone. The finished surface shall present the texture of polished marble and shall show the various aggregate particles in polished outline.

**Tooled Finish:**

This finish, typically for panels and other like work, shall be produced by the use of pneumatic tools, bush-hammer, pick, Crandall or other approved tool. No tooling shall be done until the concrete has cured for at least fourteen (14) days but as long as needed to prevent the aggregate particles from being “picked” out of the surface. The finished surface shall show a grouping of broken aggregate particles in a matrix of mortar, each aggregate particle being in slight relief.

**Sand Blast Finish:**

This finish typically for panels and other like work, shall be produced by sand blast methods. No sand blasting shall be done until the concrete has cured for at least fourteen (14 days). The sand blasting must be done by means of approved equipment and in such a manner as to produce an even grained surface in which the mortar has been cut away, leaving the aggregate particles exposed.

**Wire Brush or Scrubbed Finish:**

This type of finish shall be produced by scrubbing the surface of “green” concrete with stiff wire or fiber brushes, using a solution of muriatic acid in the proportion of one (1) part acid to four (4) parts water. As soon as the forms are removed, the concrete surface shall be thoroughly and evenly scrubbed as described above until the cement film or surface is completely removed and the aggregate particles are exposed, leaving an even pebbled texture, presenting an appearance grading from that of fine granite to coarse aggregate, depending on the size and grading of aggregate used.

As soon as the scrubbing has progressed sufficiently to produce the required texture, the entire surface shall be washed thoroughly with water, to which a small amount of ammonia has been added, to remove to neutralize the affects of the acid.

**After 6.01.03-24, add the following:**

**Material Storage:**

The Contractor shall store and maintain the A.E.A. and the HRWR materials in clean original containers as delivered by the manufacture.

**Repair Procedure:**

Prior to the Contractor removing any concrete, the Engineer will perform an inspection to determine the exact limits and locations of all areas to be repaired. The Contractor shall provide scaffolding as required for the Engineer’s access for inspection. The Contractor shall not perform any repair work without prior approval of the Engineer for locations, limits and types of repairs.

After deteriorated concrete has been removed from the designated areas, the Contractor shall perform repairs in accordance with Class “S” Concrete Repair details on the Typical Concrete Repair Details drawing.

No bridge shall receive an application of the specified material(s), including any necessary surface preparation materials, prior to the following criteria being met:

- 1) The bridge has been cleaned in accordance with the item, "Clean Historic Concrete Bridge (Site No. 1)" and the cleaning has been approved by the Engineer.
- 2) Test Reports have been developed in accordance with the item, "Testing and Analysis of Historic Concrete" and have been approved by the Engineer.
- 3) The specified material mock-up, as described elsewhere within this specification, has been approved by the Engineer as a match to the existing historic concrete in color, texture, aggregate type and distribution, and finishing technique.
- 4) Graffiti removal has been performed in accordance with the item, "Removal of Graffiti from Historic Concrete" at locations approved by the Engineer.

Extreme care shall be taken where reinforcing steel is uncovered not to damage the steel or its bond in the surrounding concrete. Pneumatic tools shall not be placed in directed contact with reinforcing steel. Maximum 15 lb size hammers shall be used for general chipping and removal. Exposed reinforcing shall remain in place except where specifically indicated for removal by direction of the Engineer. If the existing reinforcing steel is severely corroded or damaged, the Engineer shall be notified immediately. Exposed patch areas, surfaces of reinforcing steel, application of product, and surface finishing techniques shall be prepared in accordance with this special provision.

No patch shall be placed until the Engineer has approved the repair type.

Adequate measures shall be taken by the Contractor to prevent concrete chips, tools and materials from entering into adjacent roadway lanes or dropping to areas below the structure. When using sandblasting equipment, all work shall be shielded for the protection of the public. All debris shall be promptly swept up, removed, and satisfactorily disposed of by the Contractor from the site.

The perimeter of each deteriorated area shall be delineated with a 1" deep saw cut or chiseled edge. When sawcutting the concrete, care shall be taken not to cut existing reinforcing. Loose, deteriorated and hollow sounding concrete shall be removed to sound concrete. The exposed surfaces shall be thoroughly sandblasted and vacuumed immediately prior to forming. Hollow areas in the existing concrete shall be completely exposed by chipping away back to sound concrete and thoroughly sandblasted and vacuumed immediately prior to forming. Exposed reinforcing steel shall be sandblasted in accordance with SSPC-SP-6, Commercial Blast Cleaning, to remove all contaminants, rust and rust scale.

Removal of unsound concrete material shall be such to facilitate uniform placement of fresh concrete; all areas of excavated voids shall slope evenly out to within 1" of the face

of the concrete to preclude entrapping air and forming hollow spots in the freshly placed concrete. Within 1" of the surface, the outline shall be perpendicular to the surface.

Where the existing reinforcing steel is severely corroded or damaged, it shall be cut out and replaced with new reinforcing steel of the same size with a minimum length for lap splices as required under the tension lap splice requirements set forth under the AASHTO Standard Specifications for Highway Bridges. If larger size bars are encountered, the Contractor shall notify the Engineer. When existing steel is determined by the Engineer to have insufficient cover, it shall be either replaced or adjusted as directed.

All compressed air equipment used in cleaning shall have properly sized and designed oil separators, attached and functional, to assure the delivery of oil free air to the nozzle. The surfaces to be patched, including exposed reinforcing, shall be free of oil, solvent, grease, dirt, dust, bitumin, rust, loose particles and foreign matter.

The color of the patch shall be matched to the clean, historic concrete of the properly cleaned bridge. Proper cleaning shall be in accordance with the special provision, "Clean Historic Concrete Bridge (Site No. 1)".

The Engineer will determine if the patch will also require a textured finish. The Contractor will design a patch that will replicate the color and texture of the clean surface of the existing concrete.

### **Mock-ups**

The Contractor shall prepare a minimum 4' x 4' mock-up panel to demonstrate that the repair patch will match existing adjacent historic concrete in color, texture, and general appearance. The mock-up will be viewed from a distance of 10 feet for color and texture evaluation against the clean concrete it is intended to match. Should the Engineer determine that the mock-up does not match the existing concrete, additional mock-ups will be required. The Contractor shall adjust the color and/or texture of the patch mix design and assist in the preparation of all mock-ups until the Engineer determines that a match has been attained.

The Engineer will determine if the patch shall incorporate techniques to simulate exposed aggregate, where applicable. The Contractor shall submit for approval his recommendations for simulating the exposed aggregate finish. The submission shall include:

- aggregate size, type, and distribution, using, as a guide, the final "Testing Laboratory Report" for each bridge as prepared under the item, "Testing and Analysis of Historic Concrete".
- technique for exposing the aggregate in the finished patch

The mock-up shall incorporate the recommendations of the approved submission for simulating the exposed aggregate finish.



All excavated areas on vertical surfaces of concrete members shall be formed using forms coated with a plastic or similar film to preclude the use of form release agents. Forms and support systems shall be properly designed in accordance with M6.01.03-3. Forms shall be so designed that placement access shall be allowed at the top of each respective formwork assembly for contiguous void areas.

No bonding compounds shall be used before or during the placement of this concrete material. Concrete surfaces against which this material is to be placed shall be sound, tight, and thoroughly roughened by the removal and sandblasting procedures specified above. The exposed concrete surfaces shall be kept moist for at least twenty-four (24) hours prior to the placement of the concrete repair material.

Prior to forming vertical surfaces, 4x4 - 6 gauge reinforcing steel wire fabric conforming to the requirements of M.06.01-3 shall be installed at the proper depth to those areas greater than four (4) square feet and 3" deep or as approved by the Engineer. The fabric shall be tied to any exposed reinforcing steel or anchored to sound concrete with 1/4" powder actuated anchors such as the Hilti "Gunite Slip" or W-6 Threaded Stud and Eye-Coupling or equivalent and as approved by the Engineer.

Placement of the fresh concrete shall be in the maximum height lifts possible under the circumstances and all freshly placed concrete shall be consolidated during placement with adequately sized and effective vibrators.

Following curing and stripping of forms, the exposed faces of new concrete patches shall be finished similarly to adjacent existing concrete surfaces, with a specific surface finish as indicated on the plans, or as directed by the Engineer, in accordance with the aforementioned requirements of this special provision.

Cured patches shall be sounded by the Engineer to detect the presence of any hollow spots. Such spots shall be removed and replaced by the Contractor at no additional cost to the State.

**Method of Measurement:** This work will be measured for payment by the number of cubic feet used in the acceptable patches. Where sound concrete has been unnecessarily removed, the excess material for the replacement patch will not be measured for payment.

**Basis of Payment:** This work will be paid for at the contract unit price per cubic foot for "Class 'S' Concrete for Historic Bridges ", complete in place. The price shall include sawcutting, the removal of deteriorated concrete, cleaning and surface preparation of the patch areas, cementitious primer, and mock-ups. It shall also include scaffolding for access and Engineer inspection, debris shields, furnishing, placing, finishing, and proper curing of the concrete patch. All equipment, tools, labor and incidentals necessary to complete the work shall also be included in the cost of this item.

Welded wire fabric and anchors will be paid for at the contract unit price for "Deformed Steel Bars."

Pay Item  
Class "S" Concrete for Historic Bridges

Pay Unit  
c.f.

## **ITEM #0601893A – VARIABLE DEPTH PATCH FOR HISTORIC CONCRETE BRIDGES**

**Description:** This item shall consist of the Contractor, under the direction of the Engineer, removing loose concrete, deteriorated concrete, concrete overlaying hollow areas and scaled concrete surfaces and patching these areas with a matching variable depth patch material to the original contour, in accordance with these specifications and to the satisfaction of the Engineer.

### **Materials:**

**Patch Material:** The patch material shall be a single-component, non-polymer modified, cementitious, mineral-based repair mortar. It shall have high adhesive bond strength, high dimensional stability, a coefficient of thermal expansion and liquid and moisture vapor permeability that are compatible with the substrate, a low modulus of elasticity, natural appearance, and excellent workability. It shall be capable of being color and texture matched in accordance with this specification. Dry pigments shall be synthetic mineral oxides conforming to ASTM C979 and shall be a maximum 2% by weight of cement.

It shall be one of the products below, or an approved equal:

“Jahn M90” by Cathedral Stone Products  
7266 Park Circle Dr.  
Hanover, MD 21076  
Contact: Dan Perakes  
(508) 326-2921  
Email: dperakes@cathedralstone.com

“Matrix” by Conproco Corporation  
17 Production Drive  
Dover, NH 03820  
800 258-3500  
Contact: Don Michaud  
Email: dmichaud@Conproco.com

The Contractor shall coordinate with each supplier to determine their concrete sampling requirements for matching patch material to the adjacent concrete surface as described herein.

**Cementitious Primer:** shall be applied to structurally sound, exposed, rust-free reinforcing steel within a patch to restore an alkaline environment around the bar and to enhance adhesion of the patch material to the bar. The primer shall be compatible with the selected patch material as follows:

For “Jahn M90”, use “Coronado Surface Tolerant Mastic 113 Line” by Cathedral Stone Products, or approved equal.

For “Matrix”, use “ECB” anti-corrosion coating, as recommended by Conproco Corporation.

For a selected “Equal” patching material, use primer as recommended by manufacturer.

Aggregates:

Fine aggregates determined by the Department’s Architectural Historian to be a match to the aggregates of the historic concrete per the samples furnished to him under the item, “Testing and Analysis of Historic Concrete” shall be substituted for the fine aggregates of the manufacturer’s typical mix formulation of the selected repair material.

Course aggregates to be embedded in the surface of the patch shall match the exposed aggregate of adjacent concrete in color, size and shape. Aggregate selection shall be as determined in “Testing and Analysis of Historic Concrete”.

**Construction Methods:**

Minimum Qualifications of Masons

Certification

Masons who will apply the repair material chosen from the above material list must be manufacturer-certified installers of the selected repair material. No masons shall be allowed to perform historic concrete repairs without meeting the minimum qualifications listed below.

Masons who wish to be considered for performance-based approval as described below shall provide the following minimum qualifications documentation:

- Name of mason
- Manufacturer’s signed certification of the mason and the date of certification
- 3 or more examples of historic preservation work demonstrating a minimum of 5 years’ successful experience with concrete repairs, including exposed aggregate finishing techniques, repair material color matching, and surface finishing techniques
- Photographs that detail the finished preservation work
- Contact information for employers or project owners who can verify the mason’s documented experience

Performance-based Approval

The mason must also demonstrate his expertise with the repair materials by developing vertical face mock-ups that highlight his proficiency in working with the material, including finishing techniques for surface texture and methods of exposing coarse and fine aggregate on the finished surface. Upon proper curing and evaluation of these mock-ups, the mason may be approved by the Department’s Architectural Historian to perform historic concrete repairs with the repair materials of this specification. The Engineer will maintain documentation regarding masons who have been approved to work on this project.

Any mason who is certified and approved but who cannot demonstrate proficiency with the repair materials of this specification at any time during the project may be rejected by the Engineer for use in the repair of historic concrete.

#### Vertical Face Mock-ups

The purpose of creating mock-ups is to qualify the manufacturer-certified mason to perform historic concrete repairs on this project. Each mason shall prepare two 1' x 1' mock-up panels which will represent two visually distinct areas of historic concrete to be repaired. Each mock-up panel shall be prepared by the mason to match an area selected by the Department's Architectural Historian to demonstrate that the patch will match the existing historic concrete in color, texture, and general appearance. In order for the Department's Architectural Historian to perform this evaluation, designated areas must be cleaned in accordance with the specification, "Clean Historic Concrete Bridge (Site No. 1)". Each of the two mock-ups shall incorporate all of the following techniques, as applicable: color matching, methods to expose fine and/or coarse aggregate, finishing techniques.

The repair mortar shall be applied while the mock-up panel is secured in a vertical position. The repair mortar shall be allowed to cure for at least 3 days. The panel shall be portable so that it may be transported to the area the Department's Architectural Historian has designated.

The mock-up will be viewed from a distance of 10 feet for color and texture evaluation against the clean concrete it is intended to match. If the Department's Architectural Historian determines that the mock-up does not match the existing concrete in color, texture, and finish (e.g.- exposed aggregate), additional mock-ups will be required. If a mason cannot demonstrate the required proficiency within 4 mock-ups between the two designated areas, he will no longer be considered for approval.

After approval, the mason shall perform his first on-bridge patch at a visually discrete location as viewed from the Merritt Parkway. Failure of the mason to perform a repair acceptable to the Department may be grounds for prohibiting the mason from performing additional repairs to historic concrete.

#### Submittals

In addition to the documentation required for mason qualification, a minimum of 3 copies of repair material orders shipped by the manufacturer for each bridge are required and shall include:

- Bridge number
- Quantity of repair material(s)
- Identification/formulation of repair material(s)

Distribution of copies shall be as follows:

- 1 copy – Engineer
- 1 copy – Bridge Designer
- 1 copy – Department's Architectural Historian

The preferred method of submittal is by email (refer to “Notice to Contractor – Submittals”)

#### Manufacturer’s technical representative

A technical representative for the manufacturer’s product shall be made available for on-site technical assistance and training for seven occasions. Technical assistance may be sought for topics such as:

- Initial on-site training of Contractor and Engineer staff
- Follow-up on-site training of Contractor and Engineer staff
- Inspection of repairs at owner’s request
- Assistance in color selection for and color variation within a patch
- Attendance at meetings as requested by the Engineer

#### Pre-repair Criteria

No bridge shall receive an application of the specified material(s), including any necessary surface preparation materials, prior to the following criteria being met:

- 1) The bridge has been cleaned in accordance with the item, “Clean Historic Concrete Bridge (Site No. 1)” and the cleaning has been approved by the Engineer
- 2) Graffiti removal has been performed in accordance with the item, “Removal of Graffiti from Historic Concrete” at locations designated by the Engineer and removal efforts are acceptable to the Engineer.
- 3) Specified vertical mock-ups, as described herein, have been approved by the Department’s Architectural Historian as a match to the existing historic concrete.

#### Engineer’s Survey for Delineating Concrete Repairs

Prior to the Contractor removing any concrete, the Engineer will perform an inspection to determine the exact limits and locations of all areas to be repaired. The Contractor shall provide scaffolding as required for the Engineer’s access for inspection. The Contractor shall not perform any repair work without prior approval of the Engineer for locations, limits and types of repairs.

#### Sampling

Should the manufacturer require concrete samples for the purpose of developing matching repair material, the samples shall be collected from within delineated patch areas. No sampling is permitted from areas outside of delineated repair areas. Samples shall be packaged and labeled according to the manufacturer’s requirements and the label shall include the bridge number for reference.

#### Historic Concrete Repair Work

Measures shall be taken by the Contractor to prevent concrete chips, tools and materials from entering into adjacent roadway lanes or dropping to areas below the structure. When using

sandblasting equipment, all work shall be shielded for the protection of the public. All debris shall be promptly swept up, removed, and satisfactorily disposed of by the Contractor from the site.

The perimeter of each deteriorated area shall be delineated with a ½ inch deep saw cut or chiseled edge. When sawcutting the concrete, care shall be taken not to cut existing reinforcing. Loose, deteriorated and hollow sounding concrete shall be removed to sound concrete. In areas less than 4 square feet where reinforcing steel is found to be surrounded by deteriorated concrete, the depth of removal shall include all deteriorated concrete.

Extreme care shall be taken where reinforcing steel is uncovered not to damage the steel or its bond in the surrounding concrete. Pneumatic tools shall not be placed in directed contact with reinforcing steel. Maximum 15 lb size hammers shall be used for general chipping and removal. Exposed reinforcing shall remain in place except where specifically indicated for removal by direction of the Engineer. If the existing reinforcing steel is severely corroded or damaged, the Engineer shall be notified immediately.

Where the existing reinforcing steel is severely corroded or damaged, it shall be cut out and replaced with new reinforcing steel of the same size with a minimum length for lap splices as required under the tension lap splice requirements set forth under the AASHTO Standard Specifications for Highway Bridges. If larger size bars are encountered, the Contractor shall notify the Engineer. When existing steel is determined by the Engineer to have insufficient cover, it shall be either replaced or adjusted as directed.

Structurally sound corroded reinforcing steel must be mechanically abraded to a white metal finish. Mechanical means, such as sandblasting, grinding or wire brushing are acceptable if performed with proper shielding and debris collecting procedures.

After deteriorated concrete has been removed from the designated areas, a repair type (i.e. Class “S”-type or Variable Depth-type) will be determined by the Engineer. Where “Variable Depth Patch for Historic Concrete Bridges” is to be used, the Contractor shall perform repairs in accordance with Variable Depth Patch-type repair details on the “Typical Concrete Repair Details” drawing.

Exposed patch areas, surfaces of reinforcing steel, application of product, and surface finishing techniques shall be done in strict accordance with the printed instructions supplied by the manufacturer, as recommended by the manufacturer’s technical representative, and as directed by the Engineer.

All compressed air equipment used in cleaning shall have properly sized and designed oil separators, attached and functional, to assure the delivery of oil free air to the nozzle. The surfaces to be patched, including exposed reinforcing, shall be free of oil, solvent, grease, dirt, dust, bitumin, rust, loose particles and foreign matter.

The patch shall be matched to the clean, historic concrete of the properly cleaned bridge. Proper cleaning shall be in accordance with the special provision, "Clean Historic Concrete Bridge (Site No. 1)".

Patches must be finished to match the finish of adjacent concrete. Exposed aggregate finishes shall be representative of the exposed aggregate of the surrounding concrete. Patches should be flush to the adjacent surface, with no raised edges, obvious feathering, or "halo" effect. Any "halo effect", created by the grout cream that surrounds the edges of a freshly installed patch, shall be immediately eradicated. Residual bloom that remains will warrant a rejection of the repair.

Should cured patches that have been approved as matches to the adjacent historic concrete in color, texture, and finish shift in color or appearance relative to the adjacent concrete prior to project completion, the patch may be rejected.

Patches that are not approved by the Engineer as a match to the adjacent concrete shall be removed and replaced in their entirety at the Contractor's expense. Limits of removal shall be as directed by the Engineer and may be extended beyond the limits of the patch only as directed.

Cured patches shall be sounded by the Engineer to detect the presence of any hollow spots. Such spots shall be removed and replaced by the Contractor at no additional cost to the State.

**Method of Measurement:** This work will be measured for payment by the number of cubic feet of accepted patches. Where sound concrete has been unnecessarily removed, the excess material for the replacement patch will not be measured for payment.

**Basis of Payment:** This work will be paid for at the contract unit price per cubic foot for "Variable Depth Patch for Historic Concrete Bridges", complete in place. The price shall include cleaning of localized areas for evaluating mock-ups, sawcutting, removal of deteriorated concrete, furnishing and matching concrete samples, cleaning and surface preparation of the patch areas, cementitious primer, and all mock-ups. It shall also include scaffolding for access, debris shields, product application training and technical representation by the product manufacturer/supplier, furnishing, placing, finishing, and curing of the matching patch. All equipment, tools, labor and incidentals necessary to complete the work shall also be included in the cost of this item.

Pay Item  
Variable Depth Patch for Historic Bridges

Pay Unit  
c.f.



## **ITEM #0601895A – REMOVAL OF GRAFFITI FROM HISTORIC CONCRETE**

**Description:** This work shall include the satisfactory removal of graffiti found on concrete bridges by the cleaning and/or removal methods detailed within this specification and as called out within the plans. Removal methods shall be carefully employed so as not to damage or discolor the surface of the concrete and mock-up areas demonstrating the proposed removal methods shall be evaluated and approved by the Engineer prior to continuation of the removal process.

Graffiti is defined as any marking made upon the structure by any type of paints, chalks, crayons, markers, pens, pencils, pastels, polishes, or other similar materials.

**Materials:** The following materials shall be used:

Absorbent Poultices containing powder-inert clays such as kaolin or sepiolite; diatomaceous earth (fuller's earth); or cellulose products such as fluff pulp cellulose or shredded paper mixed with a cleaning solution (see below) to form a paste or slurry.

Cleaning Solutions shall consist of a liquid reagent such as water, organic solvent, paint stripper, or bleach. **Cleaning solutions shall not be allowed to enter any drainage systems nor shall solutions be allowed to absorb into the ground adjacent to the structure.** The following cleaning products, or an approved equal, or acceptable for use:

**Sure Klean ® Fast Acting Stripper (by Prosoco, Inc.)** solvent based stripping compound may be utilized on the historic concrete for removal of graffiti.

**Watch Dog WipeOut ( by Dumond Chemicals)**

**Delivery, Storage and Handling:** All materials shall be delivered to the site in the Manufacturer's original and unopened containers and packaging, bearing labels as to the type of material, brand name and Manufacturer's name. Delivered materials should be identical to tested materials.

Material shall be stored off the ground in a clean, dry location. All materials that are damaged or are otherwise unsuitable for use shall be removed from the site.

All materials shall be handled, stored and treated in strict accordance with manufacturer's instructions, with regard to application and shelf life, spillage, clean-up, safety precautions, and protective means and methods.

**Construction Methods:** Graffiti removal shall not begin until the bridge has been cleaned per the specification "Clean Historic Concrete Bridge (Site No. 1)". Graffiti removal shall always begin with the gentlest means possible. Prior to beginning the removal process, the boundary

limits for each area of graffiti as described within the Method of Measurement will be determined by the Engineer. Limits shall be outlined using non-staining, removable chalk. The Graffiti Removal Procedure Plan, as detailed below, shall be submitted to the Engineer for approval.

**1. Graffiti Removal Program:** Prior to commencing graffiti removal operations, the Contractor shall submit a written **Graffiti Removal Procedure Plan** which includes the following:

- all materials, methods, and equipment proposed for each phase of graffiti removal
- all graffiti removal products and chemical components to be used, the method(s) of application, dilution of the application, temperature of application, length of time of surface contact, method of rinsing (*temperature, pressure, and duration*), and repetition of procedures, methodology for the full collection of all waste water, and the proper disposal of all materials. The ambient temperature range shall also be noted for proper application of cleaning products in accordance with the manufacturer's recommendations and specifications.
- a written description of proposed materials and methods of protection for preventing damage to adjacent materials, soil, water bodies, wetlands, wells, vegetation, vehicular / pedestrian traffic, and adjacent property.

**Demonstration Test Area:** Prior to commencing the graffiti removal operations, the Contractor shall demonstrate a trial application of the proposed cleaning method on a discrete portion of the wingwall or abutment face, where possible. The location of the graffiti removal demonstration test shall be determined by the Engineer. The demonstration test area shall be cleaned using methods, materials and working pressures previously submitted and approved. The demonstration test shall be performed in the presence of the Engineer.

Where chemical poultices are tested, perform testing in the presence of the Manufacturer's representative.

The production work of graffiti removal at bridge concrete surfaces shall not begin without approval from the Engineer of the graffiti removal methods, working pressures, materials, equipment used. The evaluation by the Engineer of the acceptability of the Contractor's proposed graffiti removal method will include a seven (7) day observation period after completion of the trial cleaning demonstration for verification that the requested graffiti removal method has caused no surface damage to historic concrete surfaces.

**Preparation:**

- a. Demonstration Test Area: Prepare test area as specified above.
- b. Graffiti Removal Program: The Graffiti Removal program shall be submitted as specified above.

- c. Protection: All painted and unpainted metal structure, railings and decorative elements shall be protected from contact with chemical cleaners by covering with polyethylene film, waterproof masking or other proven measures, firmly fixed and sealed to the surface.

The Contractor shall comply with the graffiti removal product manufacturer's recommendations for protecting adjacent surfaces from exposure to their products.

Over-spray and splashing of the cleaning materials shall be prevented.

All persons, soil, surrounding vegetation and adjacent property shall be protected from injury, damage and contamination at all times during the graffiti removal process.

If the approved methods for graffiti removal are determined by the Engineer to be ineffectual after reasonable efforts to perform the removal have been demonstrated by the Contractor, then graffiti will be addressed as follows:

- Graffiti removed to a high degree, but faint markings remain: the Engineer may, at his discretion, instruct the Contractor to apply a color-blending sealant to the surface for the purpose of blending the surface color with adjacent concrete and/or for simulating a weathered finish. Where existing historic concrete is not uniform in color, a complimentary color, may be necessary to simulate the appearance. The Department's Architectural Historian shall recommend an appropriate color or colors to achieve the desired result.
- Graffiti removed to a lesser degree, but visible markings remain: the Engineer may instruct the Contractor to apply "Color-Matched Coating for Concrete" and a color-blending sealant

**Method of Measurement:** This item shall be measured for payment by the number of square feet of graffiti that has been removed and accepted by the Engineer. Areas of graffiti removal for payment purposes shall be defined by the external edges of the graffiti, bounded by a rectangular or square shape. In instances where markings stray outside of the boundaries of a main rectangular or square shape, those markings shall be bounded by additional rectangular or square shapes. No rectangular or square shape dimension bounding the limits of graffiti removal shall be less than 1 foot.

**Basis of Payment:** The work for this item shall be paid for at the contract price per square foot for "Removal of Graffiti from Historic Concrete" which shall include all work incidental to the removal of any graffiti, including, but not limited to, low pressure power washing, poultice application, gentle brush scrubbing, and other cleaning methods approved for the historic concrete. Also included shall be all work, equipment, or materials necessary to provide staging

for access, to provide a debris shield for the protection of traffic, and to protect persons, soil, surrounding vegetation from injury, damage and contamination, including proper containment and disposal of wastewater and cleaning agents.

Pay Item  
Removal of Graffiti from Historic Concrete

Pay Item  
s.f.

## **ITEM #0601988A - TESTING AND ANALYSIS OF HISTORIC CONCRETE**

**Description:** This work requires the furnishing, testing and analysis of concrete cores from locations on the structure to be selected by the Department's Architectural Historian. This work includes the furnishing of samples of aggregates obtained from tested cores to the Department's Architectural Historian. This work shall also include the preparation and submittal of a test report that shall include:

- Reverse engineering of the existing sound concrete.
- Determination of the historic concrete mix design and a corresponding recommended replication mix.
- Evaluation of sound concrete for sources of potential deterioration.
- Determination regarding causes and degree of actual concrete deterioration.

### **Materials:**

Cementitious Primer: Shall be that specified in the special provision, "Variable Depth Patch for Historic Concrete Bridges".

### **Construction Methods:**

The Contractor shall employ, at his own expense, an independent Concrete Testing Laboratory from the list below, or approved equal, that is experienced in performing the analysis and testing specified herein.

Highbridge Materials Consulting, Inc.  
404 Irvington St.  
Pleasantville, New York 10570  
(914) 502-0100  
Contact: Mr. John Walsh

Jablonski Building Conservation, Inc.  
40 West 27<sup>th</sup> Street, Suite 1201  
New York, NY 10001  
(212) 532-7775  
Contact: Ms. Mary Jablonski

Wiss, Janney, Elstner Associates, Inc.  
330 Pfingsten Road  
Northbrook, IL 60062  
(847) 272-7400  
Contact: Ms. Laura Powers

### Concrete Core Samples

The Contractor shall furnish concrete cores which comprise a “Core Group”, as defined below, from areas of sound or deteriorated concrete on the structure. All core locations will be determined by the Department’s Architectural Historian to meet the following criteria:

- They shall be located at discrete portions of the structure, as viewable from the Merritt Parkway, which will serve to maintain the overall structure aesthetic.
- They shall be extracted from areas least affected by moisture and staining.
- Under no circumstances will they be extracted from areas that have been previously repaired or coated with graffiti or cover-up materials.

Core holes must be inspected for exposed cut reinforcement. Any reinforcement shall be protected with cementitious primer to protect against corrosion prior to repair of the holes.

A “Core Group” from sound concrete shall consist of four cores, extracted from the same area of the structure, as follows:

- One pair of six inch (6”) diameter by six inch (6”) deep cores furnished to the selected Concrete Testing Laboratory for the testing and analysis described herein.
- One 6 inch (6”) diameter by 6 inch (6”) deep core furnished to the Department’s Architectural Historian which will serve as his control sample when evaluating the aggregates of a proposed mix design, or samples the may be furnished to him by the selected manufacturer of the concrete repair mortar under the noted items of the next bullet.
- One 6 inch (6”) diameter by 6 inch (6”) deep core furnished to the selected manufacturer of the concrete repair mortar, under the below items, for the purpose of baseline color matching of his mortar to the historic concrete (Color variations may be necessary from one repair to the next and shall be appropriately addressed as specified in the below items.

### Repair Mortar Items

“Variable Depth Patch for Historic Concrete Bridges”

“Class ‘S’ Concrete for Historic Bridges”

### Core Testing

Core testing shall be performed for the following reasons:

- Determination of the historic concrete mix design by Reverse Engineering, as defined in **Testing Laboratory Analysis**.
- Determination of potential sources of deterioration.
- Performing chloride and FTIR testing defined in **Testing Laboratory Analysis**.

For bridges with areas of deteriorated concrete, additional cores may be taken at locations delineated by the Department's Architectural Historian for:

Determination of actual sources of deterioration (e.g. - depth of carbonation and chloride penetration)

Groups of up to 4 deteriorated concrete cores at a given bridge shall define a supplemental "Core Group".

Surrounding surfaces of the bridge and site shall be protected from damage and staining during the core removal work. All adjacent surfaces on bridges and in the vicinity including grass, shrubs, and trees shall be protected.

Cores shall be taken with standard concrete coring equipment, taking care to produce a core which contains both surface and base concrete material, including fine and coarse aggregates. The cores shall be 6" in diameter by 6" in depth unless otherwise approved by the Engineer.

#### Labeling of Cores

All cores must be properly labeled. Each core is to be labeled with the following information:

- Bridge #
- Date core was taken
- Name of feature crossed (e.g. – roadway, railroad, or waterway)
- Location and purpose of core (e.g. - northwest wingwall, 4'-0" above grade, sound concrete; northwest wingwall adjacent to deteriorated concrete)

Do not mark the outer face of the core.

Core samples are to be kept clean and dry, sealed in a plastic bag and adequately labeled until furnished to the locations required herein. Testing shall be performed in a timely manner. Additional cores required by the testing agency for the purpose of completing the requirements of this specification may be approved by the Engineer but shall not bear additional cost.

#### Furnishing of Aggregates to the Department's Architectural Historian and Contractor

Coarse and fine aggregates shall be separated from one another and shall be furnished to both the Department's Architectural Historian and the Contractor in separate heavy duty, gallon-sized, clear, and re-sealable plastic bags or similarly sized heavy-duty, clear plastic containers. Each bag or container will represent the distribution of aggregates **as extracted from the tested and analyzed core sample(s) from which the mix proportions have been determined.** Each bag or container shall be labeled per the "Labeling of Cores" requirements noted above for accurate cross-referencing to the originating core samples and bridges.

The Department's Architectural Historian will use the sample aggregate distributions to evaluate the proposed mix designs as submitted under the requirements of the "Class 'S' Concrete for Historic Bridges" and "Class 'C' Concrete – Replicated" special provisions, as they apply to the project.

The Contractor will use the sample aggregates as well as the findings of the reports for the purpose of determining the matching fine and coarse aggregate types he will propose for the mix designs developed under the special provisions, "Class 'S' Concrete for Historic Bridges" and "Class 'C' Concrete – Replicated".

### **Testing Laboratory Analysis**

**Reverse Engineering:** Identify all components of the original concrete mix and proportions thereof, including water/cement ratio. The analysis shall include petrographic examination to identify components, air-void analysis to calculate volume proportions of paste, coarse and fine aggregate, air and air-void parameters (ASTM C457 modified point-count method), and cement content analysis (ASTM C1084) to calculate portland cement content. Aggregate identifications and gradations shall be assessed qualitatively using the standard procedures of ASTM C856. A comprehensive petrographic examination shall be included in this analysis and is described below.

**Petrographic Examination (ASTM C856):** Cores shall be examined using a combination of polished section, fractured section, and thin section analysis. The examination shall be comprehensive and shall be used to identify all components of the concrete design, assess overall quality of materials and original placement, identify distresses and investigate root causes of any observed deterioration. Features investigated shall include homogeneity of mix components and original hydration quality, depth of carbonation, reactions or potential reactivity of aggregates (e.g.; ASR), evidence of other distresses including freeze-thaw failure, sulfate attack or others. It is recommended that the nature of this deterioration be established to identify whether the distress is environmental in nature (e.g.; freeze-thaw distress due to lack of air-entrainment) or intrinsic to the concrete materials (e.g.; ASR failure due to reactive aggregates) as this will inform the feasibility of repair options.

**Water-Soluble Chloride Analysis (ASTM C1218):** Excessive chloride salts may interfere with the bonding of repair materials. This test will establish those values. In addition, chloride contamination is often responsible for embedded reinforcement corrosion. Chloride content should be measured at the surface as well as at two additional depths distributed evenly throughout the depth of the recovered core to assess the diffusion profile in comparison to ACI recommended limits.

**Fourier Transform Infrared Spectroscopy (FTIR):** FTIR analyzes for any organic matter such as oils or previous coating residues that might act as bond-breakers for any planned repair patches. FTIR analysis should be performed by methanol extraction on the surface of uncleaned concrete. The test may also be performed on cleaned concrete to assess the success of the cleaning procedure where an unacceptable presence of organic matter has been determined.



Examination and Analysis of Hardened Masonry Mortar (ASTM C1324): This test method will be used to separate aggregates, through acid digestion, from the solid core sample. The separated aggregates will then be proportioned according to gradation, bagged, labeled, and delivered to the Department's Architectural Historian.

### **Testing Laboratory Report**

The Testing Laboratory shall furnish to the Engineer a set of eight (8) copies of each written report by the Testing Laboratory. Reports shall also be furnished to the Engineer in PDF format. The Contractor shall also be furnished with a hardcopy of the report. A separate report shall be prepared for each bridge, which shall include:

- Name of Testing Laboratory and contact information.
- Bridge number and description of crossing.
- Date on which core samples were extracted from bridge.
- Number and sizes of cores tested.
- Locations at which core samples were taken (specify whether cores were taken from sound or deteriorated concrete).
- Results of testing laboratory analysis as defined above.
- An outline of test procedures.
- As determined through reverse engineering, a concrete mix design that replicates the original. The mix design shall include the following:

Coarse aggregates – Provide a description of the coarse aggregates, including types, sizes, colors and shapes. Provide gradations of the various sizes of the coarse aggregates and types, colors and shapes of aggregates to accurately match those of the original mix as identified through the testing of the existing concrete.

Fine aggregates – A description of the gradations of the various sizes of the fine aggregates and types, colors and shapes of aggregates to accurately match those of the original mix as identified through the testing of the existing concrete.

Cement – The proportions of the cement type(s) and color(s) (e.g. – gray and white).

Water – The ratio of water to cement.

- An evaluation of sound concrete for sources of potential deterioration.
- A determination regarding causes and degree of actual concrete deterioration.
- Color photographs cataloging the cores.
- Optional: Additional color or black and white photos that the Test Laboratory determines to be of valuable visual information.

When coatings and/or stains are specified, the Contractor shall submit one additional copy of the Testing Analysis Report to the Contractor for use by the manufacturer of the concrete coatings and stains. The manufacturer will determine and recommend proper cleaning methods for proper adhesion of his coatings to historic concrete for each bridge.

The Contractor shall allow 8 weeks for lab analysis and shall schedule his work accordingly. Any delay beyond 8 weeks for the testing lab to furnish the appropriate reports for use shall not be cause for a delay claim.

**Method of Measurement:** This work will be measured for payment by each core group, as defined elsewhere in this specification, furnished from those locations determined by the Engineer.

**Basis of Payment:** This work will be paid for at the contract unit price for each furnished “Core Group”, defined elsewhere in this specification, the cost of which shall include all material, equipment, tools, laboratory fees, furnishings to the Department’s Architectural Historian , report development, technical representation by the Test Lab, and all labor incidental thereto.

Payment will be made for this item after complete testing has been performed and all required copies of a final Testing Laboratory Report have been submitted and approved for each bridge.

Payment for the repair of core holes shall be paid for under the item “Variable Depth Patch for Historic Concrete Bridges”.

<u>Pay Item</u>	<u>Pay Unit</u>
Testing and Analysis of Historic Concrete	ea.

## **ITEM #0602910A - DRILLING HOLES AND GROUTING DOWELS**

**Description:** Work under this item shall consist of drilling holes in concrete and grouting dowels at the locations shown on the plans, in accordance with the plans, the manufacturer's recommendations, and as directed by the Engineer. For the purposes of this specification, a dowel is defined as a reinforcing bar.

**Materials:** The chemical anchoring material shall conform to Subarticle M.03.07.

**Construction Methods:** Before fabricating any materials, the Contractor shall submit manufacturer's specifications and installation for the chemical anchoring material to the Engineer for review in accordance with Article 1.05.02.

Holes for the dowels shall be located as shown on the plans. The holes shall clear the existing reinforcement and provide the minimum cover as shown on the plans. A pachometer shall be used to locate existing reinforcing steel. If existing reinforcing is encountered during the drilling operation, the holes shall be relocated and the uncompleted holes shall be filled with the chemical anchoring material and finished smooth and flush with the adjacent surface.

The depth and diameter of each hole shall be as shown on the plans. If the diameter of a hole is not shown, the diameter of the hole shall conform to the manufacturer's recommendations for the diameter of the dowel being anchored. If the depth and diameter of a hole are not shown, the hole shall conform to the manufacturer's recommendations for the diameter of the dowel being anchored such that the grouted dowels will be able to develop, in tension, 100 percent of its specified yield strength.

Hole drilling methods shall not cause spalling, cracking, or other damage to the existing concrete. The weight of the drill shall not exceed 15 lb. Those areas damaged by the Contractor shall be repaired by him in a manner suitable to the Engineer and at no expense to the State.

Prior to placing the chemical anchoring material in the holes, the holes shall be cleaned of all dirt, moisture, concrete dust and other foreign material. The dowel and the chemical anchoring material shall be installed in the holes in accordance with the chemical anchoring material manufacturer's recommendations.

The Contractor, as directed by the Engineer, shall take adequate precautions to prevent any materials from dropping to the area below, which may result in damage to any existing construction or to adjoining property. Should any damage occur to the structure as a result of the Contractor's operations, the Contractor shall make repairs at his own expense. The repair work shall be approved in advance and shall be of a quality acceptable to the Engineer.

**Method of Measurement:** This work will be measured for payment by the number of drilled holes in which dowels are embedded and accepted.

**Basis of Payment:** This work will be paid for at the contract unit price each for "Drilling Holes and Grouting Dowels," which price shall include drilling and preparing holes, furnishing and installing the chemical anchoring material in the holes and all material, equipment, tools and labor. incidental thereto.

The cost for furnishing dowels shall be paid for under the item "Deformed Steel Bars - Galvanized".

<u>Pay Item</u>	<u>Pay Unit</u>
Drilling Holes and Grouting Dowels	ea.

**ITEM #0603061A - STRUCTURAL STEEL (SITE NO. 1)**

Section 6.03 is supplemented and amended as follows:

**6.03.01 - Description:** *After the third paragraph, add the following:*

“ This special provision provides additional requirements for the surface preparation, shop painting, and field touch-up painting of new structural steel.”

**6.03.02 – Materials:** *After the second paragraph, add the following:*

“ Painting materials for this work shall conform to the following:

- The Contractor shall select a three-coat system from the qualified product List A or B, issued by the Northeast Protective Coating Committee (NEPCOAT). The approved NEPCOAT listings may be found at the NEPCOAT website at <http://www.nepcoat.org/>
- Note: The List B Carboline Company system that specifies Carboguard 888 is not eligible for use under this special provision at this time.
- The system chosen shall have a prime coat that has achieved a Class ‘B’ slip coefficient for faying surfaces. Top coat paint color shall be as determined by testing indicated in this special provision.
- Both the shop painted and field touchup applied coating systems shall be of the same three-coat system. A compatible organic zinc rich primer shall be used for any necessary field touch up.
- The same coating material manufacturer shall furnish all materials for the complete coating system. Intermixing of materials within and between coating systems will not be permitted.
- Thinning of paint shall conform to the manufacturer’s written instructions.”

**6.03.03 – Construction Methods:** Add the following:

Testing: Prior to fabrication, the Contractor shall conduct sampling of the existing finishes on the existing frames to be delivered to an architectural conservator for analysis and identification. The finishes will undergo a historic paint analysis to determine the historic color and appearance of the frames. The microscopic examination of the layers of paint will identify the primer(s) and successive finish layers using the Federal Standard No. 595C Colors numbering system.

*Revise* Subarticle 4(f) “Field Erection - High Strength Bolted Connections” *as follows:*

*Replace the first sentence of the fourth paragraph* “Surface Conditions: At the time of assembly ... other foreign material.” *with the following:*

“ Connection faying surfaces within portions of structural steel designated to be painted shall receive a single coat of primer in accordance with requirements stipulated elsewhere in this special provision.”

*Delete the fifth paragraph of Subarticle 4(f) and the three bulleted paragraphs after it:* “Paint is permitted on ... wire brushing is not permitted.”

*After the last paragraph of Article 6.03.03, before Tables A through C, add the following:*

“ The painting application shall be done in compliance with the following requirements:

**Qualifications of Shop Painting Firm:** All shop painting of structural steel must be performed by and in an enclosed shop that is certified by the SSPC Painting Contractor Certification Program QP-3, entitled “Standard Procedure for Evaluating Qualifications of Shop Painting Contractors” in the enclosed shop category or by a shop that holds an AISC Quality Certificate with a “Sophisticated Paint Endorsement” in the enclosed shop category. The firm shall be fully certified, including endorsements, for the duration of the surface preparation and coating application. A copy of the subject certification shall be provided to the Engineer prior to commencing any surface preparation or coating application.

The shop painting firm is required to have at least one (1) **Coating Application Specialist (CAS) (SSPC ACS/NACE No. 13)**-certified (Level II-Interim Status-Minimal) craft-worker. CAS-certified (Level II-Interim Status-Minimal) craft-worker(s) are required for all crews/craft-workers up to four (4) crew members. For each crew larger than four (4), an additional CAS-certified (Level II-Interim Status-Minimal) craft-worker shall be present on each painting/blasting crew during blast cleaning and spray application (Atmospheric and Immersion Service) operations. A crew-member is a person who is on the job performing hand-held nozzle blast cleaning and/or spray application of protective coatings on a steel structure. The certification(s) must be kept current for the duration of the Project work.

The complete coating system shall be applied in an enclosed shop except for field touch-up painting which shall be applied after all bolts are fully tensioned and deck formwork removed. The enclosed shop shall be a permanent facility with outside walls to grade and a roof where surface preparation and coating activities are normally conducted in an environment not subject to outdoor weather conditions or blowing dust.

**Quality Control Inspection of Shop Painting:** The firm performing shop painting of the structural steel shall have a written quality control (QC) program. A copy of the QC program and record keeping procedures shall be provided to the Engineer prior to commencing any surface preparation or coating application. The program shall contain, but not be limited to, the following:

1. Qualifications of QC staff.
2. Authority of QC staff. QC staff must have the authority to stop non-conforming work.
3. Procedure for QC staff to advise operation supervisor, in writing, of non-conforming work.
4. Sample copy of QC inspection reports that will document compliance with specifications.
5. Procedure for calibrating inspection equipment and recording calibration.
6. Procedure for repairing defective coating applications.

The Contractor or Shop shall provide at least one Quality Control Inspector for the duration of the shop application to provide Quality Control. The QC Inspector must be a National Association of Corrosion Engineers (NACE) Certified Coating Inspector Level 3 with Peer Review. The QC Inspector shall verbally inform the Engineer on a daily basis, of the progress and any corrective

actions performed on the coating work. The QC Inspector shall be present during all cleaning and coating operations.

The Contractor or Shop shall be responsible for purchasing and providing the latest version of the NACE Coating Inspector Log Book(s) and all necessary inspection tools. The Contractor's QC Inspector shall stamp the front page of each inspector's log book used during painting operations. The stamped book(s) shall indicate the inspector's NACE certification number, certification expiration date and shall also be signed. All daily coating activity shall be recorded in the Log Book. Copies of the log entries shall be provided on a daily basis to the Department's Quality Assurance (QA) shop representative. Upon completion of the coating, the log book(s) shall then be furnished to the Department's QA shop representative.

**Technical Advisor:** The Contractor or Shop shall obtain the services of a technical advisor who is employed by the coating manufacturer to assist the Engineer and shop painting firm during this work. The technical advisor shall be a qualified representative and shall be made available at the Shop upon request by the QC Inspector or the Engineer.

**Surface Preparation:** The following steps shall be performed prior to abrasive blast cleaning of steel members:

1. All corners and edges shall be rounded to a 1/16-inch radius or chamfered to a 1/16-inch chamfer.
2. All fins, slivers and tears shall be removed and ground smooth.
3. All rough surfaces shall be ground smooth.
4. Flame cut edges shall be ground over their entire surface such that any hardened surface layer is removed, and subsequent abrasive blast cleaning produces the specified surface profile depth.

Immediately before abrasive blast cleaning all steel members shall be solvent cleaned in accordance with SSPC-SP1 - "Solvent Cleaning."

Abrasive blast cleaning shall be performed in accordance with SSPC-SP 10 - "Near White Blast Cleaning" using a production line shot and grit blast machine or by air blast. The abrasive working mix shall be maintained such that the final **surface profile** is within the range described herein.

The QC Inspector shall test the abrasive for oil, grease or dirt contamination in accordance with the requirements of ASTM D7393 and document the test results. Contaminated abrasive shall not be used to blast clean steel surfaces. The blast machine shall be cleared of all contaminated abrasive and then solvent cleaned thoroughly in accordance with SSPC-SP 1 "Solvent Cleaning." New uncontaminated abrasive shall be added. Abrasive shall be tested for contaminants in accordance with the requirements of ASTM D7393 prior to the start of blast cleaning operations and at least every four hours during the blast cleaning operations.

All compressed air sources shall have properly sized and designed oil and moisture separators, attached and functional, to allow air at the nozzle, either for blast cleaning, blow-off, painting or breathing, to be oil-free, and moisture-free. The equipment shall have sufficient pressure to accomplish the associated work efficiently and effectively.

The QC Inspector shall perform the blotter test and document the results at the start of each blasting shift and at least every four hours during the blasting operation to ensure that the compressed air is free of oil and moisture. The blotter test shall be performed in accordance with the procedure outlined in ASTM D4285. For contaminated air sources, the oil and moisture separators shall be drained and the air retested.

No surface preparation or coating shall be done when the relative humidity is at or above 80 percent or when the surface temperature of the steel is less than five (5) degrees Fahrenheit above the dewpoint temperature as determined by a surface thermometer and an electric or sling psychrometer.

**Surface Profile:** The steel surface profile shall be 1 to 3 mils. Each girder or beam shall have the surface profile measured at a minimum of three locations in accordance with the test requirements of ASTM D4417, Method C. Smaller pieces such as diaphragms shall have the surface profile measured at a minimum of three locations on one piece at the beginning of abrasive blast operations and at least every four hours and at the end of abrasive blast cleaning operations. This measurement shall be performed with both coarse (0.8-2.0 mils) and extra coarse (1.5-4.5 mils) replica tape. During this measurement, special attention shall be given to areas that may have been shielded from the blast wheels, such as the corners of stiffeners and connection plates. The impressed tapes shall be filed in the NACE Coating Inspector's Log Book.

**Application Methods:** The coating system shall be applied by spray equipment of a type and size capable of applying each coat within the required thickness range. The applicator shall strictly adhere to the manufacturer's written recommendations for application methods, cure times, temperature and humidity restrictions and recoat times for each individual coat of the specified system. However, in no case shall coatings be applied in ambient conditions that exceed the relative humidity and dewpoint temperature control limits specified herein. Brushes shall be used in areas where spray application will not achieve acceptable results. Brushing technique shall be performed in a manner that will provide a uniform, blended finish.

Conventional spray equipment with mechanical agitators shall be used for prime coat application.

All storage, mixing, thinning, application and curing techniques and methods shall be accomplished in strict accordance with the printed material data sheets and application instructions published by the respective coating material manufacturer.

Surfaces shall be painted with the specified prime coat material before the end of the same work shift that they were blast cleaned and before any visible rust back occurs. Applied coatings shall not have runs, sags, holidays, pinholes or discontinuities.

The dry film thickness shall be within the range specified in the manufacturer's printed literature for the specified coating system. Dry film thickness shall be measured in accordance with SSPC-PA 2. The prime, intermediate and top coats shall be of contrasting colors as determined by the Engineer. There shall be no color variation in the topcoat as determined by comparison with Federal Standard 595.



**Areas Requiring Special Treatment:** All steel surfaces shall receive the three-coat shop applied system as specified except the following particular area types which shall be treated as follows:

1. Faying surfaces of connections shall receive a single application of primer. The dry film thickness shall be no greater than the thickness tested on the coating manufacturer's Certified Test Report for slip coefficient.
2. All steel surfaces within four (4) inches of field welds shall receive a single mist coating of primer at 0.5 - 1.5 mils dry film thickness.
3. Top surfaces of top flanges that will be in contact with concrete shall receive a single mist coating of primer at 0.5 - 1.5 mils dry film thickness.
4. Edges and shop welds shall be locally hand-stripped with a brush in the longitudinal direction with an additional coat of an appropriate zinc-rich primer prior to application of the full intermediate coat. The application of the striping materials shall be in accordance with the coatings manufacturer's written instructions. The striping material shall be a contrasting color to distinguish it from the primer and intermediate coats.
5. The interior surfaces of box girders, including bracing, shall be prepared in accordance with these specifications then coated with the first two coats of the three-coat system. The intermediate coat in these areas shall be white and match Federal Standard 595 Color Number 16231.

**Adhesion:** Adhesion strength of the fully coated assemblies shall be the more restrictive of the manufacturer's specified adhesion strength or at least 600 psi for systems with organic zinc primers and at least 250 psi for systems with inorganic zinc rich primers measured as per ASTM D4541 using apparatus under Annex A4. All adhesion test locations shall be recoated in accordance with this specification at no additional cost. The QC Inspector shall perform adhesion strength tests every 500 sf and shall document the adhesion strength test results.

If adhesion test results are less than the specified value, but equal to or greater than 80% of the specified value, four (4) additional adhesion tests shall be taken within the 500 sf area of the failed test. If any of the additional adhesion tests are less than the specified value, the coating shall be removed from the entire piece and re-applied at the Contractor's expense. If any adhesion tests are less than 80% of the specified value, the entire coating system shall be removed from the piece and re-applied at the Contractor's expense.

Smaller pieces such as diaphragms shall be analyzed in lots that have an overall coated surface area of approximately 500 sf.

**Protection of Coated Structural Steel:** All fully coated and cured assemblies shall be protected from handling and shipping damage with the prudent use of padded slings, dunnage, separators and tie downs. Loading procedures and sequences shall be designed to protect all coated surfaces. Erection marks for field identification of members and weight marks shall be affixed in such a manner as to facilitate removal upon final assembly without damage to the coating system.

**Field Touch-Up Painting of Shop Applied Coating:** Field touch-up painting shall be undertaken by the Contractor for the purpose of completing coating applications of masked-off areas at splices, connections, and for the repair of coated surfaces damaged during shipment or

construction, as directed by the Engineer. The Aesthetics of any field painting is very important. Every effort must be made to perform any field painting in a professional manner that does not affect the appearance or aesthetic value of the structural steel in any way. Significant color variations or texture changes between the shop painting and field painting will not be allowed. The Contractor will be required to perform any additional field painting work required to provide consistent color and texture throughout the structural steel. This is especially true for all Fascia surfaces and areas exposed to public view. The Engineer will be the sole judge on color variations and textures variations of the field painting.

The Painting Contractor shall submit for approval by the Engineer a complete coating application procedure for all touch-up painting and corrective work. .

The field applied coating for touch-up painting shall be the same system used in the shop applied application. The intermediate and topcoat material for field touch-up painting shall be from the same lot and batch used in the shop provided its shelf life has not expired. If the shelf life has expired, the same material of the same color from a different lot and batch shall be used.

Field application of coatings shall be in accordance with the manufacturer's written application guidelines and these specifications. All areas cleaned to bare metal must be coated with zinc-rich primer before any visible rusting occurs.

After all concrete is placed and the forms are removed, all rust, scale, dirt, grease, concrete splatter and other foreign material shall be completely removed from all painted surfaces. All surfaces to be field painted shall also be cleaned by solvent cleaning in accordance with SSPC-SP 1, hand tool cleaning SSPC-SP 2, and power tool cleaning SSPC-SP 3 and SSPC-SP 11. Areas cleaned to SSPC-SP 11 must have a 1-3 mil profile and must be primed prior to rusting. All debris generated from cleaning operations must be contained and properly disposed of by the Contractor.

Bolts, nuts, washers and surrounding areas shall receive brush applications of intermediate and topcoat after final tensioning. Careful attention shall be given to bolted connections to insure that all bolts, nuts and washers are fully coated and that no gaps are left unfilled and uncoated.

Damage to the coating system that extends to the steel surface (such as scratches, gouges or nicks), shall have the entire three-coat system locally reapplied after power tool cleaning to bare metal in **accordance with SSPC-SP 11. The coating system adjacent to the damage shall be feathered back to increase** the surface area for touch up painting. The area cleaned to SSPC-SP 11 shall be primed with a zinc-rich primer before rusting occurs.

Damage to the coating system that extends back only to the prime or intermediate coat, shall only have the topcoat applied. Application of the touch-up materials in these damaged areas shall be performed by brush only.

During any field painting the Contractor shall protect property, pedestrians, vehicular and other traffic upon, underneath, or in the vicinity of the bridge, and also all portions of the bridge superstructure and substructure against damage or disfigurement from errant coating materials.

Tarps shall be used to collect all surface preparation debris. The Contractor shall be responsible for disposing of all removed materials, including tarps.

**Contractor – Subcontractor Qualifications:** Contractors and subcontractors doing field touchup painting work are required to be certified by the SSPC Painting Contractor Certification Program (PCCP) to QP-1, entitled “Standard Procedure for Evaluating Qualifications of Painting Contractors (Field Application to Complex Structures)” at the time of field touchup coating application.

Contractors and subcontractors are required to have at least one (1) **Coating Application Specialist (CAS) (SSPC ACS/NACE No. 13)**-certified (Level II-Interim Status-Minimal) craft-worker. CAS-certified (Level II-Interim Status-Minimal) craft-worker(s) are required for all crews/craft-workers up to four (4) crew members. For each crew larger than four (4), an additional CAS-certified (Level II-Interim Status-Minimal) craft-worker shall be present on each painting/blasting crew during blast cleaning and spray application (Atmospheric and Immersion Service) operations. A crew member is a person who is on the job performing hand-held nozzle blast cleaning and/or spray application of protective coatings on a steel structure. The certification(s) must be full, not interim, and must be kept current for the duration of the Project work. If a Contractor’s, subcontractor’s or any craft-worker’s certification expires, the firm will not be allowed to do any work on this item until the certification is reissued.

Requests for extension of time for any delay to the completion of the Project due to an inactive certification will not be considered and liquidated damages will apply. At the option of the Engineer, if such a delay will adversely impact the successful and timely completion of the Project, the Department may require the Contractor to engage another SSPC certified contractor to do the painting work at the prime contractor’s expense.

**Quality Control Inspection of Field Touchup Painting:** The Contractor performing field touchup painting of the structural steel shall have a written quality control (QC) program. A copy of the QC program and record keeping procedures shall be provided to the Engineer prior to commencing any surface preparation or coating application. The program shall contain, but not be limited to, the following:

1. Qualifications of QC staff.
2. Authority of QC staff. QC staff must have the authority to stop non-conforming work.
3. Procedure for QC staff to advise operation supervisor, in writing, of non-conforming work.
4. Sample copy of QC inspection reports that will document compliance with specifications.
5. Procedure for calibrating inspection equipment and recording calibration.
6. Procedure for repairing defective coating applications.

The Contractor shall provide at least one (1) Coating Inspector who is a National Association of Corrosion Engineers (NACE) Certified Coating Inspector Level 3 with Peer Review for the duration of the field application to provide Quality Control. The QC Inspector shall verbally inform the Engineer on a daily basis, of the progress and any corrective actions performed on the coating work. The QC Inspector shall be present during all cleaning and coating operations.

The Contractor shall be responsible for purchasing and providing the latest version of the NACE Coating Inspector Log Book(s) and all necessary inspection tools. The Contractor's QC Inspector shall stamp the front page of each inspector's log book used during painting operations. The stamped book(s) shall indicate the inspector's NACE certification number, certification expiration date and shall also be signed. All daily coating activity shall be recorded in the Log Book. Copies of the log entries shall be provided on a daily basis to the Department's Quality Assurance (QA) field representative. Upon completion of the coating, the log book(s) shall then be furnished to the Department's QA field representative.

**General:** The word "PAINTED" followed by the month and year the painting of the structure is completed along with the ConnDOT Project Number and the manufacturer's abbreviations for each of the three coats, shall be stenciled on the inside of a fascia girder at mid-depth of the girder in three (3) inch high block letters located near the abutment, so as to be clearly visible from the ground below. Paint for stenciling information shall be of a contrasting color and be compatible with the topcoat."

**6.03.05 – Basis of Payment:** *Add the following at the end of the second paragraph:*

"Payment for either method for new structural steel, complete in place, shall also include shop painting, all field touch-up painting and corrective or repair field painting, QC Inspector(s), QC Log Book(s) and testing equipment, technical advisor, "Painted" stencil, equipment, tools and labor incidental thereto."

## **ITEM #0603726A EMBEDDED GALVANIC ANODES**

**Description:** Work under this item shall consist of furnishing and installing alkali-activated, galvanic anodes within concrete repairs or within new concrete at locations noted within the plans and as directed by the Engineer.

**Materials:** The galvanic anodes shall be Galvashield XP4, available through the following supplier:

Vector Corrosion Technologies, Inc.  
3822 Turman Loop, Suite 102  
Wesley Chapel, FL 33544  
(813) 830-7566  
info@vector-corrosion.com

Anodes shall consist of a minimum 5.6 oz of zinc in compliance with ASTM B418 Type II (Z13000) and ASTM B6 Special High Grade (Z13001) with iron content of 15 ppm or less cast around a pair of heat treated, uncoated steel tie wires and encased in a highly alkaline cementitious shell with a pH of 14 or greater. The anode shall contain no added sulfate nor shall it contain chloride, bromide or other constituents that are corrosive to reinforcing steel. Anode units shall be supplied with integral unspliced wires with loop ties for directly tying to the reinforcing steel.

Each anode unit shall have a volume no less than 12.5 c.i.

Repair mortars, concrete and bonding agents shall be Portland cement-based materials

**Construction Methods:** A technical representative of Vector Corrosion Technologies shall be notified of the scheduled installation of the anodes a minimum of 2 weeks in advance and be present to provide direction and assistance for the initial installations of anodes in concrete patches and succeeding anode installations until the Contractor becomes proficient in the work and to the satisfaction of the Engineer.

Tools, equipment, and techniques used to prepare the patch locations for installation of the anodes shall be approved by the Engineer and the manufacturer's technical representative prior to the start of construction. Reinforcing steel shall be clean and securely fastened together with tie wire to provide good electrical conductivity.

The work for this item shall be performed in accordance with the manufacturer's product specification and installed per the project details and as recommended by the technical representative of Vector Corrosion Technologies. The Contractor shall supply a multimeter and shall test the connections between anodes and reinforcing steel or electrical continuity as directed by the technical representative. The Contractor shall place additional tie wires or re-tie connections as directed to provide continuity.

Care shall be taken when handling anodes to prevent damage to the anodes and to the wire connections.

**Method of Measurement:** This work will be measured for payment by the actual number each of “Embedded Galvanic Anodes” installed and accepted.

**Basis of Payment:** This item will be paid for at the contract unit price each for “Embedded Galvanic Anodes”, complete in place, which price shall include all applicable technical representation and/or material application training, and all materials, equipment, tools, and labor incidental thereto.

<u>Pay Item</u>	<u>Pay Unit</u>
Embedded Galvanic Anodes	ea.

**ITEM #0707009A - MEMBRANE WATERPROOFING (COLD LIQUID ELASTOMERIC)**

**Description:** Work under this item consists of furnishing and installing a seamless elastomeric waterproofing membrane system applied to a concrete or steel surface as shown on the plans, in accordance with this specification and as directed by the Engineer. Work shall also include conditioning of the surface to be coated and all quality-control testing noted herein.

The completed membrane system shall be comprised of a primer coat followed by the membrane coating which is applied in one or two layers for a minimum total thickness of 80 mil, an additional 40 mil membrane layer with aggregate broadcast into the material while still wet, and a bond coat of bitumen-based adhesive material.

**Materials:** The Contractor shall select a waterproofing membrane system from the Department's current Qualified Product List (QPL) for Spray-Applied Membrane Waterproofing System. All materials incorporated in the works shall meet the Manufacturer's specification for the chosen system. The Engineer will reject any system that is not on the QPL.

**Materials Certificate:** The Contractor shall submit to the Engineer a Materials Certificate for the primer and membrane and bond coat material in accordance with the requirements of Article 1.06.07.

**Construction Methods:** At least ten days prior to installation of the membrane system, the Contractor shall submit to the Engineer, the manufacturer's recommended procedure for preparing the deck surface, pre-treatment or preparing at cracks and gaps, treatment at curbs, vertical surfaces or discontinuities, applying the primer and membrane, and placing of aggregated coat. Procedures shall also include recommended repairs of system non-compliant issues identified during application. The system shall be applied to the prepared area(s) as defined in the plans strictly in accordance with the Manufacturer's recommendations.

A technical representative, in the direct employ of the manufacturer, shall be present on-site immediately prior to and during application of the membrane. The representative shall inspect and approve the surface prior to priming, and provide guidance on the handling, mixing and addition of components and observe application of the primer and membrane. The representative shall perform all required quality-control testing and remain on the Project site until the membrane has fully cured.

All quality-control testing, including verbal direction or observations on the day of the installation, shall be recorded and submitted to the Engineer for inclusion in the Project's records. A submittal of the quality-control testing data shall be received by project personnel prior to any paving over the finished membrane or within 24 hours following completion of any staged portion of the work.

1. **Applicator Approval:** The Contractor's membrane Applicator shall be fully trained and licensed by the membrane manufacturer and shall have successfully completed at least three spray membrane projects in the past five years. The Contractor shall furnish references from those projects, including names of contact persons and the names, addresses and phone numbers of persons who supervised the projects. This information shall be submitted to the Engineer prior to the start of construction. The Engineer shall have sole authority to determine the adequacy and compliance of the submitted information. Inadequate proof of ability to perform the work will be grounds to reject proposed applicators.

2. **Job Conditions:**

(a) **Environmental Requirements:** Air and substrate temperatures shall be between 32°F and 104°F providing the substrate is above the dew point. Outside of this range, the Manufacturer shall be consulted.

The Applicator shall be provided with adequate disposal facilities for non hazardous waste generated during installation of the membrane system. The applicator shall follow safety instructions regarding respirators and safety equipment.

(b) **Safety Requirements:** All open flames and spark producing equipment shall be removed from the work area prior to commencement of application.

"No Smoking" signs shall be visibly posted at the job site during application of the membrane waterproofing.

Personnel not involved in membrane application shall be kept out of the work area.

3. **Delivery, Storage and Handling:**

(a) **Packaging and Shipping:** All components of the membrane system shall be delivered to the site in the Manufacturer's packaging, clearly identified with the products type and batch number.

(b) **Storage and Protection:** The Applicator shall be provided with a storage area for all components. The area shall be cool, dry and out of direct sunlight and shall be in accordance with the Manufacturer's recommendations and relevant health and safety regulations.

Copies of Material Safety Data Sheets (MSDS) for all components shall be kept on site for review by the Engineer or other personnel.

(c) **Shelf Life - Membrane Components:** Packaging of all membrane components shall include a shelf life date sealed by the Manufacturer. No membrane components whose shelf life has expired shall be used.



#### 4. Surface Preparation:

- (a) Protection: The Applicator shall be responsible for the protection of equipment and adjacent areas from over spray or other contamination. Parapets and bridge joints shall be masked prior to application of the materials.
- (b) Surface Preparation: Sharp peaks and discontinuities shall be ground smooth. The surface profile of the prepared substrate is not to exceed 1/4 inch (peak to valley) and areas of minor surface deterioration of 1/2 inch and greater in depth shall also be repaired. The extent and location of the surface patches require the approval of the Engineer before the membrane system is applied.

Surfaces shall be free of oil, grease, curing compounds, loose particles, moss, algae, growth, laitance, friable matter, dirt, bituminous products, and previous waterproofing materials. If required, degreasing shall be done by detergent washing in accordance with ASTM D4258.

The surface shall be abrasively cleaned, in accordance with ASTM D4259, to provide a sound substrate free from laitance.

Voids, honeycombed areas, and blow holes on vertical surfaces shall be repaired in the same manner.

All steel components to receive membrane waterproofing shall be blast cleaned in accordance with SSPC SP6 and coated with the membrane waterproofing system within the same work shift.

#### 5. Inspection and Testing: Prior to priming of the surface, the Engineer, Applicator and Manufacturer's technical representative shall inspect and approve the prepared substrate.

- (a) Random tests for deck moisture content shall be conducted on the substrate by the Applicator at the job site using a "Sovereign Portable Electronic Moisture Master Meter," a "Tramex CMEXpertII Concrete Moisture Meter" or approved equal. The minimum frequency shall be one test per 1000 s.f. but not less than three tests per day per bridge. Additional tests may be required if atmospheric conditions change and retest of the substrate moisture content is warranted.

The membrane system shall not be installed on substrate with a moisture content greater than that recommended by the system's manufacturer, but shall not be greater than 6%, whichever is less.

- (b) Random tests for adequate tensile bond strength shall be conducted on the substrate using an adhesion tester in accordance with the requirements of ASTM D4541. The minimum frequency shall be one test per 5,000 s.f. but not less than three adhesion tests per bridge.

Adequate surface preparation will be indicated by tensile bond strengths of primer to the substrate greater than or equal to 150 psi or failure in a concrete surface and greater than or equal to 300 psi for steel surfaces.

If the tensile bond strength is lower than the minimum specified, the Engineer may request additional substrate preparation. Any primer not adequately applied shall be removed and a new primer applied at the Contractor's expense, as directed by Engineer.

- (c) Cracks and grouted joints shall be treated in accordance with the Manufacturer's recommendations, as approved or directed by the Engineer.

#### 6. Application:

- (a) The System shall be applied in four distinct steps as follows:
  - 1) Substrate preparation and gap/joint bridging preparation
  - 2) Priming
  - 3) Membrane application
  - 4) Membrane with aggregate
- (b) Immediately prior to the application of any components of the System, the surface shall be dry (see Section 5a of this specification) and any remaining dust or loose particles shall be removed using clean, dry oil-free compressed air or industrial vacuum.
- (c) Where the area to be treated is bound by a vertical surface (e.g. curb or wall), the membrane system may be continued up the vertical, as shown on the plans or as directed by the Engineer.
- (d) The handling, mixing and addition of components shall be performed in a safe manner to achieve the desired results, in accordance with the Manufacturer's recommendations or as approved or directed by the Engineer.
- (e) A neat finish with well defined boundaries and straight edges shall be provided by the Applicator.
- (f) Primer: The primer shall consist of one coat with an overall coverage rate of 125 to 175 s.f./gal unless otherwise recommended in the manufacturer's written instructions.

All components shall be measured and mixed in accordance with the Manufacturer's recommendations.

The primer shall be spray applied using a single component spray system approved for use by the Manufacturer. If required by site conditions and allowed by the manufacturer, brush or roller application will be allowed.

The primer shall be allowed to cure tack-free for a minimum of 30 minutes or as required by the Manufacturer's instructions, whichever time is greater, prior to application of the first lift of waterproofing membrane.

Porous concrete (brick) may require a second coat of primer should the first coat be absorbed.

- (g) Membrane: The waterproofing membrane shall consist of one or two coats for a total dry film thickness of 80 mils. If applied in two coats, the second coat shall be of a contrasting color to aid in quality assurance and inspection.

The membrane shall be comprised of Components A and B and a hardener powder which is to be added to Component B in accordance with the Manufacturer's recommendations.

The substrate shall be coated in a methodical manner.

Thickness checks: For each layer, checks for wet film thickness using a gauge pin or standard comb-type thickness gauge shall be carried out typically once every 100 s.f. Where rapid set time of the membrane does not allow for wet film thickness checks, ultrasonic testing (steel surfaces only), calibrated point-penetrating (destructive) testing, in-situ sampling (cutout of small sections for measuring thicknesses), or other methods approved by the Engineer shall be employed for determination of dry film thickness. The measured thickness of each and every individual test of the membrane shall be greater than or equal to the required thickness.

Bond Strength: Random tests for adequate tensile bond strength shall be conducted on the membrane in accordance with the requirements of ASTM D4541. The minimum test frequency shall be one test per 5,000 s.f. but no less than three adhesion tests per bridge. Adequate adhesion will be indicated by tensile bond strengths of the membrane to the substrate of greater than or equal to 150 psi or failure in a concrete surface and greater than or equal to 300 psi for steel surfaces.

Spark Testing: Following application of the membrane, test for pin holes in the cured membrane system over the entire application area in accordance with ASTM D4787- "Continuity Verification of Liquid or Sheet Linings Applied to Concrete Substrates." Conduct the test at voltages recommended by the manufacturer to prevent damage to the membrane.

Repair the membrane system following destructive testing and correct any deficiencies in the membrane system or substrate noted during quality-control testing in accordance with the manufacturer's recommendations to the satisfaction of the Engineer at no additional cost to the State.

- (h) Repairs: If an area is left untreated or the membrane becomes damaged, a patch repair shall be carried out to restore the integrity of the system. The damaged areas shall be cut back to sound materials and wiped with solvent (e.g. acetone) up to a width of at least four inches on the periphery, removing any contaminants unless otherwise recommended by the manufacturer. The substrate shall be primed as necessary, followed by the membrane. A continuous layer shall be obtained over the substrate with a four inches overlap onto existing membrane.

Where the membrane is to be joined to existing cured material, the new application shall overlap the existing by at least four inches. Cleaning and surface preparation on areas to be lapped shall be as recommended in the manufacturer's written instructions.

- (i) Aggregated Finish:
- 1) Apply an additional 40 mil thick layer of the membrane material immediately followed by an aggregate coating, before the membrane cures, at a rate to fully cover the exposed area. The membrane and aggregate shall be fully integrated after the aggregate has been applied and the membrane cured.
  - 2) Localized areas not fully coated shall be touched-up with additional membrane and aggregate as needed.
  - 3) Remove loose and excess aggregate from the surface to the satisfaction of the Engineer and dispose of properly after application prior to allowing traffic onto finished surface or application of tack coat.
- (j) Bond Coat:  
Prior to application of a bituminous concrete overlay, the aggregated finish shall be coated with a bonding material. The bonding material shall be per the membrane waterproofing manufacturer's recommendations.
7. Final Review: The Engineer and the Applicator shall jointly review the area(s) over which the completed System has been installed. Any irregularities or other items that do not meet the requirements of the Engineer shall be addressed at this time.

**Method of Measurement:** The quantity to be paid for under this item shall be the number of square yards of waterproofed surface completed and accepted.

**Basis of Payment:** This item will be paid for at the contract unit price per square yard of "Membrane Waterproofing (Cold Liquid Elastomeric)," complete in place, which price shall include all surface preparation, furnishing, storing and applying the system, technical representative and quality control tests, and any necessary repairs and remediation work as well as all materials, equipment, tools, labor incidental to this work.

<u>Pay Item</u>	<u>Pay Unit</u>
Membrane Waterproofing (Cold Liquid Elastomeric)	s.y.

## **ITEM #0821019A – MERRITT PARKWAY BARRIER**

**Description:** Work under this item consists of furnishing and installing cast-in-place concrete Merritt Parkway barrier adjacent to existing bridge barrier or abutments, rock cuts, or other locations as shown on the plans, as directed by the Engineer and in accordance with these specifications.

### **Materials:**

1 - Concrete: The concrete shall conform to the requirements of the special provision “Class ‘F’ Concrete”. The cured concrete color shall be a match to nearby precast Merritt Parkway Median Barrier sections through the proportional use of white and gray Portland cements and sands or the addition of pigments.

2 - Reinforcing: The reinforcing shall be uncoated and conform to ASTM A615, Grade 60.

3 - Joint Seal: Joint seal shall conform to the requirements of Section M.03 under the “Joint Sealants” subarticle.

4 - Closed Cell Elastomer: Shall conform to the requirements of Section M.03

**Construction Methods:** Mixing, placing, curing, and finishing of the concrete shall be in accordance with Article 6.01.03.

Any newly placed concrete having a hollow sound when sounded with a hammer shall be replaced by the Contractor at his expense by a method acceptable to the Engineer.

A rubbed finish, in accordance with Article 6.01.03 except as noted herein, shall be applied to all new concrete surfaces within three days. This shall be accomplished along the entire length of the barrier in one operation to ensure uniformity of finish. Failure to perform an acceptable rubbed finish within the three day period may be cause for rejection of the barrier.

Joint sealing shall be done in accordance with Article 6.01.03.

Joint locations shall be as shown on the plans.

**Method of Measurement:** This work will be measured for payment by the number of linear feet of Merritt Parkway Barrier, completed and accepted.

**Basis of Payment:** This work will be paid for at the contract unit price per foot, for "Merritt Parkway Barrier", complete in place, which price shall include all materials, equipment, tools and labor incidental thereto.

The cost for drilling and grouting dowels will not be measured for payment under this item and will be paid for under the item “Drilling Holes and Grouting Dowels”.

<u>Pay Item</u>	<u>Pay Unit</u>
Merritt Parkway Barrier	l.f.

## **ITEM #0904049A – TWO TUBE BRIDGE RAIL**

**Description:** Work under this item shall consist of the furnishing, fabrication, hot-dip galvanizing, and installation of steel two-tube retrofit bridge rail system as shown on the plans, as directed by the Engineer and in accordance with these provisions.

### **Materials:**

#### **1. Structural Steel:**

(a): The structural-tube railing including splice and expansion sleeves shall be made from structural tubing in accordance with ASTM A500, Grade B or ASTM A501. Tube sections shall be hot-dip galvanized after fabrication in accordance with the requirements of ASTM A123.

(1): Charpy V-Notch Impact Testing: Structural steel comprising the two-tube retrofit bridge rail shall meet the Charpy V-Notch impact requirements of ASTM A370.

(b): The posts and any other shapes and/or plates shall be made from structural steel in accordance with ASTM A709 Grade 36 (ASTM A709M, Grade 205). The posts shall be galvanized in accordance with ASTM A123.

**2. Rail Post Anchor Bolts:** Rail Post Anchor bolts shall conform to the requirements of ASTM A325 (A325M), 120 ksi (830MPa) minimum tensile strength. Nuts shall conform to ASTM A563, Grade B hex, washers shall conform to ASTM F436. Anchor bolts, nuts and washers shall be hot-dip galvanized in accordance with ASTM A153.

**3. Other Bolts and Nuts:** All other bolts and nuts shall conform to the requirements of ASTM A307. Nuts shall conform to ASTM A563, Grade B hex, washers shall conform to ASTM F436. Bolts, nuts and washers shall be hot-dip galvanized in accordance with ASTM A153.

**4. Molded Pads:** Molded pads shall be manufactured from new unvulcanized elastomer and unused synthetic fibers, with a weight proportion of fiber content equal to approximately one-half of the total weight of the pad. The pads shall be formed into single sheets of 1/8”(3mm) minimum thickness, with a tolerance of plus or minus 10 percent. Pads shall have a Shore A Durometer hardness within the range of 70 to 90.

The Contractor shall furnish a Materials Certificate in conformance with the requirements of Article 1.06.07 for the following materials: rails, rail sleeves, support brackets, post connections devices, rail splices, preset anchorages, bolts, washers and molded pads.

### **Construction Methods:**

**1. General fabrication requirements:** The two-tube bridge rail system shall be fabricated and assembled in accordance with Sections 6.03.03-3 through 6.03.03-4. The cost of

inspection of shop welds shall be considered included in the cost per linear foot of the subject item.

All welds shall be accomplished before any component is galvanized. Any welding after galvanizing will be cause for rejection of that particular component.

Tubular components, rail posts, and other shapes and/or plates shall be hot-dip galvanized in accordance with ASTM A123 following fabrication.

The railings shall be accurately fabricated and installed as shown on the plans. Lengths of rail elements shall be continuous over a minimum of four rail posts wherever possible and in no case less than two. Welding of two or more rails to form an element will not be allowed. Rail splices shall be located between the support brackets. Splice bars shall have a sliding fit in the rail sections.

2. **Welding requirements:** Steel welding shall be in accordance with the American Welding Society “Structural Welding Code-Steel, ANSI/AWS D1.1-2006.
3. **Shop Plans:** Shop plans shall be submitted to the Engineer in accordance with the requirements of Article 1.05.02-3, prior to the fabrication of any material. The drawings shall include material lists, and material designations.
4. **Fabrication Initiation – Notice to Engineer:** The Contractor shall provide the Engineer a minimum of two (2) weeks prior notice to the structural fabrication of the two-tube retrofit bridge rail and galvanizing. Work shall not be initiated until the Engineer has been notified and their representative is on-site.
5. **Installation:** The two-tube bridge rail shall be carefully adjusted prior to fixing in place to insure proper matching at abutting joints and correct alignment throughout its length. All bolts shall be securely tightened. Bolts, nuts and washers shall receive touch-up galvanizing where necessary after final tensioning. Careful attention shall be given to bolted connections to insure that all bolts, nuts and washers are fully galvanized and that no gaps are left uncoated.
6. **Touch-up:** Touch-up for damaged areas that extend back to the steel surface of the galvanized bridge rail, (such as scratches, gouges or nicks) shall conform to the requirements of ASTM A780.

The open ends of the bridge rail shall be closed using end caps.

**Method of Measurement:** This work will be measured for payment by the number of linear feet of two-tube bridge rail, completed and accepted.

**Basis of Payment:** The work will be paid for at the contract unit price per linear foot for “Two Tube Bridge Rail” complete in place which price shall include all material, equipment, tools and labor incidental thereto.



Pay Unit  
Two Tube Bridge Rail

Pay Item  
l.f.

**ITEM #0910052A - MERRITT PARKWAY GUIDERAIL****ITEM #0910058A - MERRITT PARKWAY GUIDERAIL LEADING END ATTACHMENT**

**Description:** Work under this item shall consist of a single steel-backed timber rail element fastened to steel posts and the appropriate treatment at fixed objects, bridge parapets and terminal ends as shown on the plans. It shall be erected in the locations sited and fabricated in conformity with the designations, dimensions and details shown on the plans or as ordered by the engineer.

**Materials:**

1. **Steel:** All steel posts, back-up rails, splice plates and channel rubrails which are to be used as “Weathering Steel”, shall meet the requirements of ASTM A588. The fabricator shall notify the manufacturer that it is “Weathering Steel” (structural steel for use in bare, unpainted applications) and that the steel shall not be marked with paint or steel die stamped, but identification shall be stenciled with permanent ink. The dimensions of each component shall conform to the plans and ASTM A6. All steel posts shall be galvanized after fabrication to meet the requirements of ASTM A123 and conform to the galvanizing limits and tolerances shown on the plans. A single ¾” diameter hole may be drilled 2” from the top of each post, in the center of the web, to facilitate the galvanizing process on the bottom of all posts.
2. **Timber:** All timber rail and block-out components shall conform with the following:
  - a) Commercial lumber grade No. 1 or better after treatment;
  - b) AASHTO M 168;
  - c) Minimum stress rating of 1350 psi
  - d) Rough sawn (non-planed) or S4S (surface four side) Southern Yellow Pine or Douglas Fir- Larch with nominal dimensions as indicated on the plans. Variations in the size of any dimension shall not be more than  $\pm \frac{1}{4}$ ”
  - e) All timber components shall be pressure treated with CCA or ACZA depending on species supplied conforming to AWPA Standard P5 to a minimum net retention of 0.60lb/cubic foot in the assay zone in accordance with AWPA Standard C14.
  - f) All timber components shall be fabricated (including but not necessarily limited to cutting, drilling, dapping and chamfering) prior to treatment.
  - g) All timber components shall be free of excess preservative and solvent at the conclusion of the treating process. Post treatment cleaning shall be by expansion bath or steaming in accordance with AWPA Standard C2;
  - h) Kiln or air dried to a maximum moisture content of 25% after treatment (KDAT - 25);
  - i) Grade-marked after treatment by an agency certified by the American Lumber Standard Committee (ALSC).
3. **Fasteners:** Round head bolts shall be manufactured in accordance with the sizes designated on the plans, the geometric specifications included in ANSI B18.5.1.2.2 and the material specifications for ASTM A588 steel. All round head bolts shall be marked with the

manufactures symbol and A588. Hex Lag Screws shall be manufactured in accordance with ASTM A307 Grade A specifications. All Hex Lag Screws shall be hot-dipped galvanized in accordance with ASTM A153 Class C.

**Construction Methods:** The steel posts shall be driven. The Contractor shall use suitable caps and equipment to prevent damage to the posts during driving. Where rock or boulders are encountered in driving the posts, the material shall be removed so as to make a hole of sufficient size to permit the setting of the post. The hole shall then be backfilled and thoroughly compacted before the driving of the posts.

The Contractor is cautioned that within the limits of any project, buried cables for illumination or utilities, which may be energized, may be present.

The posts shall be located as shown on the plans, set plumb and in alignment with the rail or rail treatments. The block outs and rail elements shall then be erected to produce a smooth continuous rail as shown on the plans.

Whenever rail or rail treatments are being constructed adjacent to roadways open to traffic, the Contractor shall complete the installation to and including the designated terminal treatment at the close of each day's work.

On long runs or other locations where it is not practical to complete the installation to and including the designed terminal treatment by the end of each day's work, the Contractor shall use temporary methods for terminating the beam rail so as to minimize any hazard caused by leaving the end of the beam rail exposed to traffic. Temporary methods for terminating the beam rail shall include lowering the rail end to the ground and providing adequate anchorage of the rail end by bolting, securing, burying, etc.

The Contractor shall submit to the Engineer for approval details of his proposed methods for temporary terminating the end section. No work shall be performed adjacent to the areas open to traffic until approval is given.

The Contractor shall be required to furnish extra length posts at transition areas or where field conditions warrant. These posts shall be of such length that the minimum depth in the ground, as shown on the plans, is maintained.

Before final erection, all galvanized elements which have been cut or worked so as to destroy the zinc coating and cause the base metal to be exposed shall have the exposed base metal thoroughly cleaned and brush coated with zinc rich touch up material.

**Method of Measurement:** The length of Merritt Parkway Guiderail measured for payment will be the number of linear feet of accepted rail of the type or designation installed, measured along the top of the rail between centers of end posts in each continuous section.

“Merritt Parkway Guiderail (Type) End Attachment” shall be measured for payment by the actual number of each attachment installed in accordance with the “Pay Limit for attachment” as designated on the plans.

“Merritt Parkway Guiderail Replacement Parts” shall be measured for payment by the lump sum quantity.

“Drilling Hole for Guiderail Post” shall be measured to the nearest 4” in depth of actual rock encountered and removed.

**Basis of Payment:** Merritt Parkway Guiderail will be paid for at the contract unit price per linear foot for the type or designation indicated on the plan or ordered by the Engineer, complete in place. The price shall include all materials, fittings, back-up rail, posts, delineators, equipment, and tools and labor incidental to the installation of the rail.

“Merritt Parkway Guiderail (Type) End Attachment” to parapets or barriers will be paid for at the contract unit price each as shown on the plans or as ordered by the Engineer, complete and in place. The price shall include all materials, fittings, back-up rails, posts, anchor bolts, attachment brackets, drilling and grouting, chemical anchoring material, delineators, equipment, removal and disposal of surplus material, removal of existing rail, tools and labor incidental to the installation of the rail.

Drilling in or removal of rock or boulders and backfilling with suitable material when required for the installation of posts will be paid for at the contract unit price per foot of depth for “Drilling Hole for Guiderail Post”. The price shall include all materials, equipment, tools, and labor incidental thereto.

Pay Item	Pay Unit
Merritt Parkway Guiderail (Type)	L.F.
Merritt Parkway Guiderail Replacement Parts	Lump Sum
Merritt Parkway Guiderail (Type) End Attachment	Each
Drilling Hole for Guiderail Post	L.F.

## **ITEM #0911476A - MERRITT PARKWAY END ANCHORAGE-TYPE I**

Work under this item shall conform to the requirements of section 9.11, supplemented and amended as follows:

**Description:** This item shall consist of furnishing and installing terminals for sections of Merritt Parkway Guiderail (MPG) as shown on the plans. It contains appropriate treatments for anchorage of MPG end sections that are buried outside of the roadway clear zone, buried in earth-cut slopes, and anchored in rock-cut slopes as shown on the plans or as ordered by the Engineer.

### **Materials:**

1. **Steel:** All steel posts, back-up rails, splice plates and structural tees which are to be used as “Weathering Steel” shall meet the requirements of ASTM A588 and the fabricator shall notify the manufacturer that it is “Weathering Steel” (structural steel for use in bare, unpainted applications) and that the steel shall not be marked with paint or steel die stamped, but identification shall be stenciled with permanent ink. The dimensions of each component shall conform to the plans and ASTM A6. All steel posts shall be hot-dipped galvanized after fabrication in accordance with ASTM A123 and conform to the galvanizing limits and tolerances shown on the plans. A single ¾” diameter hole may be drilled 2” from the top of each post, in the center of the web, to facilitate the galvanizing process on the bottom of all posts. Any back-up rails, splice plates or structural tees that will come into contact with the ground shall be hot-dipped galvanized after fabrication in accordance with ASTM A123.
2. **Timber:** All timber rail and block-out components shall conform with the following:
  - a) Commercial lumber grade No. 1 or better after treatment;
  - b) AASHTO M 168;
  - c) Minimum stress rating of 1350 psi;
  - d) Rough sawn (non-planed) or S4S (surface four side) Southern Yellow Pine or Douglas Fir- Larch with nominal dimensions as indicated on the plans. Variations in the size of any dimension shall not be more than  $\pm 1/4$ ”.
  - e) All timber components shall be pressure treated with CCA or ACZA depending on species supplied conforming to AWWA Standard P5 to a minimum net retention of 0.60lb/cubic foot in the assay zone in accordance with AWWA Standard.
  - f) All timber components shall be fabricated (including but not necessarily limited to cutting, drilling, dapping and chamfering) prior to treatment.
  - g) All timber components shall be free of excess preservative and solvent at the conclusion of the treating process. Post treatment cleaning shall be by expansion bath or steaming in accordance with AWWA Standard C2;
  - h) Kiln or air dried to a maximum moisture content of 25% after treatment (KDAT - 25);

- i) Grade-marked after treatment by an agency certified by the American Lumber Standard Committee (ALSC).
- 3. Fasteners:** Anchor bolts shall conform to ASTM A449. The nuts and washers for anchor bolts shall conform to ASTM A563, Grade B. Round head bolts shall be manufactured in accordance with the sizes designated on the plans, the geometric specifications included in ANSI B18.5.1.2.2 and the material specifications for ASTM A307 steel. All round head bolts shall be marked with the manufactures symbol and A307. Rock anchors shall be manufactured in accordance with the sizes designated on the plans and the specifications for ASTM A307 steel. Hex lag screws shall be manufactured in accordance with the sizes designated on the plans and the specifications for ASTM A307, Grade-A steel. All anchor bolts, round head bolts, rock anchors and hex lag screws shall be hot-dipped galvanized in accordance with ASTM A 153 Class C. Unless other wise noted on the plans, all other fasteners shall conform to the requirements of M.10.02.9.

## **ITEM #0914013A – ORNAMENTAL METAL FENCE**

**Description:** Work under this item shall consist of furnishing and installing an ornamental metal fence that shall reproduce the existing ornamental metal fence located on the bridge parapet, as shown on the plans. This work includes measuring, designing, furnishing, fabricating, transporting, painting and erecting the fence system. This item shall also include the services of an architectural conservator to perform a historic paint analysis.

### **Materials:**

Top Rail – The top rail shall be 2.5 inches nominal diameter Schedule 40 Steel Pipe meeting the requirements of ASTM A53.

All other steel components shall meet the requirements of ASTM A36 and shall match the dimensions of the existing fence components.

Paint - Shall meet the requirements of M.07.01 of the Standard Specifications, Form 817, except as supplemented and amended within this specification.

Coating Systems - Ensure compatibility between each type of coating by using primers, undercoats and finish coats that are produced by the same manufacturer. Follow manufacturers' instructions regarding the preparation of each coating in the system. The coating system shall be selected from the following:

Tnemec Products:      Primer: Series 394 PerimePrime  
                                    Finish Coat: Series 27 Typoxy or Series 73 Endura-Shield

Sherwin-Williams      Primer: Pro-Cryl Universal Primer  
Products:                      Finish Coat: Sher-Cryl HPA

or equal approved by Engineer.

**Construction Methods:** Original plans included in the Contract show the original details for the existing Ornamental Metal Fence. The Contractor is responsible for the accurate reproduction of all ornamental metal fence components and details.

Shop Drawings: The Contractor shall submit shop drawings for approval in accordance with 1.05.02.

Mock-ups: The Contractor shall prepare a painted mock-up fence panel to the final dimensions, including flange attachments and spacing collars. The mock-up will be viewed along with existing ornamental metal fence for comparison of detail and dimension. The visual match inspection will be done by the Department's Architectural Historian. Documentation shall be provided to the Engineer demonstrating the Department's Architectural Historian's approval of the proposed reproduction.

Should the Department's Architectural Historian determine that the mock-up does not match the existing ornamental metal fence; additional mock-ups will be required until the Department's Architectural Historian determines that a match has been attained.

It is recommended that the Contractor fabricate the top steel pipe rail an inch longer on each end than anticipated to allow for construction tolerances of the spacing between concrete parapet posts. Prior to installation of fence panels, the distance between concrete posts shall be measured and the top steel pipe rail shall be cut an equal amount on both ends, as necessary, so that the fence panel sits centered in the spacing. The cut ends of top rail shall be field touch-up painted.

Testing: Prior to fabrication, the Contractor shall conduct sampling of the existing finish to be delivered to an architectural conservator for analysis and identification. The finish shall undergo a historic paint analysis to determine the original historic color and appearance of the ornamental metal fence.

The microscopic examination of the layers of paint shall identify the substrate, primer(s) and successive finish layers using the Federal Standard No. 595C Color numbering system.

Substrate Surface Preparation: Prepare metal elements to a minimum of SSPC-SP6 Commercial Blast Cleaning. Do not allow more than 24 hours to pass before applying a primer coat to protect the newly prepared metal.

Application of Coatings: Apply material by brush, roller, or spray strictly according to the manufacturer's directions. Use brushes best suited for the material being applied. Use rollers as recommended by the manufacturer for the material and texture required.

- Do not apply coatings over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions detrimental to forming a durable coating film.
- Apply material at the coverage rate recommended by the manufacturer unless otherwise indicated.
- The number of coats and film thickness required is the same regardless of the application method. Do not apply succeeding coats until the previous coat has cured as recommended by the manufacturer. Where sanding is required, according to the manufacturer's directions, sand between applications to produce a smooth, even surface.
- Apply finish coat within 14 days of primer application. Select a primer color that is in the family range of the finish coat, but different enough to discern holiday and incomplete coverage of the finish coats.
- When undercoats or other conditions show through the final coat, apply additional coats until the cured film has a uniform coating finish, color, and appearance. Give special attention to edges, corners, crevices, welds, exposed fasteners, and similar surfaces to ensure that they receive a dry film thickness equivalent to that of flat surfaces.



**Method of Measurement:** This work will be measured for payment by the number of linear feet of completed and accepted Ornamental Metal Fence measured along the top of fence.

**Basis of Payment:** This work will be paid for at the Contract unit price per linear foot for “Ornamental Metal Fence” complete in place, which price shall include all fence materials include pipe, threaded flanges, expansion bolts, spacing collars, channels, steel bars, and paint, paint analysis, measuring, mock-ups, installation, equipment, tools and labor incidental thereto.

Pay Item	Pay Unit
Ornamental Metal Fence	l.f.

**ITEM #0950019A – TURF ESTABLISHMENT - LAWN**

**Description:** The work included in this item shall consist of providing an accepted stand of grass by furnishing and placing seed as shown on the plans or as directed by the Engineer.

**Materials:** The materials for this work shall conform to the requirements of Section 9.50 of Standard Specification Form 817. The following mix shall be used for this item:

**Turf Seed Mix:**

In order to preserve and enhance the diversity, the source for seed mixtures shall be locally obtained within the Northeast USA including New England, New York, Pennsylvania, New Jersey, Delaware, or Maryland. One approved seed mixture is detailed below. Other proposed mixtures must be approved by the ConnDOT Landscape Design office.

<u>Proportion (Percent)</u>	<u>Species Common name</u>	<u>Scientific name</u>
20	Kentucky Bluegrass Improved varieties	Poa pratensis
45	Red Fescue Improved varieties	Festuca rubra
35	Perennial Ryegrass Improved varieties	Lolium perenne

**Construction Methods:** Construction Methods shall be those established as agronomically acceptable and feasible and that are approved by the Engineer. Rate of application shall be field determined in Pure Live Seed (PLS) based on the minimum purity and minimum germination of the seed obtained. Calculate the PLS for each seed species in the mix. Adjust the seeding rate for the above composite mix, based on 250 lbs. per acre. The seed shall be mulched in accordance with Article 9.50.03.

**Method of Measurement:** This work will be measured for payment by the number of square yards of surface area of accepted established grasses as specified or by the number of square yards of surface area of seeding actually covered and as specified.

**Basis of Payment:** This work will be paid for at the contract unit price per square yard for “Turf Establishment - Lawn” which price shall include all materials maintenance, equipment, tools, labor, and work incidental thereto. Partial payment of up to 60% may be made for work completed, but not accepted.

Pay Item  
Turf Establishment - Lawn

Pay Unit  
s.y.

## **ITEM #0952051A - CONTROL AND REMOVAL OF INVASIVE VEGETATION**

**Description:** This work shall include the development and implementation of an Invasive Vegetation Removal Plan (IVRP) to outline the materials, labor, and equipment the Contractor plans to use for the complete eradication and treatment of the invasive vegetation. The work shall also include the identification, excavation, removal, and off-Site disposal of unwanted vegetation as indicated on the plan sheets, permits or as directed by the Engineer.

All invasive vegetation listed on the following websites will be subject to eradication:

- Connecticut Invasive Plant Working Group (CIPWG) Invasive Plants Council ([http://cipwg.uconn.edu/invasive\\_plant\\_list/](http://cipwg.uconn.edu/invasive_plant_list/))
- US Army Corps of Engineers (ACOE) New England District Compensatory Mitigation Guidance Appendix K ([http://www.nae.usace.army.mil/portals/74/docs/regulatory/Mitigation/2016\\_New\\_England\\_Compensatory\\_Mitigation\\_Guidance.pdf](http://www.nae.usace.army.mil/portals/74/docs/regulatory/Mitigation/2016_New_England_Compensatory_Mitigation_Guidance.pdf))

All vegetation designated for removal shall be eradicated in its entirety in accordance with the IVRP submitted by the Contractor and approved by the Engineer. Certain situations may require the full and complete mechanical excavation of invasive vegetation including its entire root system. The use of herbicides will not be permitted between the dates of October 1 and May 31.

**Materials:** All herbicides shall be registered for the species being treated and shall be formulated as applicable for target-species foliar treatment, cut surface, or injection applications. Where work in or immediately adjacent to wetlands is necessary, the product label(s) for any chemical/adjuvant formulation applied must indicate that the formulation is approved for aquatic environments.

### **Construction Methods:**

**1. IVRP:** Prior to any ground disturbance within the Project limits, the Contractor shall submit an IVRP to the Engineer for review and approval. Within 30 days of receipt of the submittal, the Engineer will notify the Contractor whether the IVRP is approved, rejected or requires modifications by the Contractor. If any part of the plan is not approved, the Contractor shall promptly make any necessary changes and re-submit the entire plan for approval. The entire plan must be approved in writing prior to beginning any work on Site. In all cases, mechanical means shall be considered before the use of herbicides. If mechanical means is neither feasible nor recommended, an explanation must be provided in the IVRP. All removal methods shall prevent the spread of seeds – no mowing or “Brush Hog” equipment will be allowed. The approved methods must be capable of total removal and eradication of all identified invasive species in the designated areas throughout the Contract and the 2-Year Plant Establishment Period.

The IVRP shall include a schedule and outline with the following information:

- 1) The Contractor’s methods of determining invasive vegetation surveyed limits, including:
  - a. Stake out the limits prior to the initial treatment
  - b. Maintain a record of the staked limits throughout the life of the Contract
- 2) Identification of the type(s) of invasive species present within the field surveyed limits

- 3) A marked up plan sheet outlining the invasive species limits and identifying the types of invasive species present within those limits and total square yards of proposed removal
- 4) For each species present on-Site, the following shall be described:
  - a. Methods to eradicate specific invasive plant species for the life of the Contract (e.g. mechanical, herbicide, etc.) shall include any initial, intermediate and 2-Year Plant Establishment Period Treatment eradication methods for each plant species
  - b. Types and concentrations of any herbicides to be used, including any adjuvants, SDS sheets, types of tools or machinery to be used
  - c. Schedules showing dates and eradication methods for the initial, intermediate, and 2-Year Plant Establishment Period Treatments. This schedule must take into consideration stage construction, the time period required between herbicide application, and the physical removal of the target species wherever such methodology is employed
- 5) All invasive species are considered controlled materials and are to be taken off-Site to an approved disposal facility. For disposal methods:
  - a. Provide address of location, current permits / letters from the town authorizing such activity and a Site map (complete with regulated areas)
  - b. Wood chips from invasive species are not allowed to be stockpiled or reused on-Site
  - c. Wood chipping on-Site will be allowed if temporarily stored in a properly contained enclosure and removed at the end of the treatment cycle
  - d. Invasive plants shall not be buried on-Site
- 6) Proof of CT DEEP licensure for herbicide application
- 7) A description of safety equipment required
- 8) Procedures for handling chemical spills

Where certain species of invasive vegetation are present and identified on the plan sheets, permits, or as identified in the field by the Engineer, the removal via bulk mechanical excavation of such vegetation and the underlying soils may be required as directed. The approved method must be capable of the removal of all soil to a depth where invasive plant material and root system is no longer evident, or as directed by the Engineer.

Whether the Contractor's method of removal is by mechanical excavation or cutting and spraying of herbicides, invasive species must be removed separately from clearing and grubbing operations and disposed at an approved location as described in the Contractor's IVRP.

No equipment or vehicles other than that required to complete the work will be permitted in the areas designated for invasive vegetation removal. Any equipment used to process invasive vegetation, such as chippers and transport vehicles, must be cleaned prior to further use.

Any invasive species control and removal work performed throughout the duration of the Contract that causes damage or soil disturbance shall be repaired at the Contractor's expense within 7 days. It is the Contractor's responsibility to identify additional areas of concern for invasive vegetation within the limits of the Project, notify the Engineer, and to amend the IVRP.

The Contractor shall be responsible to identify invasive vegetation at all times of the year and to prepare a plan for its eradication without assistance.

All treatments, with the exception of an initial mechanical excavation of invasive species, will not be allowed outside of the optimal growing season between the dates of October 1 and May 31.

Herbicide applications will not be permitted during any rain event or during windy conditions. Broadcast or uncontrolled spray application will not be permitted and care must be taken to avoid contacting non-target native species. If any non-target native species to remain within the Project limits are inadvertently treated with herbicide and perish, the Contractor will be responsible to replace in-kind species at no cost to the State.

Remove all twining vines in treetops to the greatest extent possible without damaging the branches of the supporting desired vegetation. Cut and remove vines overtopping tree canopies to the extent practical. Climbing spikes will not be permitted for aerial work.

The Contractor shall also:

- 1) Maintain the labels for herbicides being used in his/her possession
- 2) Conduct all herbicide formulations and applications, including the addition of appropriate surfactants and other adjuvants, in strict conformance with the manufacturer's recommendation and per requirements of regulatory agencies
- 3) Maintain a written record of herbicide application, including the formulation, concentration, area treated, and date for each application. The records are to be provided by the commercial applicator and submitted to the Engineer following each treatment

Flush cut brush and trees shall not be more than 2 inches above the ground line. Prune out any branches on non-treatment plants that are damaged during removal of vegetation. All corrective pruning shall conform to the National Arborists Association Pruning Standards.

Wherever removal operations result in exposed soils, disturbed areas shall be vegetatively stabilized with the appropriate seed mix and protected with hay, cellulous fiber mulch, or erosion control matting.

Once the IVRP is approved, a field review shall be scheduled for the Contractor and Engineer to review the limits of invasive species removal (surveyed and flagged by the Contractor prior to the meeting), the specific species required to be removed, and the Contractor's submitted invasive species removal plan. At this time, the Engineer may identify additional invasive species or designate additional areas for removal that are not included with the Contractor's submitted IVRP.

If changes are required to the approved IVRP during the life of the Contract, these changes shall be documented by the Contractor and resubmitted to the Engineer for review and approval a minimum of 10 days prior to beginning of the additional work associated with the change. The Contractor shall provide a 10 day work notice to the Engineer prior to proceeding with each treatment.

**2. Treatments:** The treatment schedule below may be modified based on field conditions at the discretion of the Engineer. The Contractor shall provide a 10 day work notice to the Engineer prior to proceeding with each treatment. In all cases, each treatment must be reviewed once the work is performed, and accepted before payment is made for that treatment stage.

Initial Treatment: Shall commence at the beginning of the Contract time, prior to clearing and grubbing activities. Any invasive species found within a proposed cut slope shall be fully eradicated to the satisfaction of the Engineer prior to any earth work operations. After the completion of the initial treatment, the work must be reviewed and accepted by the Engineer prior to any earth excavation in that area. If herbicide is the initial treatment method, a minimum of 14 days is required prior to clearing and grubbing operations, so the herbicide application can take effect.

Intermediate Treatment(s): Shall be conducted during the optimal growing season between the dates of June 1 and September 30 for invasive species up to and including 10 days prior to plant installation or at the end of the Project if no landscaping plan is in the Contract. Optimal treatment times may be specific to the species being treated and this must be considered and documented when developing the Invasive Vegetation Removal Plan. Several treatments may be required to treat all species that are present.

2-Year Plant Establishment Period Treatment: Treatments as needed or as directed by the Engineer shall be conducted throughout the 2-Year Plant Establishment Period or when required under another Contract item.

**Method of Measurement:** This work will be measured for payment by the number of square yards of invasive vegetation identified, surveyed, treated and eradicated as required including any required re-treatment of any regrowth or new growth. No additional payment will be made for subsequent treatments. The area for removal will be surveyed and flagged prior to treatment and measured. After a review of the surveyed limits, the Engineer may designate additional areas for removal that are not shown on the plans. These additional areas will be measured for payment and included as part of the Contract work.

Where selective removal is required, the square yards of the drip line of the invasive vegetation will be measured for payment.

**Basis of Payment:** This work will be paid for at the Contract unit price per square yard for "Control and Removal of Invasive Vegetation." This payment shall include all labor, surveys, materials, tools, and equipment necessary for limits of the invasive area(s); maintenance of the limits throughout the Project; species identification; and cutting, excavation, treating, re-treating, removal, and off-Site disposal of designated invasive plant material. Off-Site disposal of residue shall include the loading, transport, dumping, and fees associated with legal off-site disposal.

- Upon approval of the required IVRP, the Contractor will receive a payment equal to 10% of the estimated Contract value

- Upon initial herbicide or mechanical removal treatment methods as it is described in the IVRP, the Contractor will receive a payment equal to 20% of all areas receiving treatment
- Upon successful completion of the initial treatment period, as determined during the review by the Engineer, the Contractor will receive a payment equal to 20%
- Upon successful completion of the intermediate treatment period as determined during the Site review by the Engineer, the Contractor will receive a payment equal to 20%
- Upon successful completion of the 2-Year Plant Establishment Period covering all treated areas on the Project (or the last treatment for those Projects which may not include a Plant Establishment Period), the Contractor will receive final payment equal to the measured areas in place and treated, less any previous payments

Where bulk excavation is required for removal, this work shall be covered under the Contract Item "Earth Excavation" for all excavation in excess of 2 feet. All other vegetation not designated as invasive vegetation shall be removed in compliance with the Item "Clearing and Grubbing" in accordance with Section 2.01.

Vegetative stabilization of disturbed areas will be paid for under the respective Contract Items: "Turf Establishment," "Wetland Grass Establishment," or "Conservation Seeding for Slopes."

Pay Item	Pay Unit
Control and Removal of Invasive Vegetation	s.y.

## **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 CTDOT forces and others who may be engaged to augment CTDOT forces 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	Small	Med.	Large	Extra Large
Minimum Sq. Ft. of floor space with a minimum ceiling height of 7 ft.	400	400	1000	2000
Minimum number of exterior entrances.	2	2	2	2
Minimum number of parking spaces.	7	7	10	15

**Office Layout:** The office shall have a minimum square footage as indicated in the table above, and shall be partitioned as shown on the building floor plan as provided by the Engineer.

**Tie-downs and Skirting:** Modular offices shall be tied-down and fully skirted to ground level.

**Lavatory Facilities:** 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 CTDOT personnel and such assistants as they may engage; and for field offices sizes Large and Extra Large the Contractor shall furnish two (2) separate lavatories with toilet (men and women), in separately enclosed rooms that are properly ventilated and comply with applicable sanitary codes. Each lavatory shall have hot and cold running water and flush-type toilets. For all facilities the Contractor shall supply lavatory and sanitary supplies as required.

**Windows and Entrances:** 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 CTDOT and will be kept in their possession while State 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. An ADA/ABA compliant ramp with non-skid surface shall be provided with the Extra-Large field office.



Lighting: 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.

Parking Facility: 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.

Field Office Security: 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.

Electric Service: 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 State's CTDOT electrical inspector, must be contacted at 860-594-2240. (Do Not Call Local Town Officials)
- I. Prior to field office removal, the CTDOT Office of Information Systems (CTDOT OIS) must be notified to deactivate the communications equipment.

Heating, Ventilation and Air Conditioning (HVAC): 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.

Telephone Service: The Contractor shall provide telephone service with unlimited nation-wide calling plan. For a Small, Medium and Large 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. For an Extra-Large field office this shall consist of four (4) telephone lines: three (3) lines for phone/voice service and one (1) line dedicated for facsimile machine. The Contractor shall pay all charges.

Data Communications Facility Wiring: Contractor shall install a Category 6 568B patch panel in a central wiring location and Cat 6 cable from the patch panel to each PC station, Smart Board location, Multifunction Laser Printer/Copier/Scanner/Fax, terminating in a (Category 6 568B) wall or surface mount data jack. The central wiring location shall also house either the data circuit with appropriate power requirements or a category 5 cable run to the location of the installed data circuit. The central wiring location will be determined by the CTDOT OIS staff in coordination with the designated field office personnel as soon as the facility is in place.

For Small, Medium and Large field offices the Contractor shall run a CAT 6 LAN cable a minimum length of 25 feet for each CTDOT networked device (including but not limited to: smartboards and Multi-Function Laser Printer/Copier/Scanner/Fax) to LAN switch area leaving an additional 10 feet of cable length on each side with terminated RJ45 connectors. For an Extra-Large field office the Contractor shall run CAT 6 LAN cables from workstations, install patch panel in data circuit demark area and terminate runs with RJ45 jacks at each device location. Terminate runs to patch panel in LAN switch area. Each run / jack shall be clearly labeled with an identifying Jack Number.

The Contractor shall supply cables to connect the Wi-Fi printer to the Contractor supplied internet router and to workstations/devices as needed. These cables shall be separate from the LAN cables and data Jacks detailed above for the CTDOT network.

The number of networked devices anticipated shall be at least equal to the number of personal computer tables, Multi-Function Laser Printer/Copier/Scanner/Fax, and smartboards listed below.

The installation of a data communication circuit between the field office and the CTDOT OIS in Newington will be coordinated between the CTDOT District staff, CTDOT OIS staff and the local utility company once the Contractor supplies the field office phone numbers and anticipated installation date. The Contractor shall provide the field office telephone number(s) to the CTDOT Project Engineer within 10 calendar days after the signing of the Contract as required by Article 1.08.02. This is required to facilitate data line and computer installations.

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

Furnishing Description	Office Size			
	Small	Med.	Large	Extra Large
	Quantity			
Office desk (2.5 ft. x 5 ft.) with drawers, locks, and matching desk chair that have pneumatic seat height adjustment and dual wheel casters on the base.	1	3	5	8
Standard secretarial type desk and matching desk chair that has pneumatic seat height adjustment and dual wheel casters on the base.	-	-	-	1
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 height adjustment, seat back and dual wheel casters on the base.	1	1	1	2
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 freestanding.	-	-	6	6
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
Rain Gauge	1	1	1	1
Business telephone system for three lines with ten handsets, intercom capability, and one speaker phone for conference table.	-	-	-	1
Mini refrigerator - 3.2 c.f. min.	1	1	1	1

Hot and cold water dispensing unit. Disposable cups and bottled 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
Electronic office type printing calculators capable of addition, subtraction, multiplication and division with memory and a supply of printing paper.	1	1	2	4
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 Related Hardware and Software</u>	1	1	1	1
Wi-Fi Printer as specified below under <u>Computer Related Hardware and Software</u> .	1	1	1	1
Digital Camera as specified below under <u>Computer Related Hardware and Software</u> .	1	1	3	3
Video Projector as specified below under <u>Computer Related Hardware and Software</u> .	-	-	-	1
Smart Board as specified below under <u>Computer Related Hardware and Software</u> .	-	-	-	1
Infrared Thermometer, including annual third party certified calibration, case, and cleaning wipes.	1	1	1	2
Concrete Curing Box as specified below under Concrete Testing Equipment.	1	1	1	1
Concrete Air Meter and accessories as specified below under Concrete Testing Equipment as specified below. Contractor shall provide third party calibration on a quarterly basis.	1	1	1	1
Concrete Slump Cone and accessories as specified below under Concrete Testing Equipment.	1	1	1	1
First Aid Kit	1	1	1	1
Flip Phones as specified under <u>Computer Related Hardware and Software</u> .	-	-	-	-
Smart Phones as specified under <u>Computer Related Hardware and Software</u> .	-	-	-	-

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.

Computer Related Hardware and Software: The CTDOT will supply by its own means the actual Personal Computers for the CTDOT representatives. The Contractor shall supply the Field Office Wi-Fi Connection, Wi-Fi Printer, Digital Camera(s), Flip Phones, Smart Phones, Multifunction Laser Printer/Copier/Scanner/Fax, Video Projectors, and Smart Board(s) as well as associated hardware and software, must meet the requirements of this specification as well as the latest minimum specifications posted, as of the project advertising date, at CTDOTs web site <http://www.ct.gov/dot/cwp/view.asp?a=1410&q=563904>

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, Digital Camera(s), Flip Phones, Smart Phones, Multifunction Laser Printer/Copier/Scanner/Fax, Video Projector(s) and Smart Board(s) as well as associated hardware, the Contractor must submit a copy of their proposed order(s) with catalog cuts and specifications to the Administering CTDOT District for review and approval. The Wi-Fi Printer, Wi-Fi Router, Flip Phones, Smart Phones, digital cameras, Projector(s) and Smart Board(s) will be reviewed by CTDOT District personnel. The Multifunction Laser Printer/Copier/Scanner/Fax will be reviewed by the CTDOT OIS. The Contractor shall not purchase the hardware, software, or services until the Administering CTDOT District 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 CTDOT. Installation will be coordinated with CTDOT District and Project personnel.

After the approval of the hardware and software, the Contractor shall contact the designated representatives of the CTDOT administering District, a minimum of 2 working days in advance of the proposed delivery or installation of the Field Office Wi-Fi Connection, Wi-Fi Printer, Digital Camera(s), Flip Phones, Smart Phones, 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.

First Aid Kit: 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.

Rain Gauge: The Contractor shall supply install and maintain a rain gauge for the duration of the project, meeting these minimum requirements. The rain gauge shall be installed on the top of a post such that the opening of the rain gauge is above the top of the post an adequate distance to avoid splashing of rain water from the top of the post into the rain gauge. The Location of the rain gauge and post shall be approved by the Engineer. The rain gauge shall be made of a durable material and have graduations of 0.1 inches or less with a minimum total column height of 5 inches. If the rain gauge is damaged the Contractor shall replace it prior to the next forecasted storm event at no additional cost.

Concrete Testing Equipment: If the Contract includes items that require compressive strength cylinders for concrete, in accordance with the Schedule of Minimum Testing Requirements for Sampling Materials for Test, the Contractor shall provide the following equipment.

- A) Concrete Cylinder Curing Box – meeting the requirements of Section 6.12 of the Standard Specifications.
- B) Air Meter – The air meter provided shall be in good working order and meet the requirements of AASHTO T 152.
- C) Slump Cone Mold – Slump cone, base plate, and tamping rod shall be provided in like-new condition and meet the requirements of AASHTO T119, Standard Test Method for Slump of Hydraulic-Cement Concrete.

All testing equipment will remain the property of the Contractor at the completion of the project.

Insurance Policy: 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 State-owned data equipment and supplies used in the office against all losses. The Contractor shall be named insured on that policy, and the CTDOT shall be an additional named insured on the policy. These losses shall include, but not be limited to: theft, fire, and physical damage. The CTDOT will be responsible for all maintenance costs of CTDOT owned computer hardware. In the event of loss, the Contractor shall provide replacement equipment in accordance with current CTDOT equipment specifications, within seven days of notice of the loss. If the Contractor is unable to provide the required replacement equipment within seven days, the CTDOT 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 CTDOT will reimburse the Contractor for replacement costs exceeding the amount of the required coverage.

**Maintenance:** During the occupancy by the CTDOT, 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. If snow removal, salting and sanding are not completed by the specified time, the State will provide the service and all costs incurred will be deducted from the next payment estimate.

**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, (Type),” 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.

<u>Pay Item</u>	<u>Pay Unit</u>
Construction Field Office, (Type)	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 "Prosecution and Progress":

#### **Route 15**

The Contractor shall maintain and protect the minimum number of through lanes and shoulders as dictated in the Special Provision for Section 1.08 - Prosecution and Progress "Limitations of Operations - Minimum Number of Lanes to Remain Open" Chart, on a paved travel path not less than 11 feet in width per lane.

The Contractor shall be allowed to halt traffic for a period of time not to exceed 10 minutes as approved by the Engineer. If more than one 10-minute period is required, the Contractor shall allow all stored vehicles to proceed through the work area prior to the next stoppage.

#### **West Rocks Road**

The Contractor shall maintain and protect a minimum of one lane of traffic in each direction, each lane on a paved travel path not less than 11 feet in width.

Excepted therefrom will be those periods, during the allowable periods, when the Contractor is actively working, at which time the Contractor shall maintain and protect at least an alternating one-way traffic operation, on a paved travel path not less than 11 feet in width. The length of the alternating one-way traffic operation shall not exceed 300 feet and there shall be no more than one alternating one-way traffic operation within the project limits without prior approval of the Engineer.

The Contractor will be allowed to close West Rocks Road to through traffic and detour traffic as shown on the Detour Plan contained in the contract plans.

#### **All Other Roadways**

The Contractor shall maintain and protect a minimum of one lane of traffic in each direction, each lane on a paved travel path not less than 11 feet in width.

Excepted therefrom will be those periods, during the allowable periods, when the Contractor is actively working, at which time the Contractor shall maintain and protect at least an alternating one-way traffic operation, on a paved travel path not less than 11 feet in width. The length of the alternating one-way traffic operation shall not exceed 300 feet and 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 allowed to close said driveways to perform the required work during those periods when the businesses are closed, unless permission is granted from the business owner to close the driveway during business hours. If a temporary closure of a residential driveway is necessary, the Contractor shall coordinate with the owner to determine the time period of the closure.

### **Article 9.71.03 - Construction Method is supplemented as follows:**

#### **General**

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 (bridge) section by the end of a workday (work night), 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 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 workday, if the vertical drop-off exceeds 3 inches, the Contractor shall provide a temporary traversable slope of 4:1 or flatter that is acceptable to the Engineer.

If applicable, when an existing sign is removed, it shall be either relocated or replaced by a new sign during the same working day.

The Contractor shall not store any material on-site which would present a safety hazard to motorists or pedestrians (e.g. fixed object or obstruct sight lines).

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

Construction vehicles entering travel lanes at speeds less than the posted speed are interfering with traffic, and 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 posted speeds, in order to merge with existing traffic.

#### **Existing Signing**

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

### **Requirements for Winter**

The Contractor shall schedule a meeting with representatives from the Department including the offices of Maintenance and Traffic, and the City of Norwalk to determine what interim traffic control measures the Contractor shall accomplish for the winter to provide safety to the 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.

### **Pavement Markings - Limited Access Highways, Turning Roadways and Ramps**

During construction, the Contractor shall maintain all pavement markings throughout the limits of the project.

### **Interim Pavement Markings**

The Contractor shall install painted pavement markings, which shall include lane lines (broken lines), shoulder edge lines, stop bars, lane-use arrows and gore markings, on each intermediate course of bituminous concrete pavement and on any milled surface by the end of the work day/night. All painted pavement markings will be paid under the appropriate items.

If the Contractor does not install permanent Epoxy Resin Pavement Markings by the end of the work day/night on exit ramps where the final course of bituminous concrete pavement has been installed, the Contractor shall install temporary 12 inch wide white stop bars. The temporary stop bars shall consist of Temporary Plastic Pavement Marking Tape and shall be installed by the end of the work day/night. Stop bars may consist of two 6 inch wide white markings or three 4 inch wide white markings placed side by side. The Contractor shall remove and dispose of these markings when the permanent Epoxy Resin Pavement Markings are installed. The cost of furnishing, installing and removing the Temporary Plastic Pavement Marking Tape shall be at the Contractor's expense.

If an intermediate course of bituminous concrete pavement will be exposed throughout the winter, then Epoxy Resin Pavement Markings should be installed unless directed otherwise by the Engineer.

**Final Pavement Markings**

The Contractor should install painted pavement markings on the final course of bituminous concrete pavement by the end of the work day/night. If the painted pavement markings are not installed by the end of the work day/night, then Temporary Plastic Pavement Marking Tape shall be installed as described above and the painted pavement markings shall be installed by the end of the work day/night on Friday of that week.

If Temporary Plastic Pavement Marking Tape is installed, the Contractor shall remove and dispose of these markings when the painted pavement markings are installed. The cost of furnishing, installing and removing the Temporary Plastic Pavement Marking Tape shall be at the Contractor's expense.

The Contractor shall install permanent Epoxy Resin Pavement Markings in accordance with Section 12.10 entitled "Epoxy Resin Pavement Markings, Symbols, and Legends" after such time as determined by the Engineer.

**Pavement Markings -Non-Limited Access Multilane Roadways  
Secondary and Local Roadways**

During construction, the Contractor shall maintain all pavement markings on paved surfaces on all roadways throughout the limits of the project.

**Interim Pavement Markings**

The Contractor shall install painted pavement markings, which shall include centerlines, shoulder edge lines, lane lines (broken lines), lane-use arrows, and stop bars, on each intermediate course of bituminous concrete pavement and on any milled surface by the end of the work day/night. If the next course of bituminous concrete pavement will be placed within seven days, shoulder edge lines are not required. The painted pavement markings will be paid under the appropriate items.

If the Contractor will install another course of bituminous concrete pavement within 24 hours, the Contractor may install Temporary Plastic Pavement Marking Tape in place of the painted pavement markings by the end of the work day/night. These temporary pavement markings shall include centerlines, lane lines (broken lines) and stop bars; shoulder edge lines are not required. Centerlines shall consist of two 4 inch wide yellow markings, 2 feet in length, side by side, 4 to 6 inches apart, at 40-foot intervals. No passing zones should be posted with signs in those areas where the final centerlines have not been established on two-way roadways. Stop bars may consist of two 6 inch wide white markings or three 4 inch wide white markings placed side by side. The Contractor shall remove and dispose of the Temporary Plastic Pavement Marking Tape when another course of bituminous concrete pavement is installed. The cost of furnishing, installing and removing the Temporary Plastic Pavement Marking Tape shall be at the Contractor's expense.

If an intermediate course of bituminous concrete pavement will be exposed throughout the winter, then Epoxy Resin Pavement Markings should be installed unless directed otherwise by the Engineer.

### **Final Pavement Markings**

The Contractor should install painted pavement markings on the final course of bituminous concrete pavement by the end of the work day/night. If the painted pavement markings are not installed by the end of the work day/night, then Temporary Plastic Pavement Marking Tape shall be installed as described above and the painted pavement markings shall be installed by the end of the work day/night on Friday of that week.

If Temporary Plastic Pavement Marking Tape is installed, the Contractor shall remove and dispose of these markings when the painted pavement markings are installed. The cost of furnishing, installing and removing the Temporary Plastic Pavement Marking Tape shall be at the Contractor's expense.

The Contractor shall install permanent Epoxy Resin Pavement Markings in accordance with Section 12.10 entitled "Epoxy Resin Pavement Markings, Symbols, and Legends" after such time as determined by the Engineer.

## **TRAFFIC CONTROL DURING CONSTRUCTION OPERATIONS**

The following guidelines shall assist field personnel in determining when and what type of traffic control patterns to use for various situations. These guidelines shall provide for the safe and efficient movement of traffic through work zones and enhance the safety of work forces in the work area.

### **TRAFFIC CONTROL PATTERNS**

Traffic control patterns shall be used when a work operation requires that all or part of any vehicle or work area protrudes onto any part of a travel lane or shoulder. For each situation, the installation of traffic control devices shall be based on the following:

- Speed and volume of traffic
- Duration of operation
- Exposure to hazards

Traffic control patterns shall be uniform, neat and orderly so as to command respect from the motorist.

In the case of a horizontal or vertical sight restriction in advance of the work area, the traffic control pattern shall be extended to provide adequate sight distance for approaching traffic.

If a lane reduction taper is required to shift traffic, the entire length of the taper should be installed on a tangent section of roadway so that the entire taper area can be seen by the motorist.

Any existing signs that are in conflict with the traffic control patterns shall be removed, covered, or turned so that they are not readable by oncoming traffic.

When installing a traffic control pattern, a Buffer Area should be provided and this area shall be free of equipment, workers, materials and parked vehicles.

Typical traffic control plans 19 through 25 may be used for moving operations such as line striping, pot hole patching, mowing, or sweeping when it is necessary for equipment to occupy a travel lane.

Traffic control patterns will not be required when vehicles are on an emergency patrol type activity or when a short duration stop is made and the equipment can be contained within the shoulder. Flashing lights and appropriate trafficperson shall be used when required.

Although each situation must be dealt with individually, conformity with the typical traffic control plans contained herein is required. In a situation not adequately covered by the typical traffic control plans, the Contractor must contact the Engineer for assistance prior to setting up a traffic control pattern.

### **PLACEMENT OF SIGNS**

Signs must be placed in such a position to allow motorists the opportunity to reduce their speed prior to the work area. Signs shall be installed on the same side of the roadway as the work area. On multi-lane divided highways, advance warning signs shall be installed on both sides of the highway. On directional roadways (on-ramps, off-ramps, one-way roads), where the sight distance to signs is restricted, these signs should be installed on both sides of the roadway.

### **ALLOWABLE ADJUSTMENT OF SIGNS AND DEVICES SHOWN ON THE TRAFFIC CONTROL PLANS**

The traffic control plans contained herein show the location and spacing of signs and devices under ideal conditions. Signs and devices should be installed as shown on these plans whenever possible.

The proper application of the traffic control plans and installation of traffic control devices depends on actual field conditions.

Adjustments to the traffic control plans shall be made only at the direction of the Engineer to improve the visibility of the signs and devices and to better control traffic operations. Adjustments to the traffic control plans shall be based on safety of work forces and motorists,

abutting property requirements, driveways, side roads, and the vertical and horizontal curvature of the roadway.

The Engineer may require that the traffic control pattern be located significantly in advance of the work area to provide better sight line to the signing and safer traffic operations through the work zone.

Table I indicates the minimum taper length required for a lane closure based on the posted speed limit of the roadway. These taper lengths shall only be used when the recommended taper lengths shown on the traffic control plans cannot be achieved.

**TABLE I – MINIMUM TAPER LENGTHS**

POSTED SPEED LIMIT MILES PER HOUR	MINIMUM TAPER LENGTH IN FEET FOR A SINGLE LANE CLOSURE
30 OR LESS	180
35	250
40	320
45	540
50	600
55	660
65	780

## **SECTION 1. WORK ZONE SAFETY MEETINGS**

- 1.a) Prior to the commencement of work, a work zone safety meeting will be conducted with representatives of DOT Construction, Connecticut State Police (Local Barracks), Municipal Police, the Contractor (Project Superintendent) and the Traffic Control Subcontractor (if different than the prime Contractor) to review the traffic operations, lines of responsibility, and operating guidelines which will be used on the project. Other work zone safety meetings during the course of the project should be scheduled as needed.
- 1.b) A Work Zone Safety Meeting Agenda shall be developed and used at the meeting to outline the anticipated traffic control issues during the construction of this project. Any issues that can't be resolved at these meetings will be brought to the attention of the District Engineer and the Office of Construction. The agenda should include:
- Review Project scope of work and time
  - Review Section 1.08, Prosecution and Progress
  - Review Section 9.70, Trafficpersons
  - Review Section 9.71, Maintenance and Protection of Traffic
  - Review Contractor's schedule and method of operations.
  - Review areas of special concern: ramps, turning roadways, medians, lane drops, etc.
  - Open discussion of work zone questions and issues
  - Discussion of review and approval process for changes in contract requirements as they relate to work zone areas

## **SECTION 2. GENERAL**

- 2.a) If the required minimum number of signs and equipment (i.e. one High Mounted Internally Illuminated Flashing Arrow for each lane closed, two TMAs, Changeable Message Sign, etc.) are not available; the traffic control pattern shall not be installed.
- 2.b) The Contractor shall have back-up equipment (TMAs, High Mounted Internally Illuminated Flashing Arrow, Changeable Message Sign, construction signs, cones/drums, etc.) available at all times in case of mechanical failures, etc. The only exception to this is in the case of sudden equipment breakdowns in which the pattern may be installed but the Contractor must provide replacement equipment within 24 hours.
- 2.c) Failure of the Contractor to have the required minimum number of signs, personnel and equipment, which results in the pattern not being installed, shall not be a reason for a time extension or claim for loss time.

- 2.d) In cases of legitimate differences of opinion between the Contractor and the Inspection staff, the Inspection staff shall err on the side of safety. The matter shall be brought to the District Office for resolution immediately or, in the case of work after regular business hours, on the next business day.

### **SECTION 3. INSTALLING AND REMOVING TRAFFIC CONTROL PATTERNS**

- 3.a) Lane Closures shall be installed beginning with the advance warning signs and proceeding forward toward the work area.
- 3.b) Lane Closures shall be removed in the reverse order, beginning at the work area, or end of the traffic control pattern, and proceeding back toward the advance warning signs.
- 3.c) Stopping traffic may be allowed:
- As per the contract for such activities as blasting, steel erection, etc.
  - During paving, milling operations, etc. where, in the middle of the operation, it is necessary to flip the pattern to complete the operation on the other half of the roadway and traffic should not travel across the longitudinal joint or difference in roadway elevation.
  - To move slow moving equipment across live traffic lanes into the work area.
- 3.d) Under certain situations when the safety of the traveling public and/or that of the workers may be compromised due to conditions such as traffic volume, speed, roadside obstructions, or sight line deficiencies, as determined by the Engineer and/or State Police, traffic may be briefly impeded while installing and/or removing the advance warning signs and the first ten traffic cones/drums only. Appropriate measures shall be taken to safely slow traffic. If required, traffic slowing techniques may be used and shall include the use of Truck Mounted Impact Attenuators (TMAs) as appropriate, for a minimum of one mile in advance of the pattern starting point. Once the advance warning signs and the first ten traffic cones/drums are installed/removed, the TMAs and sign crew shall continue to install/remove the pattern as described in Section 5 and traffic shall be allowed to resume their normal travel.
- 3.e) The Contractor must adhere to using the proper signs, placing the signs correctly, and ensuring the proper spacing of signs.
- 3.f) Additional devices are required on entrance ramps, exit ramps, and intersecting roads to warn and/or move traffic into the proper travel path prior to merging/exiting with/from the main line traffic. This shall be completed before installing the mainline pattern past the ramp or intersecting roadway.
- 3.g) Prior to installing a pattern, any conflicting existing signs shall be covered with an opaque material. Once the pattern is removed, the existing signs shall be uncovered.



- 3.h) On limited access roadways, workers are prohibited from crossing the travel lanes to install and remove signs or other devices on the opposite side of the roadway. Any signs or devices on the opposite side of the roadway shall be installed and removed separately.

**SECTION 4. USE OF HIGH MOUNTED INTERNALLY ILLUMINATED FLASHING ARROW**

- 4.a) On limited access roadways, one Flashing Arrow shall be used for each lane that is closed. The Flashing Arrow shall be installed concurrently with the installation of the traffic control pattern and its placement shall be as shown on the traffic control plan. For multiple lane closures, one Flashing Arrow is required for each lane closed. If conditions warrant, additional Flashing Arrows should be employed (i.e.: curves, major ramps, etc.).
- 4.b) On non-limited access roadways, the use of a Flashing Arrow for lane closures is optional. The roadway geometry, sight line distance, and traffic volume should be considered in the decision to use the Flashing Arrow.
- 4.c) The Flashing Arrow shall not be used on two lane, two-way roadways for temporary alternating one-way traffic operations.
- 4.d) The Flashing Arrow board display shall be in the “arrow” mode for lane closure tapers and in the “caution” mode (four corners) for shoulder work, blocking the shoulder, or roadside work near the shoulder. The Flashing Arrow shall be in the “caution” mode when it is positioned in the closed lane.
- 4.e) The Flashing Arrow shall not be used on a multi-lane roadway to laterally shift all lanes of traffic, because unnecessary lane changing may result.

**SECTION 5. USE OF TRUCK MOUNTED IMPACT ATTENUATOR VEHICLES (TMAs)**

- 5.a) For lane closures on limited access roadways, a minimum of two TMAs shall be used to install and remove traffic control patterns. If two TMAs are not available, the pattern shall not be installed.
- 5.b) On non-limited access roadways, the use of TMAs to install and remove patterns closing a lane(s) is optional. The roadway geometry, sight line distance, and traffic volume should be considered in the decision to utilize the TMAs.
- 5.c) Generally, to establish the advance and transition signing, one TMA shall be placed on the shoulder and the second TMA shall be approximately 1,000 feet ahead blocking the lane. The flashing arrow board mounted on the TMA should be in the “flashing arrow”

mode when taking the lane. The sign truck and workers should be immediately ahead of the second TMA. In no case shall the TMA be used as the sign truck or a work truck. Once the transition is in place, the TMAs shall travel in the closed lane until all Changeable Message Signs, signs, Flashing Arrows, and cones/drums are installed. The flashing arrow board mounted on the TMA should be in the “caution” mode when traveling in the closed lane.

- 5.d) A TMA shall be placed prior to the first work area in the pattern. If there are multiple work areas within the same pattern, then additional TMAs shall be positioned at each additional work area as needed. The flashing arrow board mounted on the TMA should be in the “caution” mode when in the closed lane.
- 5.e) TMAs shall be positioned a sufficient distance prior to the workers or equipment being protected to allow for appropriate vehicle roll-ahead in the event that the TMA is hit, but not so far that an errant vehicle could travel around the TMA and into the work area. For additional placement and use details, refer to the specification entitled “Type ‘D’ Portable Impact Attenuation System”. Some operations, such as paving and concrete repairs, do not allow for placement of the TMA(s) within the specified distances. In these situations, the TMA(s) should be placed at the beginning of the work area and shall be advanced as the paving or concrete operations proceed.
- 5.f) TMAs should be paid in accordance with how the unit is utilized. When it is used as a TMA and is in the proper location as specified, and then it should be paid at the specified hourly rate for “Type ‘D’ Portable Impact Attenuation System”. When the TMA is used as a Flashing Arrow, it should be paid at the daily rate for “High Mounted Internally Illuminated Flashing Arrow”. If a TMA is used to install and remove a pattern and then is used as a Flashing Arrow, the unit should be paid as a “Type ‘D’ Portable Impact Attenuation System” for the hours used to install and remove the pattern, typically 2 hours (1 hour to install and 1 hour to remove), and is also paid for the day as a “High Mounted Internally Illuminated Flashing Arrow”.

## **SECTION 6. USE OF TRAFFIC DRUMS AND TRAFFIC CONES**

- 6.a) Traffic drums shall be used for taper channelization on limited-access roadways, ramps, and turning roadways and to delineate raised catch basins and other hazards.
- 6.b) Traffic drums shall be used in place of traffic cones in traffic control patterns that are in effect for more than a 36-hour duration.
- 6.c) Traffic Cones less than 42 inches in height shall not be used on limited-access roadways or on non-limited access roadways with a posted speed limit of 45 mph and above.

- 6.d) Typical spacing of traffic drums and/or cones shown on the Traffic Control Plans in the Contract are maximum spacings and may be reduced to meet actual field conditions as required.

**SECTION 7. USE OF (REMOTE CONTROLLED) CHANGEABLE MESSAGE SIGNS (CMS)**

- 7.a) For lane closures on limited access roadways, one CMS shall be used in advance of the traffic control pattern. Prior to installing the pattern, the CMS shall be installed and in operation, displaying the appropriate lane closure information (i.e.: Left Lane Closed - Merge Right). The CMS shall be positioned ½ - 1 mile ahead of the lane closure taper. If the nearest Exit ramp is greater than the specified ½ - 1 mile distance, than an additional CMS shall be positioned a sufficient distance ahead of the Exit ramp to alert motorists to the work and therefore offer them an opportunity to take the exit.
- 7.b) CMS should not be installed within 1000 feet of an existing CMS.
- 7.c) On non-limited access roadways, the use of CMS for lane closures is optional. The roadway geometry, sight line distance, and traffic volume should be considered in the decision to use the CMS.
- 7.d) The advance CMS is typically placed off the right shoulder, 5 feet from the edge of pavement. In areas where the CMS cannot be placed beyond the edge of pavement, it may be placed on the paved shoulder with a minimum of five (5) traffic drums placed in a taper in front of it to delineate its position. The advance CMS shall be adequately protected if it is used for a continuous duration of 36 hours or more.
- 7.e) When the CMS are no longer required, they should be removed from the clear zone and have the display screen cleared and turned 90° away from the roadway.
- 7.f) The CMS generally should not be used for generic messages (ex: Road Work Ahead, Bump Ahead, Gravel Road, etc.).
- 7.g) The CMS should be used for specific situations that need to command the motorist's attention which cannot be conveyed with standard construction signs (Examples include: Exit 34 Closed Sat/Sun - Use Exit 35, All Lanes Closed - Use Shoulder, Workers on Road - Slow Down).
- 7.h) Messages that need to be displayed for long periods of time, such as during stage construction, should be displayed with construction signs. For special signs, please coordinate with the Office of Construction and the Division of Traffic Engineering for the proper layout/dimensions required.
- 7.i) The messages that are allowed on the CMS are as follows:

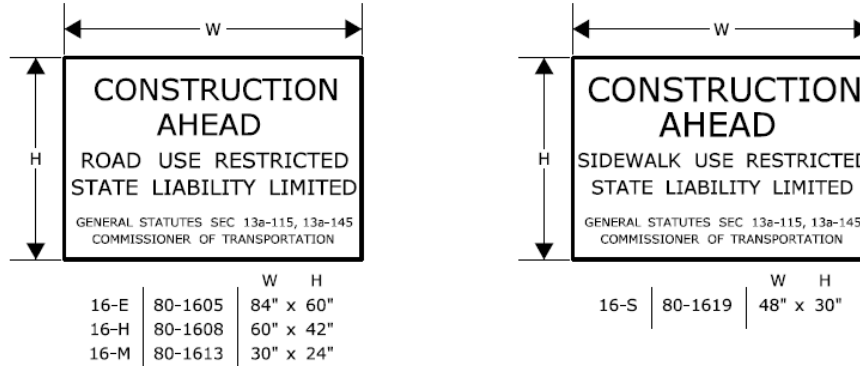
<u>Message No.</u>	<u>Frame 1</u>	<u>Frame 2</u>	<u>Message No.</u>	<u>Frame 1</u>	<u>Frame 2</u>
1	LEFT LANE CLOSED	MERGE RIGHT	9	LANES CLOSED AHEAD	REDUCE SPEED
2	2 LEFT LANES CLOSED	MERGE RIGHT	10	LANES CLOSED AHEAD	USE CAUTION
3	LEFT LANE CLOSED	REDUCE SPEED	11	WORKERS ON ROAD	REDUCE SPEED
4	2 LEFT LANES CLOSED	REDUCE SPEED	12	WORKERS ON ROAD	SLOW DOWN
5	RIGHT LANE CLOSED	MERGE LEFT	13	EXIT XX CLOSED	USE EXIT YY
6	2 RIGHT LANES CLOSED	MERGE LEFT	14	EXIT XX CLOSED USE YY	FOLLOW DETOUR
7	RIGHT LANE CLOSED	REDUCE SPEED	15	2 LANES SHIFT AHEAD	USE CAUTION
8	2 RIGHT LANES CLOSED	REDUCE SPEED	16	3 LANES SHIFT AHEAD	USE CAUTION

For any other message(s), approval must be received from the Office of Construction prior to their use. No more than two (2) displays shall be used within any message cycle.

**SECTION 8. USE OF STATE POLICE OFFICERS**

- 8.a) State Police may be utilized only on limited access highways and secondary roadways under their primary jurisdiction. One Officer may be used per critical sign pattern. Shoulder closures and right lane closures can generally be implemented without the presence of a State Police Officer. Likewise in areas with moderate traffic and wide, unobstructed medians, left lane closures can be implemented without State Police presence. Under some situations it may be desirable to have State Police presence, when one is available. Examples of this include: nighttime lane closures; left lane closures with minimal width for setting up advance signs and staging; lane and shoulder closures on turning roadways/ramps or mainline where sight distance is minimal; and closures where extensive turning movements or traffic congestion regularly occur, however they are not required.
- 8.b) Once the pattern is in place, the State Police Officer should be positioned in a non-hazardous location in advance of the pattern. If traffic backs up beyond the beginning of the pattern, then the State Police Officer shall be repositioned prior to the backup to give warning to the oncoming motorists. The State Police Officer and TMA should not be in proximity to each other.
- 8.c) Other functions of the State Police Officer(s) may include:
- Assisting entering/exiting construction vehicles within the work area.
  - Enforcement of speed and other motor vehicle laws within the work area, if specifically requested by the project.
- 8.d) State Police Officers assigned to a work site are to only take direction from the Engineer.

### SERIES 16 SIGNS



THE 16-S SIGN SHALL BE USED ON ALL PROJECTS THAT REQUIRE SIDEWALK RECONSTRUCTION OR RESTRICT PEDESTRIAN TRAVEL ON AN EXISTING SIDEWALK.

SERIES 16 SIGNS SHALL BE INSTALLED IN ADVANCE OF THE TRAFFIC CONTROL PATTERNS TO ALLOW MOTORISTS THE OPPORTUNITY TO AVOID A WORK ZONE. SERIES 16 SIGNS SHALL BE INSTALLED ON ANY MAJOR INTERSECTING ROADWAYS THAT APPROACH THE WORK ZONE. ON LIMITED-ACCESS HIGHWAYS, THESE SIGNS SHALL BE LOCATED IN ADVANCE OF THE NEAREST UPSTREAM EXIT RAMP AND ON ANY ENTRANCE RAMPS PRIOR TO OR WITHIN THE WORK ZONE LIMITS.

THE LOCATION OF SERIES 16 SIGNS CAN BE FOUND ELSEWHERE IN THE PLANS OR INSTALLED AS DIRECTED BY THE ENGINEER.

SIGNS 16-E AND 16-H SHALL BE POST-MOUNTED.

SIGN 16-E SHALL BE USED ON ALL EXPRESSWAYS.

SIGN 16-H SHALL BE USED ON ALL RAMPS, OTHER STATE ROADWAYS, AND MAJOR TOWN/CITY ROADWAYS.

SIGN 16-M SHALL BE USED ON OTHER TOWN ROADWAYS.

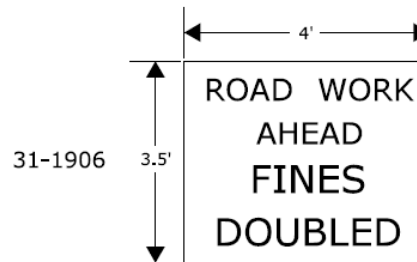
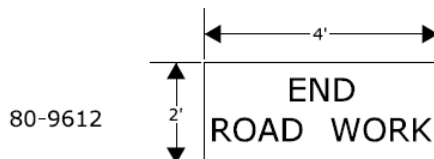
### REGULATORY SIGN "ROAD WORK AHEAD, FINES DOUBLED"

THE REGULATORY SIGN "ROAD WORK AHEAD FINES DOUBLED" SHALL BE INSTALLED FOR ALL WORK ZONES THAT OCCUR ON ANY STATE HIGHWAY IN CONNECTICUT WHERE THERE ARE WORKERS ON THE HIGHWAY OR WHEN THERE IS OTHER THAN EXISTING TRAFFIC OPERATIONS.

THE "ROAD WORK AHEAD FINES DOUBLED" REGULATORY SIGN SHALL BE PLACED AFTER THE SERIES 16 SIGN AND IN ADVANCE OF THE "ROAD WORK AHEAD" SIGN.

### "END ROAD WORK" SIGN

THE LAST SIGN IN THE PATTERN MUST BE THE "END ROAD WORK" SIGN.



SCALE: NONE

CONSTRUCTION TRAFFIC CONTROL PLAN  
**REQUIRED SIGNS**

## 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 (AA), (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 (MILES PER HOUR)	MINIMUM TAPER LENGTH FOR 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)

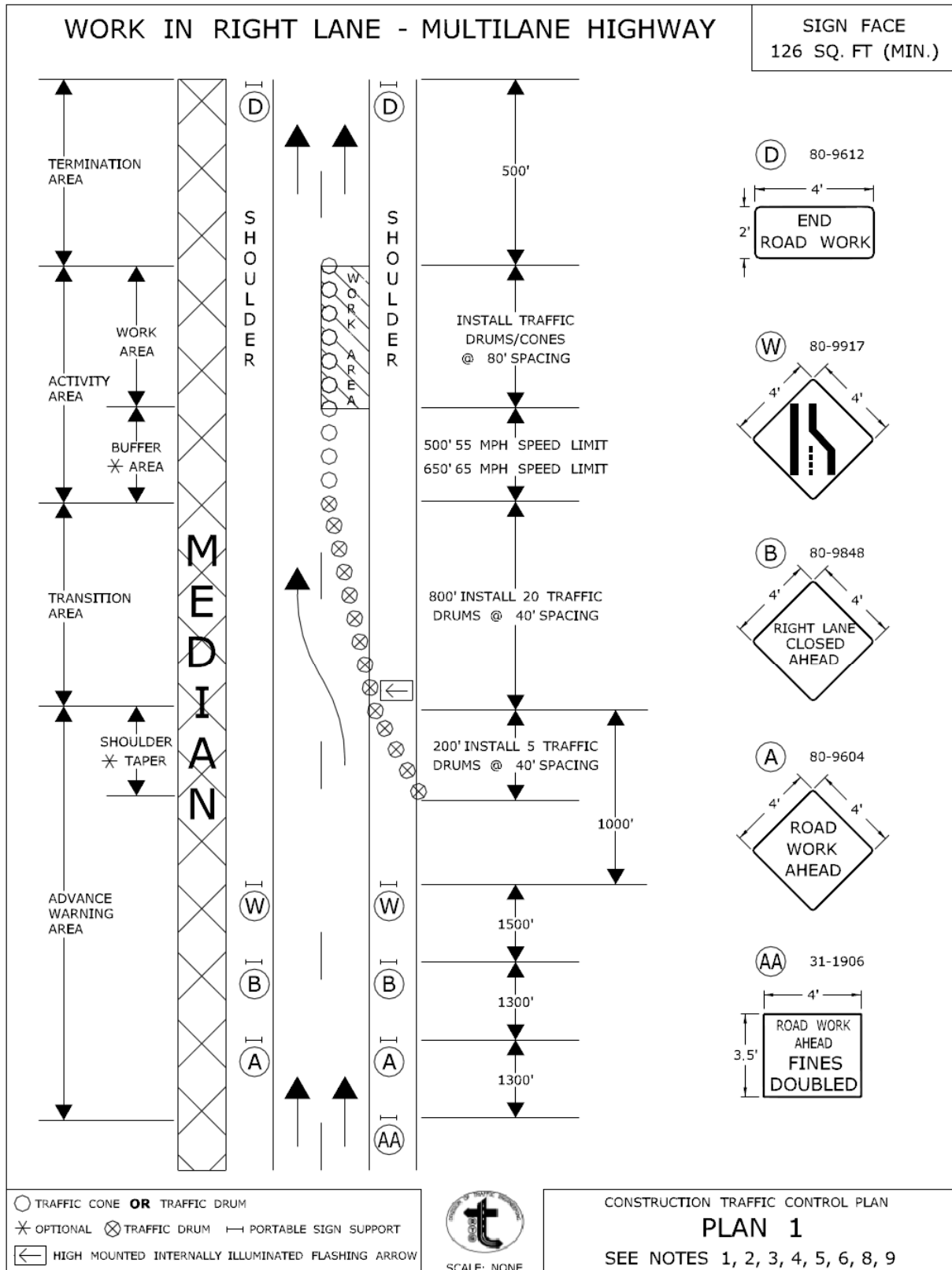
METRIC CONVERSION CHART (1" = 25mm)

ENGLISH	METRIC	ENGLISH	METRIC	ENGLISH	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



SCALE: NONE

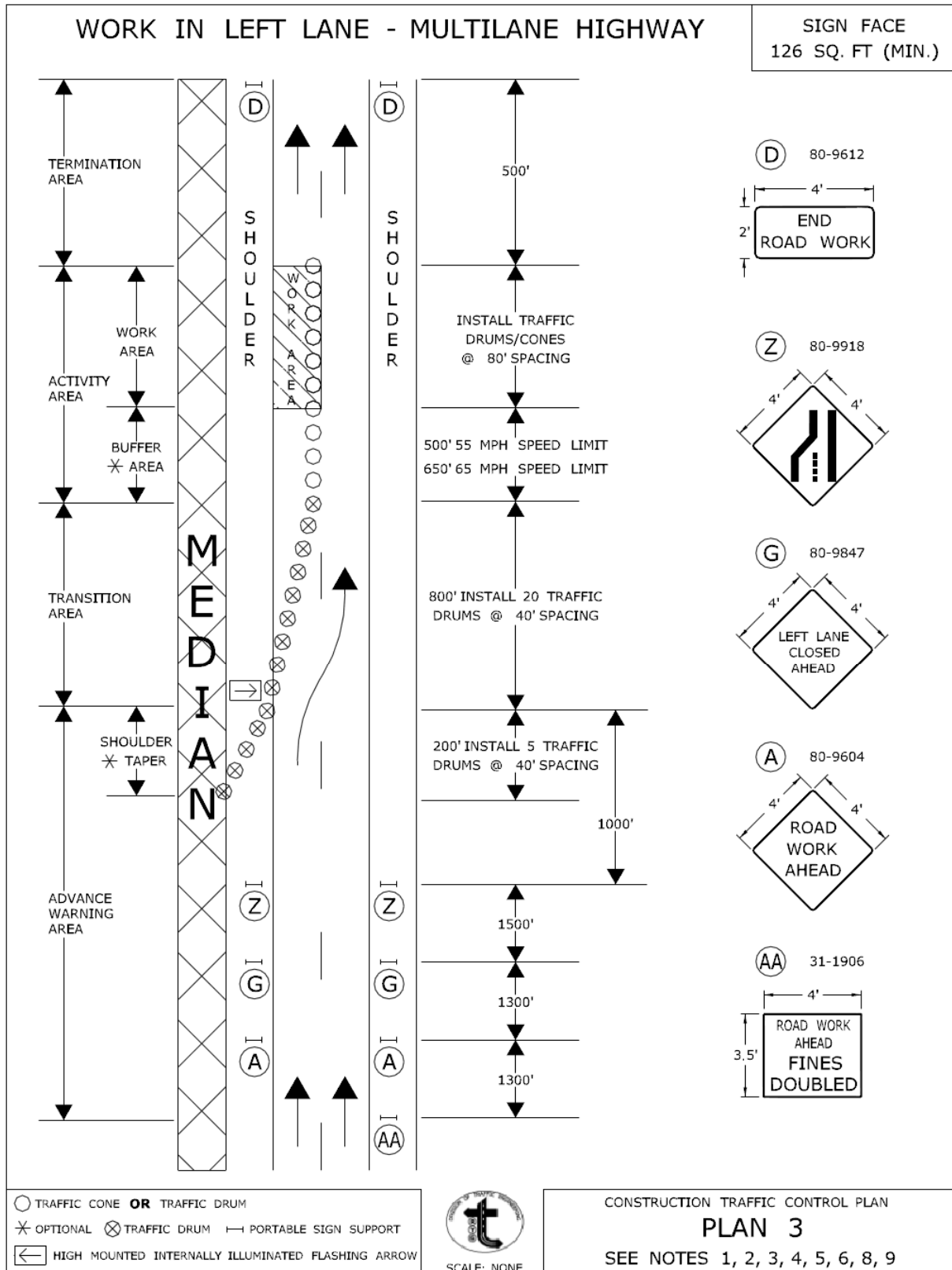
### CONSTRUCTION TRAFFIC CONTROL PLAN NOTES



CONNECTICUT DEPARTMENT OF TRANSPORTATION  
BUREAU OF ENGINEERING & CONSTRUCTION

APPROVED *Charles S. Harlow*  
Charles S. Harlow  
2012.06.05 15:51:00-0400  
PRINCIPAL ENGINEER





CONNECTICUT DEPARTMENT OF TRANSPORTATION  
BUREAU OF ENGINEERING & CONSTRUCTION

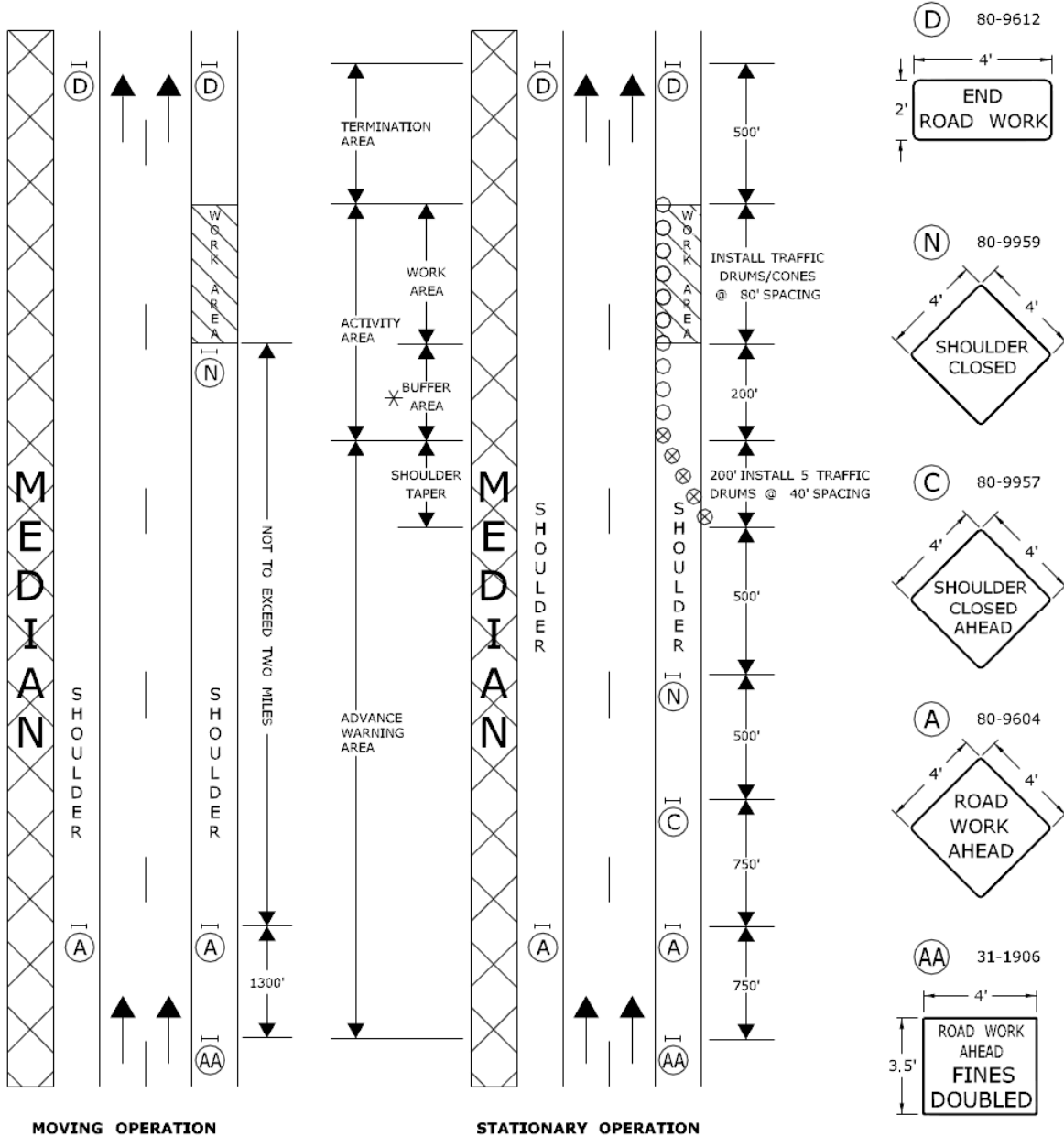


SCALE: NONE

APPROVED *Charles S. Harlow*  
 Charles S. Harlow  
 2012.06.05 15:51:46-0400  
 PRINCIPAL ENGINEER

WORK IN SHOULDER AREA - MULTILANE HIGHWAY

SIGN FACE  
94 SQ. FT (MIN.)



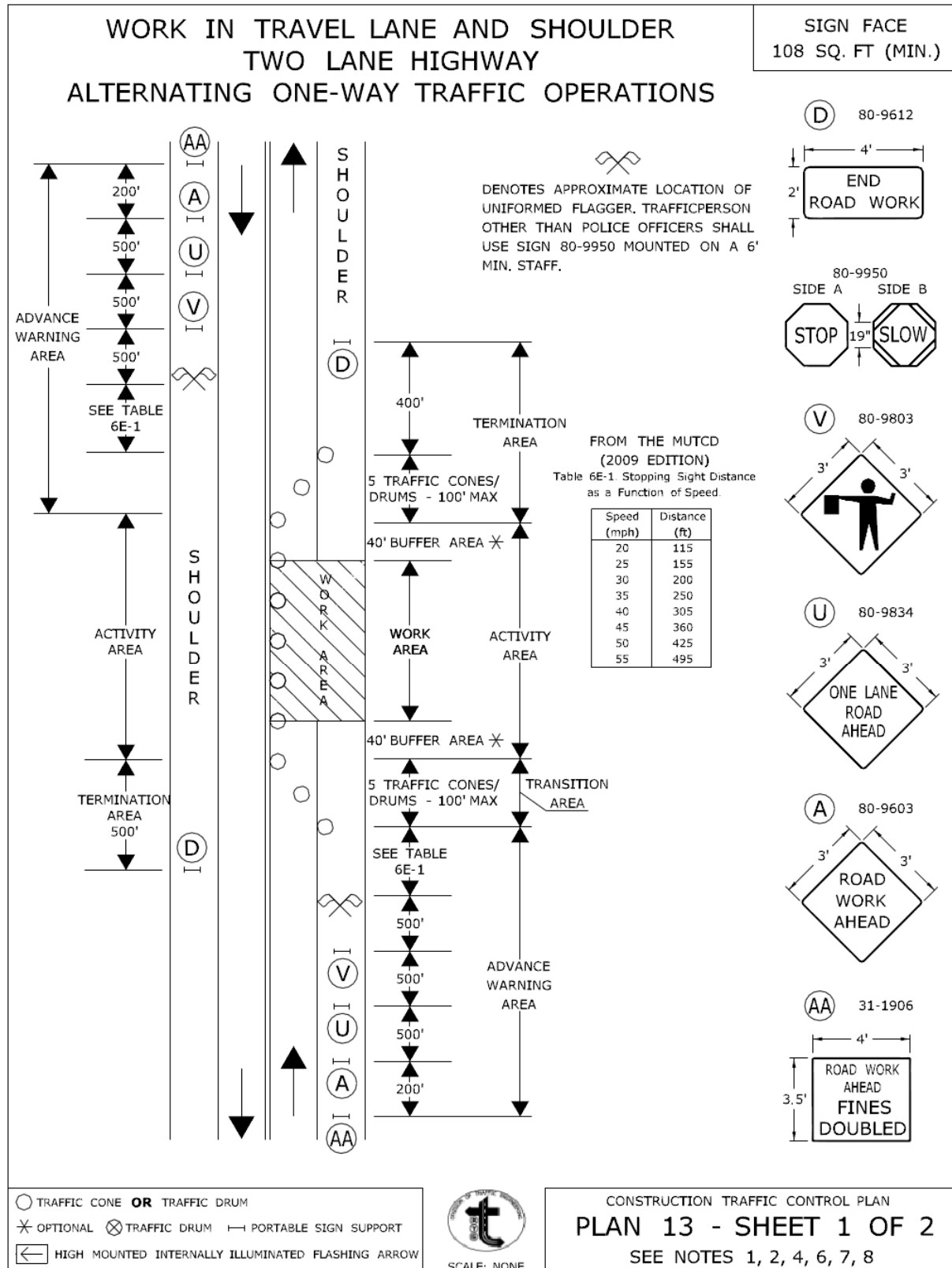
- TRAFFIC CONE OR TRAFFIC DRUM
- \* OPTIONAL ⊗ TRAFFIC DRUM — PORTABLE SIGN SUPPORT
- ◀ HIGH MOUNTED INTERNALLY ILLUMINATED FLASHING ARROW



CONSTRUCTION TRAFFIC CONTROL PLAN  
**PLAN 6**  
SEE NOTES 1, 2, 4, 8

CONNECTICUT DEPARTMENT OF TRANSPORTATION  
BUREAU OF ENGINEERING & CONSTRUCTION

APPROVED *Charles S. Harlow*  
PRINCIPAL ENGINEER  
2012.06.05 15:52:38-04'00"



# WORK IN TRAVEL LANE AND SHOULDER TWO LANE HIGHWAY ALTERNATING ONE-WAY TRAFFIC OPERATIONS

SIGN FACE  
108 SQ. FT (MIN.)

## HAND SIGNAL METHODS TO BE USED BY UNIFORMED FLAGGERS

THE FOLLOWING METHODS FROM SECTION 6E.07, FLAGGER PROCEDURES, IN THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES," SHALL BE USED BY UNIFORMED FLAGGERS WHEN DIRECTING TRAFFIC THROUGH A WORK AREA. THE STOP/SLOW SIGN PADDLE (SIGN NO. 80-9950) SHOWN ON THE TRAFFIC STANDARD SHEET TR-1220 01 ENTITLED, "SIGNS FOR CONSTRUCTION AND PERMIT OPERATIONS" SHALL BE USED.

**A. TO STOP TRAFFIC**

TO STOP ROAD USERS, THE FLAGGER SHALL FACE ROAD USERS AND AIM THE STOP PADDLE FACE TOWARD ROAD USERS IN A STATIONARY POSITION WITH THE ARM EXTENDED HORIZONTALLY AWAY FROM THE BODY. THE FREE ARM SHALL BE HELD WITH THE PALM OF THE HAND ABOVE SHOULDER LEVEL TOWARD APPROACHING TRAFFIC.



**B. TO DIRECT TRAFFIC TO PROCEED**

TO DIRECT STOPPED ROAD USERS TO PROCEED, THE FLAGGER SHALL FACE ROAD USERS WITH THE SLOW PADDLE FACE AIMED TOWARD ROAD USERS IN A STATIONARY POSITION WITH THE ARM EXTENDED HORIZONTALLY AWAY FROM THE BODY. THE FLAGGER SHALL MOTION WITH THE FREE HAND FOR ROAD USERS TO PROCEED.



**C. TO ALERT OR SLOW TRAFFIC**

TO ALERT OR SLOW TRAFFIC, THE FLAGGER SHALL FACE ROAD USERS WITH THE SLOW PADDLE FACE AIMED TOWARD ROAD USERS IN A STATIONARY POSITION WITH THE ARM EXTENDED HORIZONTALLY AWAY FROM THE BODY. TO FURTHER ALERT OR SLOW TRAFFIC, THE FLAGGER HOLDING THE SLOW PADDLE FACE TOWARD ROAD USERS MAY MOTION UP AND DOWN WITH THE FREE HAND, PALM DOWN.



- TRAFFIC CONE **OR** TRAFFIC DRUM
- ✱ OPTIONAL ⊗ TRAFFIC DRUM — PORTABLE SIGN SUPPORT
- ◀ HIGH MOUNTED INTERNALLY ILLUMINATED FLASHING ARROW

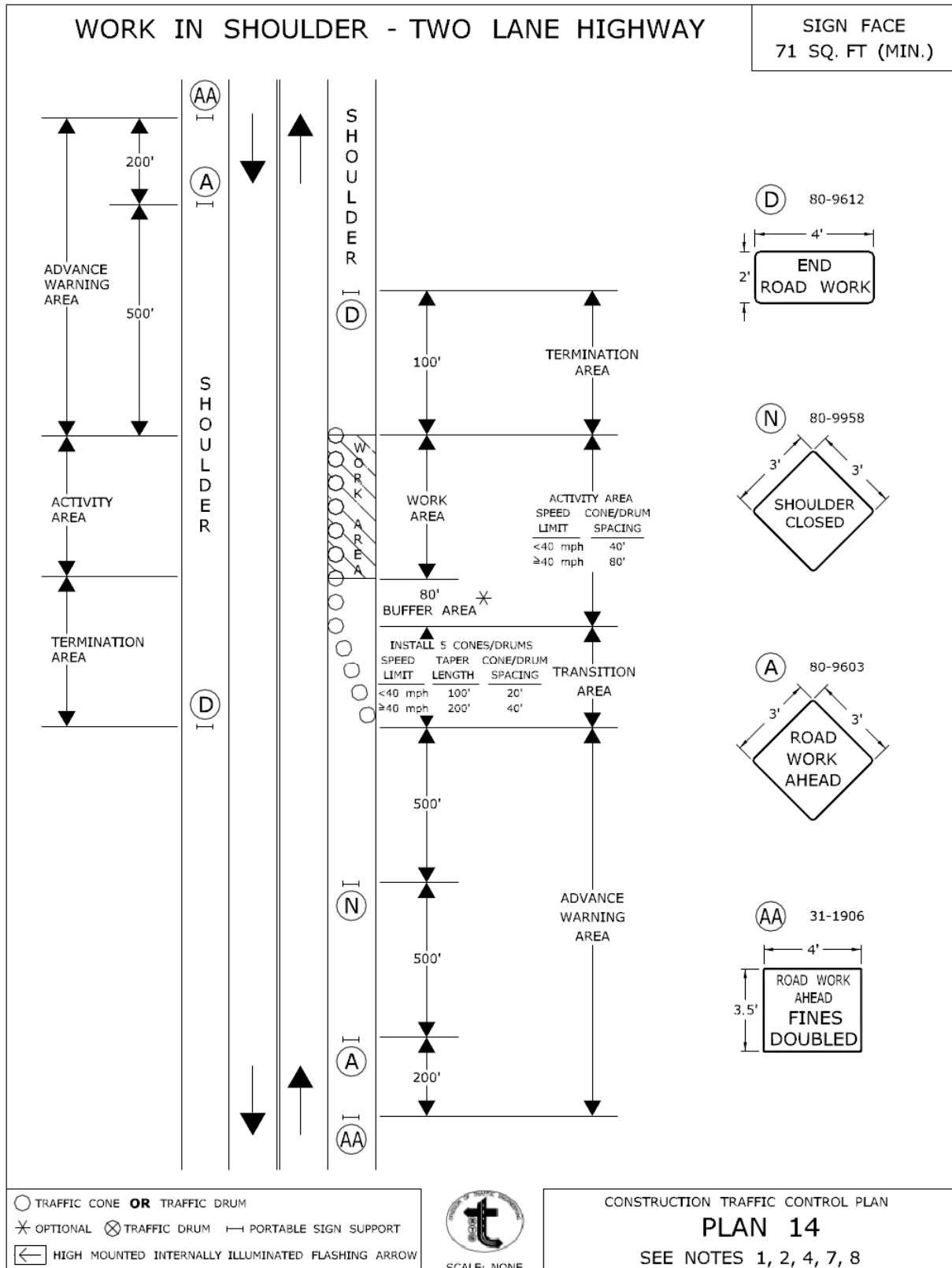


SCALE: NONE

CONSTRUCTION TRAFFIC CONTROL PLAN  
**PLAN 13 - SHEET 2 OF 2**  
SEE NOTES 1, 2, 4, 6, 7, 8

CONNECTICUT DEPARTMENT OF TRANSPORTATION  
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APPROVED *Charles S. Harlow* Charles S. Harlow  
2012.06.05 15:55:45-04'00"  
PRINCIPAL ENGINEER



○ TRAFFIC CONE **OR** TRAFFIC DRUM  
 ✱ OPTIONAL ⊗ TRAFFIC DRUM — PORTABLE SIGN SUPPORT  
 ◀ HIGH MOUNTED INTERNALLY ILLUMINATED FLASHING ARROW



SCALE: NONE

CONSTRUCTION TRAFFIC CONTROL PLAN

### PLAN 14

SEE NOTES 1, 2, 4, 7, 8

CONNECTICUT DEPARTMENT OF TRANSPORTATION  
 BUREAU OF ENGINEERING & CONSTRUCTION

APPROVED *Charles S. Harlow* Charles S. Harlow  
 2012.08.05 15:56:09-04'00"  
 PRINCIPAL ENGINEER

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

The temporary relocation of signs and supports, and the furnishing, installation and removal of any temporary supports shall be paid for under the item “Maintenance and Protection of Traffic”. Temporary overhead sign supports and foundations shall be paid for under the appropriate item(s).

The cost of furnishing, installing, and removing the material for the 4H:1V traversable slope shall be paid for under the item “Maintenance and Protection of Traffic.”

<u>Pay Item</u>	<u>Pay Unit</u>
Maintenance and Protection of Traffic	L.S.

## **ITEM #1131002A - REMOTE CONTROLLED CHANGEABLE MESSAGE SIGN**

**Description:** Work under this item shall include furnishing and maintaining a trailer-mounted, “Changeable Message Sign”, “Remote Controlled Changeable Message Sign”, “Changeable Message Sign with Radar”, or “Remote Controlled Changeable Message Sign with Radar” whichever is applicable, at the locations indicated on the plans or as directed by the Engineer.

**Materials:** The full matrix, internally illuminated variable message sign shall consist of a LED, fiber optic, lamp matrix, or hybrid magnetically operated matrix – LED message board; and a computer operated interface, all mounted on a towable, heavy duty trailer.

The sign shall have a minimum horizontal dimension of 115 inches and rotate a complete 360 degrees atop the lift mechanism.

In the raised position, the bottom of the sign shall be at least 7 feet above the roadway. The messages displayed shall be visible from a distance of 1/2 mile and be clearly legible from a distance of 900 feet during both the day and night.

The lighting system shall be controlled both manually and by a photocell for automatic sign dimming during nighttime use.

The sign shall be capable of storing a minimum of 100 preprogrammed messages and be able to display any one of those messages upon call from the trailer mounted terminal and/or through the cellular telephone hookup for the remote controlled sign.

The sign shall be a full matrix sign that is able to display messages composed of any combination of alphanumeric text, punctuation symbols, and graphic images (notwithstanding NTCIP limitations). The display shall be capable of producing arrow functions. Full- matrix displays shall allow the use of graphics, traffic safety symbols and various character heights.

Standard messages shall be displayed in a three-line message format with 8 characters per line. The letter height shall not be less than 18 inches.

The sign shall utilize yellow green for the display with a black background. Each matrix shall have a minimum size of 6 x 9 pixels. Each pixel shall utilize a minimum of four high output yellow green LEDs or equivalent light source. The LEDs or light source shall have a minimum 1.4 candela luminance intensity, 22 degrees viewing angle, and wavelength of 590 (+/- 3) nanometers.

For hybrid magnetically operated matrix – LED matrix, each pixel shall have one single shutter faced with yellow green retro-reflective sheeting with a minimum of four high output yellow green LEDs or equivalent light source. The hybrid magnetically operated matrix – LED matrix sign shall be capable of operating in three display modes; shutter only, LED only, and both LED

and shutter. These modes shall be automatically controlled by a photocell for day and night conditions and also capable of being manually controlled through the software.

The sign shall be controlled by an on-board computer. The sign shall automatically change to a preselected default message upon failure. That default message shall remain on display until the problem is corrected.

The sign shall include all necessary controls, including, but not limited to, personal computer, keyboard or alphanumeric hand-held keyboard, and software. The sign shall interface with PCs, cellular phones, and radar speed detection devices as required.

Controls shall be furnished for raising and lowering the message board, aligning the message board and, for solar powered units, a read-out of the battery bank charge.

Power shall be provided by a self-contained solar maintained power source or a diesel engine driven generator. Hardware for connection to a 110-volt power source shall also be provided.

Solar powered signs shall display programmed messages with the solar panel disconnected, in full night conditions, for a minimum of 30 consecutive days.

Remote Controlled Changeable Message Signs shall include one (1) industrial-grade cellular telephone and be equipped with a modem to control the sign and a security system to prevent unauthorized access. The security system shall allow access only through use of a code or password unique to that sign. If the proper code or password is not entered within 60 seconds of initial telephone contact, the call will be terminated. Remote control for the Remote Controlled Changeable Message Sign shall be by cellular telephone and touch tone modem decoder.

The radar equipped signs shall include a high-speed electronic control module (ECM-X), Radar SI transceiver, signal processing board and radar logging software.

The radar software will operate the sign in four modes:

- 1) The sign will display words "YOUR SPEED" followed by the speed (2 digits). The display will repeat the message as long as vehicles are detected. The sign will blank when no vehicles are present.
- 2) The sign will display a series of up to six messages (programmed by the user) when a preset speed (programmed by the user) is exceeded. The sign will blank when no vehicles are present.
- 3) Will perform like mode #2 with the addition of displaying the actual speed with it.
- 4) The sign will work as a standard Changeable Message Sign or Remote Controlled Changeable Message Sign with no radar.

**Construction Methods:** The Contractor shall furnish, place, operate, maintain and relocate the sign as required. When the sign is no longer required, it shall be removed and become the property of the Contractor. The cellular telephone required for the Remote Controlled Changeable Message Sign shall be provided to the Engineer for his use, and subsequently returned to the Contractor.



When the sign is not in use, it shall either be turned off with a blank display or turned from view.

Any signs that are missing, damaged, defaced or improperly functioning so that they are not effective, as determined by the Engineer and in accordance with the ATSSA guidelines contained in "Quality Standards for Work Zone Traffic Control Devices," shall be replaced by the Contractor at no cost to the State.

**Method of Measurement:** This work will be measured for payment for each "Changeable Message Sign", "Remote Controlled Changeable Message Sign", "Changeable Message Sign with Radar", or "Remote Controlled Changeable Message Sign with Radar", whichever applies, furnished and installed, for the number of calendar days that the sign is in place and in operation, measured to the nearest day. When a sign is in operation for less than a day, such a period of time shall be considered to be a full day regardless of actual time in operation.

**Basis of Payment:** This work will be paid for at the Contract unit price per day for each "Changeable Message Sign", "Remote Controlled Changeable Message Sign", "Changeable Message Sign with Radar", or "Remote Controlled Changeable Message Sign with Radar" which price shall include placing, maintaining, relocating and removing the sign and its appurtenances and all material, labor, tools and equipment incidental thereto. Additionally, for the "Remote Controlled Changeable Message Sign", or "Remote Controlled Changeable Message Sign with Radar", the cellular telephone service and telephone charges shall be included.

<u>Pay Item</u>	<u>Pay Unit</u>
Remote Controlled Changeable Message Sign	Day

**ITEM #1206023A - REMOVAL AND RELOCATION OF EXISTING SIGNS**

Section 12.06 is supplemented as follows:

**Article 12.06.01 – Description is supplemented with the following:**

Work under this item shall consist of the removal and/or relocation of designated side-mounted extruded aluminum and sheet aluminum signs, sign posts, sign supports, and foundations where indicated on the plans or as directed by the Engineer. Work under this item shall also include furnishing and installing new sign posts and associated hardware for signs designated for relocation.

**Article 12.06.03 – Construction Methods is supplemented with the following:**

The Contractor shall take care during the removal and relocation of existing signs, sign posts, and sign supports that are to be relocated so that they are not damaged. Any material that is damaged shall be replaced by the Contractor at no cost to the State.

Foundations and other materials designated for removal shall be removed and disposed of by the Contractor as directed by the Engineer and in accordance with existing standards for Removal of Existing Signing.

Sheet aluminum signs designated for relocation are to be re-installed on new sign posts.

**Article 12.06.04 – Method of Measurement is supplemented with the following:**

Payment under Removal and Relocation of Existing Signs shall be at the contract lump sum price which shall include all extruded aluminum and sheet aluminum signs, sign posts, and sign supports designated for relocation, all new sign posts and associated hardware for signs designated for relocation, all extruded aluminum signs, sheet aluminum signs, sign posts and sign supports designated for scrap, and foundations and other materials designated for removal and disposal, and all work and equipment required.

**Article 12.06.05 – Basis of Payment is supplemented with the following:**

This work will be paid for at the contract lump sum price for “Removal and Relocation of Existing Signs” which price shall include relocating designated extruded aluminum and sheet aluminum signs, sign posts, and sign supports, providing new posts and associated hardware for relocated signs, removing and disposing of foundations and other materials, and all equipment, material, tools and labor incidental thereto. This price shall also include removing, loading, transporting, and unloading of extruded aluminum signs, sheet aluminum signs, sign posts, and sign supports designated for scrap and all equipment, material, tools and labor incidental thereto.

<u>Pay Item</u>	<u>Pay Unit</u>
Removal and Relocation of Existing Signs	L.S.

**ITEM #1301019A – TEMPORARY RELOCATION OF WATER MAIN**

**ITEM #1301765A – FURNISHING AND INSTALLING 12” WATERMAIN**

**ITEM #1301768A – FURNISHING AND INSTALLING 12” WATERMAIN ON BRIDGE**

**Description:** The Contractor shall furnish and install high density polyethylene pipe, of the sizes indicated, and all the fittings and appurtenances to the lines and grades shown on the Contract Drawings, complete as shown, specified or directed, including but not limited to; pressure reducing valves, vaults, bends, restraint, blow off assemblies, gate/butterfly valves, air valves, sterilization fittings, watermain support system, tapping sleeves, tapping gates, RCP sleeve, gate boxes, tees, thrust blocks and anchors, polystyrene, transporting materials, digging test pits, the clearing, trenching, disposing of unused excavated materials, removing and disposing of sections of the present water mains and concrete anchors, furnishing installing and field testing the pipelines complete with lacings and harnessing, concrete anchor/thrust blocks and utility identification tape, all trenching, rock removal, refilling trenches, filter fabric, furnishing additional material for refilling, trench compaction/testing, temporary and permanent surface restoration, miscellaneous grading, sheeting, bracing, pumping and all incidental work where required, to the specifications and details of the District, except as otherwise herein provided for.

Reference to “FTDWD” in this Item refers to “First Taxing District Water Department”.

**Materials:** All materials used shall be from manufacturers and models as specified in the FTDWD “Approved Materials List for Water Main Installations” unless otherwise approved by the Engineer.

The FTDWD will furnish to the Contractor all pipeline materials for the proposed work including the insulated and non-insulated High Density Polyethylene Pipe, tapping sleeves, gate valves, air valve, insertion valves, curb boxes, blow-off assembly, line stops and any other water appurtenances shown detailed on the drawings. Material descriptions are provided for Contractor reference, and shall be specified in any shop drawings prepared by the Contractor, noting the material to be provided by FTDWD. Contractor shall coordinate work and pickup of materials with NFDWD, and shall be responsible of materials upon receipt, noting to properly ship and store the materials at the construction site until installation.

High Density Polyethylene Pipe - Submittals: Six (6) sets of the manufacturer's literature and/or shop drawings for the materials of this section shall be submitted for approval. The Contractor shall furnish detailed drawings as follows and no work shall be fabricated until they have been approved by the Engineer:

1. Dimensions and general details for typical length of pipe.

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2. Detail of joint between pipes for welded and restrained joints together with installation instructions.
3. Dimensions and general details for all fittings including joint details for both butt-fused and restrained joints.
4. Location plans or lists showing number of pipes and fittings and other such information as needed for installation.

Prior to pipe-laying, the Contractor shall dig test pits where the new pipe connects to the present water main to ascertain the location, elevation and cross-sectional dimensions of the present mains.

Pipe Specifications: All high-density polyethylene (HDPE) pipe shall be manufactured from virgin polyethylene resin, PE 3408 and shall conform to ASTM D3350. All HDPE pipe and fitting shall be DR 17 rated at 100 psi.

AWWA C960-90/ASTM D1248/ASTM D2837/ASTM F714, furnished Polyethylene PE Pressure Pipe and fitting for water distribution, for polyethylene plastic molding and extrusions, method for obtaining hydrostatic design basis for thermoplastic pipe materials, for Polyethylene plastic pipe based on outside diameter per AWWA C960-90/ASTM D1248/ASTM D2838/ASTM F714

HDPE pipe shall be homogeneous throughout, free from voids, cracks, and other defect; as uniform as commercially practical in color density and other physical properties. Pipe surfaces shall be free of nicks, scratches, and other blemishes. The joint surfaces of pipe shall be free from gouges and imperfections that could cause leakage at joints.

The Contractor shall submit to the Engineer a certified statement that the inspection and all of the specified tests have been made and met.

Where shown, specified or ordered, the pipe shall be joined by butt-fusion methods, having a complete uniform and monolithic pipe interior according to the fusion joining procedures as instructed by the manufacture. Each individual performing fusion joining shall have a minimum of one year of experience in the use of the fusion procedure.

Each pipe shall have cast or stamped on it the maker's name or mark, the year in which the pipe is cast, and the letters "HDPE" as required by the American National Standards Institute Specifications. The weight and thickness class shall be painted on each pipe, as required by the American National Standards Institute Specifications, and a record of weight for each pipe before the application of a lining or coating shall be submitted to the Engineer.

The pipes will be pre-insulated by URECON or approved equal, including the 6" diameter HDPE pipe used for the temporary watermain.

Unless otherwise shown, specified or ordered, all fittings shall be butt-fused joint (BJ).

Joint Accessories: All joint accessories shall be furnished with each pipe and fitting and shall be plainly identified as to pipe size. A certified statement that all required tests on the joint accessories have been made and met as specified shall be submitted to the Engineer.

The Contractor shall submit to the Engineer a certified statement that the inspection and all of the specified tests have been made and met.

THE FOLLOWING ARE ACCEPTABLE PIPE MANUFACTURERS:

ISCO Industries  
ENDOT Industries  
Performance Pipe

Inspection: All pipe and fittings shall be subject to inspection by the Engineer after delivery to the job site and may also be subject to inspection at the foundry by a representative of the FTDWD.

Retainer glands for mechanical joints shall conform to ANSI/AWWA C111/A21.11 and the following additional requirements:

1. All retainer glands shall be ductile iron and all retaining devices shall be heat treated ductile iron.
2. All retainer glands shall have a minimum rated working pressure of 250 psi.

The retainer glands shall be Megalug Series 2000PV as manufactured by EBAA Iron Sales, Inc. Eastland, Texas or approved equal.

Trench Refill: Trench refill materials shall meet the following requirements:

Native Backfill: Native backfill shall consist of granular soil excavated on site meeting the approval of the Engineer. Materials shall be of such a nature that they will form a stable dense fill. Materials shall not contain stones larger than 6-inch, vegetation, masses of roots, individual roots more than 12-feet long or more than 1/2-inch in diameter, trash, clays, or plastic fines. Organic matter shall not exceed two percent (2%). Non-plastic fines (silts) shall not exceed 20 percent (20%).

Bank Gravel: Bank gravel shall conform to the requirements of Article M.02.01-2, CDOT Form 816.

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**Crushed Stone:** Crushed stone shall conform to the requirements of Article M.02.01-1 Grading A, CDOT Form 816 and Sub Article M.02.02-2(a), CDOT Form 816, for loss on abrasion.

**Granular Base:** Granular base shall conform to the requirements of Article M.02.03, Grading “C”, CTDOT Form 816.

**Sand:** Sand shall conform to the requirements of Sub article M.11.04c, CDOT Form 816.

**Utility Identification Tape:** Utility identification tape shall be 4-inch wide non-detectable, designed to withstand extended underground exposure, colored blue and be durably imprinted with an appropriate warning indicating the presence of the buried pipe.

**Ductile Iron Pipe and Fittings:** Refer to the “Ductile Iron Pipe (Water Main)” specification.

**Gate Valve, Extension Stem and Gate Box:** Refer to FTDWD Detail.

**Concrete anchor/ Thrust blocks:** Anchors and thrust blocks shall be Class “A” concrete conforming to Article M.03.01.

**Harnessing:** Refer to FTDWD Detail.

**Filter fabric:** Fabric shall conform to Article M.08.01-26.

Expansion fittings shall be as manufactured by EBAA Iron EX-TEND 200 or approved equal

Water Main Support System shall conform to the material requirements detailed in the drawings and components shall conform to the following:

Pipe Roller with sockets shall be cast iron and steel axle conforming to Federal Specification WW-H-171E & A-A-1192A, Type 42 and shall be electro-galvanized.

Threaded Rods shall conform to ASTM A575 and with washers and shall be hot dip galvanized.

Structural Steel hardware shall conform to ASTM A992, Grade 50 and be hot dip galvanized.

Steel pipe clamp at support locations shall conform to Federal Specifications WW-H-171-E (Type 4) and shall be electro-galvanized.

Bearing plates at support locations shall be 18 gage steel plate to the dimensions shown on the plans and be hot dip galvanized.

Pipe U-bolts, where required, shall be type 304 Stainless Steel.

**Construction Methods:**

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**Transporting and Distributing Pipe:** The Contractor shall transport the pipe and fittings from NFDWD, shall secure all permits which may be necessary, and comply with the requirements of the Connecticut Bureau of Highways, Cities and Towns, concerning heavy transporting over State, City and Town highways.

During loading, transportation and unloading, more than ordinary care shall be taken to prevent injury to the pipes. Such work shall be done with each section of the pipe under full control at all times and under no condition shall a pipe be dropped on the ground. Pipes shall be placed on sand beds or other methods may be employed to avoid chances of pipe being frozen to the ground surface.

In distributing the pipe in the field, as permitted, each piece shall be placed as near as possible to the point where it is to be installed and faced in the proper direction. In case any pipe received damage from handling or other cause and made unacceptable to the Engineer, it shall be replaced with a new pipe at the expense of the Contractor. The Contractor is cautioned that State, City, or Town authorities may not permit storing pipe, etc., within street or highway limits.

**Clearing Trees and Bushes:** No trees within streets and highways, or adjacent to the normal trench therein, shall be damaged or removed. In streets and highways where there is no permanent paving, the Contractor shall, unless otherwise directed, remove and dispose of only those trees, bushes or shrubs required for construction and approved by the Engineer. The unlimited removal of trees and brush will generally not be required or permitted. All trees, bushes or shrubs which are not to be removed shall be preserved and protected by the Contractor. Should any trees, bushes or shrubs, which are to be preserved and protected, become damaged by the conduct of the work, the Contractor shall replace them at his own expense. Brush, small branches, trash, large trunks, stumps and all other surplus material and debris shall be removed from the site of the work.

**Trenching:** Prior to any excavation, the Contractor shall notify all affected utilities in accord with Public Act 77-350 (CALL BEFORE YOU DIG 1-800-922-4455).

The trench for the pipe shall be 18-inches beyond the outside of the barrel of the pipe on each side, the top of the barrel of the pipe shall be as shown on the Contract Drawings or as directed by the Engineer; and the bottom of the trench shall be at the bottom of the pipe. The Contractor alone shall be responsible for the stability and safety of the trenches and adjacent structures, and shall use such trench support and bracing as necessary without additional payment therefor. Pavement cuts shall be made with the edges reasonably smooth and without cracking or damage to the pavement outside the limits of the portion excavated. The methods used and the location of such cuts shall conform to the requirements and specifications of the City or State. Repairs to pavement shall be made in accordance with the requirements and specifications of the City/Town or State.

In any area to receive fill, no pipe trench shall be excavated until the fill has been placed and compacted to a level at least 3-feet above the top of the pipe to be installed.

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The Contractor may be required to excavate locally to determine the location and depth of existing underground structures on the lines of the pipe well in advance of the pipe laying. There will be no additional payment for this work, including backfilling and temporary surfacing.

**Sheeting, Bracing and Pumping:** The Contractor shall furnish and put in place such sheeting and bracing as may be necessary, to support the sides of the excavation, to prevent undermining of the pavement or to protect from possible injury any pipes, sewers, ducts, poles, conduits or other structures existing in the streets, or highways, and shall remove such sheeting and bracing as the trench is refilled unless the Engineer shall order it left in place.

The Contractor shall maintain all excavations in proper condition for carrying on the work, and to this end shall do all bailing, draining, or pumping which may be necessary to keep the trenches or other excavations free of water. No direct payment will be made for this work but the cost thereof will be considered as having been included in the price bid per linear feet of pipe.

If the Contractor installs and operates wellpoints on any section of the work, the expense of the same shall be borne by the Contractor.

**Protection of Pipes, Drains, Culverts, etc.:** All existing gas pipes, water pipes, sewers, drains, manholes, catch basins, culverts, electrical conduits, telephone ducts, utility poles or other structures which are uncovered by the excavation, and which do not, in the opinion of the Engineer, require to be changed in location, shall be carefully supported and protected from injury by the Contractor; and in case of damage, they shall be restored by him without compensation; therefore, to as good condition as that in which they were found and shall be kept in repair during the existence of this Contract.

**Laying HDPE Pipe:** Proper and suitable tools and appliances for safe and convenient handling and laying of pipe shall be used, and care shall be taken to prevent the coating of the pipe from being damaged, particularly on the inside of the pipes. The Contractor shall not start any pipe work until he has satisfied the Engineer that he has on hand and available the following minimum equipment:

1. Wheel pipe cutters, hydraulic pipe cutter or a pipe saw for the sizes of pipe to be laid;
2. Ratchet type socket wrenches for mechanical joint bolts and nuts;
3. At least two expandable pipe stops of the proper size for closing the end of the pipe being laid when not actually laying pipe.

All pipes shall be carefully examined for defects and no pipe shall be laid which is known to be defective, and should any defective pipe or other casting be discovered after being laid, it shall be removed and replaced with a sound casting at the expense of the Contractor.

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Pipe located on the bridges shall be carefully cut to length and carefully installed to insure proper positioning of joints between pipe support assemblies.

The pipe shall be laid upon sound soil, cut true and even so that the barrel of the pipe will have a bearing for its full length. In the event the trench is excavated below the grade of the bottom of the pipe, the trench will be brought up to grade with acceptable crushed stone or processed gravel, pneumatically tamped, at the expense of the Contractor, before the pipe is laid.

The utility identification tape shall be placed approximately two (2) feet above the top of the pipe.

When not actually laying pipe (e.g. overnight, weekends, holidays, etc.) the open ends of the pipe shall be kept plugged with approved watertight night caps furnished by the Contractor.

The Contractor shall take all necessary precautions to prevent water from entering the pipe during installation of the pipeline.

Unless shown otherwise on the Contract Drawings or directed otherwise by the Engineer, the pipeline shall be installed a minimum of four (4) feet - six (6) inches below finished grade. The pipeline shall also be installed to provide at least eighteen (18) inches of vertical clearance between the water pipe and storm drains or sanitary sewers.

**Cutting Pipe:** Whenever the pipes require cutting, an approved saw, wheel, or hydraulic type cutter shall be used. This work shall be done by the Contractor without extra compensation, in a manner satisfactory to the Engineer, and only experienced men shall be engaged thereon.

**Joints:** HDPE pipe joints shall be joined by butt-fusion, having a complete uniform and monolithic pipe interior according to the fusion joining procedure as instructed by the manufacturer, unless noted otherwise on the plans or directed by the engineer.

On fittings, butterfly and gate valves with mechanical joints, the follower ring and rubber gaskets shall be placed on the plain end of the pipe being (or previously) laid and entered into the socket of the fitting. The gasket shall then be evenly seated in the socket, the follower ring moved up to the face of the gasket and the "T" bolts inserted and made finger tight. The "T" bolts shall then be tightened with a ratchet or torque wrench to between 60 and 80 foot-pounds. See U-03 for additional joint requirements.

**Joint Restraints:** Where and as shown on the Contract Drawings, or as directed by the Engineer, retaining glands or eye bolts and lacing rods shall be installed with the standard lacing details shown for mechanical joint pipe or fittings.

The retaining glands shall be installed in lieu of the standard mechanical joint gland. The "T" bolts shall be tightened with a ratchet or torque wrench to between 60 and 80 foot-pounds. Only

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then shall the set screws be tightened to a maximum of 70 foot-pounds, tightening 180 degrees apart and making a final check with the wrench to ascertain that all set screws have 70 foot-pounds. The joint is then complete. Torque settings shall be done with the pipe laid in the trench in place.

Retaining glands shall also be installed adjacent to the pipe bells. No "T" bolts will be installed; however, the set screws will be installed as above.

The standard mechanical joint gland placed behind the pipe shall be installed snugly against the back of the bell to preclude movement. No "T" bolts will be installed on this gland.

Other special lacing or harnessing, if shown on the Contract Drawings, or directed by the Engineer shall be installed by the Contractor to the satisfaction of the Engineer.

Refilling Trenches: As soon as practicable after the pipes have been laid, the trenches shall be refilled at least to a level 2-feet above the top of the pipe with approved sand, deposited in layers no more than 6-inches in depth and satisfactorily compacted with pneumatic hand tampers, each layer to be leveled and thoroughly compacted to the satisfaction of the Engineer before the next layer is deposited. There will be no additional payment for necessary borrow to refill to this level. Special care shall be taken to consolidate the gravel under the pipes and the whole work of refilling shall be done in a manner which will prevent subsequent settlement and injury to the pipe. Above this level except for the surfacing material, the Contractor may use approved material from the trench excavation.

Trench Backfill: Backfill above the 24-inch level will comply with and be paid for under the appropriate items included in this Contract.

Frost in Trench or Refill: Every effort shall be extended to eliminate the presence of frost in the bottom and sides of the trench and refill material. The Contractor shall cover and heat the trench or take such other means as necessary to eliminate the frost and chance of subsequent pipe settlement.

Water Main Support System: The water main support system on the bridge shall be installed such that, under all conditions of operation, it will allow free expansion and contraction of the water main, and will prevent the introduction of excessive stresses on the water main. The Contractor shall install the support system so that the water main is uniformly supported on the support hangers and the HDPE casing and insulation are not crushed or pinched by the pipe clamps. The Contractor shall provide for vertical adjustments after erection, where feasible, to ensure the insulated pipe is at design elevation and slope.

The Contractor shall fabricate and assemble the support system, base plates, support hangers and 21 - inch sleeves as detailed on the drawings and as applicable in ANSI/ASME B31.1, ANSI/ASME B31.3, and ANSI/ASME B31.9. Support components shall be used for intended design purpose only. They shall not be used for rigging or erection purposes.

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All insulated water main pipe, fittings and appurtenances shall be assembled and installed within the support system as detailed and directed, and in full accordance with AWWA C600, manufacturer's recommendations, and accepted best practice – with the below listed qualifications and clarifications. The methods employed in performing the work and all equipment, tools and machinery used in handling the material and executing any part of the work shall be subject to the approval of the RWA before the work shall be started and, whenever found unsatisfactory, shall be changed and improved as required by the RWA.

**Cleaning:** Prior to the installation of the pipeline, the Contractor shall clean the interior of the pipelines to the satisfaction of the Engineer, by such means as the Engineer approves.

**Filling, Sterilizing and Flushing:** At the location(s) as shown on the Contract Drawings or as ordered by the Engineer, the Contractor shall install an appropriately sized chlorination inlet, chlorination blow-off and sterilization sampling connection point on the crown of the pipe for sterilization testing. All costs for providing and installing said fittings shall be included in the unit price bid per foot of pipe or pipeline installed. As soon as practicable after the Contractor has completed installation of the pipeline to include a successful leakage and hydrostatic test, the FTDWD will fill, and flush the pipeline. The Contractor shall supply labor to assist the FTDWD in filling and flushing the pipeline. If the pipeline is not connected to an existing operating water main, the Contractor shall furnish all labor, materials, equipment, at no extra cost to the District or State, to temporarily connect a FTDWD water main to the pipeline to be tested. The Contractor will not be charged for the FTDWD water used in this operation. The Contractor shall be responsible for labor, equipment and material necessary for erosion control.

Subsequent to sterilizing and flushing the water main(s), the FTDWD will test the water in accord with required state regulations. Should the water fail to pass the required tests and it is determined that the failure was caused by the Contractor's operations, all costs for re-sterilization, re-flushing, re-testing, etc., shall be borne by the Contractor.

The Contractor will attempt to minimize any damage to the road work that may occur during the flushing operation; however, he shall repair any such minor damage and the cost thereof will be considered as included in the price bid per linear feet of pipe.

### **Disinfecting and Flushing Water Mains Continuous Hypochlorite Feed Method**

The work specified in this section describes continuous feed method of disinfecting newly constructed potable-water mains. The Contractor installing water mains and appurtenances such as pipe, valves, fittings and accessories within the FTDWD service area is responsible for disinfecting the water main and pipe sections. The FTDWD requires the Contractor to adhere to the strict standards stipulated in latest edition of AWWA C651, "Standard for Disinfecting Water Mains" when performing disinfection procedures. The standards represent the physical, chemical and bacteriological parameters that must be satisfied prior to determining if newly installed water mains can be placed into service.

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The Contractor installing water mains and appurtenances within the FTDWD service area is responsible for all operations related to disinfecting water mains and pipe sections except working on the existing water distribution system. The gates within the existing water distribution system shall be operated only by the FTDWD.

The Contractor shall be required to issue a submittal for the subcontractor that will be performing the chlorine injection. The submittal shall include a minimum of three disinfection jobs of equal size and scope within the last two years and three references with contact information to establish the minimum level of required experience to perform the chlorine injection on the project. The Contractor shall be allowed to proceed with the implementation of this Section only if the submittal has been approved by the FTDWD.

After flushing and subsequent to performing the disinfection operation, the FTDWD will collect and analyze two complete sets of water samples. The two sets of water samples will be collected approximately twenty-four hours apart from each other. The first sample will be taken 2 hours after flushing and the second sample 24 hours after the first sample. Anticipate approximately two business days for sampling and test results. The FTDWD will compare the results from the water samples collected to the maximum allowable limits for each parameter. If all parameters are satisfactory then the water main is considered to have passed and can now be opened for service. It is important to note that if any one parameter fails then two additional water samples will be collected twenty-four hours apart from each other. The parameters used to compare to the water sample results are listed in Table 1.

Use of FTDWD supplied water for flushing purposes may be limited during periods of high demand or when temperatures exceed 95 degrees Fahrenheit.

#### Submittals

The Contractor shall be responsible for developing a detailed plan that discusses at a minimum the scouring full pipe diameter flushing, methods for handling the volume of water from the flushing operation, disinfecting procedure with liquid sodium hypochlorite solution, de-chlorination procedure and sampling for each section of new water main to be tested. The Contractor shall provide a detailed submittal to the Engineer and FTDWD that outlines the specifics of the proposed procedures for each location.

**SODIUM HYPOCHLORITE SOLUTION.** Sodium hypochlorite conforming to ANSI/AWWA B300 is available in liquid form in glass, rubber-lined or plastic containers typically ranging in size from 1 quart to 5 gallons. Sodium hypochlorite contains approximately 5% to 15% available chlorine, and the storage conditions and time must be controlled to minimize its deterioration.

The sanitary handling of materials, the practices during construction, and the continual inspection of the work are the primary means for ensuring the sanitary condition of the water

main. The effectiveness of disinfection depends on maintaining clean pipes and avoiding major contamination during construction activities.

**PREVENTATIVE AND CORRECTIVE MEASURES DURING CONSTRUCTION.** Heavy particles generally harbor bacteria and prevent elevated chlorine concentrations from contacting and killing these organisms. The procedures of this specification must be observed to assure that a water main and its appurtenances have been thoroughly cleaned for the final disinfection by chlorination. Also, any connection of a new water main to the active distribution system prior to the receipt of satisfactory physical and bacteriological sample results may constitute a cross-connection. Therefore, new water mains must be isolated until physical and bacteriological tests, immediately after and 24 hours following flushing of the water main, are satisfactorily completed and meeting FTDWD specifications.

A successful disinfection process begins at the early stages of construction. The Contractor must protect piping systems from contamination including interiors of pipes, fittings and valves. Pipe and appurtenances delivered for construction shall be capped or bagged to minimize the entrance of foreign material. All openings in the pipeline shall be closed with watertight plugs when pipe laying is stopped at the close of the day's work or for other reasons, such as rest breaks or meal periods. Rodent-proof plugs may be used when watertight plugs are not practicable and when thorough cleaning will be performed by flushing or other means. The sanitary handling of materials, the practices during construction, and the continual inspection of the work are the primary means for ensuring the sanitary condition of the water main.

Delay in placement of delivered pipe invites contamination. The more closely the rate of delivery is correlated to the rate of pipe laying, the lower the risk of contamination.

**JOINTS.** Joints of all pipes in the trench shall be completed before work is stopped. If water accumulates in the trench, the plugs shall remain in place until the trench is dry.

**SEALING MATERIALS.** No contaminated material or any material capable of supporting prolific growth of microorganisms shall be used for sealing joints. Sealing material or gaskets shall be handled in a manner that avoids contamination. The lubricant used in the installation of sealing gaskets shall be suitable for use in potable water and approved by the pipe manufacturer, and not contribute odors. It shall be delivered to the job in closed containers and shall be kept clean and applied with dedicated, clean applicator brushes.

**CLEANING AND SWABBING.** Each pipe section that is being readied for assembly in the field and just prior to installation, shall have the interior pipe surface swabbed with a 1% to 5% hypochlorite disinfecting solution using mechanical means like pulling a chlorine soaked mop or pigging device through the pipe or by power washing . If in the opinion of the Engineer, any dirt enters the pipe while being installed, the pipe will be swabbed again with 1% to 5%. The cleaning method used shall not force mud or debris into the interior pipe-joint spaces and shall be acceptable to the Engineer.

**WET TRENCH CONSTRUCTION.** If it is not possible to keep the pipe and fittings dry during installation, the water that may enter the pipe-joint spaces shall contain an available chlorine concentration of approximately 25 mg/L. This may be accomplished by adding calcium hypochlorite granules or tablets to each length of the pipe before it is lowered into a wet trench or by treating the trench water with hypochlorite tablets.

**FLOODING BY STORM OR ACCIDENT DURING CONSTRUCTION.** If the main is flooded during construction, it shall be cleared of the floodwater by draining and flushing with potable water until the main is clean. The section exposed to the floodwater shall then be filled with chlorinated potable water that, at the end of a 24-hour holding period, will have a free chlorine residual of not less than 25 mg/L. The chlorinated water may then be drained or flushed from the main.

**PREFLUSHING OF SOURCE WATER.** The source water used for disinfection and pressure testing shall be flushed prior to its use to ensure that normally occurring contaminants or debris are not introduced into the new water main pipe. The FTDWD will be responsible for operating gate valves in the street as necessary. Adequate drainage must be provided during flushing, away from the construction area. The contractor shall be responsible for constructing temporary discharge piping and/or materials as necessary, at no additional cost to the FTDWD.

**CONTINUOUS FEED METHOD OF CHLORINATION.** Hypo-chlorination utilizes a concentrated dose of chlorine solution, usually 25 ppm for a 24 hour period, to eradicate bacterial contamination. This is a critical operation that requires skilled personnel and therefore the FTDWD reserves his right to request the replacement of any Contractor / Subcontractor's personnel for lack of skills performing these tests. The Contractor shall not be compensated for the replacement of his Subcontractor or its personnel if requested by the FTDWD as a result of lack of skills in performing these tests. The FTDWD has developed safe and effective hypo-chlorination procedures. These procedures allow for disinfecting a new section of the FTDWD water distribution system, minimizing the risk to the field crews, to customers and to the environment. These procedures are to be followed when disinfecting all new pipelines which utilize the injection of sodium hypochlorite.

**FINAL FLUSHING.** After the applicable retention period of 24 hours, heavily chlorinated water should not remain in prolonged contact with the pipe. In order to prevent damage to the pipe lining or to prevent corrosion damage to the pipe itself, the heavily chlorinated water shall be flushed from the main, fittings, valves and branches until chlorine measurements show that the concentration in the main is no higher than that generally prevailing in the distribution system.

The Contractor shall make arrangements with the FTDWD to flush the new water main following disinfection. FTDWD forces shall be responsible for operating the gate valves in the street as necessary. It is important to note here that the new water main shall be kept isolated from the active distribution system using a physical separation until disinfectant has been flushed

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and satisfactory bacteriological, physical and VOC testing has been completed. Operation of all valves used in filling and flushing the line shall be performed by FTDWD personnel.

The Contractor shall be responsible for supplying necessary materials, equipment and appurtenances for neutralizing the chlorine and to perform all flushing operations except the operating of gate valves within the existing water distribution system. The minimum materials and equipment required to flush and neutralize the water main are:

- Five 3-inch x 20-foot rubber hoses, each with 3-inch male x female Camlock Couplings.
- Dechlorination device, model 3M-CLA, manufactured by Measurement Technologies, Sammamish WA or approved equal.
- Standard hydrant wrench.
- 90-degree ductile iron elbow with retaining gland, either 4 or 6-inch depending on blow off size.
- Customized 4 or 6-inch, 3/8-inch thick metal plate that bolts on to the 90-degree ductile iron elbow with 2-1/2-inch male fire connection (NST) thread. 4 or 6-inch depends on the blow off size.
- Ascorbic acid powder supplied by Bran NU Labs in Meriden CT or approved equal.

The Contractor shall also be responsible for determining where the water will drain during the flushing operation so as not to cause localized flooding or cause damage to property or the environment. The environment to which the chlorinated water is to be discharged shall be inspected. Following neutralization of the chlorinated water, the level of chlorine shall be between 0.1 and 0.8 mg/l and in no case higher than the chlorine level in the distribution system. It is important to note that during the summer months water mains tend to take longer to disinfect due to higher ambient temperatures increasing the bacterial count. Usually, additional flushing will result in successfully disinfecting the water main.

**DISINFECTION TESTS.** Following disinfection and flushing, FTDWD forces will collect and analyze water samples from the new main utilizing a copper sterilization sampling fitting located no more than every 1,200 feet along the newly constructed water main. One set of water samples will be collected: approximately 2 hours following the flushing operation. The results are available approximately two business days following collection. The analytical results for the samples will be compared to the maximum allowable limits for each parameter as established by the FTDWD shown in Table 1. If the parameters are satisfactory for the water sample, then the water main is considered passing and can be opened for service.

To ensure the water sample integrity, the FTDWD requires the person taking the sample to complete a “Chain of Custody” form, see attachment. This form must accompany the water sample when transporting to the FTDWD’s laboratory prior to analyzing.

Table 1  
Physical, Chemical and Bacteriological Parameters for Water Mains

Parameter	Maximum Allowable Limit
pH	6.4 to 10
Color	15 units
Turbidity	1.0 NTU
Odor	2
Hardness	60 ppm.
Specific Conductance	150 microhms at 25 °C
Coliform Bacteria	0 per 100 milliliters
Standard Heterotrophic Plate Count	< 500 per milliliter at 35 °C
Chlorine Residual	<0.1- 0.8 ppm.
Volatile Organic Compounds (VOC)	See attached <b>Procedure</b>

**RESAMPLING**

If the initial disinfection fails to produce satisfactory physical and bacteriological results for the water sample, the new main shall be re-flushed and re-sampled.

If the new water main fails two rounds of sampling, the FTDWD shall determine if re-disinfection is needed or if the new main should only be flushed.



**ATTACHMENT-CHAIN OF CUSTODY FORM**  
**FTDWD - Sample Collection \ Chain of Custody**  
**Distribution Specials**  
**New Mains**

Project DVW (when applicable to Developer Permit Agreement): \_\_\_\_\_

Project Name (for all projects): \_\_\_\_\_

Town: \_\_\_\_\_

Sample I.D.	Location (street)	Size of Main	Length of Main
S1			
S2			
S3			
S4			

Is a VOC being submitted?            YES / NO

**Time Collected**

<u>S1</u>	<u>S2</u>	<u>S3</u>	<u>S4</u>
-----------	-----------	-----------	-----------

**Chlorine residual**

<u>S1</u>	<u>S2</u>	<u>S3</u>	<u>S4</u>
-----------	-----------	-----------	-----------

Collected by: \_\_\_\_\_

Any observations that might affect the physical and bacteriological quality of the water should be noted below:

\_\_\_\_\_

Relinquished By:	Date / Time:
Received By:	Date / Time:

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Relinquished By:	Date / Time:
Received By:	Date / Time:

**Air Valve Assembly:**

All brass fittings shall be of standard design generally used by water utilities and be in accord with ASTM B62 and ANSI/AWWA C800.

The corporation stops and angle valves shall be of good, tough, composition bronze well-mixed and free from flaws and imperfections. The corporation stops shall be of a type suitable for use in ductile iron mains. The inlet end shall have an inlet taper thread type known as the "Mueller Taper Thread".

Compression fittings, valves, etc. shall be of the design employing the pipe clamp feature.

The gate valve box shall conform to the following requirements:

1. Cast iron shall conform to ASTM A48, Class 25.
2. Top section shall be of the top flange design and shall have no bead on the bottom.
3. The word "WATER" shall be cast with raised letters in the center of the cover.
4. Base section shall be of the Dwyer design which centers the operating nut for positive access to the valve.
5. For specific gate box details, see the FTDWD Details.

**Inspection Before Installation:** All tubing and fittings shall be carefully examined for defects and no material shall be installed which is known to be defective and should any defective tubing or fitting be discovered after being installed, it shall be removed and replaced with sound material at no additional cost to the FTDWD.

**Installation:** The air valves, chlorination valve and blow-off shall be installed according to the details and to the satisfaction of the Engineer. To properly receive the air valve or other assembly the ductile iron pipe shall be drilled and tapped. All tapped holes for corporation stops shall be tapped Mueller Thread.

All tapped holes in ductile iron pipe shall be cleaned by running the correct size tap into the hole immediately prior to installing the corporation.

Gate valve boxes shall be set plumb and centered on the fitting, etc. Earth fill shall be carefully tamped around the gate box to a distance of 4 feet on all sides of the box or to the undistributed trench face, if less than 4 feet.

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Excavation and refill shall conform to the requirements under other applicable Contract Sections.

**12-Inch and Smaller Gate Valves:**

Quality Assurance: All gate valves, accessories and gate boxes shall be inspected and tested at the foundry as required by the standard specifications to which the material is manufactured.

A certified statement that inspection and all of the specified tests have been made and met shall also be submitted.

All gate valves, accessories and gate boxes shall be subject to inspection by the Engineer after delivery to the job site and may also be subject to inspection at the foundry by a representative of the FTDWD.

In addition the FTDWD reserves the right to have any or all materials inspected and/or tested by an independent service at either the manufacturer's plant or elsewhere. Such inspection and/or tests shall be at the FTDWD 's expense.

A certified statement that inspection and all of the specified tests have been made and met shall also be submitted.

Gate Valve: The gate valve shall conform to ANSI/AWWA C500, ANSI/AWWA C509 and the following additional requirements:

1. Valve shall be double disc or resilient seated.
2. Bolts and nuts for connecting O-ring seal plates and bonnet to body shall either be copper-silicon alloy or stainless steel.
3. Valve shall be furnished with O-ring seals utilizing two O-rings, consistent with appropriate specifications.
4. Valve shall have mechanical joint ends, unless otherwise specifically indicated, which shall conform to ANSI/AWWA C111/A21.11. All joint accessories shall be furnished with each valve.
5. Direction to open shall be right-hand.
6. Operating nut shall be 2" square.

Gate Valve Box: The gate valve box shall conform to the following requirements:

1. Cast iron shall conform to ASTM A48, Class 25.

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2. Top section shall be of the top flange design and shall have no bead on the bottom.
3. The word "WATER" shall be cast with raised letters in the center of the cover.
4. Base section shall be of the Dwyer design which centers the operating nut for positive access to the valve.
5. For specific gate box details, see the FTDWD Details.

Extension Stem: The extension stem shall be fabricated from steel conforming to ASTM A 36. Galvanizing shall conform to the latest edition of ASTM A 123.

Inspection Before Installation: The gate valve, gate box, etc. shall be subject to a careful inspection before being installed. The valve shall be run through a full open-close cycle to insure proper operation.

Installation of Gate Valve: The gate valve shall be installed according to the details shown and to the satisfaction of the Engineer.

All debris and foreign material shall be cleared from valve openings and seats. All mechanisms shall be checked and all nuts and bolts checked for tightness.

The valve box shall be set plumb and centered directly over the operating nut of the valves. Earth fill shall be carefully tamped around the valve box to a distance of 4 feet on all sides of the box or to the undisturbed trench face, if less than 4 feet.

Where and as shown on the Contract Drawings, or ordered, a valve extension stem shall be installed. An extension stem will be ordered when the valve-operating nut is more than 4.5 feet below finished grade.

Excavation and refill shall conform to the requirements under other applicable Contract Sections.

**Blow-Off Assembly:**

Quality Assurance: All blow-off assemblies including gate valves and fittings shall be inspected and tested at the foundry as required by the standard specifications to which the material is manufactured.

All blow-off assemblies including valves and fittings shall be subject to inspection by the Engineer after delivery to the job site and may also be subject to inspection at the foundry by a representative of the FTDWD.

In addition, the FTDWD reserves the right to have any or all blow-off assemblies including valves, fittings and special castings inspected and/or tested by an independent service at either

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the manufacturer's plant or elsewhere. Such inspection and/or the tests shall be at the FTDWD 's expense.

A certified statement that inspection and all of the specified tests have been made and met shall also be submitted.

**Inspection Before Installation:** Blow-off assemblies including gate valves, pipe, fittings, gate boxes, etc. shall be subject to a careful inspection before being installed. Valves shall be run through a full open-close cycle to insure proper operation.

**Installation of Blow-off Assemblies:** Blow-off assemblies including piping, gate valves, fittings, etc. shall be installed according to the details shown and to the satisfaction of the Engineer.

All debris and foreign material shall be cleared from valve openings. The blow-off assembly shall be set plumb. Blow-off assemblies and connecting pipe shall have at least the same depth of cover as the distributing main.

Special trench refill shall be placed over the pipe and fittings from the bottom of the trench to 2 feet above the top of the pipe and fittings.

Ductile iron pipe and harnessing shall be installed in accord with the specifications.

The utility identification tape shall be placed approximately two (2) feet above the top of the pipe.

Gate valves and gate boxes shall be installed in accord with the specifications.

Three-quarter inch (3/4") crushed stone, special trench refill and concrete shall be placed in accord with the specifications.

Excavation and refill shall conform to the requirements under other applicable Contract Sections. Temporary and permanent paved and unpaved surface restoration shall conform to the requirements under other applicable Contract Sections.

**Method of Measurement:** This work will be measured for payment as follows:

“Furnishing and Installing 12” Water Main” which is considered to be the portion of the pipe buried within the soil. No Measurement shall be taken as the work shall be paid for on a Lump Sum basis. For payment limits, the change between buried installation and installation on the bridge shall be considered to occur at the back face (roadway approach side) of the concreteback wall. Measurement shall pass through and include all valves, bends, and mainline fittings. Additional measurements shall be taken for branches for Blow-off Assemblies regardless of their diameter.

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“Furnishing and Installing 12” Water Main on Bridge” which is considered to be the portion of pipe supported on the bridge. No measurement shall be taken as the work shall be paid for on a Lump Sum basis. For payment limits, the change between buried installation and installation on the bridge shall be considered to occur at the back face (roadway approach side) of the concrete thrust block.

“Temporary Relocation of Water Main” for the temporary 6-inch diameter, non-insulated HDPE pipe, shall be paid for on a lump sum basis and not be measured for payment, but shall include all fittings, bends, tees, gate valves, roller supports, U-bolts, thrust blocks, and appurtenances complete as shown on the plans. Note that the temporary supports of the temporary relocated water main shall be paid for under the item “Temporary Support of Utilities”.

Gravel fill from the bottom of the trench to the level 24-inches above the top of the pipe will not be measured for payment, but will be included in the cost of the pipe.

**Basis of Payment:** This work will be paid for at the contract lump sum for “Furnishing and Installing 12” Water Main”, the contract lump sum price for “Furnishing and Installing 12” Water Main on Bridge”, and the contract lump sum price for “Temporary Relocation of Water Main”, complete and in place. The price shall also include the cost of digging test pits; transporting the materials; clearing, trenching; disposing of excavated materials, removing and disposing of the present water pipes and any appurtenances as needed; installing the pipelines complete as shown on plans or as directed, with lacing and harnessing where required, including fittings, pressure reducing valves, vaults, bends, restraint, filter fabric, bank gravel, sand, blow off assemblies, gate/butterfly valves, air valves, sterilization fittings, tapping sleeves, tapping gates, RCP sleeve, gate boxes, tees, thrust blocks, anchors, expansion fittings, polystyrene, utility identification tape refilling trenches; furnishing the additional materials; temporary and permanent resurfacing; grading; sheeting; bracing; pumping and all incidental work, except as otherwise herein provided for. No claim will be allowed because the number of pipes and joints may be greater than estimated by the Contractor. The price shall also include all material (except material provided by FTDWD), transportation, labor, including labor required to assist the FTDWD during the testing, and equipment necessary to construct the pipelines in accord with the Contract Drawings, the Specifications and the requirements of the Engineer there under.

“Temporary Relocation of Water Main shall be paid for at the contract lump sum price for Temporary Relocation of Water Main of the appropriate size, complete in place, inclusive of all fittings, bends, tees, gate valves, roller supports, U-bolts, and appurtenances.

Price shall also include the cost of digging test pits, transporting the material to the worksite from FTDWD and the returning the material supplied by FTDWD after the temporary water main is no longer required.

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The cost of all excavation, disposing of excavated material, except that which is suitable for refilling, and furnishing other materials for refilling, unless otherwise specified, will be considered as having been included in the lump sum price.

No direct payment will be made for any work done or materials used in making the pipeline tight.

Pay Item	Pay Unit
Temporary Relocation Of Watermain	l.s.
Furnishing and Installing 12" Watermain	l.s.
Furnishing and Installing 12" Watermain On Bridge	l.s.

**ITEM #1302053A -RESET WATERGATE**

**Description:** The Contractor shall adjust to final grade, the gate boxes and covers appurtenant to the water mains as required and furnish and install extension rings, extension stems, air valve extensions, covers, and additional top or bottom sections if necessary, as shown on the contract drawings or as directed by the engineer in accordance with these specifications.

**Materials:** Gate boxes shall be manufactured in North America and shall be cast iron with a minimum five (5) foot height. The gate box shall be two piece heavy pattern sliding type. The upper or sliding section of the box shall be provided with a flange on the top of the section (not on the bottom) having sufficient bearing area to prevent undue settlement. The shaft diameter shall be 6-inches and the bottom shall be bell-bottom only. Each gate box shall be provided with a close fitting cover that is substantially dirt tight with the “WATER” shall be cast in the top of the cover. The top of the cover shall be flush with the top of the box rim. Extension stems shall be furnished as required, if necessary.

All additional materials, including any resurfacing materials and any additional fill required, shall be furnished and placed by the Contractor. Gravel shall conform to Article M.02.01.

**Construction Methods:** The Contractor shall carefully excavate around the gate boxes, remove the boxes, install extension stems and air valve extensions, if necessary, reinstall the present gate box if reusable, adjust the box to final grade using extension rings if applicable, and refill the excavation. Care shall be taken to prevent material from filling the inside of the gate box.

Extension stems will be required if the gate box is raised 24-inches or more.

Any damage done to First District Water Department facilities by the Contractor shall be repaired or replaced by the Contractor at his expense.

**Method of Measurement:** This work will be measured for payment by the number of water gate boxes that are reset, complete in place, including extension stems, gate box extension rings, covers, and additional top or bottom sections, if necessary, and accepted.

**Basis of Payment:** This work will be paid for at the contract unit price for “RESET WATERGATE” complete in place and accepted, which price shall include the cost of furnishing all materials, labor and equipment required to complete the work. It shall also include the clearing, trenching and disposal of excavated materials, refilling trenches, furnishing the additional material for refilling, grading, sheeting, bracing, pumping, and all work incidental thereto.

Pay Item	Pay Unit
Reset Watergate	ea.



## **ITEM #1504010A - TEMPORARY SUPPORT OF UTILITIES**

**Description:** Work under this item shall consist of designing, furnishing and placing temporary supports and protection measures necessary to support and protect the relocated 6-inch diameter HDPE non-insulated water main.

Work performed by the Contractor under this Item will include fabricating, furnishing, installing and removing temporary supports and providing protection measures for the temporarily relocated water main. After completion of the proposed bridge, the water main will be permanently relocated and attached to the underside of the new bridge. Once the new water main is operational, the temporary supports and protection measures and the existing water main shall be removed by the Contractor and suitably disposed of offsite.

This section shall also consist of furnishing all labor, tools, materials and equipment necessary to perform the work of completely removing the temporary water main support system, including all appurtenances and the supported existing pipe shown on the Drawings or as directed by the Engineer.

The work pertaining to temporary support and protection involves the temporary support and prevention of damages, which are possible during the removal of the existing bridge, excavation and construction of the proposed bridge, and roadway improvements under this contract. The work pertaining to the temporary protection will be required to be submitted for review and approval by the NWFWD.

The Contractor is advised that no service interruption to the water service resulting from the Contractor's operations will be allowed, except as otherwise approved by the NWFWD. Extreme caution shall be exercised during all stages of construction in order to preserve the existing utilities.

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

It is the Contractor's responsibility to verify locations, conditions and field dimensions of all existing features, as actual conditions may differ from information indicated on the plans or contained elsewhere in these specifications.

**Materials:** The materials for this work shall conform to the requirements of the contract documents and be of satisfactory quality for the purpose intended and shall be approved by the Engineer. The material shall be intended for use in structures and shall be sound and capable of safely carrying the loads anticipated as part of the design of the temporary supports and protection measures.

### **Construction Methods:**

Shop Drawings: Submit shop drawings for approval for the installation of the temporary support of utility (water main) as shown on the Drawings.

The Contractor shall design the temporary support system. Such system shall be designed by a Professional Engineer licensed in Connecticut and shall be required to meet the approval of the NWFWD and the following requirements:

The Contractor shall prepare working drawings and computations showing his proposed method of support and protection for the utility to be supported and protected. Preparation of working drawings and computations shall conform to the requirements. The support shall safely carry all dead loads and any imposed loadings under all possible construction conditions. The utility protection shields shall safely carry any imposed loadings under all possible construction conditions. Said supports and protections shall be constructed in a manner that will not interfere with the proposed construction.

The design shall be submitted to the NWFWD representatives for review and approval. Following approval, the design shall be submitted to the Engineer for final approval prior to the beginning of construction. No work will be allowed in the vicinity of any utility until the Contractor receives approval of his support method from the NWFWD representative and the Engineer.

The Contractor shall use every effort to protect all utilities from damage of any nature which might result from carelessness or negligence in his operations. He shall be held solely and strictly responsible for any damage resulting from such carelessness and negligence.

A periodic inspection of the temporary utility support and protection measures shall be performed by the Contractor (on a daily basis at a minimum, and after significant rain events), and as directed by the Engineer.

The Contractor shall support and maintain the utilities until the proposed bridge and roadway construction has been completed, and the service has been transferred to the new water main. Once the existing water main has been disassembled, the temporary utility supports and protection measures shall be removed from the site by the Contractor. The existing above ground portion of the water main and all accessories, including the existing temporary water main support system shall be removed from within the limits shown on the Contract Drawings. All material removed under this item shall become the property of the Contractor and shall be properly disposed of off the Project site at an approved facility.

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

**Basis of Payment:** The work will be paid for at the contract lump sum price for "Temporary Support of Utilities" which price shall include providing protection measures, submitting for approval, fabricating, furnishing, installing, periodic monitoring, maintaining, removing temporary supports and measures, coordinating work with the utility companies, and all materials, equipment, tools and labor incidental thereto.

It shall also shall include payment in full for all materials, equipment, tools, labor and work required to completely remove the existing above ground water main to the limits shown on the

Drawings or as directed by the Engineer, including the removal and proper disposal of all existing support components, sedimentation and erosion control, and the restoration of the disturbed area to existing grade, as directed by the Engineer.

Pay Item

Temporary Support of Utilities

Pay Unit

l.s.

**ITEM #1806201A - TYPE D PORTABLE IMPACT ATTENUATION SYSTEM**

Type D portable impact attenuation systems shall be furnished and used in accordance with Section 18.06, supplemented as follows:

**Article 18.06.02 – Materials:** is amended as follows:

Change “Prior to using a new TMA,” to read “Prior to using a TMA,” in the first sentence.

Delete the second paragraph.

**Article 18.06.04 – Method of Measurement:** Change “Type D Portable Impact-Attenuation System” to read “Type D Portable Impact Attenuation System” in the first sentence.

## **PERMITS AND/OR REQUIRED PROVISIONS:**

The following Permits and/or Supplemental to Form 817 and Required Provisions follow this page and are hereby made part of this Contract.

- **PERMITS AND/OR PERMIT APPLICATIONS**

No Permits are required for this contract

- **SUPPLEMENTAL SPECIFICATIONS TO STANDARD SPECIFICATIONS FORM 817**

- **Construction Contracts - Required Contract Provisions (State Funded Only Contracts)**

**State of Connecticut**

**Department of Transportation**

**SUPPLEMENTAL SPECIFICATIONS**

**TO**

**THE STANDARD SPECIFICATIONS**

**FOR**

**ROADS, BRIDGES, FACILITIES**

**AND INCIDENTAL CONSTRUCTION**

*FORM 817*

**2016**

**JANUARY 2017**

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Article	Book Page #	Please make the following Corrections:
1.01.02	6	add abbreviation "AAN—American Association of Nurserymen"
1.01.02	7	add abbreviation "CTDOT—Connecticut Department of Transportation"
1.01.03	11	add abbreviations "Hz—hertz, LCD—Liquid Crystal Display, QCPFA—Quality Control Plan for Fine Aggregates"
1.01.03	12	add abbreviations "USB—Universal Serial Bus, VDC—Volts Direct Current"
1.05.02	27	in Subarticle 2a(i), change "Form" to "form" and delete "Number CON-500,"
1.05.08	36	change font to bold face for paragraph titles "Biweekly Schedules" and "Recovery Schedules"
1.05.13	39	in the first sentence of the third paragraph, delete "(CON-13),"
1.20-1.01.02	93	add abbreviation "AAN—American Association of Nurserymen"
1.20-1.01.02	94	add abbreviation "CTDOT—Connecticut Department of Transportation"
1.20-1.01.03	98	add abbreviations "Hz—hertz, LCD—Liquid Crystal Display, MLSI—Major Lump Sum Item"
1.20-1.01.03	99	add abbreviations "QCPFA—Quality Control Plan for Fine Aggregates, USB—Universal Serial Bus, VDC—Volts Direct Current"
1.20-1.09.01	180	in the first sentence of the first paragraph, delete "(System International)"
1.20-9.75.04	203	in the last sentence of the last paragraph, delete the "t" after "100%"
2.09.01	240	in two places in the second paragraph, after "precast barrier curb" insert "or curbing"
2.16.02	248	change the only sentence in subarticle 1. as follows "The crushed stone or gravel shall meet the grading requirements specified in Table M.01.02-2 for No. 3 or No. 4 coarse aggregate or a combination of both."
2.19.03	250	1. in the sentence that begins "All geotextile fences shall..." delete the word "have" 2. change the only sentence of the last paragraph as follows: "The sedimentation control systems shall be maintained ... .. purpose intended or are ordered removed from the Site at the completion ... .. authorized by the Engineer to be left in place."
4.06.04	285	under Percent Adjustment for Air Voids, change last sentence as follows: "n = number of sub lots based on Table M.04.03-2"
5.14.03	310	in Subarticle 10 add a paragraph return before the last sentence as follows: "... of the member.¶ Deviations in excess of the permissible tolerances will be cause for rejection." to separate it from item 2 as the sentence refers to both items 1 and 2, not just item 2
6.52.02	367	in the only sentence, replace the words "Gravel Fill" with "Granular Fill"
6.52.03	368	in both paragraphs, replace the words "gravel fill" with "granular fill"
6.52.04	368	in the only sentence of the third paragraph, replace the words "Gravel Fill" with "Granular Fill"
6.52.05	368	in the only sentence of the third paragraph, replace the words "Gravel Fill" with "Granular Fill"
7.01.02	370	change the only sentence in subarticle 1.(d) as follows: "Coarse aggregate shall meet the grading requirements specified in Table M.01.02-2 for No. 8 coarse aggregate."
7.06.02	404	in the second sentence of Subarticle 5, delete the word "with"
7.06.03	413	in the fourth column of Table 7.06-1, Cyclic Load Schedule for Verification Pile Load Test, delete the word "minutes" next to the entries for "Step 2, Cycle 1 0.60 SVL" and "Step 3, Cycle 2, 0.750 UPC" to show the "Hold Time (minutes)" entries of "2.5" corresponding to the subsequent fractions of the "Applied Load" in the table
7.14.04	420	change the last sentence of the Article as follows: "Sheet piling left in place solely at the Contractor's option, with the Engineer's permission, will not be measured for payment."

Article	Book Page #	Please make the following Corrections:
7.16.02	421	<i>in the last sentence in the article, change “material certificates” to “Materials Certificates”</i>
7.28.02	423	<i>change the only sentence as follows: “The crushed stone shall meet the requirements of Table M.01.02-2 for No. 3 coarse aggregate.”</i>
9.43.04, 9.43.05	462	<i>in the first sentence of each article, replace the word “million” with “m.”</i>
9.50.03	472-473	<i>1. in subarticle 2. Seeding Season change the Fall ending date to “October 31” 2. in the first sentence of subarticle 5, change “100 plants” to “60% coverage”</i>
9.50.05	473	<i>1. in the only sentence of the second paragraph, insert the word “(Type)” after “Erosion Control Matting” 2. in the Pay Item – Pay Unit table, insert the word “(Type)” after “Erosion Control Matting”</i>
9.77.02	485	<i>change the end of the last sentence of the article to read “... or the AASHTO Manual for Assessing Safety Hardware (MASH) for Category 1 Devices”</i>
10.02.02	505	<i>in the second line, replace the words “Gravel Fill” with “Granular Fill”</i>
10.10.02	511	<i>1. in the article referenced for “No. 6 Crushed Aggregate”, change “M.01.01” to “M.01.02” 2. in the only sentence of the second paragraph, replace “lb./in<sup>2</sup>” with “psi” 3. in the last sentence of the article, close the quotation marks as follows: “TRAFFIC.”</i>
10.10.03	511	<i>in the second sentence of the second paragraph of the article, close the parentheses as follows: “...4 inches)”</i>
12.01.02	535	<i>change the only sentence as follows: “Materials for this work shall meet the requirements of M.03.05, M.06.02, M.18.02 and the Contract.”</i>
12.07.02	542	<i>in the last sentence, change “FS TT-P-641 Type 1” to “ASTM A780”</i>
12.09.02	544	<i>change the end of the only sentence of the article to read “... M.07.30 for glass beads, Type 1 (smaller beads).”</i>
12.09.03	544	<i>in the only sentence of the second paragraph of the article, insert “Type 1 (smaller beads)” after the phrase “... with glass beads”</i>
12.10.03	547	<i>1. in the first sentence of the eighth paragraph in Subarticle 2, replace “Grading ‘B’ (larger beads)” with “Type 4 (larger beads)” 2. in the same sentence, replace “Grading ‘A’ (smaller beads)” with “Type 1 (smaller beads)”</i>
12.10.03	548	<i>in the only sentence of Subarticle 4. Crosswalks, replace “Grading ‘A’ (smaller beads)” with “Type 1 (smaller beads)”</i>
18.06.02	557	<i>in the first sentence, capitalize “Materials Certificate”</i>
18.07.02	559	<i>in the second sentence of the second paragraph, capitalize “Materials Certificate”</i>
M.03.01	574	<i>1. replace entire subarticle 1. Coarse Aggregate with the following: “Coarse aggregate shall conform to the requirements of M.01.” 2. replace entire subarticle 2. Fine Aggregate with the following “Fine aggregate shall conform to the requirements of M.01.”</i>
M.03.02	577	<i>in the fifth column of Table M.03.02-1 change the heading to read “Maximum Aggregate Size Required M.01 Gradation”</i>
M.04.01	583	<i>in the first sentence of the second paragraph under (b) Basis of Approval change “#4 sieve” to “No. 4 sieve”</i>
M.04.01	586	<i>in Subarticle 4. Performance Graded Asphalt Binder, 1. in (b) Neat Performance Grade (PG) Binder, i., at the end of the second sentence, capitalize “Certified Test Report” 2. in (d) Warm Mix Additive Technology, i., change “NEAUPG” to “North East Asphalt User Producer Group (NEAUPG)”</i>

Article	Book Page #	Please make the following Corrections:
M.04.01	588	<i>in Subarticle 6. Reclaimed Asphalt Pavement (RAP), (b) Basis Approval:</i> 1. <i>in paragraph i, capitalize "Materials Certificate"</i> 2. <i>in the second sentence in paragraph ii, change "material certificate" to "Materials Certificate"</i>
M.04.02	593	<i>in the third bullet under ii Superpave Mixtures with RAP, insert the word "with" between "in accordance" and "AASHTO"</i>
M.04.02	594	1. <i>in the third sentence of the third bullet in iii Superpave Mixtures with RAS, insert the word "with" between "in accordance" and "AASHTO" and capitalize "Appendix"</i> 2. <i>in the first sentence in iv Superpave Mixtures with CRCG, capitalize "Materials Certificate"</i>
M.05.01	611	<i>in Subarticle 1:</i> 1. <i>add the heading "Table M.05.01-1" to the only table in the article</i> 2. <i>correct the following typographical error: in the first row under "Square Mesh Sieves" in the Gradation table (Table M.05.01-1) change "Pass 1 1/2 inches" to "Pass 2 1/2 inches"</i>
M.05.02	612	<i>add the heading "Table M.05.02-1" to the only table in the article</i>
M.08.03	636	1. <i>in the last sentence of subarticle 1. Bedding Material, change "Article M.01.01" to "M.01.02"</i> 2. <i>change the only sentence of subarticle 2. Aggregates for Underdrain as follows: "The crushed stone shall meet the grading requirements of Table M.01.02-2 for Size No. 8 coarse aggregate."</i>
M.10.02	644	<i>in the last sentence of Subarticle 9. PLASTIC BLOCKOUTS, change "Material Certificate" to "Materials Certificate"</i>
M.12.02 M.12.04	654	1. <i>change the only sentence in subarticle 4. Special Riprap as follows: "The crushed stone shall meet the grading requirements of Table M.01.02-2 for No. 3 coarse aggregate."</i> 2. <i>in the second sentence in 12.04-1. Waterproofing Asphalt, correct typographical error: "mrrt" should be "meet"</i>
M.12.06	655	<i>delete the only sentence in the next to last paragraph of Subarticle 1. Granite Curbing, "For straight curbing,..."</i>
M.12.07	656	<i>in the only sentence of subarticle 3. Gravel Base, change "gravel fill" to "granular fill"</i>
M.12.13	657	<i>in the first sentence, change "Material Certificate, Certificate of Compliance and Certified Test Report" to "Materials Certificate and Certified Test Report"</i>
M.16.04	685	<i>in the second sentence in Subarticle (m) Fabrication, change "materials certificates" to "Materials Certificates"</i>
M.16.05	688	<i>in the second sentence in Subarticle 2.(e) Fabrication, change "materials certificates" to "Materials Certificates"</i>
M.17.01	712	<i>in the last sentence in Subarticle (c) under 4. Adhesive for Bonding, change "Material Certificates" to "Materials Certificates"</i>
N/A	730	<i>in the LIST OF STANDARD PAY ITEMS,</i> 1. <i>add "8.03, Paved Apron, s.y."</i> 2. <i>delete "8.16, Granite Slope Curbing (Size), l.f." and "8.16, Curved Granite Slope Curbing (Size), l.f."</i>
N/A	733	<i>in the LIST OF STANDARD PAY ITEMS, delete "12.16, (Width) Black Epoxy Resin Pavement Markings, l.f." and delete "12.16, Black Epoxy Resin Symbols and Legends, s.f."</i>

**SECTION 1.01  
DEFINITION OF TERMS AND  
PERMISSIBLE ABBREVIATIONS**

*Replace Article 1.01.01 with the following:*

**1.01.01—Definitions:** In these specifications, unless the context requires otherwise, words of the masculine gender include the feminine and the neuter, and, when the sense so indicates, words of the neuter gender may refer to any gender. Where appropriate, words in the singular form shall be deemed to include the plural, and words in the plural form to include the singular.

**ADDENDUM:** Contract revisions developed and incorporated into the contract after bid advertisement and before the opening of bid proposals.

**AIR OPERATIONS AREA:** Any paved or unpaved area of the airport used or intended to be used for the unobstructed movement of aircraft. These movements shall include landings, takeoffs, and surface maneuverings.

**AWARD:** The Department's acceptance in writing of the proposal of the lowest responsible bidder for the work, subject to the execution and approval by the Department of a contract therefor and the provision by the bidder of performance and payment bonds to secure the performance thereof which are acceptable to the Commissioner, and to such other conditions as may be specified by the Department or required by law.

**BID:** The submission of a proposal for the work contemplated.

**BID ADVERTISEMENT:** A public announcement soliciting bids for a contract for work to be performed or materials to be furnished.

**BID MANUAL:** "The State of Connecticut Department of Transportation Construction Contract Bidding and Award Manual," copies of which are available from the Department's Division of Contracts and at the following link: <http://www.ct.gov/dot/cwp/view.asp?a=2288&q=259258>

**BIDDER:** Any individual, firm, partnership, corporation, or combination thereof, submitting a proposal for the work contemplated, acting directly or through a duly authorized representative

**CALENDAR DAY:** Every day shown on the calendar, Sundays and holidays included.

**CATALOG CUT (PRODUCT DATA):** Document(s) with information such as manufacturer's product specifications, manufacturer's installation instructions, standard color charts, wiring diagrams showing factory-installed wiring, printed performance curves and operational range diagrams. Product data that must be specially prepared because standard printed data is not suitable shall be considered shop drawings.

**CERTIFICATE OF COMPLIANCE:** The formal document issued at the completion of a project by the State Building Inspector's representative. The document is often referred to informally as a "Certificate of Occupancy," "C.O.C." or "C.O."

**CHANNEL:** A channel shall be interpreted to mean a natural or artificial watercourse having an average width at the bottom, after excavation, of 4 feet or more.

**COMMISSIONER:** State of Connecticut Transportation Commissioner acting directly or through a duly-authorized representative.

**CONNECTICUT GUIDELINES FOR SOIL EROSION AND SEDIMENT CONTROL:** This Department of Energy and Environmental Protection (DEEP) Bulletin is intended to provide information to government agencies and the public on soil erosion and sediment control.

[http://www.ct.gov/deep/cwp/view.asp?a=2720&q=325660&deepNav\\_GID=1654%20](http://www.ct.gov/deep/cwp/view.asp?a=2720&q=325660&deepNav_GID=1654%20)

**CONNECTICUT STORMWATER QUALITY MANUAL:** This DEEP publication provides guidance on measures necessary to protect waters of the State from adverse impacts of post-construction stormwater runoff. [http://www.ct.gov/deep/cwp/view.asp?a=2721&q=325704&depNav\\_GID=1654%20-%20download](http://www.ct.gov/deep/cwp/view.asp?a=2721&q=325704&depNav_GID=1654%20-%20download)

**CONSTRUCTION ORDER, CHANGE ORDER:** A written order signed by the Engineer for a contractor to perform work or provide supplies stipulated therein at the price or upon the basis of payment set forth therein.

**CONTRACT:** The agreement covering the performance of the work and the furnishing of materials required for the construction of the Project. The Contract shall be deemed to include the "Plans," "Specifications" (*i.e.*, the Department's "Standard Specifications for Roads, Bridges, Facilities and Incidental Construction" which is in effect on the date of the Bid Advertisement), "Construction Orders," and such other provisions as may be incorporated into the agreement, in addition to the contents of the bound contract containing the schedule of prices, signature sheet, addenda, special provisions, required federal and state provisions, supplemental specifications, labor and wage schedules, permits and other such

material.

**CONTRACTOR:** When the word is capitalized, the party of the second part to the Contract, acting directly or through its agents or employees. When this word is not capitalized, it is to be taken in its more general sense.

**CULVERT:** A covered channel or a large pipe for carrying a watercourse below ground level, usually under a road or railway.

**DEPARTMENT:** State of Connecticut Department of Transportation.

**DESIGNER:** A duly-authorized representative of the Engineer, responsible for the design of the Project.

**DRAINAGE DITCH:** An unpaved, artificially-constructed open depression having an average width of less than 4 feet at the bottom, after excavation, constructed for the purpose of carrying off surface water.

**ENGINEER:** The Commissioner or Deputy Transportation Commissioner, acting directly or through a duly-authorized representative.

**EXECUTION OF CONTRACT:** The date of execution of the Contract by the Department is the date on which the Department's authorized signatory signs the Contract on behalf of the Department.

**EQUAL:** A material, device, type of equipment, or method other than what is specified in the Contract, which is a recognized equivalent in substance and function for that specified thing, taking into account quality, workmanship, economy of operation, durability, and suitability for purposes intended, provided that the proposed equivalent would not require or constitute a change in Contract work.

**FIXED COSTS:** Any labor, material and equipment costs directly incurred for the item or items under consideration, which are necessary for the fulfillment of Contract requirements and which remain constant regardless of the quantity of the work done.

**HIGHWAY:** A general term denoting a public way used for vehicular travel. When referred to in the Contract, it signifies the whole right of way reserved for or secured by the Department for use in constructing or maintaining a roadway and its appurtenances.

**INSPECTOR:** A duly-authorized representative of the Engineer, assigned to make inspections of the work performed and materials furnished by the Contractor.

**LABORATORY:** Unless another laboratory or type of laboratory is indicated, the official testing laboratory of the Department.

**LIQUIDATED DAMAGES:** The amount prescribed in the Contract specifications, to be paid to the State or to be deducted from any payments due or to become due the Contractor, for a specified time unit delay in completing the whole or any specified portion of the work beyond the time allowed in the Contract.

**MAJOR ITEM:** An individual Contract item, whose value at the time of bidding (either lump sum price or the product of its unit price multiplied by its estimated quantity) is equal to or greater than 10% of the total original Contract bid price shall be considered a Major Item.

**MANAGER OF CONTRACTS:** The Transportation Manager of Contracts, who is the head of the Department's Division of Contracts, and whose office is located at the headquarters of the Department at 2800 Berlin Turnpike, Newington, CT.

**MATERIAL:** Any substance specified in the Contract for use in the construction of the Project, including appurtenances of products that are substantially shaped, cut, worked, mixed, finished, refined or otherwise fabricated, processed, or installed to form a part of the work.

**MINOR ITEM:** An individual Contract item that is not a Major Item.

**MUNICIPALITY:** City, town or county.

**NOTICE TO PROCEED:** A written notice issued by the Engineer to the Contractor stating the date on which the Contractor is authorized to commence and proceed with the Contract work.

**PAVEMENT STRUCTURE:** The combination of sub-base, base course and surface course placed on subgrade to support and distribute the traffic load.

**PLANS:** All drawings or reproductions of drawings supplied by the Department to the Contractor pertaining to the construction or details of the Project.

A. Standard Sheets – Standardized plans containing details approved by the Department and the

FHWA, for construction of a given type on any project, included in contracts on an as-needed basis.

**PRODUCT DATA (CATALOG CUT):** Document(s) with information such as manufacturer's product specifications, manufacturer's installation instructions, standard color charts, wiring diagrams showing factory-installed wiring, printed performance curves and operational range diagrams. Product data that must be specially prepared because standard printed data is not suitable shall be considered shop drawings.

**PROJECT:** All work included under one Department contract, notwithstanding the occasional use by the Department of multiple project numbers for the work included within one contract.

**PROJECT SITE (or SITE):** The space available to the Contractor, under the Contract, for performing

construction activities. The extent of the Project site is as indicated on the plans or elsewhere in the Contract.

**QUALIFIED PRODUCTS LIST (QPL):** A report that has been developed as a means for determining what products, suppliers, manufacturers, equipment and methodologies may be used on construction projects. This report can be located on the CT Department of Transportation Website:

<http://www.ct.gov/dot/cwp/view.asp?a=1387&q=259630>

**RECLAIMED CONCRETE AGGREGATE:** Reclaimed waste consisting of crushed and graded concrete removed from pavements, structures, or buildings. Metal may be acceptable only where it is contained as reinforcement within small fragments of concrete; *e.g.*, metal projecting from concrete fragments would be unacceptable. All such material trucked from beyond the limits of the Project must be accompanied by a Materials Certificate and Certified Test Report indicating that the material is environmentally acceptable and structurally sound in accordance with Section 1.06.07, unless the source of the material is a Department Project and that source is acceptable to the Engineer.

**RECLAIMED MISCELLANEOUS AGGREGATE:** Glass-free and clinker-free reclaimed waste, which has been crushed, graded and blended, as specified in the Contract, with natural crushed stone or gravel. Metal may be acceptable only where it is contained as reinforcement within small fragments of concrete; *e.g.*, metal projecting from concrete fragments would be unacceptable. All such material trucked from beyond the limits of the Project must be accompanied by a Materials Certificate and Certified Test Report indicating that the material is environmentally acceptable and structurally sound in accordance with Section 1.06.07, unless the source of the material is a Department Project and that source is acceptable to the Engineer.

**RECLAIMED WASTE:** Debris from the demolition of buildings, structures, and pavements; residue from incineration and recycled glass. Acceptable material shall include concrete, bituminous concrete, glass, ceramics, brick, pavement sub-base and base courses, and clinker from resource recovery plants. Metal may be acceptable only when it is contained within large fragments of concrete. Reclaimed waste trucked from beyond the limits of the Project must be accompanied by a Materials Certificate and Certified Test Report indicating that the waste is environmentally acceptable and structurally sound in accordance with Section 1.06.07, unless the source of the material is a Department Project and that source is acceptable to the Engineer.

**RENTAL RATE BLUE BOOK:** As used in these specifications, refers to the current edition of the Rental Rate Equipment Watch Blue Book Services.

**RIGHT-OF-WAY:** A general term denoting land, property of interest therein, usually in a strip, acquired for or devoted to transportation purposes.

**ROADBED:** The graded portion of a highway, including portions within the top and side slopes, which have been prepared as a foundation for the pavement structure and shoulders.

**ROADWAY:** The portion of the highway, including shoulders, which may be used for vehicular travel within the Project limits.

**SHOP DRAWINGS:** Drawings, including proposed details, diagrams, schedules, procedures and other supporting data, prepared by a Contractor to supplement the Contract documents, showing all information necessary for fabrication of items for which some specific design or detail appears in the Contract.

**SHOULDER:** The portion of the roadway adjacent to the traveled way that can accommodate stopped vehicles for emergency use, and that provides lateral support of base and surface courses.

**SPECIFICATIONS:** The Department's written provisions and requirements for the performance of the Contract, contained in or incorporated by the Contract.

- A. *Standard Specifications*—A set of specifications approved by the Department for general application and repetitive use, entitled the "Standard Specifications for Roads, Bridges, Facilities and Incidental Construction" found at the following link:  
<http://www.ct.gov/dot/cwp/view.asp?a=3609&q=430362>
- B. *Supplemental Specifications*—Approved additions to and revisions of the Standard Specifications.
- C. *Special Provisions*—Other Department specifications applicable to an individual project.

**STATE:** State of Connecticut.

**SUBCONTRACTOR:** Any individual, firm, partnership or corporation to which the Contractor sublets, with the approval of the Commissioner, any part or parts of the Project covered by the Contract.

**SUBSTANTIAL COMPLETION:** The date at which the performance of all work on the Project has been completed except minor or incidental items, final cleanup, work required under a warranty and repair of unacceptable work, and provided the Engineer has determined that:

- A. The Project is safe and convenient for use by the public, and

- B. All traffic lanes including all safety appurtenances are in their final configuration, and
- C. Failure to complete the work and repairs excepted above does not result in the deterioration of other completed work, and provided further, that the value of work remaining to be performed, and cleanup is less than 1% of the estimated final Contract amount, and
- D. If applicable, a Certificate of Compliance has been issued.

**SUBSTITUTE:** A replacement for a specified material, device, type of equipment, or method, which is sufficiently different in substance and function, quality, or workmanship to constitute a change in the Contract work.

**SUBSTRUCTURE:** All of that part of the bridge below the bearings of simple and continuous spans, skewbacks of arches and tops of footings of rigid frames, including backwalls, wingwalls and any protective railings mounted on the wingwalls.

**SUB-SUBCONTRACTOR:** Any individual, firm, partnership or corporation to which a subcontractor sublets, with the approval of the Commissioner, any part or parts of the Project covered by the Contract.

**SUPERSTRUCTURE:** The entire bridge except the substructure.

**UTILITY:** Any public service company and the plant of such a company or similar facilities. Such companies may consist of, but not be limited to, companies selling or controlling the sale, distribution or use of water, gas, electricity, communications systems, sewers and railroad lines. Such facilities may consist of, but not be limited to, wires, cables, ducts, pipes, manholes, transformers, poles, towers and tracks.

**WORK:** The provision of labor, materials or services necessary for or relating to the design and construction of the Project.

**WORKING DRAWINGS:** Drawings, calculations, procedures and other supporting data prepared by a Contractor, documenting the Contractor's proposed design, details, materials, construction methods and equipment for any construction for which no specific design or detail appears in the Contract.



**SECTION 1.04  
SCOPE OF WORK**

*Replace Section 1.04 in its entirety with the following:*

**SECTION 1.04  
SCOPE OF WORK**

**1.04.01—Intent of Contract**

**1.04.02—Changes in Quantities of Pay Items, Including Elimination of Such Items**

**1.04.03—Changes in Quantities and Significant Changes in the Character of Work**

**1.04.04—Differing Site Conditions**

**1.04.05—Extra Work**

**1.04.06—Removal and Disposal of Structures on the Work Site**

**1.04.07—Rights in and Use of Materials Found on the Work Site**

**1.04.01—Intent of Contract:** The Contract directs and obliges the Contractor to perform the Project described in strict compliance with the Contract terms, including its specifications, plans, special provisions, and other Contract documents. If the Engineer revises any of those terms in writing during the life of the Contract, the Contractor must comply with said revised terms. Among other things, the Contract obliges the Contractor to perform all Project work in conformity with the lines, grades, typical cross-sections, dimensions, and other data shown on the plans and other Contract documents. The Department will pay the Contractor only for work (including materials necessary for that work, whether or not they are incorporated into that work) that the Contractor has actually performed under a Contract pay item, and only if the Engineer has accepted said work. (See 1.02.03 herein.) (The Contract as it existed when first duly executed by the Engineer is sometimes referred to herein as “the original Contract.”)

**1.04.02—Changes in Quantities of Pay Items, Including Elimination of Such Items:** The quantities given in the original Contract for Contract pay items are only estimates of the quantities of those items that may be required for Project completion. (The quantities for given pay items in the original Contract are sometimes referred to herein as the “estimated quantities” or “original quantities.”) A change in the original quantity of a Contract pay item (whether an increase or decrease of the quantity) shall be deemed to have occurred when the Engineer explicitly orders said change of quantity or when the change of quantity has been necessitated by a construction order or other written direction issued by the Engineer to the Contractor.

A Contract pay item shall be deemed a Major Item if the item’s lump sum priced in the original Contract, or its original quantity multiplied by its unit price in the original Contract, is equal to or greater than 10% of the original Contract’s total bid price. All other Contract items shall be deemed Minor Items.

The provisions of 1.04.03 herein shall govern changes in compensation related to a “significant change” in Contract work (as such changes are defined in 1.04.03) necessitated by a written order of the Engineer.

The provisions of 1.04.04 herein shall govern changes in compensation related to any differing site condition encountered by the Contractor that affects its performance of Contract work.

The provisions of 1.04.03 or 1.04.04 shall govern in any case in which they conflict with another provision of the Contract.

If the Engineer and the Contractor together determine that a particular change in compensation to the Contractor should be made due to a change in a Contract pay item quantity (including an item’s complete elimination), they may make that change in compensation by a written agreement to do so.

**Changes in Quantities to Minor Items:**

**(a) Quantity Increases of More Than 25% over Original Quantity:** If the actual quantity of work authorized and accepted by the Engineer under a Contract pay item exceeds the item’s original quantity by 25%, the Department will pay for the quantity in excess of 125% of the original quantity in one of the following three ways. (One-time fixed costs for which the Department has already reimbursed the Contractor in paying for 125% of the original quantity shall not be included in a calculation of the actual cost of the excess units.)

- (1) Pay for the aggregate excess units on a cost-plus basis as provided in 1.09.04.
- (2) Adjust the unit price by the increase or decrease in the unit price for the excess units, which shall be the difference between the original Contract unit price and the actual unit cost (calculated on a cost-plus basis as provided in 1.09.04) of the excess units, said difference to be calculated as of the time when work under the item was completed.

(3) Pay for the units in any other manner agreed on in writing by the Engineer and the Contractor. If, however, the aggregate payment for the units in excess of 125% is less than \$25,000 (using the original Contract unit price for the calculation) the Engineer will not adjust that unit price.

**(b) Quantity Decreases of More Than 25% below Original Quantity:** If the actual quantity of a Contract pay item authorized and accepted by the Engineer is less than 75% of the item's original quantity, the Engineer will not adjust the original Contract unit price for said item unless the Contractor makes a written request to the Engineer for such adjustment and the Engineer grants it in writing. If the Engineer grants such a request, the Engineer will adjust the price for each accepted unit of said item performed or provided in one of the following three ways:

- (1) Pay for the total item units actually performed or provided in the aggregate units on a cost-plus basis as provided in 1.09.04.
- (2) Adjust the unit price by any increase in the unit price for the deficit units, which shall be the difference between the original Contract unit price and the actual unit cost (calculated on a cost-plus basis as provided in 1.09.04) of the total units performed or provided, said difference to be calculated as of the time when work under the item was completed.
- (3) Pay for the item units performed or provided in any manner agreed on in writing by the Engineer and the Contractor.

In no instance however, shall the unit price paid for the number of units performed or provided, when their quantity has been decreased by more than 25% of the original quantity, be less than their original unit price; and in no instance shall the aggregate payment for such a decreased quantity of items be more than the Engineer would have paid for the performance or provision of 75% of the original quantity at the original unit price.

Regarding treatment of eliminated Contract items, refer to 1.09.05 herein.

**1.04.03—Changes in Quantities and Significant Changes in the Character of Work:**

- (i) The Engineer reserves the right to make, in writing, at any time during the work, such changes in quantities and such alterations in the work as are necessary to satisfactorily complete the Project. Such changes in quantities and alterations shall not invalidate the Contract nor release the surety, and the Contractor agrees to perform the work as altered.
- (ii) If the alterations or changes in quantities significantly change the character of the work under the Contract, whether such alterations or changes are in themselves significant changes to the character of the work or by affecting other work cause such other work to become significantly different in character, an adjustment, excluding anticipated profit, will be made to the Contract. The basis for the adjustment shall be agreed upon prior to the performance of the work. If a basis cannot be agreed upon, then an adjustment will be made either for or against the Contractor in such amount as the Engineer may determine to be fair and equitable.
- (iii) If the alterations or changes in quantities do not significantly change the character of the work to be performed under the Contract, the altered work will be paid for as provided elsewhere in the Contract.
- (iv) The term "significant change" shall be construed to apply only to the following circumstances:
  - (A) When the character of the work as altered differs materially in kind or nature from that involved or included in the original proposed construction; or
  - (B) When a Major Item of work, as defined elsewhere in the Contract, is increased in excess of 125% or decreased below 75% of the original Contract quantity. Any allowance for an increase in quantity shall apply only to that portion in excess of 125% of original Contract item quantity, or in case of a decrease below 75%, to the actual amount of work performed.

**1.04.04—Differing Site Conditions:**

- (i) During the progress of the work, if subsurface or latent physical conditions are encountered at the Site differing materially from those indicated in the Contract or if unknown physical conditions of an unusual nature, differing materially from those ordinarily encountered and generally recognized as inherent in the work provided for in the Contract, are encountered at the Site, the party discovering such conditions shall promptly notify the other party in writing of the specific differing conditions before the Site is disturbed and before the affected work is performed.
- (ii) Upon written notification, the Engineer will investigate the conditions, and if it is determined that the conditions materially differ and cause an increase or decrease in the cost or time required for the performance of any work under the Contract, an adjustment, excluding anticipated profits, will be made and the Contract modified in writing accordingly. The Engineer will notify the Contractor of

the determination whether or not an adjustment of the Contract is warranted.

- (iii) No Contract adjustment which results in a benefit to the Contractor will be allowed unless the Contractor has provided the required written notice.
- (iv) No Contract adjustment will be allowed under this clause for any effects caused on unchanged work.

**1.04.05—Extra Work:** Unforeseen work made necessary by the Engineer's changes of the Contract plans or specifications, or work that is necessary for completion of the Project, but for which no price is provided in the Contract, shall be done in accordance with the requirements of the specifications and as directed by the Engineer. The Engineer shall notify the Contractor of the necessity for such extra work, stipulating its character and extent, and shall notify the Contractor as to whether the Engineer wants the Contractor to propose a unit price or, lump sum price, or to perform the extra work on a cost-plus basis in accordance with 1.09.04. The Engineer need not solicit any price for the extra work from the Contractor, but may, in any event, simply order the Contractor to perform the extra work on a cost-plus basis. If the Engineer does solicit from the Contractor a unit or lump sum price for the extra work, the Contractor must propose such a price in writing within 5 days of the Engineer's request for one.

The Contractor's price proposal shall be itemized and reasonably detailed, and shall include all known or anticipated direct and indirect costs of the work, including but not limited to, the costs of all safety and other equipment, small tools, labor, subcontractor quotes, consumables, field office overhead, home office overhead, insurance, bonding, and profit.

The character and extent of the extra work, together with the basis of compensation, shall be communicated to the Contractor by means of a construction order which, when signed by the Engineer, shall become a part of the Contract. If a Contractor objects to any portion of a construction order submitted to it, the Contractor must, within 15 days of its receipt of said order, return the order with a letter to the Department's Assistant District Engineer administering the Contract, describing specifically what portions of the order the Contractor finds objectionable, the nature of its objections, and the bases for its objections. If the Contractor does not do so, it shall be deemed to have accepted the terms of the construction order.

If the Engineer changes the scope of Contract work, the Contractor shall submit a proposed revised schedule and a cost revision proposal, which takes all such changes into account, if the Contractor believes that such revisions are warranted. If the schedule is to be revised, it will be revised in accordance with 1.08.08.

**1.04.06—Removal and Disposal of Structures on the Work Site:** All structures on the Project site which are not to remain on the Project site after completion of the Project shall be removed from said site and disposed of by the Contractor once it is no longer needed for the Project, and any such structure shall then become the property of the Contractor, except as otherwise required or provided by 1.10.07.

**1.04.07—Rights in and Use of Materials Found on the Work Site:** Upon written request of the Contractor and with the written approval of the Engineer, subject to limitations which may be set forth within such approval, any stone, gravel, sand, topsoil or any material from existing bridge substructures, buildings, or other structures, found within the limits of the Project may be excavated or removed and used by the Contractor on the Project, provided that said materials meet the requirements of the specification for such materials. Any materials excavated or removed shall not be taken off the Project site unless the Engineer in writing specifically authorizes such action. The following conditions shall govern these matters:

1. Excavation or removal of materials that would necessarily be excavated or removed in making the improvement will be paid for at the applicable Contract unit prices; and, in addition, the item for which this material is used will also be paid for at its Contract unit price. The Contractor will not be charged for such materials. The Contractor shall, without compensation, place in the embankment or elsewhere, as appropriate, sufficient suitable material to fill the space that the excavated materials would have occupied, unless otherwise directed by the Engineer.
2. The excavation or removal of materials that are not required to be excavated or removed in connection with the Contract work will not be paid for; and the Contractor will be charged for such materials at a negotiated unit price. The item for which this material is used will be paid for at its Contract unit price. The Contractor shall, without compensation, backfill with accepted material the space that the excavated materials had occupied, to the satisfaction of the Engineer, unless otherwise directed by the Engineer.

Surplus material shall be removed from the Project only with the Engineer's written permission. The Engineer may determine that such material is not surplus, and may order that it be incorporated into the Project.

**SECTION 1.08**  
**PROSECUTION AND PROGRESS**

*Replace Article 1.08.08 with the following:*

**1.08.08—Extension of Time:** The Contractor may present to the Engineer a request in writing for an extension of Contract time if the time necessary for completion of the Project has been increased due to extra or added work or delays resulting from unforeseeable causes beyond the control and without the fault or negligence of the Contractor, except for weather or seasonal conditions (unless extraordinary and catastrophic). Such causes include, but are not limited to, natural catastrophes, acts of the State in either its sovereign or contractual capacity, acts of another contractor in the performance of a contract with the State, the presence of utility facilities (including railroads), fires, strikes, floods, or delays by suppliers arising from unforeseeable causes beyond the control and without the fault or negligence of either the Contractor or such suppliers.

The Contractor's plea that insufficient Contract time was allowed under the Contract before commencement of the Project is not a valid reason for extending the Contract time. Requests for an extension of time with adequate substantiation must be presented within 60 calendar days from the event that is the basis of the request or from the first effect of such an event on the Project. The Contractor will be responsible for providing all the documentation necessary to support the reasonableness of the additional time requested. This shall include a Critical Path Method Schedule Analysis and accompanying narrative that includes the specific dates and number of days for which the extension is sought, the basis or bases for the extension, and the schedule analysis illustrated in a graphic representation of the schedule impacts such as a bar chart or other type of graphical schedule. The critical path is a sequence of activities in a project wherein none of the activities can be delayed without affecting the final project end date.

Such requests will be considered by the Engineer and granted to the extent that he deems to be fair and reasonable. Requests will not be considered if based on delays caused solely by conditions existing at the time the bids were received and of which the Contractor might reasonably be expected to have had full knowledge at the time, or upon delays caused by failure on the part of the Contractor to anticipate properly the requirements of the Project as to materials, labor, or equipment. For all Project delays or time increases, except as provided below, additional Contract time is the sole remedy that the Contractor may have, and such periods of additional Contract time shall be deemed "Non-Compensable Delays." For delays caused by the State in its Contractual capacity, the Contractor may, in addition to a time extension, request additional compensation to reimburse it for damages sustained as a direct result of such delay, and such periods of extended Contract time may be deemed "Compensable Delays."

The period of compensable delay is limited as follows:

- (1) it may not include time more than 60 days prior to the Engineer's receiving written notice from the Contractor, with adequate substantiation, of its intent to claim damages for the delay, and
- (2) it may not include periods of delay for which the State was responsible, but during which the Contractor experienced concurrent delays for which the State was not responsible.

Damages for periods of Project delay for which the State had sole responsibility shall be limited to the increased costs incurred by the Contractor (which shall not include lost profits), which the Contractor substantiates and which the Contractor shows were caused by such delays.

If an approved extension of Contract time extends beyond November 30, the number of days of the approved extension remaining on that date will not begin to run again until the following April 1.

The Critical Path Method Schedule Analysis shall include at a minimum:

1. The manner in which the Contractor planned to construct the Project, in terms of activities, logical interrelationships of activities, work sequences, activity durations, and calendars.
2. The actual duration and sequences of the activities, based on what actually occurred on the Project.
3. The variances between the planned and actual performance of the work, listed in a chronological and cumulative manner, summing to the net total delay on the Project at the time of the request.
  - a. The causes of the variances between the planned and actual performance of the work, specifically allocating legal responsibility for each to either the Department or the Contractor.
  - b. The effects of the variances in work sequences, activity durations, manpower, and resources on the incurred costs of the affected party or parties.

4. An identification analysis of the causes of any concurrent delays on the Project.
5. Statements as to whether the time extension days sought are compensable or non-compensable, along with a specific statement of any compensation requested in connection with the time extension. Any request for a time extension that does not include a corresponding request for compensation will be assumed to be a request for a non-compensable time extension.
6. All associated analysis documents, worksheets, schedules and contemporaneous documents supporting the Critical Path Method Schedule Delay Analysis.

**SECTION 1.09**  
**MEASUREMENT AND PAYMENT**

*Replace Articles 1.09.04 and 1.09.05 with the following:*

**1.09.04—Extra and Cost-Plus Work:** Extra work shall be performed only under the conditions and subject to the requirements outlined in 1.04.05. Payment for extra work may be made on any unit price or lump sum price or other basis to which the Engineer and the Contractor agree in writing, or the Engineer may order that the Contractor will be paid for the work on the cost-plus basis described in this Article.

The following sets forth the components of the cost-plus basis for making payments:

**(a) Labor:**

- (1) For all labor used by the Contractor for the subject work, the Department will pay the Contractor the wage rate that it actually paid for same, as shown by its certified payroll, which shall be at least the minimum rate established for the Project by the CT Department or the U.S. Department of Labor. For all foremen in direct charge of Project work, the Department will pay the Contractor the actual wage paid to the foremen as shown on the Contractor's certified payroll.
- (2) The Department will reimburse the Contractor for the actual costs paid to, or on behalf of, workers by reason of allowances, health and welfare benefits, pension fund benefits and other such benefits in connection with the subject work, when such amounts are required by a collective bargaining agreement or another employment contract generally applicable to the classes of labor employed on the Project. The Contractor shall certify all such costs in writing to the Engineer.
- (3) For property damage, liability and workmen's compensation insurance premiums, unemployment insurance contributions and social security taxes on Project cost-plus work, the Department will reimburse the Contractor for its actual Project costs. The Contractor shall provide to the Engineer documentation, satisfactory to the Engineer in form and substance, of all such costs.
- (4) The Department will also pay to the Contractor an amount equal to 20% (15% for overhead, 5% for profit) of the total sums described in **(a)** (1) through (3) above.

No part of the salary or expenses of anyone connected with the Contractor's forces above the grade of foreman, who provides general supervision of Project work, will be included in the above payment calculations, except when the Contractor's organization is entirely occupied with cost-plus work, in which case the salary of a superintendent may be included in said labor item when the nature of the pertinent Project work is such that, in the opinion of the Engineer, a superintendent was required for that work. The Engineer and the Contractor may agree in writing to the allowable rate of pay for such superintendent, or the Engineer may make payment based on such rate as he deems reasonable.

The Engineer reserves the right to determine the number and type of personnel to be employed for the cost-plus Project work.

**(b) Specialized Work:** When the Engineer directs the Contractor to perform specialized work requiring skills, tools and equipment substantially unlike those ordinarily used by the Contractor or its authorized Project subcontractors, the Department will pay the Contractor for the use of a specialist to perform the specialized work. For such specialized services, including materials incorporated into the Project, the Department will pay the Contractor its actual costs, plus additional compensation in accordance with subparagraph (e) below. If so requested by the Engineer, the Contractor shall obtain and submit to the Engineer, prior to performing such specialized work, a minimum of three price quotes for the work.

**(c) Materials:** For all materials necessary for cost-plus Project work, the Department will pay the Contractor its actual cost for such materials, including delivery charges as shown by original receipted bills, plus 15 % of the sum of said cost and charges.

In lieu of receipted bills for materials used for the Project, but which were not specifically purchased for the Project, but rather were taken from the Contractor's stock, the Contractor shall provide to the Engineer an affidavit certifying that such materials were not purchased for the Project, that the materials were taken from the Contractor's stock, that the quantity claimed to have been used on the Project was actually so used, and that the price claimed for the materials reflects their fair market value at the time of their use on the Project. The Department will pay for costs of transporting the materials to the Project site, in accordance with subparagraphs (a) and (d) hereof.

The Department will not reimburse the Contractor for any penalty or charge incurred by the Contractor due to the Contractor's late or delayed payment for the pertinent materials.

**(d) Equipment:** All equipment used for cost-plus Project work must, in the judgment of the Engineer, be

in good working condition and suitable for its Project purpose; and the Engineer reserves the right to determine the size and number of units of equipment to be used for such work. The manufacturer's ratings shall be the basis for all Rental Rate Blue Book classifications used for payment purposes. ("Rental Rate Blue Book" as used in these specifications refers to the current edition of the Rental Rate Equipment Watch Blue Book Services, taking into account all current Rate Adjustment Tables, and amendments thereof.)

Trucks will be classified by cubic-yard capacity.

No percentage mark-up will be added for payment purposes to amounts charged by the Contractor based on equipment rental rates.

The Department will not pay rental rates for small tools needed to complete the cost-plus Project work.

For payment purposes, estimated operating costs per hour from the Rental Rate Blue Book will apply only to the actual time during which the equipment is actively being used to perform cost-plus Project work.

For equipment that is also being used for non-cost-plus Project work, the Department will pay the applicable hourly rate only for the actual time that the equipment was assigned to cost-plus Project work. The applicable period of assignment for each piece of equipment shall start when the equipment commences to be used for cost-plus Project work ordered by the Engineer, and shall end at the time designated by the Engineer.

For equipment brought to the Site exclusively for cost-plus work, the Department will reimburse the Contractor for loading and unloading costs and costs of transporting such equipment to and from the Project site; provided, however, that payment for return transportation from the Site shall not exceed the cost of moving the equipment to the Site. If such a piece of equipment is self-propelled, and is driven to the Site under its own power, then the Department will pay only operating costs and labor costs for its transport to and from the Project site. The Department will not, however, pay for any loading, unloading and transportation costs if the equipment is used for any Project work on the Site other than cost-plus work.

- (1) Owned Equipment: The Department will pay the Contractor the applicable rental rate set forth in the Rental Rate Blue Book for any equipment (1) which the Contractor uses, with the Engineer's authorization, to perform cost-plus Project work, and (2) which is owned by the Contractor or a subsidiary, affiliate, or parent company of the Contractor (no matter how far up or down the chain of ownership from the Contractor).

The maximum hourly rate to be used in paying for Contractor-owned equipment assigned to cost-plus work shall be the applicable monthly rate in the Rental Rate Blue Book, divided by 176 (176 being the number of working hours per month).

Should the proper completion of the cost-plus Project work require equipment of a type not covered by the Rental Rate Blue Book, the Engineer will determine, and the Department will make payment to the Contractor at, a reasonable rental rate based on relevant rates prevailing in the area of the Project. If practicable, such rates shall be determined by the Engineer before the affected work is begun. If the Contractor proposes that the Engineer use a particular rate in such an instance, the Contractor must disclose to the Engineer the specific sources of, or support for, said rate.

If a piece of equipment owned by the Contractor is assigned to cost-plus Project work, but remains idle for some portion of the period of the cost-plus work, the Department will pay for that idle time at 50% of the applicable rental rate (exclusive of operating costs) in the Rental Rate Blue Book.

For payment purposes, the period of equipment usage shall be deemed to start when the Contractor begins to use the equipment for cost-plus Project work and shall be deemed to end when the equipment is released by the Engineer from use for such work. Any hours during which the equipment is used for work other than cost-plus Project work will be deducted from the pertinent payment period.

For any piece of Contractor-owned equipment assigned to cost-plus Project work, the Department will reimburse the Contractor for an aggregate minimum of 8 hours (of use time, idle time, or a combination thereof) in each 24-hour day (measured from one midnight to the following midnight) during the assignment period. No such reimbursement will be made, however, for Saturdays, Sundays and legal holidays during which the Contractor does no Project work, or for any other day on which the Engineer orders the Contractor to do no Project work. If the equipment is used to perform cost-plus Project work for more than 8 hours in a day, the Department will pay the Contractor at the applicable hourly rate computed on a monthly basis for the actual time of use; however the Department will not pay the Contractor for more than 8 hours of idle time for a piece of equipment during a given day.

The Department shall have the right to limit its aggregate Project payments for idle time for a given

piece of equipment to the replacement value of that equipment.

- (2) **Rented Equipment:** If the Engineer determines that in order to perform the cost-plus Project work the Contractor must rent certain machinery, trucks or other equipment not owned by the Contractor or a subsidiary, affiliate, or parent company of the Contractor (no matter how far up or down the chain of ownership from the Contractor), the Contractor shall provide to the Engineer in writing, in advance of such rental:

1. the specific nature of the rental(s),
2. the reasons for its need for such rental(s),
3. the anticipated or proposed rental rate(s), and
4. the estimated duration for the use of each piece of such rented equipment.

Proposed rates for such rented equipment must be based on the following:

- A daily rate per hour when the equipment is to be specifically assigned to Project work by the Engineer for a period of 7 consecutive calendar days or less.
- A weekly rate per hour when such assigned time exceeds 7 consecutive calendar days, but does not exceed 21 consecutive calendar days.
- A monthly rate per hour when such assigned time exceeds 21 consecutive calendar days.

The applicable daily, weekly, or monthly rate will be determined at the expiration of 21 calendar days or upon release of the equipment by the Engineer, whichever occurs first. Interruptions of the rental period, when equipment is used for work other than assigned cost-plus work, will not entitle the Contractor to payment at a rental rate that would be applicable to a shorter period that might arguably have been occasioned by such interruptions.

If so requested by the Engineer, the Contractor shall, prior to renting such equipment, obtain and submit to the Engineer in writing a minimum of three rate quotes for rental of the equipment.

The Department will pay the Contractor for such rental at the rate actually paid by the Contractor, provided that the given use and rental rate are acceptable to the Engineer. In order to obtain such payment, the Contractor must provide the Engineer with a copy of the original receipted bill for the rental expenses incurred.

(e) **Administrative Expense:** When extra work is performed on a cost-plus basis by a subcontractor acceptable to the Engineer, the Department will pay the Contractor an additional 7.5% for that work; such payment will be in addition to the percentage payments described in (a), (b), (c) and (d) above, as a reimbursement for the Contractor's administrative expense in connection with such work. The Engineer will approve such additional payments only if and when the Contractor provides to the Engineer receipted invoices for all relevant costs.

(f) **Miscellaneous:** The compensation provided for in (a), (b), (c), (d) and (e) above shall be deemed to be payment in full for the extra work, and shall be deemed as full compensation for same, including costs of superintendence, use of small tools, equipment for which no rental is allowed, safety equipment, consumables, field office overhead, home office overhead, bonding, other insurance, and profit. The Contractor's representative and the Engineer shall compare their respective records related to the extra work done on a cost-plus basis at the end of each day. Copies of these records shall be signed by both the Engineer and the Contractor's representative. The Engineer will then forward a copy of same to the Contractor and to any affected subcontractor in accordance with Department procedures. Upon payment of such costs by the Contractor, the Contractor shall immediately furnish the Engineer with original receipted bills covering the costs, including transportation charges, for all materials used for such work.

**1.09.05—Eliminated Items:** The Engineer may eliminate from the Contract any pay unit item, or any portion of Project work contained in a lump sum item by giving written notice of said elimination to the Contractor. Such elimination shall in no way invalidate the Contract.

The Engineer will make final payment to the Contractor for materials at the actual cost of the materials for eliminated pay unit items or portions of work contained in a lump sum item only under the following terms and conditions:

1. the materials were ordered by the Contractor prior to the Engineer's issuance to the Contractor of a written notice of the unit or work's elimination (as evidenced by a dated invoice from the vendor);
2. the materials conformed to all Contract requirements; and
3. the Contractor could not have cancelled its order within 2 days after the issuance of the elimination notice.



Any materials paid for by the Department on these conditions shall then be the property of the State, and the State will assume, or will reimburse the Contractor for, the actual cost of any further handling necessary to deliver said materials to a location designated by the Engineer.

If the relevant materials purchased by the Contractor are returnable to their vendor and if the Engineer so directs, the Contractor shall return the materials to the vendor, in which case the Department will reimburse the Contractor for any reasonable charges made to the Contractor by the vendor for the return of the materials, and for the actual costs to the Contractor of its handling the materials in returning them to the vendor. Such reimbursements by the Department shall be computed as though the work were being paid for on a cost-plus basis under 1.09.04.

If the Engineer determines that an elimination of a pay unit item, or portion of work contained in a lump sum item constitutes a "significant change" in the character of the Contract work, as defined under 1.04.03 necessitated by a written order of the Engineer, the terms of 1.04.03 shall govern the payment to be made in relation to the eliminated item or work.

**SECTION 1.11  
CLAIMS**

*Replace Section 1.11 in its entirety with the following:*

**SECTION 1.11  
CLAIMS**

**1.11.01—General****1.11.02—Notice of Claim****1.11.03—Record Keeping****1.11.04—Claim Compensation****1.11.05—Required Claim Documentation****1.11.06—Auditing of Claims**

**1.11.01—General:** When the Contractor files against the Department or the State a formal claim (a “formal” claim being one that seeks resolution through binding arbitration or court litigation, rather than through negotiation or mediation) under C.G.S Section 4-61 as revised (“Section 4-61”), whether as a Section 4-61 notice of claim, demand for arbitration or as a complaint in the Superior Court, the Contractor must follow the procedures and comply with the requirements set forth in this Section of the Specifications, as well as those set forth in Section 4-61. If this Section sets forth additional, more specific, or demanding requirements than does Section 4-61 in any respect, this Section shall govern the matter. While the requirements of this Section may not strictly apply to informal claims (“informal” claims being those which the Contractor seeks to resolve through negotiations with the Department, in or outside of a mediation) for additional compensation or other relief from the Department, the Contractor should understand that the Department may need and may demand (in which case the Contractor must provide), the same kinds of documentation and other substantiation that are required under this Section for formal claims. In addition, any time extension request submitted as part of a claim, must satisfy the requirements of this provision and those of 1.08.08. It is the intent of the Department to compensate the Contractor for actual increased costs caused by or arising from acts or omissions on the part of the Department that violate legal or contractual duties owed to the Contractor by the Department.

**1.11.02—Notice of Claim:** Whenever the Contractor intends to file a demand for arbitration or a court complaint against the Department under Section 4-61, the Contractor must first notify the Commissioner of the details of said claim, in writing via certified mail (in strict compliance with Section 4-61), and such written notice must contain all pertinent information described in 1.11.05 below.

Once a formal notice of a claim under Section 4-61 has been given to the Commissioner, the claimant may not change the claim in any way, in either concept or monetary amount, except insofar as the claim seeks damages that will continue to accrue after submission of the notice, in ways described and anticipated in that notice.

**1.11.03—Record Keeping:** The Contractor shall keep daily records identifying:

- (1) each aspect of the Project affected by matters related to any claim for additional compensation or relief that the Contractor has filed, intends to file, or has reason to believe that it may file against the Department;
- (2) the specific Project locations where Project work has been so affected;
- (3) the number of people working on the affected aspects of the Project at the pertinent time(s); and
- (4) the types and number of pieces of equipment on the Site at the pertinent time(s).

All events or conditions that have a potential or anticipated effect on the Project’s progress or schedule and that may result in a claim by the Contractor shall be documented contemporaneously with the event or discovery of the pertinent condition(s), or immediately thereafter. If this is not done, the Contractor may not file the related claim and may not be awarded relief upon it. Without such information, the Department and the Office of the Attorney General may not be able to adequately determine what claims have merit or to what extent they have merit, or what amounts of compensation may be warranted and supportable. Moreover, State officials involved in the analytic or negotiation process may not be able to properly substantiate and support the recommendations that they must make to their superiors, including the Attorney General, and sometimes the Governor, in the course of a settlement process.

**1.11.04—Claim Compensation:** If the Contractor proves entitlement for damages, payment shall be

made in accordance with the following provisions:

1. **Compensable Items:** The liability of the Department for claims will be limited to the following specifically-identified items of cost, insofar as they have not otherwise been paid for by the Department (for instance, through payment for extra work, which under 1.04.05 includes overhead and profit), and insofar as they were caused solely by the actions or omissions of the Department or its agents.

The Department will pay for direct labor expenses, direct costs for materials, and direct costs for active equipment use, plus an additional ten percent (10%) of the total amount of such direct costs as payment for home office overhead and profit.

**Compensable delay-related costs:** The Department will pay for any additional field office overhead and idle equipment costs for each day of Project Critical Path delay or suspension caused solely by action or inaction of the Department.

If the Critical Path delay or suspension period is less than 30 calendar days, the Department will pay an additional ten percent (10%) of the additional field office overhead costs as payment for home office overhead and profit. For delays less than 30 calendar days, idle equipment will be paid at 50% of the Rental Rate Blue Book rate.

For delays equal to or longer than 30 calendar days, the Department will pay a per diem rate, calculated as six percent (6%) of the original total Contract amount divided by the original number of days of Contract time, as payment for home office overhead and profit.

In paying for idle equipment equal to or longer than 30 calendar days, the Department will pay for actual equipment costs. Actual equipment costs shall be based upon records kept in the normal course of business and in accordance with generally-accepted accounting principles. Under no circumstances shall Blue Book or other guide or rental rates be used for this purpose (unless the Contractor had to rent the equipment from an unrelated party, in which case the actual rental charges paid by the Contractor, so long as they are reasonable, shall be reimbursed by the Department).

If the final Contract Value is greater than the original Contract Value, any delay-related costs that are compensable under this Article shall be reduced by eight percent (8%) of the difference between the final Contract Value and the original Contract Value.

Such payments for compensable delay-related costs shall be deemed to be complete and mutually-satisfactory compensation for field and home office overhead related to the period of delay or suspension.

Subcontractor costs of any kind, however, may be paid for by the Department only (a) in the context of a negotiated claims settlement or (b) if the Contractor has itself paid or legally-assumed, present unconditional liability for those subcontractor costs.

2. **Non-Compensable Items:** The Department will have no liability for the following specifically-identified non-compensable items:
  - (1) Profit in excess of that provided for herein.
  - (2) Loss of anticipated profit.
  - (3) Loss of bidding opportunities.
  - (4) Reduction of bidding capacity.
  - (5) Home office overhead in excess of that provided for herein.
  - (6) Attorney's fees, claims preparation expenses, or other costs of claims proceedings or resolution.
  - (7) Any other consequential or indirect expenses or costs, such as tort damages, or any other form of expense or damages not provided for in these Specifications or elsewhere in the Contract.

**1.11.05—Required Claim Documentation:** All claims shall be submitted in writing to the Commissioner, and shall be sufficient in detail to enable the Engineer to ascertain the basis and the amount of each claim, and to investigate and evaluate each claim in detail. When submitting any claim over \$50,000, the Contractor shall certify in writing, under oath and in accordance with the formalities required by the Contract, that the following are true:

1. That supporting data is accurate and complete to the Contractor's best knowledge and belief;
2. That the amount of the dispute and the dispute itself accurately reflects what the Contractor in good faith believes to be the Department's liability.

The certification shall be executed by an officer or general partner of the Contractor having overall responsibility for the conduct of the Contractor's affairs.

When submitting a claim to the Commissioner, as a minimum, the Contractor must provide the following

information for each and every claim and sub-claim asserted:

- (a) A detailed factual statement of the claim, with all dates, locations and items of work pertinent to the claim.
- (b) A statement of whether each requested additional amount of compensation or extension of time is based on provisions of the Contract or on an alleged breach of the Contract. Each supporting or breached Contract provision and a statement of the reasons why each such provision supports the claim must be specifically identified or explained.
- (c) Excerpts from manuals or other texts which are standard in the industry, if available, that support the Contractor's claim.
- (d) The details of the circumstances that gave rise to the claim.
- (e) The date(s) on which any and all events resulting in the claim occurred, and the date(s) on which conditions resulting in the claim first became evident to the Contractor.
- (f) Specific identification of any pertinent document, and detailed description of the substance of any material oral communication, relating to the substance of such claim.
- (g) The name, function, and pertinent activity of each Contractor's or subcontractor's official, or employee involved in or knowledgeable about events that give rise to, or facts that relate to, the claim.
- (h) The amount(s) of additional compensation sought and a break-down of the amount(s) into the categories specified as payable under 1.11.04 above.
- (i) The name, function, and pertinent activity of each Department official, employee or agent involved in or knowledgeable about events that give rise to, or facts that relate to, the claim.

**1.11.06—Auditing of Claims:** All claims filed against the Department shall be subject to audit by the Department or its agents at any time following the filing of notice of such claim. The Contractor and its subcontractors and suppliers shall cooperate fully with the inquiries and document requests of the Department's auditors. Failure of the Contractor, its subcontractors, or its suppliers to maintain and retain records that are sufficient to enable the Department or its agents to fully evaluate the claim shall constitute a waiver of any portion of such claim that cannot be verified by specific, adequate, contemporaneous records, and shall bar recovery on any formal claim or any portion of such a claim for which such verification is not produced. Without limiting the foregoing requirements, and as a minimum, the Contractor shall make available to the Department and its agents the following documents in connection with any claim that the Contractor submits:

- (1) Daily time sheets and foreman's daily reports.
- (2) Union agreements, if any.
- (3) Insurance, welfare, and benefits records.
- (4) Payroll register.
- (5) Earnings records.
- (6) Payroll tax returns.
- (7) Records of property tax payments.
- (8) Material invoices, purchase orders, and all material and supply acquisition contracts.
- (9) Materials cost distribution worksheets.
- (10) Equipment records (list of company equipment, rates, cost pools, etc.).
- (11) Vendor rental agreements.
- (12) Subcontractor and vendor subcontracts, purchase orders, and/or agreements including all change orders and modifications.
- (13) Subcontractor and vendor invoices to the Contractor, and the Contractor's certificates of payments to subcontractors and vendors.
- (14) Subcontractor payment certificates.
- (15) Canceled checks (payroll, subcontractors, and vendors).
- (16) Job cost reports.
- (17) Job payroll ledger.
- (18) General ledger, general journal (if used), and all subsidiary ledgers and journals, together with all supporting documentation pertinent to entries made in these ledgers and journals.
- (19) Cash disbursements journals.
- (20) Financial statements for all years reflecting the operations on the Project.
- (21) Income tax returns for all years reflecting the operations on the Project.

- (22) Depreciation records on all company equipment, whether such records are maintained by the company involved, its accountant, or others.
- (23) If a source other than depreciation records is used to develop costs for the Contractor's internal purposes in establishing the actual cost of owning and operating equipment, all such other source documents.
- (24) All documents which reflect the Contractor's actual profit and overhead during the years that the Project was being performed, and for each of the five years prior to the commencement of the Project.
- (25) All documents related to the preparation of the Contractor's bid, including the final calculations on which the bid was based.
- (26) All documents which relate to the claim or to any sub-claim, together with all documents that support the amount of damages as to each claim or sub-claim.
- (27) Worksheets used to prepare the claim, which indicate the cost components of each item of the claim, including but not limited to the pertinent costs of labor, benefits and insurance, materials, equipment, and subcontractors' damages, as well as all documents which establish the relevant time periods, individuals involved, and the Project hours and the rates for the individuals.

**SECTION 1.20  
SUPPLEMENTED GENERAL CLAUSES FOR FACILITIES CONSTRUCTION**

**SECTION 1.20-1.01  
DEFINITION OF TERMS AND  
PERMISSIBLE ABBREVIATIONS FOR  
FACILITIES CONSTRUCTION**

*Replace Article 1.20-1.01.01 with the following:*

**1.20-1.01.01—Facilities Construction - Definitions:** In these specifications, unless the context requires otherwise, words of the masculine gender include the feminine and the neuter, and, when the sense so indicates, words of the neuter gender may refer to any gender. Where appropriate, words in the singular form shall be deemed to include the plural, and words in the plural form to include the singular.

**ADDENDUM:** Contract revisions developed and incorporated into the contract after bid advertisement and before the opening of bid proposals.

**AIR OPERATIONS AREA:** Any paved or unpaved area of the airport used or intended to be used for the unobstructed movement of aircraft. These movements shall include landings, takeoffs, and surface maneuverings.

**AWARD:** The Department's acceptance in writing of the proposal of the lowest responsible bidder for the work, subject to the execution and approval by the Department of a contract therefor and the provision by the bidder of performance and payment bonds to secure the performance thereof which are acceptable to the Commissioner, and to such other conditions as may be specified by the Department or required by law.

**BID:** The submission of a proposal for the work contemplated.

**BID ADVERTISEMENT:** A public announcement soliciting bids for a contract for work to be performed or materials to be furnished.

**BIDDER:** Any individual, firm, partnership, corporation, or combination thereof, submitting a proposal for the work contemplated, acting directly or through a duly authorized representative

**BID MANUAL:** "The State of Connecticut Department of Transportation Construction Contract Bidding and Award Manual," copies of which are available from the Department's Division of Contracts and at the following link: <http://www.ct.gov/dot/cwp/view.asp?a=2288&q=259258>

**CALENDAR DAY:** Every day shown on the calendar, Sundays and holidays included.

**CATALOG CUT (PRODUCT DATA):** Document(s) with information such as manufacturer's product specifications, manufacturer's installation instructions, standard color charts, wiring diagrams showing factory-installed wiring, printed performance curves and operational range diagrams. Product data that must be specially prepared because standard printed data is not suitable shall be considered shop drawings.

**CERTIFICATE OF COMPLIANCE:** The formal document issued at the completion of a project by the State Building Inspector. The document is often referred to informally as a "Certificate of Occupancy," "C.O.C." or "C.O."

**CHANNEL:** A channel shall be interpreted to mean a natural or artificial watercourse having an average width at the bottom, after excavation, of 4 feet or more.

**COMMISSIONER:** State of Connecticut Transportation Commissioner acting directly or through a duly-authorized representative.

**CONNECTICUT GUIDELINES FOR SOIL EROSION AND SEDIMENT CONTROL:** This Department of Energy and Environmental Protection (DEEP) Bulletin is intended to provide information to government agencies and the public on soil erosion and sediment control.

[http://www.ct.gov/deep/cwp/view.asp?a=2720&q=325660&deepNav\\_GID=1654%20](http://www.ct.gov/deep/cwp/view.asp?a=2720&q=325660&deepNav_GID=1654%20)

**CONNECTICUT STORMWATER QUALITY MANUAL:** This DEEP publication provides guidance on measures necessary to protect waters of the State from adverse impacts of post-construction stormwater runoff. [http://www.ct.gov/deep/cwp/view.asp?a=2721&q=325704&depNav\\_GID=1654%20-%20download](http://www.ct.gov/deep/cwp/view.asp?a=2721&q=325704&depNav_GID=1654%20-%20download)

**CONSTRUCTION ORDER, CHANGE ORDER:** A written order signed by the Engineer for a contractor to perform work or provide supplies stipulated therein at the price or upon the basis of payment set forth therein.

**CONTRACT:** The agreement covering the performance of the work and the furnishing of materials required for the construction of the Project. The Contract shall be deemed to include the "Plans," "Specifications" (*i.e.*, the Department's "Standard Specifications for Roads, Bridges, Facilities and

Incidental Construction" which is in effect on the date of the Bid Advertisement), "Construction Orders," and such other provisions as may be incorporated into the agreement, in addition to the contents of the bound contract containing the schedule of prices, signature sheet, addenda, special provisions, required federal and state provisions, supplemental specifications, labor and wage schedules, permits and other such material.

**CONTRACTOR:** When the word is capitalized, the party of the second part to the Contract, acting directly or through its agents or employees. When this word is not capitalized, it is to be taken in its more general sense.

**CULVERT:** A covered channel or a large pipe for carrying a watercourse below ground level, usually under a road or railway.

**DEPARTMENT:** State of Connecticut Department of Transportation.

**DESIGNER:** A duly-authorized representative of the Engineer, responsible for the design of the Project.

**DRAINAGE DITCH:** An unpaved, artificially-constructed open depression having an average width of less than 4 feet at the bottom, after excavation, constructed for the purpose of carrying off surface water.

**ENGINEER:** The Commissioner or Deputy Transportation Commissioner, acting directly or through a duly-authorized representative.

**EXECUTION OF CONTRACT:** The date of execution of the Contract by the Department is the date on which the Department's authorized signatory signs the Contract on behalf of the Department.

**EQUAL:** A material, device, type of equipment, or method other than what is specified in the Contract, which is a recognized equivalent in substance and function for that specified thing, taking into account warranty, performance, weight, size, visual effect, specific features and requirements indicated, quality, workmanship, economy of operation, durability, and suitability for purposes intended, provided that the proposed equivalent would not require or constitute a change in Contract work.

**HIGHWAY:** A general term denoting a public way used for vehicular travel. When referred to in the Contract, it signifies the whole right of way reserved for or secured by the Department for use in constructing or maintaining a roadway and its appurtenances.

**INSPECTOR:** A duly-authorized representative of the Engineer, assigned to make inspections of the work performed and materials furnished by the Contractor.

**LABORATORY:** Unless another laboratory or type of laboratory is indicated, the official testing laboratory of the Department.

**LIQUIDATED DAMAGES:** The amount prescribed in the Contract specifications, to be paid to the State or to be deducted from any payments due or to become due the Contractor, for a specified time unit delay in completing the whole or any specified portion of the work beyond the time allowed in the Contract.

**MAJOR ITEM:** An individual Contract item, whose value at the time of bidding (either lump sum price or the product of its unit price multiplied by its estimated quantity) is equal to or greater than 10% of the total original Contract bid price shall be considered a Major Item.

**MAJOR LUMP SUM ITEM (MLSI):** The original Contract item(s) that includes all work depicted on the Contract Plans, described in the Contract Specifications, or is otherwise required for performance and completion of the work, including mobilization and project closeout, but not including any unit price or other lump sum items listed in the Bid Proposal Form.

**MANAGER OF CONTRACTS:** The Transportation Manager of Contracts, who is the head of the Department's Division of Contracts, and whose office is located at the headquarters of the Department at 2800 Berlin Turnpike, Newington, CT.

**MATERIAL:** Any substance specified in the Contract for use in the construction of the Project, including appurtenances of products that are substantially shaped, cut, worked, mixed, finished, refined or otherwise fabricated, processed, or installed to form a part of the work.

**MINOR ITEM:** An individual Contract item that is not a Major Item.

**MUNICIPALITY:** City, town or county.

**NOTICE TO PROCEED:** A written notice issued by the Engineer to the Contractor stating the date on which the Contractor is authorized to commence and proceed with the Contract work.

**OWNER:** Where used herein, it is synonymous with Department or State.

**PAVEMENT STRUCTURE:** The combination of sub-base, base course and surface course placed on subgrade to support and distribute the traffic load.

**PLANS:** All drawings or reproductions of drawings supplied by the Department to the Contractor pertaining to the construction or details of the Project.

- A. Standard Sheets – Standardized plans containing details approved by the Department and the FHWA, for construction of a given type on any project, included in contracts on an as-needed basis.

**PRODUCT DATA (CATALOG CUT):** Document(s) with information such as manufacturer's product specifications, manufacturer's installation instructions, standard color charts, wiring diagrams showing factory-installed wiring, printed performance curves and operational range diagrams. Product data that must be specially prepared because standard printed data is not suitable shall be considered shop drawings.

**PROJECT:** All work included under one Department contract, notwithstanding the occasional use by the Department of multiple project numbers for the work included within one contract.

**PROJECT SITE (or SITE):** The space available to the Contractor, under the Contract, for performing construction activities. The extent of the Project site is as indicated on the plans or elsewhere in the Contract.

**QUALIFIED PRODUCTS LIST (QPL):** A report that has been developed as a means for determining what products, suppliers, manufacturers, equipment and methodologies may be used on construction projects. This report can be located on the CT Department of Transportation Website:

<http://www.ct.gov/dot/cwp/view.asp?a=1387&q=259630>

**RECLAIMED CONCRETE AGGREGATE:** Reclaimed waste consisting of crushed and graded concrete removed from pavements, structures, or buildings. Metal may be acceptable only where it is contained as reinforcement within small fragments of concrete; *e.g.*, metal projecting from concrete fragments would be unacceptable. All such material trucked from beyond the limits of the Project must be accompanied by a Materials Certificate and Certified Test Report indicating that the material is environmentally acceptable and structurally sound in accordance with 1.20-1.06.07, unless the source of the material is a Department Project and that source is acceptable to the Engineer.

**RECLAIMED MISCELLANEOUS AGGREGATE:** Glass-free and clinker-free reclaimed waste, which has been crushed, graded and blended, as specified in the Contract, with natural crushed stone or gravel. Metal may be acceptable only where it is contained as reinforcement within small fragments of concrete; *e.g.*, metal projecting from concrete fragments would be unacceptable. All such material trucked from beyond the limits of the Project must be accompanied by a Materials Certificate and Certified Test Report indicating that the material is environmentally acceptable and structurally sound in accordance with 1.20-1.06.07, unless the source of the material is a Department Project and that source is acceptable to the Engineer.

**RECLAIMED WASTE:** Debris from the demolition of buildings, structures, and pavements; residue from incineration and recycled glass. Acceptable material shall include concrete, bituminous concrete, glass, ceramics, brick, pavement sub-base and base courses, and clinker from resource recovery plants. Metal may be acceptable only when it is contained within large fragments of concrete. Reclaimed waste trucked from beyond the limits of the Project must be accompanied by a Materials Certificate and Certified Test Report indicating that the waste is environmentally acceptable and structurally sound in accordance with 1.20-1.06.07, unless the source of the material is a Department Project and that source is acceptable to the Engineer.

**RIGHT-OF-WAY:** A general term denoting land, property of interest therein, usually in a strip, acquired for or devoted to transportation purposes.

**ROADBED:** The graded portion of a highway, including portions within the top and side slopes, which have been prepared as a foundation for the pavement structure and shoulders.

**ROADWAY:** The portion of the highway, including shoulders, which may be used for vehicular travel within the Project limits.

**SHOP DRAWINGS:** Drawings, including proposed details, diagrams, schedules, procedures and other supporting data, prepared by a Contractor to supplement the Contract documents, showing all information necessary for fabrication of items for which some specific design or detail appears in the Contract.

**SHOULDER:** The portion of the roadway adjacent to the traveled way that can accommodate stopped vehicles for emergency use, and that provides lateral support of base and surface courses.

**SPECIFICATIONS:** The Department's written provisions and requirements for the performance of the Contract, contained in or incorporated by the Contract.

A. *Standard Specifications*—A set of specifications approved by the Department for general application and repetitive use, entitled the "Standard Specifications for Roads, Bridges, Facilities and Incidental Construction" found at the following link:

<http://www.ct.gov/dot/cwp/view.asp?a=3609&q=430362>

B. *Supplemental Specifications*—Approved additions to and revisions of the Standard Specifications.

C. *Special Provisions*—Other Department specifications applicable to an individual project.

**STATE:** State of Connecticut.



**SUBCONTRACTOR:** Any individual, firm, partnership or corporation to which the Contractor sublets, with the approval of the Commissioner, any part or parts of the Project covered by the Contract.

**SUBSTANTIAL COMPLETION:** The date at which the performance of all work on the Project has been completed except minor or incidental items, final cleanup, work required under a warranty, and repair of unacceptable work, and provided the Engineer has determined that:

- A. The Project is safe and convenient for use by the public, and
- B. All traffic lanes including all safety appurtenances are in their final configuration, and
- C. Failure to complete the work and repairs excepted above does not result in the deterioration of other completed work, and provided further, that the value of work remaining to be performed, and cleanup is less than 1% of the estimated final Contract amount, and
- D. A Certificate of Compliance has been issued.

**SUBSTITUTE:** A replacement for a specified material, device, type of equipment, or method, which is sufficiently different in substance and function, quality, or workmanship to constitute a change in the Contract work.

**SUBSTRUCTURE:** All of that part of the bridge below the bearings of simple and continuous spans, skewbacks of arches and tops of footings of rigid frames, including backwalls, wingwalls and any protective railings mounted on the wingwalls.

**SUB-SUBCONTRACTOR:** Any individual, firm, partnership or corporation to which a subcontractor sublets, with the approval of the Commissioner, any part or parts of the Project covered by the Contract.

**SUPERSTRUCTURE:** The entire bridge except the substructure.

**UTILITY:** Any public service company and the plant of such a company or similar facilities. Such companies may consist of, but not be limited to, companies selling or controlling the sale, distribution or use of water, gas, electricity, communications systems, sewers and railroad lines. Such facilities may consist of, but not be limited to, wires, cables, ducts, pipes, manholes, transformers, poles, towers and tracks.

**WORK:** The provision of labor, materials or services necessary for or relating to the design and construction of the Project.

**WORKING DRAWINGS:** Drawings, calculations, procedures and other supporting data prepared by a Contractor, documenting the Contractor's proposed design, details, materials, construction methods and equipment for any construction for which no specific design or detail appears in the Contract.

## SECTION 1.20-1.02 PROPOSAL REQUIREMENTS AND CONDITIONS FOR FACILITIES CONSTRUCTION

*Replace Article 1.20-1.02.13 with the following:*

**1.20-1.02.13—Facilities Construction - Knowledge of Applicable Laws:** Bidders shall be deemed to know and understand all federal, state and local laws, ordinances and regulations and municipal bylaws which in any manner apply to projects for which they bid; such legal requirements shall include, but not necessarily be limited to, those which apply to the conduct of the Contract work, the equipment and materials to be used on the Project, or the treatment of individuals or classes of individuals in relationship to their involvement with the Project. A Contractor's ignorance of such requirements shall not, in any internal Department proceeding or in any claims or other legal proceeding, constitute justification for the Contractor's failure to consider such requirements in formulating a bid proposal, or for the Contractor's failure to ensure that such legal requirements are met with regard to any Department project in which that Contractor participates.

The Contractor agrees that if it should be awarded the contract for any project supported at least in part by federal funding, the Contractor will not knowingly enter into any lower-tier transaction on that project with a person (including entities) who, by virtue of federal law or regulation, or by voluntary agreement, is currently ineligible to participate in such a project, unless after disclosure of such ineligibility, such participation is authorized by appropriate federal and State authorities.

The Department expects the Contractor to obey municipal laws and regulations and cooperate with municipal officials. In some instances, however, municipal laws or regulations, or the orders of municipal officials, may conflict with necessary Project activities. In most such cases, the municipality does not have the legal power to enforce its laws and regulations upon the State or upon a State project. This is because the State is protected by its sovereign immunity. If local police or other authorities should attempt to stop

the Contractor from carrying out activities that are necessary in order for the Contractor to comply with Contract requirements, the Contractor should politely inform the municipal authorities that they probably do not have jurisdiction over the State's project, and the Contractor should immediately inform the Engineer of the attempted interference with Project activities. If the municipal authorities continue to insist upon preventing the Contractor from carrying out Project activities, the Contractor should not defy the authorities, but, to the extent possible, should await directions from the Engineer.

All work to be performed by the Contractor shall comply with, as a minimum, the State Building Code as adopted pursuant to CGS 29-252, as amended; the State Fire Prevention Code as adopted pursuant to CGS 29-291a, as amended; and the Fire Safety Code as adopted pursuant to CGS 29-292, as amended.

The State Building Code, including latest Connecticut Supplements and Amendments, includes the following:

1. The 2012 International Building Code.
2. The 2012 International Plumbing Code.
3. The 2012 International Mechanical Code.
4. The 2012 International Existing Building Code.
5. The 2012 International Energy Conservation Code.
6. The 2014 NFPA 70 National Electrical Code.
7. The 2009 ICC/ANSI A117.1.

The State Fire Safety Code, including latest Connecticut Supplements and Amendments, includes the following:

1. The 2012 International Fire Code.
2. The 2012 NFPA 101 Life Safety Code.

The State Fire Prevention Code, including latest Connecticut Supplements and Amendments, includes the following:

1. The 2012 NFPA 1.

The edition of the code governing the Project shall be the code which is in effect as per the above CGS Sections on the date that the Contract is advertised for solicitation of bids.

All work to be performed by the Contractor shall comply with the 2010 Department of Justice "ADA Standards for Accessible Design."

### **SECTION 1.20-1.03 AWARD AND EXECUTION OF CONTRACT FOR FACILITIES CONSTRUCTION**

*Replace the first paragraph of Article 1.20-1.03.01 with the following:*

**1.20-1.03.01—Facilities Construction - Consideration of Bids:** See 1.20-1.02.01.

The apparent low bidder shall submit to the Manager of Contracts a Schedule of Values within 7 calendar days after bid opening. Any other Contractor that the Department may subsequently designate as the apparent lowest bidder shall make the aforesaid submission within 7 calendar days from the date on which the Department notifies said Contractor that it has become the apparent lowest bidder. If, however, the Department deems it necessary for such a subsequently designated Contractor to make said submission within a shorter period of time, the Contractor shall make the submission within the time designated by the Department.

**SECTION 1.20-1.04  
SCOPE OF WORK FOR  
FACILITIES CONSTRUCTION**

*Replace Section 1.20-1.04 in its entirety with the following:*

**SECTION 1.20-1.04  
SCOPE OF WORK FOR  
FACILITIES CONSTRUCTION**

**1.20-1.04.01—Facilities Construction - Intent of Contract**

**1.20-1.04.02—Facilities Construction - Changes in Quantities of Pay Items, Including Elimination of Such Items**

**1.20-1.04.03—Facilities Construction - Changes in Quantities and Significant Changes in the Character of Work**

**1.20-1.04.04—Facilities Construction - Differing Site Conditions**

**1.20-1.04.05—Facilities Construction - Extra Work**

**1.20-1.04.06—Facilities Construction - Removal and Disposal of Structures on the Work Site**

**1.20-1.04.07—Facilities Construction - Rights in and Use of Materials Found on the Work Site**

**1.20-1.04.01—Facilities Construction - Intent of Contract:** The Contract directs and obliges the Contractor to perform the Project described in strict compliance with the Contract terms, including its specifications, plans, special provisions, and other Contract documents. If the Engineer revises any of those terms in writing during the life of the Contract, the Contractor must comply with said revised terms. Among other things, the Contract obliges the Contractor to perform all Project work in conformity with the lines, grades, typical cross-sections, dimensions, and other data shown on the plans or other Contract documents. The Department will pay the Contractor only for work (including materials necessary for that work, whether or not they are incorporated into that work) that the Contractor has actually performed under a Contract pay item, and only if the Engineer has accepted said work. (See 1.02.03 herein.) (The Contract as it existed when first duly executed by the Engineer is sometimes referred to herein as “the original Contract.”)

**1.20-1.04.02—Facilities Construction - Changes in Quantities of Pay Items, Including Elimination of Such Items:** The quantities given in the original Contract for Contract pay items are only estimates of the quantities of those items that may be required for Project completion. (The quantities for given pay items in the original Contract are sometimes referred to herein as the “estimated quantities” or “original quantities.”) A change in the original quantity of a Contract pay item (whether an increase or decrease of the quantity) shall be deemed to have occurred when the Engineer explicitly orders said change of quantity or when the change of quantity has been necessitated by a construction order or other written direction issued by the Engineer to the Contractor.

A Contract pay item shall be deemed a Major Item if the item’s lump sum price in the original Contract, or its original quantity multiplied by its unit price in the original Contract, is equal to or greater than 10% of the original Contract’s total bid price. All other Contract items shall be deemed Minor Items.

The provisions of 1.20-1.04.03 herein shall govern changes in compensation related to a “significant change” in Contract work, (as such changes are defined in 1.20-1.04.03) necessitated by a written order of the Engineer.

The provisions of 1.20-1.04.04 herein shall govern changes in compensation related to any differing site condition encountered by the Contractor that affects its performance of Contract work.

The provisions of 1.20-1.04.03 or 1.20-1.04.04 shall govern in any case in which they conflict with another provision of the Contract.

If the Engineer and the Contractor together determine that a particular change in compensation to the Contractor should be made due to a change in a Contract pay item quantity (including an item’s complete elimination), they may make that change in compensation by a written agreement to do so.

**Changes in Quantities to Minor Items:**

**(a) Quantity Increases of More Than 25% over Original Quantity:** If the actual quantity of work authorized and accepted by the Engineer under a Contract pay item exceeds the item’s original quantity by 25%, the Department will pay for the quantity in excess of 125% of the original quantity in one of the following three ways. (One-time fixed costs for which the Department has already reimbursed the Contractor in paying for 125% of the original quantity shall not be included in a calculation of the actual

cost of the excess units.)

- (1) Pay for the aggregate excess units on a cost-plus basis as provided in 1.20-1.09.04.
  - (2) Adjust the unit price by the increase or decrease in the unit price for the excess units, said difference to be calculated as of the time when work under the item was completed.
  - (3) Pay for the units in any other manner agreed on in writing by the Engineer and the Contractor.
- If, however, the aggregate payment for the units in excess of 125% is less than \$25,000 (using the original Contract unit price for the calculation) the Engineer will not adjust that unit price.

**(b) Quantity Decreases of More Than 25% below Original Quantity:** If the actual quantity of a Contract pay item authorized and accepted by the Engineer is less than 75% of the item's original quantity, the Engineer will not adjust the original Contract unit price for said item unless the Contractor makes a written request to the Engineer for such an adjustment and the Engineer grants it in writing. If the Engineer grants such a request, the Engineer will adjust the price for each accepted unit of said item performed or provided in one of the following three ways:

- (1) Pay for the total item units actually performed or provided in the aggregate units on a cost-plus basis as provided in 1.20-1.09.04.
- (2) Adjust the unit price by any increase in the unit price for the deficit units, which shall be the difference between the original Contract unit price and the actual unit cost (calculated on a cost-plus basis as provided in 1.20-1.09.04) of the total units performed or provided, said difference to be calculated as of the time when work under the item was completed.
- (3) Pay for the item units performed or provided in any manner agreed on in writing by the Engineer and the Contractor.

In no instance however, shall the unit price paid for the number of units performed or provided, when their quantity has been decreased by more than 25% of the original quantity, be less than their original unit price; and in no instance shall the aggregate payment for such a decreased quantity of items be more than the Engineer would have paid for the performance or provision of 75% of the original quantity at the original unit price.

Regarding treatment of eliminated Contract items, refer to 1.20-1.09.05 herein.

**1.20-1.04.03—Facilities Construction - Changes in Quantities and Significant Changes in the Character of Work:**

- (i) The Engineer reserves the right to make, in writing, at any time during the work, such changes in quantities and such alterations in the work as are necessary to satisfactorily complete the project. Such changes in quantities and alterations shall not invalidate the contract nor release the surety, and the Contractor agrees to perform the work as altered.
- (ii) If the alterations or changes in quantities significantly change the character of the work under the Contract, whether such alterations or changes are in themselves significant changes to the character of the work or by affecting other work cause such other work to become significantly different in character, an adjustment, excluding loss of anticipated profits, will be made to the Contract. The basis for the adjustment shall be agreed upon prior to the performance of the work. If a basis cannot be agreed upon, then an adjustment will be made either for or against the Contractor in such amount as the Engineer may determine to be fair and equitable.
- (iii) If the alterations or changes in quantities do not significantly change the character of the work to be performed under the Contract, the altered work will be paid for as provided elsewhere in the Contract.
- (iv) The term "significant change" shall be construed to apply only to the following circumstances:
  - (A) When the character of the work as altered differs materially in kind or nature from that involved or included in the original proposed construction or
  - (B) When a Major Item of work, as defined elsewhere in the Contract, is increased in excess of 125% or decreased below 75% of the original Contract quantity. Any allowance for an increase in quantity shall apply only to that portion in excess of 125% of original Contract item quantity, or in case of a decrease below 75%, to the actual amount of work performed

**1.20-1.04.04—Facilities Construction - Differing Site Conditions:**

- (i) During the progress of the work, if subsurface or latent physical conditions are encountered at the Site differing materially from those indicated in the Contract or if unknown physical conditions of an unusual nature, differing materially from those ordinarily encountered and generally recognized as inherent in the work provided for in the Contract, are encountered at the Site, the party discovering such conditions shall promptly notify the other party in writing of the specific differing conditions

before the Site is disturbed and before the affected work is performed.

- (ii) Upon written notification, the Engineer will investigate the conditions, and if it is determined that the conditions materially differ and cause an increase or decrease in the cost or time required for the performance of any work under the Contract, an adjustment, excluding loss of anticipated profits, will be made and the Contract modified in writing accordingly. The Engineer will notify the Contractor of his/her determination whether or not an adjustment of the Contract is warranted.
- (iii) No Contract adjustment which results in a benefit to the Contractor will be allowed unless the Contractor has provided the required written notice.
- (iv) No Contract adjustment will be allowed under this clause for any effects caused on unchanged work.

**1.20.1.04.05—Facilities Construction - Extra Work:** Unforeseen work made necessary by the Engineer's changes of the Contract plans or specifications, or work that is necessary for completion of the Project, but for which no price is provided in the Contract, shall be done in accordance with the requirements of the specifications and as directed by the Engineer. The Engineer shall notify the Contractor of the necessity for such extra work, stipulating its character and extent, and shall notify the Contractor as to whether the Engineer wants the Contractor to propose a unit price or, lump sum price, or to perform the extra work on a cost-plus basis in accordance with 1.20-1.09.04. The Engineer need not solicit any price for the extra work from the Contractor, but may, in any event, simply order the Contractor to perform the extra work on a cost-plus basis. If the Engineer does solicit from the Contractor a unit or lump sum price for the extra work, the Contractor must propose such a price in writing within 5 days of the Engineer's request for one.

The Contractor's price proposal shall be itemized and reasonably detailed, and shall include all known or anticipated direct and indirect costs of the work, including but not limited to, the costs of all safety and other equipment, small tools, labor, subcontractor quotes, consumables, field office overhead, home office overhead, insurance, bonding, and profit.

The character and extent of the extra work, together with the basis of compensation, shall be communicated to the Contractor by means of a construction order which, when signed by the Engineer, shall become a part of the Contract. If a Contractor objects to any portion of a construction order submitted to it, the Contractor must, within 15 days of its receipt of said order, return the order with a letter to the Department's Assistant District Engineer administering the Contract, describing specifically what portions of the order the Contractor finds objectionable, the nature of its objections, and the bases for its objections. If the Contractor does not do so, it shall be deemed to have accepted the terms of the construction order.

If the Engineer changes the scope of Contract work, the Contractor shall submit a proposed revised schedule and a cost revision proposal, which takes all such changes into account, if the Contractor believes that such revisions are warranted. If the schedule is to be revised, it will be revised in accordance with 1.20-1.08.08.

**1.20-1.04.06—Facilities Construction - Removal and Disposal of Structures on the Work Site:** All structures on the Project site which are not to remain on the Project site after completion of the Project shall be removed from said site and disposed of by the Contractor once it is no longer needed for the Project, and any such structure shall then become the property of the Contractor, except as otherwise required or provided by 1.20-1.10.07.

**1.20-1.04.07—Facilities Construction - Rights in and Use of Materials Found on the Work Site:** Upon written request of the Contractor and with the written approval of the Engineer, subject to limitations which may be set forth within such approval, any stone, gravel, sand, topsoil or any material from existing bridge substructures, buildings, or other structures, found within the limits of the Project may be excavated or removed and used by the Contractor on the Project, provided that said materials meet the requirements of the specification for such materials. Any materials excavated or removed shall not be taken off the Project site unless the Engineer in writing specifically authorizes such action. The following conditions shall govern these matters:

1. Excavation or removal of materials that would necessarily be excavated or removed in making the improvement will be paid for at the applicable Contract unit prices; and, in addition, the item for which this material is used will also be paid for at its Contract unit price. The Contractor will not be charged for such materials. The Contractor shall, without compensation, place in the embankment or elsewhere, as appropriate, sufficient suitable material to fill the space that the excavated materials would have occupied, unless otherwise directed by the Engineer.
2. The excavation or removal of materials that are not required to be excavated or removed in connection with the Contract work will not be paid for; and the Contractor will be charged for such

materials at a negotiated unit price. The item for which this material is used will be paid for at its Contract unit price. The Contractor shall, without compensation, backfill with accepted material the space that the excavated materials had occupied, to the satisfaction of the Engineer, unless otherwise directed by the Engineer.

Surplus material shall be removed from the Project only with the Engineer's written permission. The Engineer may determine that such material is not surplus, and may order that it be incorporated into the Project.

**SECTION 1.20-1.05  
CONTROL OF THE WORK FOR  
FACILITIES CONSTRUCTION**

*Replace Articles 1.20-1.05.02 and 1.20-1.05.13 with the following:*

**1.20-1.05.02—Facilities Construction - Contractor Submittals:**

**1. General: Vacant**

**2. Submittal Preparation and Processing: Vacant**

**3. Transmittal of Submittals: Vacant**

**4. Submittal Schedule:** At the Pre-Construction Meeting, the Contractor shall submit the initial submittal schedule. The initial submittal schedule will include all submittals required during the first 60 calendar days of construction, all submittals required to maintain orderly progress of the Work, and all submittal required early because of long lead time for manufacture or fabrication.

Following the Engineer's response to the initial submittal, the Contractor shall provide copies of the schedule to the Engineer, Designer, the Contractor's subcontractors, and other parties required to comply with submittal dates indicated.

The Contractor shall submit the complete submittal schedule within 60 calendar days of the Notice to Proceed.

The Contractor shall update its submittal schedule once a month and distribute and post each updated schedule in the manner described above.

The submittal schedule shall be organized in numerical order by special provision number and by CSI-formatted specification section number. The Contractor shall include (1) time required for review, ordering, manufacturing, fabrication, and delivery when establishing dates; and (2) additional time required for making corrections or revisions to submittals noted by Designer or Engineer and additional time for handling and reviewing submittals required by those corrections. The Contractor shall coordinate submittal schedule with its subcontracts, the schedule of values, and their construction schedule.

**5. Working Drawings (Delegated Design Submittals):** When required by the Contract, or when ordered to do so by the Engineer, the Contractor shall prepare and submit working drawings, signed, sealed and dated by a qualified Professional Engineer licensed to practice in the State of Connecticut, for review.

There will be no direct payment for furnishing any working drawings, procedures or supporting calculations, but the cost thereof shall be considered as included in the general cost of the work.

- a. Working Drawings for Permanent Construction: The Contractor shall submit drawings to the Designer on 22 inch x 34 inch sheets with a border and title block similar to the Department standard. Each drawing shall be a separate PDF file. Drawings shall be searchable. The first drawing shall include the Contractor's designer's Professional Engineer's digital signature, meeting the requirements of Adobe's Certified Document Services (CDS), and all other drawings shall include a watermark of the Professional Engineer's stamp in a common area of the border. Calculations, procedures and other supporting data may be submitted in an 8-1/2 inch x 11 inch format and shall be in a single PDF file. The first sheet of calculations shall include the Contractor's designer's Professional Engineer's digital signature, meeting the CDS requirements. Documents shall be named "Drawings," "Calculations," or "Supporting Documentation" as applicable.

The Contractor's designer, who prepares the working drawings, 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 \$2,000,000 per error or omission. The Contractor's designer may elect to obtain a policy containing a maximum \$250,000 deductible clause, but if the Contractor's designer should obtain a policy containing such a clause, they shall be liable to the extent of at least the deductible amount. The Contractor's designer shall obtain the appropriate and proper endorsement of its Professional Liability Policy to cover the indemnification clause in this Contract, as the same relates to negligent acts, errors or omissions in the Project work performed by them. The Contractor's designer shall continue this liability insurance coverage for a period of

(i) 3 years from the date of acceptance of the work by the Engineer, as evidenced by a State of Connecticut, Department of Transportation form entitled "Certificate of Acceptance of Work," issued to the Contractor; or

(ii) 3 years after the termination of the Contract, whichever is earlier, subject to the continued commercial availability of such insurance.

The Contractor shall supply to the Assistant District Engineer a certificate of insurance in accordance with 1.20-1.03.07 at the time that the working drawings for the Project are submitted.

- b. Working Drawings for Temporary Construction: The Contractor shall submit drawings, calculations, procedures and other supporting data in a format acceptable to the Assistant District Engineer.
- c. Working Drawings for Permanent Construction: Drawings shall be submitted to the Designer on 22 inch x 34 inch sheets with a border and title block similar to the Department standard. Each drawing shall be a separate PDF file. Drawings shall be searchable. The first drawing shall include the Contractor's designer's Professional Engineer's digital signature, meeting the requirements of Adobe's Certified Document Services (CDS), and all other drawings shall include a watermark of the Professional Engineer's stamp in a common area of the border. Calculations, procedures and other supporting data may be submitted in an 8-1/2 inch x 11 inch format and shall be in a single PDF file. The first sheet of calculations shall include the Contractor's designer's Professional Engineer's digital signature, meeting the CDS requirements. Documents shall be named "Drawings," "Calculations," or "Supporting Documentation" as applicable.

**6. Shop Drawings:** When required by the Contract, or when ordered to do so by the Engineer, the Contractor shall prepare and submit shop drawings for review. Drawings shall be submitted on 22 inch x 34 inch sheets with an appropriate border and with a title block in the lower right-hand corner of each sheet. Each drawing shall be a separate PDF file. Drawings shall be searchable.

Shop Drawings consist of fabrication and installation drawings, roughing-in and setting drawings, schedules, patterns, templates and similar drawings, and wiring diagrams showing field-installed wiring, including power, signal, and control wiring. Standard information prepared without specific reference to the Project shall not be considered to be a Shop Drawing. Shop Drawings shall be project specific.

Shop drawings shall include the following information: Contract number, Project description, number and title of the drawing, date of drawing, revision number, name of Contractor and subcontractor submitting drawings, dimensions, identification of products, shop work manufacturing instructions, design calculations, statement of compliance with Contractual standards, notation of dimensions established by field measurement, notation of coordination requirements, relationship to adjoining construction clearly indicated, seal and signature of a professional engineer if specified, and any other information required by individual Contract provisions.

There will be no direct payment for furnishing any shop drawings, procedures or supporting calculations, but the cost thereof shall be considered as included in the general cost of the work.

**7. Coordination Drawings:** When required by the Contract, or when ordered to do so by the Engineer, the Contractor shall prepare and submit coordination drawings for review. Each drawing shall be a separate PDF file. Drawings shall be searchable.

The Contractor shall prepare coordination drawings according to requirements in other Contract provisions, and additionally where installation is not completely shown on Shop Drawings, where limited space availability necessitates coordination, or if coordination is required to facilitate integration of products and materials fabricated or installed by more than one entity.

Coordination Drawings shall include Project-specific information drawn accurately to a scale large enough to indicate and resolve conflicts. Coordination Drawings shall not be based on standard printed data. Coordination Drawings shall include the following information, as applicable: (1) use applicable plans as a basis for preparation of Coordination Drawings and prepare sections, elevations, and details as needed to describe relationship of various systems and components; (2) coordinate the addition of trade-specific information to the coordination drawings by multiple contractors in a sequence that best provides for coordination of the information and resolution of conflicts between installed components before submitting for review; (3) indicate functional and spatial relationships of components of architectural, structural, civil, mechanical, and electrical systems; (4) indicate space requirements for routine maintenance and for anticipated replacement of components during the life of the installation; (5) show location and size of access doors required for access to concealed dampers, valves, and other controls; (6) indicate required installation sequences; (7) indicate dimensions shown on the plans, specifically noting dimensions that appear to be in conflict with submitted equipment and minimum clearance requirements, and (8) provide alternate sketches to the Designer indicating proposed resolution of such conflicts.

There will be no direct payment for furnishing any coordination drawings, but the cost thereof shall be considered as included in the general cost of the work.

**8. Product Data:** When required by the Contract, or when ordered to do so by the Engineer, the Contractor shall prepare and submit product data for review in a PDF file.



The Contractor shall provide all product data in a single submittal for each element of construction or system and shall mark each submittal with the Contract item number.

The Contractor shall mark each copy of a product data submittal to show applicable choices and options. Where product data includes information on several products that are not required, copies shall be marked to indicate the applicable information. Product data shall include the following information and confirmations to the extent applicable: manufacturer’s printed recommendations, compliance with recognized trade association standards, compliance with recognized testing agency standards, application of testing agency labels and seals, notation of coordination requirements, and any other information required by the individual Contract provisions.

There will be no direct payment for furnishing any product data, but the cost thereof shall be considered as included in the general cost of the work.

**9. Product Samples:** When required by the Contract, or when ordered to do so by the Engineer, the Contractor shall prepare and submit product samples for review.

Product Samples are samples submitted for review and action by the Designer, which are: (1) physically identical to the proposed product or material cured and finished as required by the Contract; or (2) submitted for review of kind, color, pattern, thickness, and texture. Samples shall be used for a final check of these characteristics with other elements, and for a comparison of the characteristics of the approved sample with those of the actual component as delivered and installed.

The following information shall be submitted with product samples to the extent applicable: Contract number; Project description; generic description of the sample (name or trade reference, type or quality or grade, and any further designation necessary to identify the items or materials); sample source; product name; manufacturer’s name; confirmation of availability; and anticipated delivery time.

In conjunction with the submission of physical product samples, a digital photograph of the sample shall be uploaded into ProjectWise.

The Designer will retain one set of the samples, transmit one set of same to the Engineer, and transmit any remaining sets of samples to the Contractor. The Engineer will retain the samples at the Project site for quality comparisons throughout the duration of the Project.

There will be no direct payment for furnishing any product samples, but the cost thereof shall be considered as included in the general cost of the work.

**10. Quality Assurance Submittals:** When required by the Contract, or when ordered to do so by the Engineer, the Contractor shall prepare and submit quality assurance submittals for review in a PDF file. Quality assurance submittals consist of qualification data, design data, certifications, manufacturer's instructions, manufacturer's field reports, test reports, Material Safety Data Sheets (MSDSs), and other quality assurance information required by individual Contract provisions.

Where Contract provisions require certification that a product, material, or installation complies with specified requirements, the Contractor shall submit a notarized certification from the manufacturer certifying said compliance. An officer of the manufacturer or other individual authorized to sign documents on behalf of the company shall sign the certification.

Where Contract provisions require the Contractor shall provide a certification letter on the manufacturer’s letterhead to certify that asbestos is not contained in the materials.

The manufacturer certification letter shall be formatted in the following manner:

[Addressed to:]	Commissioner of Transportation Department of Transportation P.O. Box 317546 Newington, Connecticut 06131-7546
Project Title and Number	
[We] hereby certify that all materials manufactured by [Insert Manufacturer Name] are asbestos-free.	
[Signature:]	[Name of authorized signatory] [Title]

Submittals associated with these materials will not be reviewed without the required manufacturer certification letter.

There will be no direct payment for furnishing any quality assurance submittals, but the cost thereof shall be considered as included in the general cost of the work.

**11. Submittal Reviewer's Action:** The Designer or Engineer will review each submittal, mark each with a uniform, self-explanatory action stamp, and return the stamped submittal promptly to the Contractor. The stamp will be marked as follows to indicate the action taken:

(a) If submittals are marked "No Exceptions Noted," the Designer or Engineer has not observed any statement or feature that appears to deviate from the Contract requirements. This disposition is contingent on being able to execute the manufacturer's written warranty in compliance with the Contract provisions.

(b) If submittals are marked "Exceptions as Noted," the considerations or changes noted by the Designer or Engineer are necessary in order for the submittal to comply with Contract requirements. This disposition is contingent on being able to execute the manufacturer's written warranty in compliance with the Contract provisions.

(c) If submittals are marked "Revise and Resubmit," the Contractor shall revise and resubmit the submittal to address the deficiencies or provide additional information requested by the Designer or Engineer

(d) If submittals are marked "Rejected," the Contractor shall prepare and submit a new submittal in accordance with the Designer's notations.

(e) If submittals are primarily for information or record purposes, the Designer will return the submittal marked "No Action Required." This disposition is contingent on being able to execute the manufacturer's written warranty in compliance with the Contract provisions.

Upon completion of the review, the submittal reviewer will notify the Contractor by e-mail that the submittal dispositions are available in ProjectWise.

The Contractor shall not proceed with the part of the Project covered by the submittal until the submittal is marked "No Exceptions Noted" or "Exceptions as Noted" by the Designer or the Engineer. The Contractor shall retain sole responsibility for compliance with all Contract requirements.

The Contractor shall print 2 color copies through ProjectWise of each submittal marked "No Exceptions Noted" or "Exceptions as Noted" to the Assistant District Engineer for use by the Engineer within 7 calendar days of the Contractor's receipt of the submittal reviewer's e-mail. The Contractor shall not perform physical work related to the submittal until the 2 copies are provided to the Assistant District Engineer.

The Contractor shall mark up one set of shop drawings and one set of working drawings and retain them as a "Record Document."

Maintenance manuals and warranties will not be returned unless they are Rejected.

**1.20-1.05.13—Facilities Construction - Examining and Copying Contractor's Records:** The Contractor shall permit the Department and its duly-authorized representatives to examine and copy all documents and other records of the Contractor that are relevant to charges for extra work, alleged breaches of Contract, or any formal or informal claim for additional compensation or for damages in connection with the Project.

With the exception noted below, the Contractor shall also permit the Department to examine and copy such of its documents and other records pertaining to the Project as the Department may deem necessary in order to determine whether or not the Contractor has complied with all laws, regulations and other governmental mandates, e.g., those relating to labor compliance, affirmative action programs, and equal employment opportunity. Documents and other records relating to the Project, if they were created prior to the opening of bids for the Contract, and if they are sought by the Department only for the purpose of confirming such compliance with legal requirements, shall, however, not be subject to examination by the Department pursuant to this Article without the consent of the Contractor.

The Contractor further agrees that it shall keep all documents and other records relating to the Project at least until the expiration of 3 years after the date of acceptance of the Project by the Department, as designated in a "Certificate of Acceptance of Work and Acceptance of Project" issued by the Department. If any claims are brought by the Department or the Contractor prior to that expiration, however, the Contractor shall keep all such records until the Department has given the Contractor a full and final release from all pending and potential claims regarding the Project. If the Contractor does not so keep any such records, it may not assert any formal or informal claim for compensation or damages that could have been substantiated or disproven with such records.

The Contractor shall ensure that the requirements of this provision are made applicable to its subcontractors and suppliers, for the State's benefit, by including the operative language of this Article in its Project subcontracts and purchase agreements.

**SECTION 1.20-1.08**  
**PROSECUTION AND PROGRESS FOR**  
**FACILITIES CONSTRUCTION**

*Replace Article 1.20-1.08.08 with the following:*

**1.20-1.08.08—Facilities Construction - Extension of Time:** The Contractor may present to the Engineer a request in writing for an extension of Contract time if the time necessary for completion of the Project has been increased due to extra or added work or delays resulting from unforeseeable causes beyond the control and without the fault or negligence of the Contractor, except for weather or seasonal conditions (unless extraordinary and catastrophic). Such causes include, but are not limited to, natural catastrophes, acts of the State in either its sovereign or contractual capacity, acts of another contractor in the performance of a contract with the State, the presence of utility facilities (including railroads), fires, strikes, floods, or delays by suppliers arising from unforeseeable causes beyond the control and without the fault or negligence of either the Contractor or such suppliers.

The Contractor's plea that insufficient Contract time was allowed under the Contract before commencement of the Project is not a valid reason for extending the Contract time. Requests for an extension of time with adequate substantiation must be presented within 60 calendar days from the event that is the basis of the request or from the first effect of such an event on the Project. The Contractor will be responsible for providing all the documentation necessary to support the reasonableness of the additional time requested. This shall include a Critical Path Method Schedule Analysis and accompanying narrative that includes the specific dates and number of days for which the extension is sought, the basis or bases for the extension, and the schedule analysis illustrated in a graphic representation of the schedule impacts such as a bar chart or other type of graphical schedule. The critical path is a sequence of activities in a project wherein none of the activities can be delayed without affecting the final project end date.

Such requests will be considered by the Engineer and granted to the extent that he deems to be fair and reasonable. Requests will not be considered if based on delays caused solely by conditions existing at the time the bids were received and of which the Contractor might reasonably be expected to have had full knowledge at the time, or upon delays caused by failure on the part of the Contractor to anticipate properly the requirements of the Project as to materials, labor, or equipment. For all Project delays or time increases, except as provided below, additional Contract time is the sole remedy that the Contractor may have, and such periods of additional Contract time shall be deemed "Non-Compensable Delays." For delays caused by the State in its Contractual capacity, the Contractor may, in addition to a time extension, request additional compensation to reimburse it for damages sustained as a direct result of such delay, and such periods of extended Contract time may be deemed "Compensable Delays."

The period of compensable delay is limited as follows:

- (1) it may not include time more than 60 days prior to the Engineer's receiving written notice from the Contractor, with adequate substantiation, of its intent to claim damages for the delay, and
- (2) and it may not include periods of delay for which the State was responsible, but during which the Contractor experienced concurrent delays for which the State was not responsible.

Damages for periods of Project delay for which the State had sole responsibility shall be limited to the increased costs incurred by the Contractor (which shall not include lost profits), which the Contractor substantiates and which the Contractor shows were caused by such delays.

The Critical Path Method Schedule Analysis shall include at a minimum:

1. The manner in which the Contractor planned to construct the Project, in terms of activities, logical interrelationships of activities, work sequences, activity durations, and calendars.
2. The actual duration and sequences of the activities, based on what actually occurred on the Project.
3. The variances between the planned and actual performance of the work, listed in a chronological and cumulative manner, summing to the net total delay on the Project at the time of the request.
  - a. The causes of the variances between the planned and actual performance of the work, specifically allocating legal responsibility for each to either the Department or the Contractor.
  - b. The effects of the variances in work sequences, activity durations, manpower, and resources on the incurred costs of the affected party or parties.
4. An identification analysis of the causes of any concurrent delays on the Project.
5. Statements as to whether the time extension days sought are compensable or non-compensable,

- along with a specific statement of any compensation requested in connection with the time extension. Any request for a time extension that does not include a corresponding request for compensation will be assumed to be a request for a non-compensable time extension.
6. All associated analysis documents, worksheets, schedules and contemporaneous documents supporting the Critical Path Method Schedule Delay Analysis.

**SECTION 1.20-1.09  
MEASUREMENT AND PAYMENT FOR  
FACILITIES CONSTRUCTION**

*In the list of Articles, add 1.20-1.09.00 as follows:*

**1.20-1.09.00—Facilities Construction - Unit Price Items, Lump Sum Items, Major Lump Sum Items**

*Add Article 1.20-1.09.00 as follows:*

**1.20-1.09.00—Facilities Construction - Unit Price Items, Lump Sum Items, Major Lump Sum Items:** Facilities Construction projects are bid with both lump sum and unit price items which are in addition to the Major Lump Sum Item (MLSI) of the Project. These separate items will be measured for payment on a unit price or lump sum basis (whichever is applicable) for which a separate bid price is required, at the quantities indicated in the Bid Proposal Form. Each item to be measured is more specifically described in a corresponding Standard Specification or a special provision.

Standard Items are referenced by their item numbers; refer to the applicable article for the requirements for this item. Special provisions are referenced by their item number followed by an "A" suffix; refer to the special provisions for requirements for this item.

All work depicted on the Contract Plans and described in the Contract Specifications, including mobilization and project closeout, is included in the MLSI of the Project, with the exception of the unit price or other lump sum items listed in the Bid Proposal Form. Any work incidental to an item which is not specifically described or included in the item, but which is required for performance and completion of the work required under the Contract, is included in the MLSI.

*Replace Articles 1.20-1.09.04 and 1.20-1.09.05 with the following:*

**1.20-1.09.04—Facilities Construction - Extra and Cost-Plus Work:** Extra work shall be performed only under the conditions and subject to the requirements outlined in 1.20-1.04.05. Payment for extra work may be made on any unit price or lump sum price or other basis to which the Engineer and the Contractor agreed in writing, or the Engineer may order that the Contractor will be paid for the work on the cost-plus basis described in this Article.

The following sets forth the components of the cost-plus basis for making payments:

**(a) Labor:**

- (1) For all labor used by the Contractor for the subject work, the Department will pay the Contractor the wage rate that it actually paid for same, as shown by its certified payroll, which shall be at least the minimum rate established for the Project by the CT Department or the U.S. Department of Labor. For all foremen in direct charge of Project work, the Department will pay the Contractor the actual wage paid to the foremen as shown on the Contractor's certified payroll.
- (2) The Department will reimburse the Contractor for the actual costs paid to, or on behalf of, workers by reason of allowances, health and welfare benefits, pension fund benefits and other such benefits in connection with the subject work, when such amounts are required by a collective bargaining agreement or another employment contract generally applicable to the classes of labor employed on the Project. The Contractor shall certify all such costs in writing to the Engineer.
- (3) For property damage, liability and workmen's compensation insurance premiums, unemployment insurance contributions and social security taxes on Project cost-plus work, the Department will reimburse the Contractor for its actual Project costs. The Contractor shall provide to the Engineer documentation, satisfactory to the Engineer in form and substance, of all such costs.
- (4) The Department will also pay to the Contractor an amount equal to 20% (15% for overhead, 5% for profit) of the total sums described in (a) (1) through (3) above.

No part of the salary or expenses of anyone connected with the Contractor's forces above the grade of project superintendent, who provides general supervision of Project work, will be included in the above payment calculations, except when the Contractor's organization is entirely occupied with cost-plus work, in which case the salary of a superintendent may be included in said labor item when the nature of the pertinent Project work is such that, in the opinion of the Engineer, a superintendent was required for that work. The Engineer and the Contractor may agree in writing to the allowable rate of pay for such superintendent, or the Engineer may make payment based on such rate as he deems reasonable.

The Engineer reserves the right to determine the number and type of personnel to be employed for the cost-plus Project work.

**(b) Specialized Work:** When the Engineer directs the Contractor to perform specialized work requiring skills, tools and equipment substantially unlike those ordinarily used by the Contractor or its authorized Project subcontractors, the Department will pay the Contractor for the use of a specialist to perform the specialized work. For such specialized services, including materials incorporated into the Project, the Department will pay the Contractor its actual costs, plus additional compensation in accordance with subparagraph (e) below. If so requested by the Engineer, the Contractor shall obtain and submit to the Engineer, prior to performing such specialized work, a minimum of three price quotes for the work.

**(c) Materials:** For all materials necessary for cost-plus Project work, the Department will pay the Contractor its actual cost for such materials, including delivery charges as shown by original receipted bills, plus 15 % of the sum of said cost and charges.

In lieu of receipted bills for materials used for the Project, but which were not specifically purchased for the Project, but rather were taken from the Contractor's stock, the Contractor shall provide to the Engineer an affidavit certifying that such materials were not purchased for the Project, that the materials were taken from the Contractor's stock, that the quantity claimed to have been used on the Project was actually so used, and that the price claimed for the materials reflects their fair market value at the time of their use on the Project. The Department will pay for costs of transporting the materials to the Project site, in accordance with subparagraphs (a) and (d) hereof.

The Department will not reimburse the Contractor for any penalty or charge incurred by the Contractor due to the Contractor's late or delayed payment for the pertinent materials.

**(d) Equipment:** All equipment used for cost-plus Project work must, in the judgment of the Engineer, be in good working condition and suitable for its Project purpose; and the Engineer reserves the right to determine the size and number of units of equipment to be used for such work. The manufacturer's ratings shall be the basis for all Rental Rate Blue Book classifications used for payment purposes. ("Rental Rate Blue Book" as used in these specifications refers to the current edition of the Rental Rate Equipment Watch Blue Book Services, taking into account all current Rate Adjustment Tables, and amendments thereof.) Trucks will be classified by cubic-yard capacity.

No percentage mark-up will be added for payment purposes to amounts charged by the Contractor based on equipment rental rates.

The Department will not pay rental rates for small tools needed to complete the cost-plus Project work.

For payment purposes, estimated operating costs per hour from the Rental Rate Blue Book will apply only to the actual time during which the equipment is actively being used to perform cost-plus Project work.

For equipment that is also being used for non-cost-plus Project work, the Department will pay the applicable hourly rate only for the actual time that the equipment was assigned to cost-plus Project work. The applicable period of assignment for each piece of equipment shall start when the equipment commences to be used for cost-plus Project work ordered by the Engineer, and shall end at the time designated by the Engineer.

For equipment brought to the Site exclusively for cost-plus work, the Department will reimburse the Contractor for loading and unloading costs and costs of transporting such equipment to and from the Project site; provided, however, that payment for return transportation from the Site shall not exceed the cost of moving the equipment to the Site. If such a piece of equipment is self-propelled, and is driven to the Site under its own power, then the Department will pay only operating costs and labor costs for its transport to and from the Project site. The Department will not, however, pay for any loading, unloading and transportation costs if the equipment is used for any Project work on the Site other than cost-plus work.

(1) Owned Equipment: The Department will pay the Contractor the applicable rental rate set forth in the Rental Rate Blue Book for any equipment (1) which the Contractor uses, with the Engineer's authorization, to perform cost-plus Project work, and (2) which is owned by the Contractor or a subsidiary, affiliate, or parent company of the Contractor (no matter how far up or down the chain of ownership from the Contractor).

The maximum hourly rate to be used in paying for Contractor-owned equipment assigned to cost-plus work shall be the applicable monthly rate in the Rental Rate Blue Book, divided by 176 (176 working hours per month).

Should the proper completion of the cost-plus Project work require equipment of a type not covered by the Rental Rate Blue Book, the Engineer will determine, and the Department will make payment to the Contractor at, a reasonable rental rate based on relevant rates prevailing in the area of the Project. If practicable, such rates shall be determined by the Engineer before the affected work is begun. If the Contractor proposes that the Engineer use a particular rate in such an instance, the Contractor must disclose to the Engineer the specific sources of, or support for, said rate.

If a piece of equipment owned by the Contractor is assigned to cost-plus Project work, but remains idle for some portion of the period of the cost-plus work, the Department will pay for that idle time at 50% of the applicable rental rate (exclusive of operating costs) in the Rental Rate Blue Book.

For payment purposes, the period of equipment usage shall be deemed to start when the Contractor begins to use the equipment for cost-plus Project work and shall be deemed to end when the equipment is released by the Engineer from use for such work. Any hours during which the equipment is used for work other than cost-plus Project work will be deducted from the pertinent payment period.

For any piece of Contractor-owned equipment assigned to cost-plus Project work, the Department will reimburse the Contractor for an aggregate minimum of 8 hours (of use time, idle time, or a combination thereof) in each 24-hour day (measured from one midnight to the following midnight) during the assignment period. No such reimbursement will be made, however, for Saturdays, Sundays and legal holidays during which the Contractor does no Project work, or for any other day on which the Engineer orders the Contractor to do no Project work. If the equipment is used to perform cost-plus Project work for more than 8 hours in a day, the Department will pay the Contractor at the applicable hourly rate computed on a monthly basis for the actual time of use; however the Department will not pay the Contractor for more than 8 hours of idle time for a piece of equipment during a given day.

The Department shall have the right to limit its aggregate Project payments for idle time for a given piece of equipment to the replacement value of that equipment.

- (2) **Rented Equipment:** If the Engineer determines that in order to perform the cost-plus Project work the Contractor must rent certain machinery, trucks or other equipment not owned by the Contractor or a subsidiary, affiliate, or parent company of the Contractor (no matter how far up or down the chain of ownership from the Contractor), the Contractor shall provide to the Engineer in writing, in advance of such rental,
1. the specific nature of the rental(s),
  2. the reasons for its need for such rental(s),
  3. the anticipated or proposed rental rate(s), and
  4. the estimated duration for the use of each piece of such rented equipment.

Proposed rates for such rented equipment must be based on the following:

—A daily rate per hour when the equipment is to be specifically assigned to Project work by the Engineer for a period of 7 consecutive calendar days or less.

—A weekly rate per hour when such assigned time exceeds 7 consecutive calendar days, but does not exceed 21 consecutive calendar days.

—A monthly rate per hour when such assigned time exceeds 21 consecutive calendar days.

The applicable daily, weekly, or monthly rate will be determined at the expiration of 21 calendar days or upon release of the equipment by the Engineer, whichever occurs first. Interruptions of the rental period, when equipment is used for work other than assigned cost-plus work, will not entitle the Contractor to payment at a rental rate that would be applicable to a shorter period that might arguably have been occasioned by such interruptions.

If so requested by the Engineer, the Contractor shall, prior to renting such equipment, obtain and submit to the Engineer in writing a minimum of three rate quotes for rental of the equipment.

The Department will pay the Contractor for such rental at the rate actually paid by the Contractor, provided that the given use and rental rate are acceptable to the Engineer. In order to obtain such payment, the Contractor must provide the Engineer with a copy of the original receipted bill for the rental expenses incurred.

- (e) **Administrative Expense:** When extra work is performed on a cost-plus basis by a subcontractor acceptable to the Engineer, the Department will pay the Contractor an additional 7.5% for that work; such

payment will be in addition to the percentage payments described in (a), (b), (c) and (d) above, as a reimbursement for the Contractor's administrative expense in connection with such work. The Engineer will approve such additional payments only if and when the Contractor provides to the Engineer receipted invoices for all relevant costs.

**(f) Miscellaneous:** The compensation provided for in (a), (b), (c), (d) and (e) above shall be deemed to be payment in full for the extra work, and shall be deemed as full compensation for same, including costs of superintendence, use of small tools, equipment for which no rental is allowed, safety equipment, consumables, field office overhead, home office overhead, bonding, other insurance, and profit. The Contractor's representative and the Engineer shall compare their respective records related to the extra work done on a cost-plus basis at the end of each day. Copies of these records shall be signed by both the Engineer and the Contractor's representative. The Engineer will then forward a copy of same to the Contractor and to any affected subcontractor in accordance with Department procedures. Upon payment of such costs by the Contractor, the Contractor shall immediately furnish the Engineer with original receipted bills covering the costs, including transportation charges, for all materials used for such work.

**1.20-1.09.05—Facilities Construction - Eliminated Items:** The Engineer may eliminate from the Contract any pay unit item, or any portion of Project work contained in a lump sum item by giving written notice of said elimination to the Contractor. Such elimination shall in no way invalidate the Contract.

The Engineer will make final payment to the Contractor for materials at the actual cost of the materials for eliminated pay unit items or portions of work contained in a lump sum item only under the following terms and conditions:

1. the materials were ordered by the Contractor prior to the Engineer's issuance to the Contractor of a written notice of the unit or work's elimination (as evidenced by a dated invoice from the vendor);
2. the materials conformed to all Contract requirements; and
3. the Contractor could not have cancelled its order within 2 days after the issuance of the elimination notice.

Any materials paid for by the Department on these conditions shall then be property of the State, and the State will assume, or will reimburse the Contractor for, the actual cost of any further handling necessary to deliver said materials to a location designated by the Engineer.

If the relevant materials purchased by the Contractor are returnable to their vendor and if the Engineer so directs, the Contractor shall return the materials to the vendor, in which case the Department will reimburse the Contractor for any reasonable changes made to the Contractor by the vendor for the return of the materials, and for the actual costs to the Contractor of its handling the materials in returning them to the vendor. Such reimbursements by the Department shall be computed as though the work were being paid for on a cost-plus basis under 1.20-1.09.04.

If the Engineer determines that an elimination of a pay unit item or portion of work contained in a lump sum item constitutes a "significant change" in the character of the Contract work, as defined under 1.20-1.04.03, necessitated by a written order of the Engineer, the terms of 1.20-1.04.03 shall govern the payment to be made in relation to the eliminated item or work.

### **SECTION 1.20-1.11 CLAIMS FOR FACILITIES CONSTRUCTION**

*Replace Section 1.20-1.11 in its entirety with the following:*

### **SECTION 1.20-1.11 CLAIMS FOR FACILITIES CONSTRUCTION**

**1.20-1.11.01—Facilities Construction - General**

**1.20-1.11.02—Facilities Construction - Notice of Claim**

**1.20-1.11.03—Facilities Construction - Record Keeping**

**1.20-1.11.04—Facilities Construction - Claim Compensation**

**1.20-1.11.05—Facilities Construction - Required Claim Documentation**

**1.20-1.11.06—Facilities Construction - Auditing of Claims**

**1.20-1.11.01—Facilities Construction - General:** When the Contractor files against the Department or the State a formal claim (a "formal" claim being one that seeks resolution through binding arbitration or

court litigation, rather than through negotiation or mediation) under CGS Section 4-61 as revised (“Section 4-61”), whether as a Section 4-61 notice of claim, demand for arbitration or as a complaint in the Superior Court, the Contractor must follow the procedures and comply with the requirements set forth in this Section of the Specifications, as well as those set forth in Section 4-61. If this Section sets forth additional, more specific, or demanding requirements than does Section 4-61 in any respect, this Section shall govern the matter. While the requirements of this Section may not strictly apply to informal claims (“informal” claims being those which the Contractor seeks to resolve through negotiations with the Department, in or outside of a mediation) for additional compensation or other relief from the Department, the Contractor should understand that the Department may need and may demand (in which case the Contractor must provide), the same kinds of documentation and other substantiation that are required under this Section for formal claims. In addition, any time extension request submitted as part of a claim, must satisfy the requirements of this specification and those of 1.08.08. It is the intent of the Department to compensate the Contractor for actual increased costs caused by or arising from acts or omissions on the part of the Department that violate legal or contractual duties owed to the Contractor by the Department.

**1.20-1.11.02—Facilities Construction - Notice of Claim:** Whenever the Contractor intends to file a demand for arbitration or a court complaint against the Department under Section 4-61, the Contractor must first notify the Commissioner of the details of said claim, in writing via certified mail (in strict compliance with Section 4-61), and such written notice must contain all pertinent information described in 1.20-1.11.05 below.

Once a formal notice of a claim under Section 4-61 has been given to the Commissioner, the claimant may not change the claim in any way, in either concept or monetary amount, except insofar as the claim seeks damages that will continue to accrue after submission of the notice, in ways described and anticipated in that notice.

**1.20-1.11.03—Facilities Construction - Record Keeping:** The Contractor shall keep daily records identifying:

- (1) Each aspect of the Project affected by matters related to any claim for additional compensation or relief that the Contractor has filed, intends to file, or has reason to believe that it may file against the Department
- (2) The specific Project locations where Project work has been so affected
- (3) The number of people working on the affected aspects of the Project at the pertinent time(s)
- (4) The types and number of pieces of equipment on the Project site at the pertinent time(s)

All events or conditions that have a potential or anticipated effect on the Project’s progress or schedule and that may result in a claim by the Contractor shall be documented contemporaneously with the event or discovery of the pertinent condition(s), or immediately thereafter. If this is not done, the Contractor may not file the related claim and may not be awarded relief upon it. Without such information, the Department and the Office of the Attorney General may not be able to adequately determine what claims have merit or to what extent they have merit, or what amounts of compensation may be warranted and supportable. Moreover, State officials involved in the analytic or negotiation process may not be able to properly substantiate and support the recommendations that they must make to their superiors, including the Attorney General, and sometimes the Governor, in the course of a settlement process.

**1.20-1.11.04—Facilities Construction - Claim Compensation:** If the Contractor proves entitlement for damages, payment shall be made in accordance with the following provisions:

**(a) Compensable Items:** The liability of the Department for claims will be limited to the following specifically-identified items of cost, insofar as they have not otherwise been paid for by the Department (for instance, through payment for extra work, which under 1.20-1.04.05 includes overhead and profit), and insofar as they were caused solely by the actions or omissions of the Department or its agents. The Department will pay for direct labor expenses, direct costs for materials, and direct costs for active equipment use, plus an additional ten percent (10%) of the total amount of such direct costs as payment for home office overhead and profit.

**Compensable delay-related costs:** The Department will pay for any additional field office overhead and idle equipment costs for each day of Project Critical Path delay or suspension caused solely by action or inaction of the Department.

If the Critical Path delay or suspension period is less than 30 calendar days, the Department will pay an additional ten percent (10%) of the additional field office overhead costs as payment for home office overhead and profit. For delays less than 30 calendar days, idle equipment will be paid at 50% of the Rental Rate Blue Book rate.



For delays equal to or longer than 30 calendar days, the Department will pay a per diem rate, calculated as six percent (6%) of the original total Contract amount divided by the original number of days of Contract time, as payment for home office overhead and profit.

In paying for idle equipment equal to or longer than 30 calendar days, the Department will pay for actual equipment costs. Actual equipment costs shall be based upon records kept in the normal course of business and in accordance with generally-accepted accounting principles. Under no circumstances shall Rental Rate Blue Book or other guide or rental rates be used for this purpose (unless the Contractor had to rent the equipment from an unrelated party, in which case the actual rental charges paid by the Contractor, so long as they are reasonable, shall be reimbursed by the Department).

If the final Contract Value is greater than the original Contract Value, any delay-related costs that are compensable under this Article shall be reduced by eight percent (8%) of the difference between the final Contract Value and the original Contract Value.

Such payments for compensable delay-related costs shall be deemed to be complete and mutually-satisfactory compensation for field and home office overhead related to the period of delay or suspension.

Subcontractor costs of any kind, however, may be paid for by the Department only (a) in the context of a negotiated claims settlement or (b) if the Contractor has itself paid or legally-assumed, present unconditional liability for those subcontractor costs.

**(b) Non-Compensable Items:** The Department will have no liability for the following specifically-identified non-compensable items:

- (1) Profit, in excess of that provided for herein.
- (2) Loss of anticipated profit.
- (3) Loss of bidding opportunities.
- (4) Reduction of bidding capacity.
- (5) Home office overhead in excess of that provided for herein.
- (6) Attorney's fees, claims preparation expenses, or other costs of claims proceedings or resolution.
- (7) Any other consequential or indirect expenses or costs, such as tort damages, or any other form of expense or damages not provided for in these Specifications or elsewhere in the Contract.

**1.20-1.11.05—Facilities Construction - Required Claim Documentation:** All claims shall be submitted in writing to the Commissioner, and shall be sufficient in detail to enable the Engineer to ascertain the basis and the amount of each claim, and to investigate and evaluate each claim in detail. When submitting any claim over \$50,000, the Contractor shall certify in writing, under oath and in accordance with the formalities required by the Contract, that the following are true:

1. That supporting data is accurate and complete to the Contractor's best knowledge and belief;
2. That the amount of the dispute and the dispute itself accurately reflects what the Contractor in good faith believes to be the Department's liability.

The certification shall be executed by an officer or general partner of the Contractor having overall responsibility for the conduct of the Contractor's affairs.

When submitting a claim to the Commissioner, as a minimum, the Contractor must provide the following information for each and every claim and sub-claim asserted:

- (a) A detailed factual statement of the claim, with all dates, locations and items of work pertinent to the claim.
- (b) A statement of whether each requested additional amount of compensation or extension of time is based on provisions of the Contract or on an alleged breach of the Contract. Each supporting or breached Contract provision and a statement of the reasons why each such provision supports the claim, must be specifically identified or explained.
- (c) Excerpts from manuals or other texts which are standard in the industry, if available, that support the Contractor's claim.
- (d) The details of the circumstances that gave rise to the claim.
- (e) The date(s) on which any and all events resulting in the claim occurred, and the date(s) on which conditions resulting in the claim first became evident to the Contractor.
- (f) Specific identification of any pertinent document, and detailed description of the substance of any material oral communication, relating to the substance of such claim.
- (g) The name, function, and pertinent activity of each Contractor's or subcontractor's official, or employee involved in or knowledgeable about events that give rise to, or facts that relate to, the claim.
- (h) The amount(s) of additional compensation sought and a breakdown of the amount(s) into the categories specified as payable under 1.20-1.11.04 above.

- (i) The name, function, and pertinent activity of each Department official, employee or agent involved in or knowledgeable about events that give rise to, or facts that relate to, the claim.

**1.20-1.11.06—Facilities Construction - Auditing of Claims:** All claims filed against the Department shall be subject to audit by the Department or its agents at any time following the filing of notice of such claim. The Contractor and its subcontractors and suppliers shall cooperate fully with the inquiries and document requests of the Department's auditors. Failure of the Contractor, its subcontractors, or its suppliers to maintain and retain records that are sufficient to enable the Department or its agents to fully evaluate the claim shall constitute a waiver of any portion of such claim that cannot be verified by specific, adequate, contemporaneous records, and shall bar recovery on any formal claim or any portion of such a claim for which such verification is not produced. Without limiting the foregoing requirements, and as a minimum, the Contractor shall make available to the Department and its agents the following documents in connection with any claim that the Contractor submits:

- (1) Daily time sheets and project superintendent's daily reports.
- (2) Union agreements, if any.
- (3) Insurance, welfare, and benefits records.
- (4) Payroll register.
- (5) Earnings records.
- (6) Payroll tax returns.
- (7) Records of property tax payments.
- (8) Material invoices, purchase orders, and all material and supply acquisition contracts.
- (9) Materials cost distribution worksheets.
- (10) Equipment records (list of company equipment, rates, cost pools, etc.).
- (11) Vendor rental agreements
- (12) Subcontractor and vendor subcontracts, purchase orders, and/or agreements including all change orders and modifications.
- (13) Subcontractor and vendor invoices to the Contractor, and the Contractor's certificates of payments to subcontractors and vendors.
- (14) Subcontractor payment certificates.
- (15) Canceled checks (payroll, subcontractors, and vendors).
- (16) Job cost reports.
- (17) Job payroll ledger.
- (18) General ledger, general journal (if used), and all subsidiary ledgers and journals, together with all supporting documentation pertinent to entries made in these ledgers and journals.
- (19) Cash disbursements journals.
- (20) Financial statements for all years reflecting the operations on the Project.
- (21) Income tax returns for all years reflecting the operations on the Project.
- (22) Depreciation records on all company equipment, whether such records are maintained by the company involved, its accountant, or others.
- (23) If a source other than depreciation records is used to develop costs for the Contractor's internal purposes in establishing the actual cost of owning and operating equipment, all such other source documents.
- (24) All documents which reflect the Contractor's actual profit and overhead during the years that the Project was being performed, and for each of the five (5) years prior to the commencement of the Project.
- (25) All documents related to the preparation of the Contractor's bid, including the final calculations on which the bid was based.
- (26) All documents which relate to the claim or to any sub-claim, together with all documents that support the amount of damages as to each claim or sub-claim.
- (27) Worksheets used to prepare the claim, which indicate the cost components of each item of the claim, including but not limited to the pertinent costs of labor, benefits and insurance, materials, equipment, and subcontractors' damages, as well as all documents which establish the relevant time periods, individuals involved, and the Project hours and the rates for the individuals.

**SECTION 2.11**  
**ANTI-TRACKING PAD**

*In Article 2.11.02, change the first sentence as follows:*

**2.11.02—Materials:** The crushed stone shall meet the grading requirements of M.01.02 for No. 3 stone. |

*In Article 2.11.03, change the first sentence as follows:*

**2.11.03—Construction Methods:** Clear area of anti-tracking pad of all vegetation and excavate to a maximum depth of 4 inches. Place geotextile filter fabric over the full width and length of excavated area and cover with No. 3 crushed stone to a minimum depth of 6 inches. |

**SECTION 5.04  
RAILROAD PROTECTION**

*Replace Section 5.04 in its entirety with the following:*

**SECTION 5.04  
RAILROAD PROTECTION**

**5.04.01—Description:** This item shall consist of securing protective services of workers such as flagmen, electric traction linemen, inspectors, track foremen, signalmen, or other such protective services deemed necessary by a railroad engaged in or affected by the Project operations of the Contractor on, over, under or adjacent to the railroad's right-of-way. This item shall also include any material or equipment incidental to or required for the provision of such required protective services. The Contractor shall secure such services as are required by the railroad, and if said services are obtained from the railroad, the Contractor shall reimburse the railroad for them, in accordance with relevant Contract terms or with the railroad's customary terms for such transactions. The Contractor must understand that the railroad may require advance payment of all or a portion of the estimated costs for the services, in which case the Contractor shall make such advance payment.

**5.04.02—Vacant**

**5.04.03—Vacant**

**5.04.04—Method of Measurement:** Only Project-related protective services billed by the railroad and approved by the Engineer will be measured for payment. Protective services which the Engineer did not approve or deem necessary for the proper completion of the Project will not be measured for payment.

**5.04.05—Basis of Payment:** The sum of money for this item shown in the bid Estimate and in the itemized bid proposal as "Estimated Cost" for this work will be considered and treated as the bid price for it, even though payment for it will be made as described below. The estimated cost figure is not to be altered in any manner by the bidder. Should the bidder alter the amount shown, the altered figures will be disregarded and the original bid price will be used as the total amount for the Contract item. The Department will pay the Contractor for "Railroad Protection" at the actual hourly rate charged to the Contractor for railroad protection services approved by the Engineer (shown in the monthly statement or receipted bills to the Contractor from the entity that provided the actual services), plus a 5% markup. This price shall include all labor, material and equipment provided by a railroad for protective services required for Project operations.

Protective services used solely for the convenience or benefit of the Contractor shall be the legal and financial responsibility of the Contractor and will not be included in this item.

Final acceptance of the Project and resolution of financial Project obligations by the Department will be contingent upon the Contractor's providing the Department with proof that each railroad involved in the Project has been reimbursed for all necessary protective services provided by the railroad or that the Contractor has made some other arrangements satisfactory to said railroad(s) for such reimbursement.

Pay Item	Pay Unit
Railroad Protection	est.

**SECTION 8.03  
PAVED DITCHES AND CHANNELS**

*Replace Section 8.03 in its entirety with the following:*

**SECTION 8.03  
PAVED DITCHES, PAVED APRONS AND  
PAVED CHANNELS**

- 8.03.01—Description**
- 8.03.02—Materials**
- 8.03.03—Construction Methods**
- 8.03.04—Method of Measurement**
- 8.03.05—Basis of Payment**

**8.03.01—Description:** The work under this item includes placing and compacting of a bituminous concrete course on a pre-excavated foundation forming paved ditches, aprons or channels in accordance with the line, grade, compacted final thickness and typical cross-section shown on the plans.

**8.03.02—Materials:** The materials for this work shall meet the following requirements:  
Bituminous Concrete Curb Mix shall meet the requirements of 4.06 and M.04.01.  
Processed Aggregate Base shall meet the requirements of M.05.01.

**8.03.03—Construction Methods:** The processed aggregate base course shall be placed in a single course, 4 inches compacted thickness, in accordance with 3.04.03. The surface shall be a 2 inch course of bituminous concrete curb mix. The bituminous concrete shall be placed and thoroughly compacted with compaction equipment suitable for small areas.

**8.03.04—Method of Measurement:** The quantity to be measured for these items will be the surface area in square yards of paved ditch, paved apron or paved channel constructed and accepted.  
Formation of Subgrade and Processed Aggregate Base will not be measured for payment.

**8.03.05—Basis of Payment:** This work will be paid for at the Contract unit price per square yard for "Paved Ditch," "Paved Apron" or "Paved Channel." The price shall include all materials, tools, equipment and work incidental thereto.

Excavation will be paid for in accordance with 2.06.  
Bituminous Concrete Lip Curbing for Paved Channels will be paid for in accordance with 8.15.

Pay Item	Pay Unit
Paved Ditch	s.y.
Paved Apron	s.y.
Paved Channel	s.y.

**SECTION 8.11  
CONCRETE CURBING**

*Replace Section 8.11 in its entirety with the following:*

**SECTION 8.11  
CONCRETE CURBING**

**8.11.01—Description:** This item shall consist of concrete curbing, furnished in accordance with the dimensions and details of the plans, and installed to the lines and grades shown on the plans.

**8.11.02—Materials:** All concrete curbing shall be constructed with Class "F" concrete as defined in M.03.02.

Precast curbing shall meet the requirements of M.08.02-4.

Joint filler shall meet the requirements of M.03.08-2.

Base material, if required, shall meet the requirements of M.02. 01, M.02.02 or M.05.01.

**8.11.03—Construction Methods:** Construction methods shall meet the requirements of 6.01.03, as supplemented by the following:

**1. Excavation:** Excavation shall be made to the required depth, and the base upon which the curbing is to be set shall be compacted to a firm, even surface.

**2. Section Lengths and Joints:** All straight curbing sections shall be uniform length and a minimum of 8 feet.

Curved curb section lengths may vary with radii of curves.

When a gap of less than 8 feet is required for closure, the length of curbing may be varied, but no section less than 2 feet will be permitted.

For both precast and cast-in-place concrete curbing, a 1/2 inch joint shall be filled with joint filler at intervals of approximately 50 feet; and contraction joints shall be placed at intervals of approximately 15 feet.

**3. Cast-In-Place Curbing:** Forms shall be clean and founded on a moist, firm, unfrozen base and the curbing shall be constructed so that the exposed faces may be accessed before the concrete has taken final set to allow finishing. Cast-in-place curbing shall be finished in accordance with 6.01.03-10(b).

**4. Precast Concrete Curbing:** The Contractor shall stabilize the precast concrete curbing during installation until backfilling is complete.

Precast curbing set on a radius of 50 feet or less shall be fabricated to the required radius within the manufacturer's tolerance.

**5. Backfilling:** The backfill shall consist of approved material placed in 6 inch layers and each layer shall be thoroughly compacted. The final elevation of the backfill shall match the lines shown on the plans, or as ordered by the Engineer.

**8.11.04—Method of Measurement:** This work will be measured for payment along the top of the curb and will be the actual number of linear feet of concrete curbing completed and accepted.

**8.11.05—Basis of Payment:** Payment for this work will be made at the Contract unit price per linear foot for "Concrete Curbing" of the type specified, complete and accepted in place, which price shall include all excavation, materials, equipment, tools, backfilling, disposal of surplus material, and labor incidental thereto.

There will be no direct payment for furnishing, placing and compacting base material, but the cost of this work shall be considered as included in the general cost of the work.

Pay Item	Pay Unit
Concrete Curbing (Type)	l.f.

**SECTION 8.13  
STONE CURBING**

*Replace Section 8.13 in its entirety with the following:*

**SECTION 8.13  
STONE CURBING**

**8.13.01—Description:** This item shall consist of stone curbing, furnished in accordance with the dimensions and details of the plans, and installed to the lines and grades shown on the plans.

**8.13.02—Materials:** The stone curbing shall meet the requirements of M.12.06.

The mound of concrete required at all stone curbing joints shall meet the requirements of any mix design type listed in Table M.03.02-1.

Mortar shall meet the requirements of M.11.04.

Base material, if required, shall meet the requirements of M.02.01, M.02.02 or M.05.01.

**8.13.03—Construction Methods:**

**1. Excavation:** Excavation shall be made to the required depth and the base upon which the curbing is to be set shall be compacted to a firm, even surface.

**2. Section Lengths and Joints:** For straight curbing, approximately 80% of the stones shall be furnished in lengths of not less than 6 feet and the remaining 20% in lengths of not less than 4 feet, interspersed at random in order to allow for closures.

Curved curb section lengths may vary with radii of curves, but no section less than 2 feet will be permitted.

The space between each section of curbing shall be 1/2 inch and shall be pointed with mortar for the full depth of the curbing. At uniform intervals of approximately 50 feet, one joint shall be left unfilled

A mound of concrete, as shown on the plans, shall be placed at each joint prior to placing sections adjacent to the joint.

Break back of stone curbing shall be as shown on the plans.

The ends of the curbing at driveways and intersections shall be cut at a bevel or rounded, as directed by the Engineer.

**3. Curved Stone Curbing:** This shall be defined as curbing set on a radius of 100 feet or less and shall be fabricated to the required radius within the manufacturer's tolerance.

**4. Backfilling:** The backfill shall consist of approved material placed in 6 inch layers and each layer shall be thoroughly compacted. The final elevation of the backfill shall match the lines shown on the plans, or as ordered by the Engineer.

**8.13.04—Method of Measurement:** This work will be measured for payment along the top of the curb and will be the actual number of linear feet of stone curbing or curved stone curbing completed and accepted.

**8.13.05—Basis of Payment:** Payment for this work will be made at the Contract unit price per linear foot for "Stone Curbing" or "Curved Stone Curbing," of the type and size specified, complete and accepted in place, which price shall include all excavation, materials, equipment, tools, backfilling, disposal of surplus material and labor incidental thereto.

There will be no direct payment for furnishing, placing and compacting base material, beveling or rounding the ends of the curbing and pointing the joints with mortar, but the cost of this work shall be considered as included in the general cost of the work.

Pay Item	Pay Unit
Stone Curbing (Type-Size)	l.f.
Curved Stone Curbing	l.f.

**SECTION 8.16  
GRANITE SLOPE CURBING**

*Delete Section 8.16 in its entirety.*



**SECTION 9.44  
TOPSOIL**

*Replace Articles 9.44.02, 9.44.03 and 9.44.05 with the following:*

**9.44.02—Material:** The material shall meet the requirements of M.13

**9.44.03—Construction Methods:** Any material delivered to the Project, which does not meet the proper pH requirements for that soil must be amended on Site prior to final acceptance.

The areas on which topsoil is to be placed shall be graded to a reasonably true surface. Topsoil shall then be spread and shaped to the lines and grades shown on the plans, or as directed by the Engineer. The required depth to which the topsoil is to be placed is to be the depth after settlement of the material has taken place. All stones, roots, debris, sod, weeds and other undesirable material shall be removed. After shaping and grading, all trucks and other equipment shall be excluded from the finished areas to prevent excessive compaction. The Contractor shall perform such work as required to provide a friable surface for seed germination and plant growth prior to seeding.

During hauling and spreading operations, the Contractor shall immediately remove any material dumped or spilled on the shoulders or pavement.

It shall be the Contractor's responsibility to restore to the line, grade and surface all eroded areas with approved material and to keep the finished areas in acceptable condition until the completion of the construction work.

**9.44.05—Basis of Payment:** Payment for this work will made at the Contract unit price per square yard for "Furnishing and Placing Topsoil" which price shall include all materials, application of lime if necessary, equipment, tools, labor and work incidental thereto.

Pay Item	Pay Unit
Furnishing and Placing Topsoil	s.y.

**SECTION 9.49**  
**FURNISHING, PLANTING and MULCHING**  
**TREES, SHRUBS, VINES and GROUND COVER PLANTS**

*Replace Section 9.49 in its entirety with the following:*

**SECTION 9.49**  
**FURNISHING, PLANTING and MULCHING**  
**TREES, SHRUBS, VINES and GROUND COVER PLANTS**

**9.49.01—Description****9.49.02—Materials****9.49.03—Construction Methods****9.49.04—Method of Measurement****9.49.05—Basis of Payment**

**9.49.01—Description:** The work under these items shall consist of furnishing trees, shrubs, vines and ground cover, preparation of planting areas, plant layout, planting, staking and guying, fertilizing, watering and mulching, as indicated on the plans or in the Contract. It shall also include all incidental procedures, such as the care of the living plants and the replacement of dead and unsatisfactory plants or unsatisfactory materials before final acceptance of the Contract.

**9.49.02—Materials:** The materials for these items shall meet the requirements of M.13.

**9.49.03—Construction Methods:** Construction methods shall be performed in accordance with the details shown on the landscape plans.

At the discretion of the Engineer, a pre-planting meeting may be held to discuss the source of supply, location of plantings, preparation of soil, time frame of delivery, temporary storage location, Contract specifics and any other incidental procedures relating to this item.

The Contractor is cautioned that within the limits of any project, buried cable for illumination or utilities, which may be energized may be present on Site. The requirements of 1.05.15 shall apply.

**1. Planting Season:** The planting seasons shall be those indicated below, as specified in the Contract or directed by the Engineer. Planting shall not be done if the ground is frozen, covered in snow, or if the soil is in an unsatisfactory condition as determined by the Engineer.

**Deciduous Material**

**Spring:** March 1st to May 31st (inclusive), except for balled and burlapped material. Balled and burlapped material may be planted any time from March 1st to June 15th (inclusive).

**Fall:** From October 15th until the ground freezes.

**Evergreen Material**

**Spring:** March 1st to May 31st (inclusive).

**Fall:** August 15th to October 31st (inclusive).

**2. Delivery and Storage of Plants:** The Contractor shall ensure that plants arrive to the Project location undamaged. The following care shall be taken during transport from the nursery through final planting location:

- a. Plants shall have mulch and water as necessary to keep moist and fresh at all times.
- b. Plants shall be protected against overexposure to sun, wind and freezing temperatures at all times.
- c. Bare-root plants, if not planted immediately upon receipt, shall be separated upon delivery and stored in an area where their roots are kept covered to keep air away until they are ready for planting.
- d. Balled and burlapped plants shall be stored with their earth balls covered by soil, wood chips, cloth, straw or other suitable material and kept moist until planting.
- e. Unless specified, all plants shall be stored in a shady location until planted.

**3. Field Coordination:** The Contractor shall submit a Source of Supply per M.13.07-4 to initiate the inspection and approval of all material. The Contractor shall review Site conditions and inform the Engineer of any conflicts. The Contractor shall coordinate planting layout with the Engineer for approval. The Contractor must notify the Engineer no less than 48 hours in advance, excluding weekends and holidays, of the completion of layout for approval. The planting layout must be approved by the Engineer prior to the commencement of work. The installation of plant material shall occur only after the completion of paving, the installation of footings or other operations which could damage the plants or alter the finished grades.

**4. Planting Layout:** Plant material locations and bed outlines shall be staked in the presence of the Engineer before any plant pits or beds are excavated. Labor, equipment and new, smooth stakes of approved quality are to be furnished by the Contractor for this purpose.

**5. Preparation of Planting Areas:** Planting areas shall be prepared by use of approved tools. All undesirable vegetation, roots or other obstructions shall be removed from the planting areas. Any unsuitable material shall be removed from the Site and disposed of by the Contractor in a manner satisfactory to the Engineer.

If backfill is required, as determined by the Engineer, it shall meet the planting soil requirements of M.13.01-2.

In planting areas, but not less than 14 day before the installation of plant material, the remaining turf grasses and unwanted vegetation may be sprayed at the Contractor's expense, unless otherwise directed by the Engineer, with Glyphosate or approved equal at the manufacturer's recommended rate.

**6. Pit Excavation:** Planting pits may be excavated or hand dug at the discretion of the Engineer. Suitable excavated soil may be set aside to be incorporated into the planting mix. The planting pit shall be excavated so that the horizontal dimension of the hole is twice the diameter of the root ball, container, or bare root spread, as shown on the plans. The depth of the plant pit excavation shall be 2 inches less than the distance between the bottom of the root ball, container, or bare root mass, and the location of the root flare or top of the root structure. It may be required to remove the burlap and some soil from the top of the root ball to expose the root structure. Care must be taken so that soil will not loosen from the roots inside the ball.

Any rock or underground obstruction shall be removed to the depth necessary for planting as specified, unless other locations for the planting are approved by the Engineer. If removal of obstructions results in a deeper hole than needed for planting, or if the pit is overexcavated, backfill shall be added, and must be thoroughly compacted to the proper depth prior to setting plants. If backfill is required, it shall meet the planting soil requirements of M.13.01-2.

**7. Setting Plants:** The Contractor shall move the plants from storage to the planting location, retying any untied burlap to prevent shifting while placing the plant into the planting pit. Carefully place the plant into the center of the pit. Ensure that the root flare or the top of the root system is 2 inches above finished grade. Correct pit depth if the plant is less than 2 inches, or more than 4 inches above finished grade. All plants shall be set plumb. Backfill with planting soil to 1/2 the depth of the planting pit and thoroughly tamp around the ball. Fill the remaining area of the pit with water. Once water has completely drained, fill the remainder of the pit with planting soil. Water the planting area, re-tamp, and add additional planting soil to correct any low spots. Saucers shall be formed outside of individual plants (exclusive of plant beds) by placing ridges of planting soil around each, or as directed by the Engineer. In addition, the following shall be completed for each respective type of plant:

- a. **Balled and Burlapped Plants (B&B):** If wire baskets are used, the Contractor shall cut all of the horizontal wires in the top 2/3 of the rootball and bend down or remove the top 1/3 of the wire basket. Remove excess soil from the top of the root ball to expose the root structure, and cut away any small feeder or girdling roots. Roots that have been wrapped around the ball within the burlap shall be straightened.
- b. **Container Grown Plants (CG):** Carefully remove the plant from the container over the prepared pits. Gently loosen the soil and straighten all roots as naturally as possible. It may be required to cut and remove excessive amounts of root mass if roots are tightly wrapped or bound.
- c. **Bare-roots Plants (BR):** Carefully spread roots as naturally as possible and place into the bottom of the pit. All broken or frayed roots shall be cleanly cut off.

**8. Fertilizing:** All plants shall be fertilized at the rate of 3 lb. per 100 s.f. of surface area (broadcast). The fertilizer shall be uniformly applied to the surface of the beds and worked into the upper 2 inches of soil. Individual trees shall be fertilized at the rate of 2 lb. per inch of trunk diameter, and the fertilizer shall be mixed into the upper 2 inches of soil.

A second application of fertilizer shall be applied to all plant items at the same specified rates over the wood-chip mulch at the end of the period of establishment.

**9. Watering:** All plants shall be watered upon setting and as many times thereafter as conditions warrant. The following is a guide for minimum requirements per application:

- Trees: 2 1/2 inch Caliper and less – 15 gal. each.
- 3 inch to 5 inch Caliper – 20 gal. each.
- 5 1/2 inch Caliper and above – 25 gal. each.

- Shrubs: 24 inches and less – 6 gal. each.
- More than 24 inches - 10 gal. each.
- Vines, Perennials, and Ornamental Grasses – 3 gal. each.
- Groundcovers and Bulbs – 2 gal. per s.f.

Water shall be applied at a controlled rate and in such a manner to ensure that the water reaches the root zone of each plant and does not run off to adjacent areas. Watering shall be applied in a manner that does not dislodge plants, erode soil or mulch, or cause damage to saucer.

The Contractor may use slow-release, drip irrigation bags for watering at the Contractor’s expense in accordance with manufacturer’s instructions.

Overhead hydro-seeder spray nozzles shall not be used as watering devices.

**10. Guying and Staking:** Immediately after planting, trees shall be guyed or staked as shown on the plans. Guy wires, hose and tree support stakes shall be removed after the initial establishment period.

**11. Pruning:** As directed by the Engineer, plants shall be pruned before or immediately after planting. No leader shall be cut unless directed by the Engineer. Broken, or badly bruised branches, sucker growth, etc., shall be removed with clean cuts.

**12. Spraying:** Spraying with antidesiccant shall be at the Contractor's discretion and as approved by the Engineer, at the Contractor’s expense.

**13. Mulching:** After installation of the plantings, the type of mulch specified in the Contract shall be hand placed and spread to a depth of 4 inches and raked to an even surface over all saucer areas for individual trees and shrubs and over the entire area of shrub beds and elsewhere as directed.

**14. Repair:** Repair of existing grass areas damaged by the Contractor in the progress of the work shall be the responsibility of the Contractor, who shall restore the disturbed areas to their original condition at the Contractor’s expense.

**15. One-Year Establishment Period:** All plant material shall be subject to a One-Year Establishment Period. During this time, the Contractor shall use currently accepted horticultural practices to keep all plant material installed in a healthy, vigorous growing condition at the date of final acceptance. The date of final acceptance shall be 1 full calendar year following the satisfactory completion of the planting activities as confirmed by the Engineer.

An inspection will be held 1 year from the date of installation with the Contractor, Engineer, and Landscape Designer to determine the acceptability of the plant establishment. An inventory of losses and rejected materials will be made and corrective and necessary clean up measures will be determined at the plant inspection.

**9.49.04—Method of Measurement:**

**1. Planting:** The quantity for which payment will be made will be the number of each size and kind of plant counted in place, planted and accepted.

**2. Mulching:** This work will be measured for payment by the number of square yards surface measurement of the specified thickness for the area on which the type of mulch specified in the plans has been completed and accepted.

**9.49.05—Basis of Payment:**

**1. Planting:** Payment for this work will be made at the Contract unit price each for the kind and size of plant and method of planting, as the case may be, completed and accepted in place.

**2. Mulching:** This work will be paid for at the Contract unit price per square yard for mulch complete in place.

**3. The unit prices** shall include all materials, equipment, tools, labor, transportation, operations and all work incidental thereto, including the removal of guy wires, hose and tree support stakes after the initial establishment period, except that payment for excavation of solid ledge rock, concrete pavement and boulders 1/2 cubic yard in volume or greater will be made under 9.51, "Rock Excavation for Planting."

Pay Item	Pay Unit
(Plant Name) (Caliper)	ea.
(Plant Name) (Height)	ea.
(Plant Name) (Size)	ea.
(Vine Name) (Size)	ea.
(Ground Cover Name) (Size)	ea.
Wood Chip Mulch	s.y.
Gravel Mulch	s.y.

**SECTION 12.04  
SIGN PANEL OVERLAY**

*Replace Section 12.04 in its entirety as follows:*

**SECTION 12.04  
SIGN-PANEL OVERLAY**

**12.04.01—Description:** Work under this item shall consist of furnishing and installing a plywood overlay of the type specified to cover an existing sign where shown on the plans or where directed by the Engineer.

**12.04.02—Materials:** Plywood shall have a minimum thickness of 1/4 inch and shall be exterior grade A-C as designated by APA.

The wood preservative shall be of a type that will have no adverse effect on paint adhesion and will not cause future paint discoloration.

Primer shall meet the requirements of A-A-2336.

The enamel paint to be used for the finish coat shall be as specified in Article M.18.08.

Copy shall meet the requirements contained in M.18.09 or M.18.10 of the Contract.

**12.04.03—Construction Methods:** The plywood overlay shall completely cover the existing sign, including the exit crown panel. The plywood sheets shall be joined together to form a single overlay by means of 1 inch x 4 inches construction grade fir wood battens securely fastened to adjoining panels with 1 inch galvanized wood screws. The battens shall be fastened to the Grade C back face of the overlay.

Before assembly and before painting, all wood shall be treated with a coat of wood preservative on all surfaces.

The entire overlay surface shall be painted with 1 coat of primer and 1 coat of enamel.

The plywood shall remain in place for the duration of the Project.

All work fabricating and clamping the plywood sign-panel overlay shall be done to ensure that no damage occurs to the existing sign.

**12.04.04—Method of Measurement:** Sign-panel overlay of the type specified will be measured for payment by the actual number of square feet installed and accepted.

**12.04.05—Basis of Payment:** This work will be paid for at the Contract unit price per square foot for "Sign Panel Overlay," of the type specified complete in place, which price shall include all materials, equipment, tools and labor incidental thereto.

Pay Item	Pay Unit
Sign Panel Overlay—Plain	s.f.
Sign Panel Overlay—with Copy	s.f.

**SECTION 12.14  
PREFORMED BLACK LINE MASK PAVEMENT MARKING TAPE**

*Replace Article 12.14.05 with the following:*

**12.14.05—Basis of Payment:** This work shall be paid for at the Contract unit price per linear foot for “Preformed Black Line Mask Pavement Marking Tape” of the width specified. This price shall be for all the work required by this Section including the cleaning and preparing of the pavement surface, installation and removal, and all materials, equipment, tools and labor incidental thereto.

Any masking tape which is no longer effective, in the opinion of the Engineer, shall be replaced by the Contractor, at its own expense.

Removed masking tape shall become the property of the Contractor and shall be removed from the Project. Any damage to the underlying markings caused by the Contractor’s operations shall be repaired by the Contractor, at its own expense.

Pay Item	Pay Unit
(Width) Preformed Black Line Mask Pavement Marking Tape	l.f.

**SECTION 12.16**  
**BLACK EPOXY RESIN PAVEMENT MARKINGS**  
**BLACK EPOXY RESIN SYMBOLS AND LEGENDS**

*Delete Section 12.16 in its entirety.*

**SECTION M.01  
GRADATION OF AGGREGATE**

*Replace Section M.01 in its entirety with the following:*

**SECTION M.01  
AGGREGATES**

**M.01.01—General****M.01.02—Coarse Aggregates****M.01.03—Fine Aggregates****M.01.04—Portland Cement Concrete (PCC) Aggregates****M.01.05—Bituminous Concrete Aggregates****M.01.01—General:**

Each source of aggregate must be qualified for use by the Engineer as indicated in 1.06.01. Material from a qualified source is still subject to Project-level testing and may be subject to rejection as indicated in 1.06.04.

Aggregates must not have expansive or reactive properties. Aggregates reclaimed from pavements or structures may only be used where specifically allowed in the specifications.

Aggregate stockpiles must be located on smooth, hard, sloped/well-drained areas. Each source and gradation of aggregate must have an individual stockpile or bin. Stockpiles must be managed to minimize segregation and contamination with foreign materials.

**M.01.02—Coarse Aggregates:**

Coarse aggregate must be uniform in consistency and only contain clean, hard, tough, durable fragments meeting the criteria in Table M.01.02-1.

**TABLE M.01.02-1: Coarse Aggregate Criteria by Pit/Quarry Source**

Item	Title	AASHTO Test Methods	Criteria
1	Material Passing No. 200 Sieve	T 11	1% maximum.
2	Loss on Abrasion	T 96	40% maximum
3	Soundness by Magnesium Sulfate	T 104	10% maximum @ 5 cycles

Standard sizes of coarse aggregate for applications other than bituminous concrete must meet the gradation requirements listed in Table M.01.02-2 as determined by AASHTO T 27.

**TABLE M.01.02-2: Gradation of Standard Sizes of Coarse Aggregate**

Square Mesh Sieves	Percent Passing by Weight					
	No. 3	No. 4	No. 6	No. 67	No. 8	No. 9
2 1/2 inches	100					
2 inches	90-100	100				
1 1/2 inches	35-70	90-100				
1 inch	0-15	20-55	100	100		
3/4 inch		0-15	90-100	90-100		
1/2 inch	0-5		20-55		100	
3/8 inch		0-5	0-15	20-55	85-100	100
No. 4			0-5	0-10	10-30	85-100
No. 8				0-5	0-10	10-40
No. 16					0-5	0-10
No. 50						0-5



**M.01.03—Fine Aggregates:**

Fine aggregate must consist of clean, hard, durable, tough, uncoated particles free from lumps, meeting the requirements listed in Table M.01.03-1.

**TABLE M.01.03-1: Fine Aggregate Requirements**

Item	Property	AASHTO Test	Criteria
1	<b>Grading</b>		
	Portland Cement Concrete	T 11 T 27	3% maximum passing No. 200 sieve Table M.01.04-1
	Bituminous Concrete	T 27	100% Passing 3/8 inch, 95% passing the No. 4 min.
2	<b>Absorption</b>	T 84	3% maximum
3	<b>Plasticity limits</b>	T 90	0 or not detectable
4	<b>L.A. Abrasion</b>	T 96	50% maximum (fine agg. particle size $\geq$ No. 8)
5	<b>Soundness by Magnesium Sulfate</b>	T 104	15% maximum@ 5 cycles for PC Concrete 20% maximum@ 5 cycles for Bituminous Concrete
6	<b>Clay Lumps and Friable Particles</b>	T 112	3% maximum
7	<b>Deleterious Material</b> - organic or inorganic calcite, hematite, pyrrhotite, shale, clay, coal-lignite, shells, loam, mica, clinkers, or other organic matter (wood, etc.).	As determined by the Engineer	Must not contain more than 3% by mass of any individual listed constituent and not more than 5% by mass in total of all listed constituents.

Screenings and Dust must meet the requirements of Table M.01.03-2 as determined by AASHTO T 27.

**TABLE M.01.03-2: Screenings and Dust Gradation**

Square Mesh Sieves	Percent Passing by weight	
	Screenings	Dust
3/8 inch	100	
No. 4		100
No. 8	60-100	40-100

**M.01.04—Portland Cement Concrete (PCC) Aggregates:**

In addition to the requirements in M.01.01 through M.01.03, the aggregates used in Portland Cement Concrete must meet the following:

**All Aggregates:** Coarse and Fine aggregates must originate from the aggregate producers and locations included on the Department's Qualified Materials List (QML). The list is available on the Department website. <http://www.ct.gov/dot/site/default.asp>. The criteria for inclusion in the QML are stated within the list.

**Coarse Aggregate:** Coarse aggregate of a size retained on a 1 inch square opening sieve must not contain more than 8% of flat and elongated pieces when tested in accordance to ASTM D4791 at a 1:5 ratio.

Reclaimed concrete aggregates must consist of clean, durable fragments of uniform quality. Materials must be from crushing or otherwise processing of concrete structures or portions thereof. Prior to demolition or removal, concrete structures must not exhibit signs of material degradation and be inspected by the Engineer. Reclaimed aggregate must be tested separately to confirm compliance with all requirements prior to blending with virgin aggregate.

Reclaimed coarse aggregate must not contain chlorides in excess of 0.5 lb./c.y. Chloride content must be determined in accordance with AASHTO T 260, Procedure A. Regardless of chloride content, reclaimed aggregates must not be used in concrete for pre-stressed concrete members.

**Fine Aggregate:** Manufactured sand must be produced from washed stone screenings; stone screenings or gravel; or combinations thereof, after mechanical screening or with a process approved by the Engineer.

The fineness modulus of fine aggregate from a source must not vary more than 0.20 from the base fineness modulus of that source.

The fine aggregate must not produce a color darker than Gardner Color Standard No. 11 in accordance with AASHTO T 21.

Fine aggregates that fail to meet soundness requirements as specified in Table M.01.03-1, but meet all other requirements, may be used with the approval of the Engineer on a case-by-case basis. Typically concrete composing any surface subject to polishing or abrasion (i.e., wheel traffic or running water) will not be allowed to contain such material.

Gradation of each size aggregate must be within the ranges listed in Table M.01.04-1 as determined by AASHTO T 27.

**Table M.01.04-1: Fine Aggregate Gradations**

Sieve Size	3/8 inch	No. 4	No. 8	No. 16	No. 30	No. 50	No. 100
% passing	100	95-100	80-100	50-85	25-60	10-30	2-10

**M.01.05—Bituminous Concrete Aggregates**

In addition to the requirements in M.01.01 through M.01.03, the source of aggregates used in Bituminous Concrete must have a Quality Control Plan for Fine Aggregates (QCPFA) on file with the Engineer. The QCPFA must describe the locations and manufacturing processing methods used at the source. The QCPFA must describe how conformance to Items 1 through 7 in Table M.01.03-1 is monitored and what actions will be taken if nonconformance is observed. The QCPFA must be revised and resubmitted to the Engineer whenever the process, location, or manner of how the fine aggregate is produced or monitored changes. A source of fine aggregate may be suspended by the Engineer due to demonstrated noncompliance with the QCPFA or if consistent production of material does not meet Project specifications as determined by the Engineer.

**SECTION M.07  
PAINT**

*Replace Section M.07 in its entirety with the following:*

**SECTION M.07  
PAINT**

- M.07.01—General for All Paints and Enamels**
- M.07.02—Coating Systems for Structural Steel**
- M.07.03—Vacant**
- M.07.04—Vacant**
- M.07.05—Vacant**
- M.07.06—Vacant**
- M.07.07—Vacant**
- M.07.08—Vacant**
- M.07.09—Vacant**
- M.07.10—Vacant**
- M.07.11—Vacant**
- M.07.12—Vacant**
- M.07.13—Vacant**
- M.07.14—Vacant**
- M.07.15—Vacant**
- M.07.16—Vacant**
- M.07.17—Vacant**
- M.07.18—Vacant**
- M.07.19—Vacant**
- M.07.20—Waterborne Pavement Marking Paint**
- M.07.21—Hot-Applied Waterborne Pavement Marking Paint**
- M.07.22—Epoxy Resin Pavement Markings**
- M.07.23—Vacant**
- M.07.24—Preformed Black Line Mask Pavement Marking Tape**
- M.07.25—Vacant**
- M.07.30—Glass Beads**

**M.07.01—General for All Paints and Enamels:**

**1. Paints and enamels** shall consist of pigments of the required fineness and composition, ground in the required vehicle by a suitable grinding machine to the required fineness. All pigments, resins, oils, thinners and driers shall be free from adulterants.

**2. Proportions:** All proportions in formulas are by weight unless otherwise specified.

**3. Fineness:** All pigments, except aluminum, unless otherwise specified, shall be finely ground with 100% passing the No. 200 sieve; with no less than 97% passing the No. 325 sieve.

**4. Curdling, Livering, Leveling:** The paint or enamel shall not liver or curdle. The pigment shall remain in suspension in a satisfactory manner through the expected shelf life specified on the label. The enamel type paints shall level properly and not show brush marks.

**5. Colors:** All paints and enamels shall be matched to the Department's standard shades.

**6. Time of Drying:** All paints or enamels, unless otherwise specified, shall dry to full gloss in not more than 18 hours.

**7. Weight per Gallon:** The weight per gallon of all paints and enamels shall be determined at 77°F.

**8. Shipping:** All paints and enamels shall be shipped in containers plainly marked with the name, net weight and volume of paint or enamel content. The manufacturer's name, address, date and lot number shall be marked on every package.

**9. Samples, Sampling, and Testing:** The manufacturer shall supply a Certified Test Report per lot for any pigment, oil, resin, thinner, drier or paint. When a portion of the lot is delivered, a Material Certificate is required. Upon request by the Engineer, the manufacturer shall submit a sample.

Sampling and testing shall be performed in accordance with ASTM, Federal Standards, or by methods established by the Department.

**M.07.02—Coating Systems for Structural Steel:** The coating system used shall be specified in the Contract and shall be selected from the [Northeast Protective Coating Committee's](#) (NEPCOAT's) Specification Criteria for Protective Coatings qualified products list.

Color: The color of the topcoat material shall be as noted on the plans (FS 595 Color Number).

Packaging and Labeling of Coating Material: The container shall be designed to store the specific coating material. Each container of coating material shall bear a label that identifies the name of the coating manufacturer, the name of the product, the lot and batch numbers, the date of manufacture and the shelf life expiration date. The label shall also include complete specific instructions for opening the container and for mixing, thinning, and applying the coating material contained therein. If the coating material cannot be positively identified from the label on the container, it shall not be used.

Delivery: Coating material shall be furnished in the manufacturer's original sealed and undamaged container.

Control of Materials: For each coating material, a Materials Certificate shall be submitted in conformance with 1.06.07. The Material Certificate shall indicate compliance with NEPCOAT Acceptance Criteria for Protective Coatings, List A or B.

**M.07.03—Vacant**

**M.07.04—Vacant**

**M.07.05—Vacant**

**M.07.06—Vacant**

**M.07.07—Vacant**

**M.07.08—Vacant**

**M.07.09—Vacant**

**M.07.10—Vacant**

**M.07.11—Vacant**

**M.07.12—Vacant**

**M.07.13—Vacant**

**M.07.14—Vacant**

**M.07.15—Vacant**

**M.07.16—Vacant**

**M.07.17—Vacant**

**M.07.18—Vacant**

**M.07.19—Vacant**

**M.07.20—Waterborne Pavement-Marking Paint:** Pavement-marking paint shall be waterborne paint and shall be white or yellow, depending on its use, for application on bituminous concrete and Portland cement concrete pavement. This paint shall be compatible with the stripe-painting equipment to be used on the Project. All requirements shall be as specified in M.07.21, except as follows:

1. Total nonvolatile compounds shall not be less than 70% by weight.
2. Pigment shall be 50 to 60% by weight.
3. Drying time for no-pick-up shall be 15 minutes or less when tested in accordance with ASTM D711.
4. The Contractor shall provide a Materials Certificate in accordance with 1.06.07 for each portion of a batch or lot delivered to the Project site.

**M.07.21—Hot-Applied Waterborne Pavement-Marking Paint:** Fast-drying waterborne pavement-marking paint to be applied on bituminous concrete and Portland cement concrete pavements shall be the color specified on the plans. This paint shall be capable of being applied with stripe-painting equipment at an application temperature of 130 to 145°F and shall have good spraying characteristics. The Contractor shall provide a Materials Certificate in accordance with 1.06.07 for each portion of a batch or lot delivered to the Project site.

**General:** Specifications and publications that apply are as follows:

- FS TT-P-1952 - Paint, Traffic and Air Field Marking, Waterborne
- Federal Test Method Standard (FTMS) No.141 - Paint, Varnish, Lacquer and Related Materials, Methods of Inspection, Sampling and Testing

- FS No. 595 – Colors

**ASTM Standards:**

- D211 - Specifications for Chrome Yellow and Chrome Orange Pigments
- D476 - Classification for Dry Pigmentary for Titanium Dioxide Pigments

**Detailed Requirements, Formulation and Manufacture:** The paint shall be formulated and manufactured from first-grade raw materials and shall be free from defects and imperfections. The materials shall not exhibit settling or jelling after storage in the sealed containers upon receipt. The paint shall provide the proper anchorage, refraction and reflection for the finished glass spheres when applied as specified.

**Composition:** The composition of the paint material shall meet the requirements of any applicable Federal, State or Local regulation for products of this type and shall meet the following requirements:

1. Paint shall not contain more than 0.06% lead when tested in accordance with ASTM D3335
2. Total nonvolatile organic compounds shall be a minimum of 76% by weight
3. Pigment shall be 58 to 63% by weight when tested in accordance with ASTM D3723
4. Resin solids shall be composed of 100% acrylic emulsion polymer
5. Volatile organic compounds shall not exceed 1.25 lb./gal. excluding water when tested in accordance with ASTM D2369
6. Flash Point: Closed-cup flash point shall not be less than 145°F
7. Density: Weight per gallon shall not be less than 12.5 lb./gal. when tested in accordance with ASTM D1475

**Viscosity:** The consistency of the paint shall not be less than 80, nor more than 90 Krebs units when tested in accordance with ASTM D562.

**Flexibility:** The paint shall not show cracking or flaking when tested in accordance with ASTM D522. The panels shall be lightly buffed with steel wool and thoroughly cleaned with solvent before being used for tests.

**Dry Opacity:** Both white and yellow paints shall have a minimum contrast ratio of 0.96 when tested in accordance with ASTM D2805. Contrast ratio shall be determined by applying a wet film thickness of 0.005 inch to a standard hiding- power chart. After drying, the black- and- white-reflectance values shall be determined using a suitable reflectometer and the contrast ratio determined.

**Bleeding:** The paints shall have a minimum bleeding ratio of 0.97 when tested in accordance with FS TT-P-1952.

**Abrasion Resistance:** No less than 210 liters of sand shall be required to remove paint film when tested in accordance with TT-P-1952.

**Color:** The paint shall not discolor in sunlight and shall maintain colorfastness throughout its life. Color determination shall be made without beads, after a minimum of 24 hours. Color for yellow paint shall be a visual match for FS 595-13538. If not a visual match, the diffuse day color of the paint when tested in accordance with ASTM E1347 shall conform to the CIE Chromaticity coordinate limits as follows:

	x	y	x	y	x	y	x	y	Brightness
White	0.305	0.295	0.360	0.360	0.388	0.377	0.280	0.310	84.0 min
Yellow	0.485	0.455	0.506	0.452	0.484	0.428	0.477	0.438	50.0 min

**Glass Bead Adhesion:** The paint with glass beads conforming to M.07.30, applied at the rate of 6.0 lb./gal. of paint, shall require not less than 150 liters of sand to remove paint film and glass beads.

**Scrub Resistance:** The paint shall pass 300 cycles minimum when tested in accordance with ASTM D2486.

**Drying Time:** Drying time to no pick-up shall be 3 minutes or less when tested in accordance with ASTM D711.

**M.07.22—Epoxy Resin Pavement Markings:**

**General Requirements:**

**Identification:** Each container must be labeled with the following information: Name and address of manufacturer, production batch number, date of manufacture, grade name and/or identification number, type of material, number of gallons, Contract number, directions for mixing and application.

**Certification:** The Contractor shall provide a Material Certificate in accordance with 1.06.07 for each portion of a batch or lot delivered to the Site.

**Detailed Requirements:**

- (a) **Epoxy Resin Material:** The material shall be composed of epoxy resins and pigments only. The white and the yellow epoxy resin materials shall be composed of approved materials and be lead- and chromium-free.

- (b) **Composition:**

WHITE (percent by weight)	YELLOW (percent by weight)
20% ± 2% Titanium Dioxide (ASTM D476 Type III)	
80% ± 2% Epoxy Resins	75% ± 2% Epoxy Resins

(c) **Color:** The white material shall be the color of chip 17778 of FS No. 595 of the latest issue, when the material is placed in a type EH weatherometer for a period of 500 hours and weathered according to ASTM G152. The yellow material shall be the color of chip 13538 of the FS No. 595 of the latest issue.

(d) **Adhesion Capabilities:** When the adhesion of the material to Portland cement concrete is tested in accordance with AASHTO T 237, the failure of the system must take place in the concrete.

(e) **Abrasion Resistance:** When the abrasion resistance of the material is tested according to ASTM D4060 with a CS-17 wheel under a load of 1000 grams for 1000 cycles, the wear index shall be no greater than 82.

(f) **Hardness:** The Type D durometer hardness of the material shall be not less than 75 nor more than 90 when tested in accordance with ASTM D2240 after the material has cured for 72 hours at  $73^{\circ}\text{F} \pm 3.5^{\circ}\text{F}$ .

(g) **Tensile Strength:** The tensile strength of the material, when tested in accordance with ASTM D638, shall not be less than 6,000 psi after 72 hours cure at  $73^{\circ}\text{F} \pm 3.5^{\circ}\text{F}$ .

(h) **Compressive Strength:** The compressive strength of the material, when tested in accordance with ASTM D695, shall not be less than 12,000 psi after 72 hours cure at  $73^{\circ}\text{F} \pm 3.5^{\circ}\text{F}$ .

(i) **Shelf Life:** The individual components shall not require mixing prior to use when stored for a period of 12 months.

(j) **Glass Beads:** The glass beads shall meet the requirements of M.07.30.

#### M.07.23—Vacant

#### M.07.24—Preformed Black-Line Mask Pavement-Marking Tape:

**General Requirements:** The preformed, patterned black-line mask pavement- marking tape shall consist of a matte black, non-reflective tape in widths or sizes sufficiently large to mask the existing markings which are to be temporarily covered.

The patterned masking tape shall be pre-coated with a pressure sensitive adhesive and shall be capable of being adhered to existing markings, on bituminous concrete pavement or Portland cement concrete in accordance with the manufacturer's instructions without the use of heat, solvents or other additional adhesives, and shall be immediately ready for traffic use after application. The Contractor shall identify equipment necessary for proper application and removal, and make recommendations for application that will assure effective product performance.

The preformed, patterned black-line masking pavement-marking tape shall be suitable for use for 1 year after the date of receipt when stored in accordance with the manufacturer's recommendations.

#### Detailed Requirements:

(a) **Composition:** The non-reflective, patterned black-line mask pavement-marking tape shall not contain metallic foil and shall consist of a mixture of high quality polymeric materials, pigments and inorganic fillers distributed throughout its base cross-sectional area, with a matte black non-reflective top layer. The patterned surface shall have a minimum of 20% of the surface area raised and coated with non-skid particles. The channels between the raised areas shall be substantially free of particles. The film shall be pre-coated with a pressure sensitive adhesive. A non-metallic medium shall be incorporated to facilitate removal.

(b) **Skid Resistance:** The surface of the patterned, non-reflective black-line mask pavement-marking tape shall provide an initial average skid resistance value of 60 British Pendulum Number when tested in accordance with ASTM E303.

(c) **Thickness:** The patterned material, without adhesive, shall have a minimum thickness of 0.065 inch at the thickest portion of the patterned cross-section and a minimum thickness of 0.02 inch at the thinnest portion of the cross-section.

(d) **Adhesion:** The black-line mask pavement- marking tape shall adhere to the pavement and existing pavement markings under climatic and traffic conditions normally encountered in the construction work zone.

(e) **Removability:** The black-line mask pavement-marking tape shall be capable of being removed after its intended use without the use of heat, solvents, grinding, sand or water blasting.

#### M.07.25—Vacant

**M.07.30—Glass Beads:** The glass beads shall meet the requirements of AASHTO M 247, Type 1 or 4, depending on application.

**SECTION M.13  
ROADSIDE DEVELOPMENT**

*Replace Section M.13 in its entirety with the following:*

**SECTION M.13  
ROADSIDE DEVELOPMENT**

**M.13.01—Topsoil and Planting Soil****M.13.02—Agricultural Ground Dolomitic Limestone****M.13.03—Fertilizer****M.13.04—Seed Mixtures****M.13.05—Mulch Materials****M.13.06—Compost****M.13.07—Plant Materials****M.13.08—Sod****M.13.09—Erosion Control Matting****M.13.01—Topsoil and Planting Soil:**

**1. Topsoil:** The term topsoil used herein shall mean a soil meeting the soil textural classes established by the USDA Classification System based upon the proportion of sand, silt, and clay size particles after passing a No. 10 sieve and subjected to a particle size analysis. The topsoil shall contain 5% to 20% organic matter as determined by loss on ignition of oven-dried samples dried at 221°F. The pH range of the topsoil shall be 5.5 to 7.0.

The following textural classes shall be acceptable:

1. Loamy sand, including coarse, loamy fine, and loamy very fine sand, with not more than 80% sand
2. Sandy loam, including coarse, fine and very fine sandy loam
3. Loam
4. Clay loam, with not more than 30% clay
5. Silt loam, with not more than 60% silt
6. Sandy clay loam, with not more than 30% clay

All textural classes of topsoil with greater than 80% sand content will be rejected.

The topsoil furnished by the Contractor shall be a natural, workable soil that is screened and free of subsoil, refuse, stumps, roots, brush, weeds, rocks and stones over 1 1/4 inches diameter, and any other foreign matter that would be detrimental to the proper development of plant growth.

The Contractor shall notify the Engineer of the location of the topsoil at least 15 calendar days prior to delivery. The topsoil and its source shall be inspected and approved by the Engineer before the material is delivered to the Project. Material delivered to the Project which does not meet specifications or which has become mixed with undue amounts of subsoil during any operation at the source or during placing and spreading, will be rejected and shall be replaced by the Contractor with acceptable material.

When topsoil is not furnished by the Contractor, it shall be material taken from the Site in accordance with 2.02 or furnished by the State.

**2. Planting Soil:** Soil Material to be used for plant backfill shall be one of the following textural classes:

1. Loamy sand, with not more than 80% sand
2. Sandy loam
3. Loam
4. Clay loam, with not more than 30% clay
5. Silt loam, with not more than 60% silt
6. Sandy clay loam, with not more than 30% clay

Planting soil shall be premixed, consisting of approximately 15 % compost, 10% peat, with topsoil and/or native soil. Planting soil shall be loose, friable, and free from refuse, stumps, roots, brush, weeds, rocks and stones 2 inches diameter. In addition, the material shall be free from any material that will prevent proper development and plant growth.

- (a) For ericaceous plants and broad-leaved evergreens requiring an acid soil, planting soil shall have a true pH of 4.5 to 5.5. If it has not, it shall be amended by the Contractor at its expense to the proper pH range by mixing with sulphur.
- (b) Planting soil for general planting of nonacid-loving plants shall have a true pH value of 5.6 to 6.5. If it has not, it shall be amended by the Contractor at its expense to the proper pH range by mixing with dolomitic limestone.

The Engineer reserves the right to draw such samples and to perform such tests as deemed necessary to ensure that these specifications are met.

The amount of sulphur or limestone required to adjust the planting soil to the proper pH range appropriate for its use (above) shall be determined by the Contractor based on the physical testing of a representative sample of the material. Testing must be documented in accordance with the Department’s “[Minimum Schedule for Acceptance Testing](#).” Limestone shall meet the requirements of M.13.02. Sulphur shall be intended for agricultural use and packaged in containers with the manufacturer’s name, chemical analysis and net weight clearly shown on the container. The Contractor shall follow the manufacturer’s recommended procedures for application of the sulphur to the soil.

**M.13.02—Agricultural Ground Dolomitic Limestone:** Agricultural ground dolomitic limestone shall conform to the standards of the Association of Official Agricultural Chemists (AOAC), and must comply with all existing State and Federal regulations.

The material must comply with the following gradation:

Square Mesh Sieves	Percent Passing By Weight
Pass No. 10	100
Pass No. 20	95
Pass No. 100	50
The minimum calcium carbonate equivalent shall be	90

The Engineer reserves the right to draw such samples and perform such tests as deemed necessary to assure that these specifications are met.

**M.13.03—Fertilizer:** Fertilizer shall be slow release and commercial grade granular 10-10-10 fertilizer. At least 40% of the nitrogen content shall be slow release, phosphorus shall be available phosphoric acid, and potassium shall be water soluble potash. The fertilizer shall be delivered to the Project in new, clean, sealed containers which bear a label fully describing the contents, the chemical analysis of each nutrient, the fertilizer grade, the net bulk, the brand, and the name and address of the manufacturer. The fertilizer and labels shall conform to all existing State and Federal regulations, and shall meet the standards of the AOAC.

The delivery of each shipment of fertilizer to the Project shall be accompanied by a properly executed and acceptable affidavit of the form shown herein. The affidavit shall be submitted to the Engineer. The Engineer reserves the right to draw such samples and perform such tests as may be deemed necessary to ensure compliance with these specifications.

**Form for Affidavit - Fertilizers (Official Stationery of Supplier)**

Date _____
To Whom It May Concern:
I hereby certify that I have sold and delivered _____ tons of commercial fertilizer of _____ grade. This material is designated as our batch number(s) _____ and was delivered to _____ for _____ (Contractor’s Name)
Connecticut Department of Transportation Project Number(s): _____ at _____, Connecticut. The material was delivered on _____. The labels and contents meet all State and Federal regulations. The mixture consists of: (List analyses of each major plant nutrient as percent by weight)
Signature _____ (Company Official)
Signature and Seal _____ Notary Public



Should the material fail to meet these specifications, the Contractor shall supply additional acceptable material and perform such work necessary to rectify the deficiencies without cost to the State.

**M.13.04—Seed Mixtures:**

(a) The grass seed mixture shall conform to the following:

<u>Species</u>	<u>Proportion By Weight Pounds</u>	<u>Minimum Purity (Percent)</u>	<u>Minimum Germination (Percent)</u>
VELVET BENTGRASS, ( <u>AGROSTIS CANINA</u> ) CERTIFIED VARIETY: OR EQUAL CERTIFIED VARIETY;	25	96	85
RED FESCUE ( <u>FESTUCA RUBRA L. SSP. RUBRA</u> ) CERTIFIED VARIETY: OR EQUAL CERTIFIED VARIETY	35	97	80
PARTRIDGE PEA ( <u>CHAMAECRISTA FASCICULATA</u> ) CERTIFIED VARIETY:	10	95	90
INDIAN GRASS ( <u>SORGHASTRUM NUTANS</u> ) CERTIFIED VARIETY:	15	95	90
CANADA WILD RYE ( <u>ELYMUS CANADENSIS</u> ) CERTIFIED VARIETY:	5	95	90
KENTUCKY BLUE GRASS ( <u>POA PRATENSIS</u> ) CERTIFIED VARIETY:	10	95	90

Under no circumstances shall annual Ryegrass, Italian Rye, or any other seed be added to the seed mixture.

(b) The "temporary" grass seed shall be perennial ryegrass (*Lolium perenne*) or an improved variety thereof, such as Manhattan, having a minimum purity of 98% and a minimum germination of 90%.

The seed mixture shall be delivered in new, clean, sealed containers. Labels and contents shall conform to all State and Federal regulations. Seed shall be subject to the testing provisions of the Association of Official Seed Analysts.

The seed shall be delivered to the Project accompanied by a properly executed affidavit for each type and shipment of seed. The affidavit shall be of the form shown herein.

**Form for Affidavit - Seed (Official Stationery of Supplier)**

Date _____
To Whom It May Concern:
I hereby certify that _____ pounds of seed mixture, lot of commercial fertilizer of _____ grade. This material is designated as our number _____, (Label attached) has been sold and delivered to _____ for _____ (Contractor's Name)
Connecticut Department of Transportation Project Number(s): _____
at _____, Connecticut. The material was delivered on _____. The labels and contents meet all State and Federal regulations. The mixture consists of: (List component parts, proportions, minimum purity, minimum germination)
Signature _____ (Company Official)
Signature and Seal _____ Notary Public

The Engineer reserves the right to take such samples and to make such tests as they deem necessary to ensure compliance with these specifications. The Contractor shall supply such additional acceptable material and perform such work as required to rectify any deficiencies without cost to the State.

**M.13.05—Mulch Materials:**

**1. Wood Chips:** Wood chip mulch shall be sound, green wood, and shall be 1/8 inch nominal thickness with not less than 50% of the chips having an area of not less than 1 square inch, nor more than 6 square inches. The material shall be free from rot, leaves, twigs, shavings, debris, and any material injurious to plant growth.

**2. Hay:** Hay shall be from properly cured grass or legume mowings, free from weeds, reeds, twigs, debris or other objectionable material. It shall be free from rot or mold, and shall have a moisture content of not more than 15% when delivered to the Project. No salt hay shall be used.

**3. Wood Fiber Mulch:** Wood fiber mulch or wood cellulose fiber mulch shall be material manufactured for mulching seeded areas. The material shall be produced from clean wood, uniform in texture and free of shavings, rot and mold. Wood fiber mulch shall be commercially pre-packaged bearing the brand, name and address of the manufacturer.

**4 Shredded Bark Mulch:** This shall consist of the outer bark of pine or hardwood trees. The material shall be aged for a minimum of 6 months and be dark brown in color, free of chunks and pieces of wood thicker than 1/4 inch, and shall not contain, in the judgement of the Engineer, an excess of fine particles. Mulch must be free of long stringy material and dyed wood chips.

**M.13.06—Compost:** Compost shall be a stable, humus-like organic material produced by the aerobic, biological and biochemical decomposition of source-separated organic waste, that may include, leaves and yard trimmings, food scraps, food processing residuals, manure and/or other agricultural residuals, forest residues and bark. Compost may be either commercially packaged or from a bulk source. Compost shall not be altered by the addition of materials such as sand, soil and glass. Compost shall not contain substances toxic to plants and shall contain less than 0.1% by dry weight of man-made foreign matter. Compost shall pose no objectionable odor and shall not closely resemble the raw material from which it was derived. Compost shall be suitable for use as a soil amendment or mulch and shall support the growth

of nursery stock or seeding.. All compost material must be accompanied by a Materials Certificate and Certified Test Report in accordance with 1.06.07.

Compost shall have the following properties:

1. A minimum organic content of 50% dry weight basis as determined by loss on ignition in accordance with ASTM D2974.
2. Carbon:Nitrogen ratio range of 11:1 to 25:1.
3. Carbon:Phosphorus ratio of 120:1 to 240:1.
4. A moisture content of 35 to 60% in accordance with ASTM D2974.
5. Particle size less than 1/2 inch for Planting Backfill, and 1 inch for Erosion Control in accordance with AASHTO T27.
6. The pH of compost shall be in the range of 6 to 7.8.
7. The soluble salt content of compost shall not exceed 4.0 mmhos/cm (dS/m) as determined by using a dilution of 1 part compost to 1 part distilled water.
8. The maturity or stability of the compost shall be Stable or Very Stable, meeting either of the following criteria:
  - (a) > 6 using the Solvita Compost Maturity Test, or
  - (b) < 10°C above ambient temperature (Dewar self-heating test)
9. Maximum foreign matter 1%.

**M.13.07—Plant Materials:** The materials for this work shall meet the following requirements:

**1. General:** For the most part, the latest revised version of "Standardized Plant Names," prepared by the Editorial Committee of the American Joint Committee on Horticultural Nomenclature, shall be the authority for all botanical plant names.

All plants shall be first-class representatives of their normal species or varieties in accordance with the ANSI American Standards for Nursery Stock and as specified on the plans. They shall have well-furnished branch systems together with vigorous fibrous root systems.

Plants shall be free from all insect pests, plant diseases, disfiguring knots, stubs, sun-scalds, abrasions of the bark or any other form of injury or objectionable disfigurements. All plant material shall comply with the State and Federal laws with respect to inspection for plant diseases and insect infestations.

Plants shall not be pruned before delivery and no plants shall be cut back from larger sizes to meet the sizes specified.

Plants shall be nursery grown unless otherwise specified and bear evidence of proper nursery care, including adequate transplanting and root pruning.

No plant will be considered to be nursery grown unless it has been growing in a nursery for at least 2 years and unless it has been root pruned or transplanted no more than 5 years prior to digging.

**2. Balled & Burlapped (B & B) Material:** Nursery-grown trees shall meet the requirements as specified in the current edition of "U.S. American Standards for Nursery Stock," or as further specified in the plans. Nursery-grown trees shall have no cuts which are not healing, no cuts over 3/4 inch diameter which have not completely calloused over and no abrasions of the bark. They must have good fibrous root systems characteristic of the kind.

Trees shall have straight trunks, well-balanced tops and a single leader or as may be characteristic of the species.

Trees in which the leader or branches have been cut back or otherwise topped or de-horned will not be accepted. The caliper of shade trees up to and including 4 inches diameter shall be measured above the root collar (or swelling at the ground) 6 inches above ground level. Caliper shall be the determining measurement in grading. Height measurements shall be given in single feet in sizes up to and including 6 feet.

Small deciduous trees shall be completely natural. Tree "clumps" shall have 3 or more main stems starting from the ground. Bush from trees shall be those with branches which start from the main trunk close to the ground.

**3. Container Grown (CG):** Container grown shrubs shall possess the minimum number of stems and root mass for the height or container size specified.

Vines and groundcover plants shall be well-furnished with vigorous root systems. They shall be field-grown unless otherwise specified. Plants grown in pots or bands shall have sufficient roots to retain the soil in which they are growing when such plants are removed from their containers. Such plants shall not be root-bound.

**4. Inspections:** All plants shall be subject to inspection by the Engineer. The Contractor shall designate its wholesale plant material source(s) of supply to the Engineer in writing at least 1 month in

advance of each planting season to facilitate an orderly and timely inspection of the items to be installed. Based on the Project schedule, material procured in the spring for fall installation must be approved before digging occurs. The Contractor shall be represented during such inspection. Inspection may be made at the nursery, on Site or via photos at the discretion of the Engineer.

All tagged samples shall be delivered to the Project for which they were sampled. All deliveries to the planting site shall be accompanied by both the vendor's invoice (designating kind, size, quantity and source(s) of supply) and Certificates of Inspection issued by Federal or State authorities or both. Such certificates shall attest to the freedom of the plant material from diseases and insect infestations. The State reserves the right to inspect all plant materials at the growing sites. Further inspections will be made when the materials are delivered to the Project site or storage area.

**5. Substitutions:** No change in size, kind or quality of plants from those specified will be permitted without written approval of the Engineer. The Contractor shall submit a written request for permission to make a substitution. Upon receipt of such request, the Engineer will suggest plants meeting the requirements of the Contract as to function, size and type and indicate the reduced cost to the State as the result of said substitution. In no case shall the price for substitutions exceed the bid price of those replaced.

**6. Digging Plants:** Plants shall be dug immediately before shipment unless otherwise approved. Special precaution shall be taken to avoid any unnecessary injury to or removal of fibrous roots. Damaged roots shall be cut off clean.

- (a) After deciduous bare-root plants are dug, their roots shall be protected from exposure to sun, wind and freezing temperatures. All bare roots of trees, shrubs and vines, unless otherwise directed, shall be puddled in a wet clay mixture which will cover and adhere to the entire root system. Bare roots shall be further protected by wrapping them in wet straw, moss, burlap or other suitable material, or by heeling them in and watering them in order to keep them fresh and viable.
- (b) B & B plants shall be lifted so as to retain as many fibrous roots as possible. Excess soil and feeder roots shall be removed prior to digging. All B & B plants must come from soil which will hold a firm ball. The State reserves the right to reject plants grown in excessively sandy or clayey soil if the plant is to be installed in a dissimilar soil type. The plants shall be wrapped with burlap, or similar approved material, and tightly laced with bio-degradable twine in such a manner as to hold the balls firm and intact. All B & B material arriving with broken or loose balls, or with manufactured balls, will be rejected.

**7. Transportation and Labeling:** Plants transported by open vehicles shall be covered by tarpaulins or other suitable covers securely tied to the body of the vehicle. Closed vehicles shall be adequately ventilated to prevent overheating of the plants. The heads of trees shall be tied in carefully to prevent breakage of the leaders and the branches. Trunks and branches shall be adequately supported on padding to prevent their being scraped or bruised.

Legible labels shall be attached to all separate plants, boxes, bundles, bales or other plant containers, indicating the name, size, and quantity of units in each container and other information necessary for inspection.

**8. Delivery:** Notice of delivery of plants shall be given to the Engineer by the Contractor at least 48 hours in advance of the anticipated delivery date, unless otherwise authorized. The Engineer shall be furnished a legible copy of the invoice for each shipment showing kind, sizes and quantities of materials.

All plant materials which are delivered in such a stage as to reasonably endanger their survival will not be accepted.

All plant materials shall be produced in a latitude north of Washington, D.C. and in a longitude east of the Mississippi River.

(a) **Spring Dug:** All deciduous plants shall be received with buds unopened and intact; evergreen plants with the new growth retarded.

(b) **Fall Dug:** Deciduous plants shall not be dug before the plants have hardened off.

**9. Water:** Water shall be free from oil, acid, alkalis, salts and any other substances harmful to plants. Water from streams shall not be used unless authorized by the Engineer.

**10. Peat:** Peat shall be commercially packaged peat from sedge, sphagnum or reed sources. Material shall be in such physical condition that it may be rudded through a 1/2 inch mesh screen, and may be readily mixed with soil material. It shall be free from sticks, roots, stones and other objectionable material. It shall be delivered to the Project in clean, new, sealed containers bearing the brand, net bulk, and name and address of the packer. The material shall have an acidity that falls in the pH range of 3.0 to 7.0. It shall have a minimum organic content of 90% and a minimum water-absorbing capacity of 1000%.

**11. Miscellaneous:**

- (a) Anchor stakes for guying trees shall be of sound hardwood with a minimum length of 2 feet and minimum diameter of 2 inches at the smaller end. Stakes made from lumber shall measure no less than 2 inches x 2 inches throughout their lengths. Trees over 3 1/2 inch caliper shall require either stakes or dead-men for support as approved by the Engineer. The type of stake used shall be uniform throughout the Site.
- (b) Tree support posts shall be sawed posts cut to a uniform square cross-section of 2 inches x 2 inches throughout their lengths. They shall be cut from sound, hard, clean, straight wood free from crooks, 8 feet long for major trees and 4 - 5 feet long for minor trees or as approved by the Engineer.
- (c) Hose for protecting the bark of major and minor trees from guy wires shall be of good quality rubber or plastic hose acceptable to the Engineer, with a minimum inside diameter of 3/8 inch and a maximum inside diameter of 3/4 inch.
- (d) Wire shall be pliable, new, annealed, galvanized, 12-gage, for staking support and 10-gage for guying to trees. Alternate staking and guying systems shall be submitted to the Engineer for approval.
- (e) Flags shall be white cotton cloth or white plastic ribbon, 2 inches wide and 18 inches long. Gauze is not acceptable.
- (f) Anti-desiccant shall be an emulsion such as will provide a film over plant surfaces, permeable enough to permit transpiration. Anti-desiccant shall be delivered in containers of the manufacturer and shall be mixed according to the manufacturer's instructions.

**M.13.08—Sod:** Sod shall be living sod procured from areas where the soil is reasonably fertile and from areas similar in the degree of moisture to the area to be planted. It shall be cut or stripped, by approved methods, from turf areas relatively free of large stones, roots or other materials which might be detrimental to the sodding operation or to future maintenance. The sod shall contain a sufficient proportion of pasture grasses to ensure a good mat of roots and a reasonably dense turf unless Type No. 1, which is a superior quality, is specified on the plans.

Any growth more than 3 inches high shall be mowed to a height of 3 inches not more than 5 days before the sod is lifted.

Sources of sod shall be made known to the Engineer at least 5 days before cutting and shall be approved before mowing. The sod shall be cut into squares or rectangular portions which shall be 12 inches wide and may vary in length, but must be of a size which will permit them to be lifted without breaking. The sod shall be sufficiently moist so the soil will adhere firmly to the roots when it is handled and may require watering before lifting. Field grown sod shall be cut to a minimum depth of 1 1/2 to 2 inches. Where Type No. 1 Sod is specified, it shall be cut to a minimum depth of 1 to 1 1/2 inches.

Type No. 1 Sod shall be obtained from inspected and approved commercial sod farm sources of supply and shall be free from noxious weeds, insect infestations, and fungus and bacterial diseases.

**M.13.09—Erosion Control Matting:** Erosion control matting shall be from the Department's [Qualified Products List](#). Staples shall meet the Manufacturer's requirements. Material which shows signs of degradation shall not be used and shall be removed from the Project.

**SECTION M.18  
SIGNING**

*Replace Section M.18 in its entirety with the following:*

**SECTION M.18  
SIGNING**

**M.18.01—Vacant**

**M.18.02—Anchor Bolts**

**M.18.03—Vacant**

**M.18.04—Vacant**

**M.18.05—Vacant**

**M.18.06—Vacant**

**M.18.07—Delineators**

**M.18.08—Paint for Sign Panel Overlay**

**M.18.09—Retroreflective Sheeting**

**M.18.10—Demountable Copy**

**M.18.11—Sign Panels-Extruded Aluminum**

**M.18.12—Panel Bolt Assemblies and Post Clip Assemblies**

**M.18.13—Sign Face—Sheet Aluminum**

**M.18.14—Metal Sign Posts**

**M.18.15—Sign-Mounting Bolts**

**M.18.01—Vacant**

**M.18.02—Anchor Bolts:** Anchor bolts shall meet the requirements of ASTM A449.

Leveling nuts and nuts for anchor bolt assemblies shall meet the requirements of ASTM A563, Grade DH. Leveling nuts and anchor bolt assemblies shall be hot-dip galvanized in accordance with the requirements of ASTM A153, Class C. Leveling nuts shall be tapped oversize, after galvanizing, in accordance with ASTM A563, Section 7.5.1, and shall be provided with a lubricant in accordance with the requirements of ASTM A325.

The Pedestal grout leveling template shall meet the requirements of ASTM A36 and shall be a minimum of 1/2 inch thick.

**M.18.03—Vacant**

**M.18.04—Vacant**

**M.18.05—Vacant**

**M.18.06—Vacant**

**M.18.07—Delineators**

**1. Reflectors:** Reflective sheeting shall meet the requirements of M.18.09 and be the type, color and shape indicated on the plans. Backplate or sign blank material shall be an aluminum alloy of the type, shape and thickness indicated on the plans.

**2. Metal Delineator Posts:**

The "Standard Metal Delineator Posts" shall be made of ASTM A36 structural steel. The posts shall be fabricated to the dimensions and weight shown on the plans. After delineator mounting holes have been made, the posts shall be galvanized in accordance with ASTM A123.

**3. Bridge Rail Mounting Brackets:**

The bracket shall be made of 0.125 inch Aluminum Alloy 6061-T6 fabricated to the dimensions shown on the plans and shall be fastened to the metal bridge rail with 2 each 3/8 inch diameter x 5/8 inch long cadmium plated steel box head self-tapping screws. Fasteners shall meet the requirements indicated on the plans.

**M.18.08—Paint for Sign Panel Overlay:** The paint to be used for the finished coat shall be an extremely durable, highest quality, semi-gloss green enamel for use on plywood and metal signs and shall be resistant to air, sun and water.

It shall consist of pigments of the required fineness and composition ground in the required vehicle by a

suitable grinding machine to the required fineness. All pigments, resins, oils, thinners and driers used shall be of the best quality, free from adulterants of any kind, and shall comply with the following requirements:

Enamel Composition	Min.	Max.
Pigment, %	40	-
Vehicle, %	-	60
Volatile matter in vehicle, % by weight	-	55
Coarse particles and skins retained on No. 325 screen, based on pigment, %	-	0.5
Viscosity, Krebs units at 77°F	65	75
Weight per gallon, pounds	10.5	-
Fineness of grind (North Standard)	5	-

Pigment Composition	Min.	Max.
Chrome green, %	57	-
Extender pigment, %	-	43

The chrome green shall be Imperial A 4464 Velvet Green or approved equal.

The extender pigments shall consist of any of the following or combination thereof: magnesium silicate, barium sulfate, or diatomaceous silica. A ratio of 50% magnesium silicate and 50% diatomaceous silica has been found to produce the desired semi-gloss.

**Vehicle**—The vehicle shall contain not less than 45% solids by weight and shall be composed of a long oil soya modified alkyd resin solution or solutions, petroleum solvent thinners and driers. Rosin or rosin derivatives shall not be present. The alkyd resin solution or solutions shall conform to FS TT-R-266, Type I, Class A of latest issue.

**Specular Gloss**—The enamel shall be flowed on a tin panel and allowed to dry for 24 hours before measuring. The specular gloss at 60 degree angle of incident, ASTM D523 shall be between 35 and 45.

**Setting and Drying Time**—This enamel shall set to touch in less than 5 hours. It shall dry hard and tough in not more than 24 hours.

**Flash Point**—Not below 86°F as tested in accordance with ASTM D93.

**Water Resistance**—The enamel shall be flowed on a tin panel and allowed to dry for 48 hours. After being immersed for 18 hours in distilled water, it shall show no blistering or wrinkles upon removal and shall show no dulling or change in color after 2 hours recovery.

**Skinning**—This enamel shall not skin over within 48 hours in a 3/4 filled, closed container. Small amounts of anti-skinning agents, wetting agents, suspension agents, and anti-drier absorption agents may be added at the discretion of the manufacturer.

**Working Properties**—The enamel shall be well ground, shall not settle in the container, and shall be capable of being broken up with a paddle to a smooth uniform enamel of good brushing consistency, and shall have good flowing, covering and leveling properties.

**M.18.09—Retroreflective Sheeting:** The manufacturer and type of retroreflective sheeting materials shall be listed on the Department's Qualified Product List for the application intended.

**M.18.10—Demountable Copy:** The materials for this work shall meet the following:

**1. Vacant**

**2. Type IV Retroreflective Sheeting:**

Demountable cutout letters, digits, border, corner radii and copy accessories shall consist of adhesive coated retroreflective sheeting permanently adhered to flat aluminum backing. The retroreflective sheeting shall conform to M.18.09. The design of letters and accessories shall conform to FHWA Standards for use on "National System of Interstate and Defense" highways.

Aluminum backing shall be a minimum of 0.040 inch thick aluminum sheet of 3003-H14 alloy.

Aluminum sheeting shall be properly treated according to sheeting manufacturer's specifications.

The demountable copy shall be fastened to the sign panel with aluminum rivets. Rivets shall be of the pull through type and of the size and number designated by the demountable copy manufacturer.

**3. Non-Reflective Plastic Sheeting:**

Description: Demountable cutout letters, digits, border, corner radii and copy accessories shall consist of adhesive-coated, non-reflective plastic sheeting permanently adhered to flat aluminum backing.

The material shall consist of a flexible, pigmented, plastic film completely pre-coated with a solvent or heat-activated, tack-free adhesive. The adhesive shall be protected by a treated paper liner, which shall be removable without soaking in water or other solvents. The non-reflective plastic sheeting shall conform to the following:

Property Requirements:

A. Thickness: The thickness of the plastic film with adhesive shall be a minimum of 0.003 inch and a maximum of 0.004 inch.

B. Film: The unapplied or applied film shall be readily processed with, and insure adequate adhesion of, process inks recommended by the manufacturer.

(1) Flexibility: The material shall be sufficiently flexible to permit application over and conform to moderately contoured surfaces.

(2) Gloss: The film shall have an initial 60-degree gloss value of 35 (minimum), when tested in accordance with ASTM D523, measuring at least 3 portions of the film to obtain uniformity.

C. Adhesive: The pre-coated adhesive shall form a durable bond to smooth, clean, corrosion and weather-resistant surfaces, shall be of uniform thickness, non-corrosive to applied surfaces and shall have no staining affect on the film.

D. Adhesion: The material, applied according to Paragraph J "Preparation of Test Panels," shall have sufficient bond to prevent removal from the panel in 1 piece without the aid of a physical tool.

E. Exterior Exposure: The material shall withstand 3 years' vertical, south-facing exterior exposure at a site acceptable to the Engineer, showing no appreciable discoloration, cracking, crazing, blistering, delamination, or loss of adhesion. A slight amount of chalking is permissible. The film shall not support fungus growth.

F. Dimensional Stability: The material shall show no more than 0.02 inch shrinkage in any direction from edge of the panel when prepared in accordance with Paragraph J after being subjected to a temperature of 149°F for 48 hours.

G. Heat Resistance: The material, applied according to Paragraph J, shall be heat-resistant enough to retain adhesion after 1 week at 149°F.

H. Solvent and Chemical Resistance: The material, when prepared in accordance with Paragraph J, shall withstand immersion in the following liquids at 70-90°F, showing no appreciable decrease in adhesion, color or general appearance:

Liquids	Time/Hours
Reference Fuel (MIL-F-8799A) (15 parts xylol – 85 parts mineral spirits by weight)	1
Distilled Water	24
SAE #20 Motor Oil	24

I. Opacity: When applied, the material shall be sufficiently opaque to hide a contrasting black printed legend and white surface.

J. Preparation of Test Panels: Test panels shall be prepared using a 6.5 inch x 6.5 inch piece of the plastic film, applied to a clean 6.0 inch x 6.0 inch aluminum panel, premasked or as recommended by the manufacturer, trimmed evenly at the edge of the panel, and aged for 48 hours at 70 - 90°F.

K. Shelf-Life Storage: The material shall withstand 1 year's shelf life when stored in a clean area free from exposure to excessive heat, moisture and direct sunlight.

L. General Characteristics and Packaging: The plastic film shall be furnished in rolls, cut sheets or characters, as may be specified. The film, as supplied, shall be free from ragged edges, streaks, blisters, foreign matter or other surface imperfections which would make it unsuitable for the intended usage, and shall be readily cut with scissors, knife, blade, shears or other production tools. Complete and detailed instructions for mounting the plastic film shall be supplied with each package of material.

M. Quality Assurance: For the non-reflective plastic sheeting a Certified Test Report in accordance with 1.06.07 shall be submitted.



**M.18.11—Sign Panels-Extruded Aluminum:** Sign panels (extruded aluminum) shall be of the butt type, alloy 6063-T6 ASTM B221. Several extruded sections shall be joined with panel nuts, bolts, and washers to achieve the desired sign size. The extruded aluminum panels shall be of 6 inch and 12 inch heights to achieve sign panel vertical dimensions in increments of 6 inches; however, no more than one 6 inch panel shall be used on any sign. The weight and section properties of the 6 inch and 12 inch extruded panels shall be as indicated on the plans.

On the vertical axis (the 6 inch or 12 inch dimension), the panel face shall be in the same plane within 0.015 inch in any 6 inches. Extruded sections shall be mounted horizontally, and the panel faces shall be flush after the erection of the sign is complete.

**Cleaning:** Extruded aluminum sign panels shall be thoroughly cleaned and degreased by total immersion in an alkaline solution which is controlled and titrated to the solution manufacturer's recommendations. Immersion time shall be sufficient to completely remove all grease, dirt or other contaminants. After cleaning, the panels shall be thoroughly rinsed with clear running water.

**Pretreatment:** Sign panels shall be treated with a light, tightly adherent chromate conversion coating, free of any powdery residue, ranging in color from a silvery iridescent to a pale yellow, conforming with ASTM B449, Class 2, 10-35 mg/s.f., with 25 mg/s.f. as the optimum coating weight.

**M.18.12—Panel Bolt Assemblies and Post Clip Assemblies:**

**Panel Bolt Assembly:** Aluminum hex head bolt, hex nut and washer shall be as shown on the plans and shall be used to unite several panels sections to conform to the designed sign size. Nuts shall be drawn tight. Bolt holes may be drilled or blanked to finished size.

Thread fit for bolts shall conform to class 2-A fit of American Standard Association.

**Post Clip Assembly:** Aluminum post clips square head bolt, lock nut and washer shall be as shown on the plans.

The shank of the post clip bolts shall fit tightly against the sign support flange after nuts have been tightened. The clip bolts shall be torqued to 20 ft-lb. when using dry, clean, unlubricated threads.

**M.18.13—Sign Face—Sheet Aluminum:** Sheet aluminum sign blanks shall be constructed of sheet aluminum, alloy 6061 T6 or alloy 5052 H38. Sheet aluminum sign blanks shall meet the requirements of ASTM B209. They shall be degreased and etched in accordance with the recommendations of the sheeting manufacturer or treated with a light, tightly adherent chromate conversion coating, free of any powdery residue, ranging in color from silvery iridescent to a pale yellow, meeting the requirements of ASTM B449, Class 2 10-35 mg/s.f. with 25 mg/s.f. as the optimum coating. The thickness shall be as specified on the plans.

**M.18.14—Metal Sign Posts:** Metal sign posts, square tubular supports and parapet-mounted sign supports shall conform to the requirements on the plans. The size, shape and mass of posts and supports shall be as specified in the plans.

After fabrication of the posts and supports, including hole punching or drilling, they shall be galvanized in accordance with ASTM A123 unless otherwise noted on the plans.

**M.18.15—Sign-Mounting Bolts:** Bolts used for sign-mounting shall be stainless steel and meet the requirements of ASTM F593, Group 1 or 2 (Alloy Types 304 or 316). Locking nuts shall be stainless steel and shall meet the requirements of ASTM F594, Group 1 or 2 (Alloy Types 304 or 316). Washers shall also be stainless steel and shall meet the requirements of ASTM A240 (Alloy Types 304 or 316).

**Construction Contracts - Required Contract Provisions  
(State Funded Only Contracts)**

**Index**

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- EXHIBIT C – Health Insurance Portability and Accountability Act of 1996 (HIPAA) (page 17)
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- EXHIBIT E - State Wage Rates (Attached at the end)

## **1. Title VI of the Civil Rights Act of 1964 / Nondiscrimination Requirements**

The Contractor shall comply with Title VI of the Civil Rights Act of 1964 as amended (42 U.S.C. 2000 et seq.), all requirements imposed by the regulations of the United States Department of Transportation (49 CFR Part 21) issued in implementation thereof, and the Title VI Contractor Assurances attached hereto at Exhibit A, all of which are hereby made a part of this Contract.

## **2. Contractor Work Force Utilization / Equal Employment Opportunity**

- (a) The Contractor shall comply with the Contractor Work Force Utilization / Equal Employment Opportunity requirements attached at Exhibit B and hereby made part of this Contract, whenever a contractor or subcontractor at any tier performs construction work in excess of \$10,000. These goals shall be included in each contract and subcontract. Goal achievement is calculated for each trade using the hours worked under each trade.
- (b) Companies with contracts, agreements or purchase orders valued at \$10,000 or more will develop and implement an Affirmative Action Plan utilizing the ConnDOT Affirmative Action Plan Guideline. This Plan shall be designed to further the provision of equal employment opportunity to all persons without regard to their race, color, religion, sex or national origin, and to promote the full realization of equal employment opportunity through a positive continuation program. Plans shall be updated as required by ConnDOT.

## **3. Contract Wage Rates**

The Contractor shall comply with:

The State wage rate requirements indicated in Exhibit E hereof are hereby made part of this Contract.

Prevailing Wages for Work on State Highways; Annual Adjustments. With respect to contracts for work on state highways and bridges on state highways, the Contractor shall comply with the provisions of Section 31-54 and 31-55a of the Connecticut General Statutes, as revised.

As required by section 1.05.12 (Payrolls) of the State of Connecticut, Department of Transportation's Standard Specification for Roads, Bridges and Incidental Construction (FORM 816), as may be revised, every Contractor or subcontractor performing project work on a federal aid project is required to post the relevant prevailing wage rates as determined by the United States Secretary of Labor. The wage rate determinations shall be posted in prominent and easily accessible places at the work site.

## **4. Americans with Disabilities Act of 1990, as Amended**

This provision applies to those Contractors who are or will be responsible for compliance with the terms of the Americans with Disabilities Act of 1990, as amended (42 U.S.C. 12101 et seq.), (Act), during the term of the Contract. The Contractor represents that it is familiar with the terms of this Act and that it is in compliance with the Act. Failure of the Contractor to satisfy this standard as the same applies to performance under this Contract, either now or during the term of the Contract as it may be amended, will render the Contract voidable at the option of the State upon notice to the contractor. The Contractor warrants that it will hold the State harmless and indemnify the State from any liability which may be imposed upon the State as a result of any failure of the Contractor to be in compliance with this Act, as the same applies to performance under this Contract.

## 5. Connecticut Statutory Labor Requirements

**(a) Construction, Alteration or Repair of Public Works Projects; Wage Rates.** The Contractor shall comply with Section 31-53 of the Connecticut General Statutes, as revised. The wages paid on an hourly basis to any person performing the work of any mechanic, laborer or worker on the work herein contracted to be done and the amount of payment or contribution paid or payable on behalf of each such person to any employee welfare fund, as defined in subsection (i) of section 31-53 of the Connecticut General Statutes, shall be at a rate equal to the rate customary or prevailing for the same work in the same trade or occupation in the town in which such public works project is being constructed. Any contractor who is not obligated by agreement to make payment or contribution on behalf of such persons to any such employee welfare fund shall pay to each mechanic, laborer or worker as part of such person's wages the amount of payment or contribution for such person's classification on each pay day.

**(b) Debarment List. Limitation on Awarding Contracts.** The Contractor shall comply with Section 31-53a of the Connecticut General Statutes, as revised.

**(c) Construction Safety and Health Course.** The Contractor shall comply with section 31-53b of the Connecticut General Statutes, as revised. The contractor shall furnish proof to the Labor Commissioner with the weekly certified payroll form for the first week each employee begins work on such project that any person performing the work of a mechanic, laborer or worker pursuant to the classifications of labor under section 31-53 of the Connecticut General Statutes, as revised, on such public works project, pursuant to such contract, has completed a course of at least ten hours in duration in construction safety and health approved by the federal Occupational Safety and Health Administration or, has completed a new miner training program approved by the Federal Mine Safety and Health Administration in accordance with 30 CFR 48 or, in the case of telecommunications employees, has completed at least ten hours of training in accordance with 29 CFR 1910.268.

Any employee required to complete a construction safety and health course as required that has not completed the course, shall have a maximum of fourteen (14) days to complete the course. If the employee has not been brought into compliance, they shall be removed from the project until such time as they have completed the required training.

Any costs associated with this notice shall be included in the general cost of the contract. In addition, there shall be no time granted to the contractor for compliance with this notice. The contractor's compliance with this notice and any associated regulations shall not be grounds for claims as outlined in Section 1.11 – "Claims".

**(d) Awarding of Contracts to Occupational Safety and Health Law Violators Prohibited.** The Contract is subject to Section 31-57b of the Connecticut General Statutes, as revised.

**(e) Residents Preference in Work on Other Public Facilities. NOT APPLICABLE TO FEDERAL AID CONTRACTS.** Pursuant to Section 31-52a of the Connecticut General Statutes, as revised, in the employment of mechanics, laborers or workmen to perform the work specified herein, preference shall be given to residents of the state who are, and continuously for at least six months prior to the date hereof have been, residents of this state, and if no such person is available, then to residents of other states

## 6. Tax Liability - Contractor's Exempt Purchase Certificate (CERT – 141)

The Contractor shall comply with Chapter 219 of the Connecticut General Statutes pertaining to tangible personal property or services rendered that is/are subject to sales tax. The Contractor is responsible for determining its tax liability. If the Contractor purchases materials or supplies pursuant to the Connecticut Department of Revenue Services' "Contractor's Exempt Purchase Certificate (CERT-141)," as may be revised, the Contractor acknowledges and agrees that title to such materials and supplies installed or placed in the project will vest in the State simultaneously with passage of title from the retailers or vendors thereof, and the Contractor will have no property rights in the materials and supplies purchased.

Forms and instructions are available anytime by:

Internet: Visit the DRS website at [www.ct.gov/DRS](http://www.ct.gov/DRS) to download and print Connecticut tax forms; or Telephone: Call 1-800-382-9463 (Connecticut calls outside the Greater Hartford calling area only) and select Option 2 or call 860-297-4753 (from anywhere).

## 7. Executive Orders

This contract is subject to the provisions of Executive Order No. Three of Governor Thomas J. Meskill, promulgated June 16, 1971, concerning labor employment practices, Executive Order No. Seventeen of Governor Thomas J. Meskill, promulgated February 15, 1973, concerning the listing of employment openings and Executive Order No. Sixteen of Governor John G. Rowland promulgated August 4, 1999, concerning violence in the workplace, all of which are incorporated into and are made a part of the contract as if they had been fully set forth in it. The contract may also be subject to Executive Order No. 14 of Governor M. Jodi Rell, promulgated April 17, 2006, concerning procurement of cleaning products and services and to Executive Order No. 49 of Governor Dannel P. Malloy, promulgated May 22, 2015, mandating disclosure of certain gifts to public employees and contributions to certain candidates for office. If Executive Order No. 14 and/or Executive Order No. 49 are applicable, they are deemed to be incorporated into and are made a part of the contract as if they had been fully set forth in it. At the Contractor's request, the Department shall provide a copy of these orders to the Contractor.

## 8. Non Discrimination Requirement (pursuant to section 4a-60 and 4a-60a of the Connecticut General Statutes, as revised): References to "minority business enterprises" in this Section are not applicable to Federal-aid projects/contracts. Federal-aid projects/contracts are instead subject to the Federal Disadvantaged Business Enterprise Program.

(a) For purposes of this Section, the following terms are defined as follows:

- i. "Commission" means the Commission on Human Rights and Opportunities;
- ii. "Contract" and "contract" include any extension or modification of the Contract or contract;
- iii. "Contractor" and "contractor" include any successors or assigns of the Contractor or contractor;
- iv. "gender identity or expression" means a person's gender-related identity, appearance or behavior, whether or not that gender-related identity, appearance or behavior is different from that traditionally associated with the person's physiology or assigned sex at birth, which gender-related identity can be shown by providing evidence including, but not limited to, medical history, care or treatment of the gender-related identity, consistent and uniform assertion of the gender-related identity or any other evidence that the gender-related identity is sincerely held, part of a person's core identity or not being asserted for an improper purpose.

- v. "good faith" means that degree of diligence which a reasonable person would exercise in the performance of legal duties and obligations;
- vi. "good faith efforts" shall include, but not be limited to, those reasonable initial efforts necessary to comply with statutory or regulatory requirements and additional or substituted efforts when it is determined that such initial efforts will not be sufficient to comply with such requirements;
- vii. "marital status" means being single, married as recognized by the State of Connecticut, widowed, separated or divorced;
- viii. "mental disability" means one or more mental disorders, as defined in the most recent edition of the American Psychiatric Association's "Diagnostic and Statistical Manual of Mental Disorders", or a record of or regarding a person as having one or more such disorders;
- ix. "minority business enterprise" means any small contractor or supplier of materials fifty-one percent or more of the capital stock, if any, or assets of which is owned by a person or persons: (1) who are active in the daily affairs of the enterprise, (2) who have the power to direct the management and policies of the enterprise, and (3) who are members of a minority, as such term is defined in subsection (a) of Connecticut General Statutes § 32-9n; and
- x. "public works contract" means any agreement between any individual, firm or corporation and the State or any political subdivision of the State other than a municipality for construction, rehabilitation, conversion, extension, demolition or repair of a public building, highway or other changes or improvements in real property, or which is financed in whole or in part by the State, including, but not limited to, matching expenditures, grants, loans, insurance or guarantees.

For purposes of this Section, the terms "Contract" and "contract" do not include a contract where each contractor is (1) a political subdivision of the State, including, but not limited to, a municipality, (2) a quasi-public agency, as defined in Conn. Gen. Stat. Section 1-120, (3) any other state, including but not limited to any federally recognized Indian tribal governments, as defined in Conn. Gen. Stat. Section 1-267, (4) the federal government, (5) a foreign government, or (6) an agency of a subdivision, agency, state or government described in the immediately preceding enumerated items (1), (2), (3), (4) or (5).

- (b) (1) The Contractor agrees and warrants that in the performance of the Contract such Contractor will not discriminate or permit discrimination against any person or group of persons on the grounds of race, color, religious creed, age, marital status, national origin, ancestry, sex, gender identity or expression, intellectual disability, mental disability or physical disability, including, but not limited to, blindness, unless it is shown by such Contractor that such disability prevents performance of the work involved, in any manner prohibited by the laws of the United States or of the State of Connecticut; and the Contractor further agrees to take affirmative action to insure that applicants with job-related qualifications are employed and that employees are treated when employed without regard to their race, color, religious creed, age, marital status, national origin, ancestry, sex, gender identity or expression, intellectual disability, mental disability or physical disability, including, but not limited to, blindness, unless it is shown by the Contractor that such disability prevents performance of the work involved; (2) the Contractor agrees, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, to state that it is an "affirmative action-equal opportunity employer" in accordance with regulations adopted by the Commission; (3) the Contractor agrees to provide each labor union or representative of workers with which the Contractor has a collective bargaining Agreement or other contract or understanding and each vendor with which the Contractor has a contract or

understanding, a notice to be provided by the Commission, advising the labor union or workers' representative of the Contractor's commitments under this section and to post copies of the notice in conspicuous places available to employees and applicants for employment; (4) the Contractor agrees to comply with each provision of this Section and Connecticut General Statutes §§ 46a-68e and 46a-68f and with each regulation or relevant order issued by said Commission pursuant to Connecticut General Statutes §§ 46a-56, 46a-68e and 46a-68f; and (5) the Contractor agrees to provide the Commission on Human Rights and Opportunities with such information requested by the Commission, and permit access to pertinent books, records and accounts, concerning the employment practices and procedures of the Contractor as relate to the provisions of this Section and Connecticut General Statutes § 46a-56. If the contract is a public works contract, the Contractor agrees and warrants that he will make good faith efforts to employ minority business enterprises as subcontractors and suppliers of materials on such public works projects.

- (c) Determination of the Contractor's good faith efforts shall include, but shall not be limited to, the following factors: The Contractor's employment and subcontracting policies, patterns and practices; affirmative advertising, recruitment and training; technical assistance activities and such other reasonable activities or efforts as the Commission may prescribe that are designed to ensure the participation of minority business enterprises in public works projects.
- (d) The Contractor shall develop and maintain adequate documentation, in a manner prescribed by the Commission, of its good faith efforts.
- (e) The Contractor shall include the provisions of subsection (b) of this Section in every subcontract or purchase order entered into in order to fulfill any obligation of a contract with the State and such provisions shall be binding on a subcontractor, vendor or manufacturer unless exempted by regulations or orders of the Commission. The Contractor shall take such action with respect to any such subcontract or purchase order as the Commission may direct as a means of enforcing such provisions including sanctions for noncompliance in accordance with Connecticut General Statutes §46a-56; provided if such Contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction by the Commission, the Contractor may request the State of Connecticut to enter into any such litigation or negotiation prior thereto to protect the interests of the State and the State may so enter.
- (f) The Contractor agrees to comply with the regulations referred to in this Section as they exist on the date of this Contract and as they may be adopted or amended from time to time during the term of this Contract and any amendments thereto.
- (g) (1) The Contractor agrees and warrants that in the performance of the Contract such Contractor will not discriminate or permit discrimination against any person or group of persons on the grounds of sexual orientation, in any manner prohibited by the laws of the United States or the State of Connecticut, and that employees are treated when employed without regard to their sexual orientation; (2) the Contractor agrees to provide each labor union or representative of workers with which such Contractor has a collective bargaining Agreement or other contract or understanding and each vendor with which such Contractor has a contract or understanding, a notice to be provided by the Commission on Human Rights and Opportunities advising the labor union or workers' representative of the Contractor's commitments under this section, and to post copies of the notice in conspicuous places available to employees and applicants for employment; (3) the Contractor agrees to comply with each provision of this section and with each regulation or relevant order issued by said Commission pursuant to Connecticut General Statutes § 46a-56;



and (4) the Contractor agrees to provide the Commission on Human Rights and Opportunities with such information requested by the Commission, and permit access to pertinent books, records and accounts, concerning the employment practices and procedures of the Contractor which relate to the provisions of this Section and Connecticut General Statutes § 46a-56.

- (h) The Contractor shall include the provisions of the foregoing paragraph in every subcontract or purchase order entered into in order to fulfill any obligation of a contract with the State and such provisions shall be binding on a subcontractor, vendor or manufacturer unless exempted by regulations or orders of the Commission. The Contractor shall take such action with respect to any such subcontract or purchase order as the Commission may direct as a means of enforcing such provisions including sanctions for noncompliance in accordance with Connecticut General Statutes § 46a-56; provided, if such Contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction by the Commission, the Contractor may request the State of Connecticut to enter into any such litigation or negotiation prior thereto to protect the interests of the State and the State may so enter.”

The Nondiscrimination Certifications can be found at the Office of Policy and Management website.

<http://www.ct.gov/opm/cwp/view.asp?a=2982&Q=390928>

## 9. Whistleblower Provision

The following clause is applicable if the Contract has a value of Five Million Dollars (\$5,000,000) or more.

**Whistleblowing.** This Contract may be subject to the provisions of Section 4-61dd of the Connecticut General Statutes. In accordance with this statute, if an officer, employee or appointing authority of the Contractor takes or threatens to take any personnel action against any employee of the Contractor in retaliation for such employee's disclosure of information to any employee of the contracting state or quasi-public agency or the Auditors of Public Accounts or the Attorney General under the provisions of subsection (a) of such statute, the Contractor shall be liable for a civil penalty of not more than five thousand dollars for each offense, up to a maximum of twenty per cent of the value of this Contract. Each violation shall be a separate and distinct offense and in the case of a continuing violation, each calendar day's continuance of the violation shall be deemed to be a separate and distinct offense. The State may request that the Attorney General bring a civil action in the Superior Court for the Judicial District of Hartford to seek imposition and recovery of such civil penalty. In accordance with subsection (f) of such statute, each large state contractor, as defined in the statute, shall post a notice of the provisions of the statute relating to large state contractors in a conspicuous place which is readily available for viewing by the employees of the Contractor.

## 10. Connecticut Freedom of Information Act

- (a) **Disclosure of Records.** This Contract may be subject to the provisions of section 1-218 of the Connecticut General Statutes. In accordance with this statute, each contract in excess of two million five hundred thousand dollars between a public agency and a person for the performance of a governmental function shall (a) provide that the public agency is entitled to receive a copy of records and files related to the performance of the governmental function, and (b) indicate that such records and files are subject to FOIA and may be disclosed by the public agency pursuant to FOIA. No request to inspect or copy such records or files shall be valid unless the request is made to the public agency in accordance with FOIA. Any complaint by a person who is denied the right to inspect or copy such records or files shall be brought to the Freedom of Information Commission in accordance with the provisions of sections 1-205 and 1-206 of the Connecticut General Statutes.

**(b) Confidential Information.** The State will afford due regard to the Contractor's request for the protection of proprietary or confidential information which the State receives from the Contractor. However, all materials associated with the Contract are subject to the terms of the FOIA and all corresponding rules, regulations and interpretations. In making such a request, the Contractor may not merely state generally that the materials are proprietary or confidential in nature and not, therefore, subject to release to third parties. Those particular sentences, paragraphs, pages or sections that the Contractor believes are exempt from disclosure under the FOIA must be specifically identified as such. Convincing explanation and rationale sufficient to justify each exemption consistent with the FOIA must accompany the request. The rationale and explanation must be stated in terms of the prospective harm to the competitive position of the Contractor that would result if the identified material were to be released and the reasons why the materials are legally exempt from release pursuant to the FOIA. To the extent that any other provision or part of the Contract conflicts or is in any way inconsistent with this section, this section controls and shall apply and the conflicting provision or part shall not be given effect. If the Contractor indicates that certain documentation is submitted in confidence, by specifically and clearly marking the documentation as "CONFIDENTIAL," DOT will first review the Contractor's claim for consistency with the FOIA (that is, review that the documentation is actually a trade secret or commercial or financial information and not required by statute), and if determined to be consistent, will endeavor to keep such information confidential to the extent permitted by law. See, *e.g.*, Conn. Gen. Stat. §1-210(b)(5)(A-B). The State, however, has no obligation to initiate, prosecute or defend any legal proceeding or to seek a protective order or other similar relief to prevent disclosure of any information that is sought pursuant to a FOIA request. Should the State withhold such documentation from a Freedom of Information requester and a complaint be brought to the Freedom of Information Commission, the Contractor shall have the burden of cooperating with DOT in defense of that action and in terms of establishing the availability of any FOIA exemption in any proceeding where it is an issue. In no event shall the State have any liability for the disclosure of any documents or information in its possession which the State believes are required to be disclosed pursuant to the FOIA or other law.

## **11. Service of Process**

The Contractor, if not a resident of the State of Connecticut, or, in the case of a partnership, the partners, if not residents, hereby appoints the Secretary of State of the State of Connecticut, and his successors in office, as agent for service of process for any action arising out of or as a result of this Contract; such appointment to be in effect throughout the life of this Contract and six (6) years thereafter.

## **12. Substitution of Securities for Retainages on State Contracts and Subcontracts**

This Contract is subject to the provisions of Section 3-112a of the General Statutes of the State of Connecticut, as revised.

## **13. Health Insurance Portability and Accountability Act of 1996 (HIPAA)**

The Contractor shall comply, if applicable, with the Health Insurance Portability and Accountability Act of 1996 and, pursuant thereto, the provisions attached at Exhibit C, and hereby made part of this Contract.

#### **14. Forum and Choice of Law**

Forum and Choice of Law. The parties deem the Contract to have been made in the City of Hartford, State of Connecticut. Both parties agree that it is fair and reasonable for the validity and construction of the Contract to be, and it shall be, governed by the laws and court decisions of the State of Connecticut, without giving effect to its principles of conflicts of laws. To the extent that any immunities provided by Federal law or the laws of the State of Connecticut do not bar an action against the State, and to the extent that these courts are courts of competent jurisdiction, for the purpose of venue, the complaint shall be made returnable to the Judicial District of Hartford only or shall be brought in the United States District Court for the District of Connecticut only, and shall not be transferred to any other court, provided, however, that nothing here constitutes a waiver or compromise of the sovereign immunity of the State of Connecticut. The Contractor waives any objection which it may now have or will have to the laying of venue of any Claims in any forum and further irrevocably submits to such jurisdiction in any suit, action or proceeding.

#### **15. Summary of State Ethics Laws**

Pursuant to the requirements of section 1-101qq of the Connecticut General Statutes, the summary of State ethics laws developed by the State Ethics Commission pursuant to section 1-81b of the Connecticut General Statutes is incorporated by reference into and made a part of the Contract as if the summary had been fully set forth in the Contract.

#### **16. Audit and Inspection of Plants, Places of Business and Records**

- (a) The State and its agents, including, but not limited to, the Connecticut Auditors of Public Accounts, Attorney General and State's Attorney and their respective agents, may, at reasonable hours, inspect and examine all of the parts of the Contractor's and Contractor Parties' plants and places of business which, in any way, are related to, or involved in, the performance of this Contract. For the purposes of this Section, "Contractor Parties" means the Contractor's members, directors, officers, shareholders, partners, managers, principal officers, representatives, agents, servants, consultants, employees or any one of them or any other person or entity with whom the Contractor is in privity of oral or written contract and the Contractor intends for such other person or entity to Perform under the Contract in any capacity.
- (b) The Contractor shall maintain, and shall require each of the Contractor Parties to maintain, accurate and complete Records. The Contractor shall make all of its and the Contractor Parties' Records available at all reasonable hours for audit and inspection by the State and its agents.
- (c) The State shall make all requests for any audit or inspection in writing and shall provide the Contractor with at least twenty-four (24) hours' notice prior to the requested audit and inspection date. If the State suspects fraud or other abuse, or in the event of an emergency, the State is not obligated to provide any prior notice.
- (d) The Contractor shall keep and preserve or cause to be kept and preserved all of its and Contractor Parties' Records until three (3) years after the latter of (i) final payment under this Agreement, or (ii) the expiration or earlier termination of this Agreement, as the same may be modified for any reason. The State may request an audit or inspection at any time during this period. If any Claim or audit is started before the expiration of this period, the Contractor shall retain or cause to be retained all Records until all Claims or audit findings have been resolved.
- (e) The Contractor shall cooperate fully with the State and its agents in connection with an audit or inspection. Following any audit or inspection, the State may conduct and the Contractor shall cooperate with an exit conference.
- (f) The Contractor shall incorporate this entire Section verbatim into any contract or other agreement that it enters into with any Contractor Party.

## **17. Campaign Contribution Restriction**

For all State contracts, defined in Conn. Gen. Stat. §9-612(f)(1) as having a value in a calendar year of \$50,000 or more, or a combination or series of such agreements or contracts having a value of \$100,000 or more, the authorized signatory to this contract expressly acknowledges receipt of the State Elections Enforcement Commission's notice advising state contractors of state campaign contribution and solicitation prohibitions, and will inform its principals of the contents of the notice, as set forth in "Notice to Executive Branch State Contractors and Prospective State Contractors of Campaign Contribution and Solicitation Limitations," a copy of which is attached hereto and hereby made a part of this contract, attached as Exhibit D.

## **18. Tangible Personal Property**

- (a) The Contractor on its behalf and on behalf of its Affiliates, as defined below, shall comply with the provisions of Conn. Gen. Stat. §12-411b, as follows:
- (1) For the term of the Contract, the Contractor and its Affiliates shall collect and remit to the State of Connecticut, Department of Revenue Services, any Connecticut use tax due under the provisions of Chapter 219 of the Connecticut General Statutes for items of tangible personal property sold by the Contractor or by any of its Affiliates in the same manner as if the Contractor and such Affiliates were engaged in the business of selling tangible personal property for use in Connecticut and had sufficient nexus under the provisions of Chapter 219 to be required to collect Connecticut use tax;
  - (2) A customer's payment of a use tax to the Contractor or its Affiliates relieves the customer of liability for the use tax;
  - (3) The Contractor and its Affiliates shall remit all use taxes they collect from customers on or before the due date specified in the Contract, which may not be later than the last day of the month next succeeding the end of a calendar quarter or other tax collection period during which the tax was collected;
  - (4) The Contractor and its Affiliates are not liable for use tax billed by them but not paid to them by a customer; and
  - (5) Any Contractor or Affiliate who fails to remit use taxes collected on behalf of its customers by the due date specified in the Contract shall be subject to the interest and penalties provided for persons required to collect sales tax under chapter 219 of the general statutes.
- (b) For purposes of this section of the Contract, the word "Affiliate" means any person, as defined in section 12-1 of the general statutes, that controls, is controlled by, or is under common control with another person. A person controls another person if the person owns, directly or indirectly, more than ten per cent of the voting securities of the other person. The word "voting security" means a security that confers upon the holder the right to vote for the election of members of the board of directors or similar governing body of the business, or that is convertible into, or entitles the holder to receive, upon its exercise, a security that confers such a right to vote. "Voting security" includes a general partnership interest.
- (c) The Contractor represents and warrants that each of its Affiliates has vested in the Contractor plenary authority to so bind the Affiliates in any agreement with the State of Connecticut. The Contractor on its own behalf and on behalf of its Affiliates shall also provide, no later than 30 days after receiving a request by the State's contracting authority, such information as the State may require to ensure, in the State's sole determination, compliance with the provisions of Chapter 219 of the Connecticut General Statutes, including, but not limited to, §12-411b.

## **19. Bid Rigging and/or Fraud – Notice to Contractor**

The Connecticut Department of Transportation is cooperating with the U.S. Department of Transportation and the Justice Department in their investigation into highway construction contract bid rigging and/or fraud.

A toll-free “HOT LINE” telephone number 800-424-9071 has been established to receive information from contractors, subcontractors, manufacturers, suppliers or anyone with knowledge of bid rigging and/or fraud, either past or current. The “HOT LINE” telephone number will be available during normal working hours ( 8:00 am – 5:00 pm EST). Information will be treated confidentially and anonymity respected.

**20. Consulting Agreement Affidavit**

The Contractor shall comply with Connecticut General Statutes Section 4a-81(a) and 4a-81(b), as revised. Pursuant to Public Act 11-229, after the initial submission of the form, if there is a change in the information contained in the form, a contractor shall submit the updated form, as applicable, either (i) not later than thirty (30) days after the effective date of such change or (ii) prior to execution of any new contract, whichever is earlier.

The Affidavit/Form may be submitted in written format or electronic format through the Department of Administrative Services (DAS) website.

## EXHIBIT A

### TITLE VI CONTRACTOR ASSURANCES

During the performance of this Contract, the contractor, for itself, its assignees and successors in interest (hereinafter referred to as the "Contractor") agrees as follows:

**1. Compliance with Regulations:** The Contractor shall comply with the regulations relative to nondiscrimination in federally assisted programs of the United States Department of Transportation (hereinafter, "USDOT"), Title 49, Code of Federal Regulations, Part 21, as they may be amended from time to time (hereinafter referred to as the "Regulations"), which are herein incorporated by reference and made a part of this contract.

**2. Nondiscrimination:** The Contractor, with regard to the work performed by it during the Contract, shall not discriminate on the grounds of race, color, national origin, sex, age, or disability in the selection and retention of subcontractors, including procurements of materials and leases of equipment. The Contractor shall not participate either directly or indirectly in the discrimination prohibited by Subsection 5 of the Regulations, including employment practices when the Contract covers a program set forth in Appendix B of the Regulations.

**3. Solicitations for Subcontracts, Including Procurements of Materials and Equipment:**

In all solicitations either by competitive bidding or negotiation made by the Contractor for work to be performed under a subcontract, including procurements of materials or leases of equipment, each potential subcontractor or supplier shall be notified by the Contractor of the Contractor's obligations under this contract and the Regulations relative to nondiscrimination on the grounds of race, color, national origin, sex, age, or disability.

**4. Information and Reports:** The Contractor shall provide all information and reports required by the Regulations or directives issued pursuant thereto and shall permit access to its books, records, accounts, other sources of information, and its facilities as may be determined by the Connecticut Department of Transportation (ConnDOT) or the Funding Agency (FHWA, FTA and FAA) to be pertinent to ascertain compliance with such Regulations, orders, and instructions. Where any information required of a Contractor is in the exclusive possession of another who fails or refuses to furnish this information, the Contractor shall so certify to ConnDOT or the Funding Agency, as appropriate, and shall set forth what efforts it has made to obtain the information.

**5. Sanctions for Noncompliance:** In the event of the Contractor's noncompliance with the nondiscrimination provisions of this Contract, the ConnDOT shall impose such sanctions as it or the Funding Agency may determine to be appropriate, including, but not limited to:

- A. Withholding contract payments until the Contractor is in-compliance; and/or
- B. Cancellation, termination, or suspension of the Contract, in whole or in part.

**6. Incorporation of Provisions:** The Contractor shall include the provisions of paragraphs 1 through 5 in every subcontract, including procurements of materials and leases of equipment, unless exempt by the Regulations or directives issued pursuant thereto. The Contractor shall take such action with respect to any subcontract or procurement as the ConnDOT or the Funding Agency may -direct as a means of enforcing such provisions including sanctions for noncompliance. Provided, however, that in the event a Contractor becomes involved in, or is threatened with, litigation with a subcontractor or supplier as a result of such direction, the Contractor may request the ConnDOT to enter into such litigation to protect the interests of the Funding Agency, and, in addition, the Contractor may request the United States to enter into such litigation to protect the interests of the United States

**EXHIBIT B****CONTRACTOR WORKFORCE UTILIZATION / EQUAL EMPLOYMENT OPPORTUNITY****1. Project Workforce Utilization Goals:**

These goals are applicable to all the Contractor's construction work (whether or not it is Federal or Federally assisted or funded) performed in the covered area. If the contractor performs construction work in a geographical area located outside of the covered area, it shall apply the goals established for the geographical area where the work is actually performed.

Whenever the Contractor, or any Subcontractor at any tier, subcontracts a portion of the work involving any construction trade, it shall physically include in each subcontract in excess of \$10,000 the provisions of these specifications which contain the applicable goals for minority and female participation.

The goals for minority and female utilization are expressed in percentage terms for the contractor's aggregate work-force in each trade on all construction work in the covered area, are referenced in the Appendix A below.

**STATE FUNDED PROJECTS (only)****APPENDIX A****(Labor Market Goals)****LABOR MARKET AREA GOAL**  
**Female****Minority**

<b>Bridgeport</b>				<b>14%</b>
<b>6.9%</b>				
Ansonia	Beacon Falls	Bridgeport	Derby	
Easton	Fairfield	Milford	Monroe	
Oxford	Seymour	Shelton	Stratford	
Trumbull				
<b>Danbury</b>				<b>4%</b>
<b>6.9%</b>				
Bethel	Bridgewater	Brookfield	Danbury	
Kent	New Fairfield	New Milford	Newtown	
Redding	Ridgefield	Roxbury	Sherman	
Washington				
<b>Danielson</b>				<b>2%</b>
<b>6.9%</b>				
Brooklyn	Eastford	Hampton	Killingly	
Pomfret	Putnam	Scotland	Sterling	
Thompson	Voluntown	Union	Woodstock	
<b>Hartford</b>				<b>15%</b>
<b>6.9%</b>				

Andover	Ashford	Avon	Barkhamsted
Belin	Bloomfield	Bolton	Bristol
Burlington	Canton	Chaplin	Colchester
Columbia	Coventry	Cromwell	Durham
East Granby	East Haddam	East Hampton	East Hartford
East Windsor	Ellington	Enfield	Farmington
Glastonbury	Granby	Haddam	Hartford
Harwinton	Hebron	Lebanon	Manchester
Mansfield	Marlborough	Middlefield	Middletown
Newington	Plainville	Plymouth	Portland
Rocky Hill	Simsbury	Somers	South Windsor
Southington	Stafford	Suffield	Tolland
Vernon	West Hartford	Wethersfield	Willington
Winchester	Windham	Windsor	Windsor Locks

<b>Lower River</b> <b>6.9%</b>			<b>2%</b>
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Chester	Deep River	Essex	Old Lyme
Westbrook			

<b>New Haven</b> <b>6.9%</b>			<b>14%</b>
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Bethany	Branford	Cheshire	Clinton
East Haven	Guilford	Hamden	Killingworth
Madison	Meriden	New Haven	North Branford
North Haven	Orange	Wallingford	West Haven
Woodbridge			

<b>New London</b> <b>6.9%</b>			<b>8%</b>
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Bozrah	Canterbury	East Lyme	Franklin
Griswold	Groton	Ledyard	Lisbon
Montville	New London	North Stonington	Norwich
Old Lyme	Old Saybrook	Plainfield	Preston
Salem	Sprague	Stonington	Waterford
Hopkinton	RI – Westerly Rhode Island		

<b>Stamford</b> <b>6.9%</b>			<b>17%</b>
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Darien	Greenwich	New Canaan	Norwalk
Stamford	Weston	Westport	Wilton

<b>Torrington</b> <b>6.9%</b>			<b>2%</b>
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Canaan	Colebrook	Cornwall	Goshen
Hartland	Kent	Litchfield	Morris
Norfolk	North Canaan	Salisbury	Sharon
Torrington	Warren		



<b>Waterbury</b> <b>6.9%</b>				<b>10%</b>
Bethlehem	Middlebury	Naugatuck	Prospect	
Southbury	Thomaston	Waterbury	Watertown	
Wolcott	Woodbury			

## EXHIBIT C

### Health Insurance Portability and Accountability Act of 1996 (“HIPAA”).

- (a) If the Contactor is a Business Associate under the requirements of the Health Insurance Portability and Accountability Act of 1996 (“HIPAA”), the Contractor must comply with all terms and conditions of this Section of the Contract. If the Contractor is not a Business Associate under HIPAA, this Section of the Contract does not apply to the Contractor for this Contract.
- (b) The Contractor is required to safeguard the use, publication and disclosure of information on all applicants for, and all clients who receive, services under the Contract in accordance with all applicable federal and state law regarding confidentiality, which includes but is not limited to HIPAA, more specifically with the Privacy and Security Rules at 45 C.F.R. Part 160 and Part 164, subparts A, C, and E; and
- (c) The State of Connecticut Agency named on page 1 of this Contract (hereinafter the “Department”) is a “covered entity” as that term is defined in 45 C.F.R. § 160.103; and
- (d) The Contractor, on behalf of the Department, performs functions that involve the use or disclosure of “individually identifiable health information,” as that term is defined in 45 C.F.R. § 160.103; and
- (e) The Contractor is a “business associate” of the Department, as that term is defined in 45 C.F.R. § 160.103; and
- (f) The Contractor and the Department agree to the following in order to secure compliance with the HIPAA, the requirements of Subtitle D of the Health Information Technology for Economic and Clinical Health Act (hereinafter the HITECH Act), (Pub. L. 111-5, sections 13400 to 13423), and more specifically with the Privacy and Security Rules at 45 C.F.R. Part 160 and Part 164, subparts A, C, and E.
- (g) Definitions
  - (1) “Breach shall have the same meaning as the term is defined in section 13400 of the HITECH Act (42 U.S.C. §17921(1))
  - (2) “Business Associate” shall mean the Contractor.
  - (3) “Covered Entity” shall mean the Department of the State of Connecticut named on page 1 of this Contract.
  - (4) “Designated Record Set” shall have the same meaning as the term “designated record set” in 45 C.F.R. § 164.501.
  - (5) “Electronic Health Record” shall have the same meaning as the term is defined in section 13400 of the HITECH Act (42 U.S.C. §17921(5))

- (6) "Individual" shall have the same meaning as the term "individual" in 45 C.F.R. § 160.103 and shall include a person who qualifies as a personal representative as defined in 45 C.F.R. § 164.502(g).
  - (7) "Privacy Rule" shall mean the Standards for Privacy of Individually Identifiable Health Information at 45 C.F.R. part 160 and parts 164, subparts A and E.
  - (8) "Protected Health Information" or "PHI" shall have the same meaning as the term "protected health information" in 45 C.F.R. § 160.103, limited to information created or received by the Business Associate from or on behalf of the Covered Entity.
  - (9) "Required by Law" shall have the same meaning as the term "required by law" in 45 C.F.R. § 164.103.
  - (10) "Secretary" shall mean the Secretary of the Department of Health and Human Services or his designee.
  - (11) "More stringent" shall have the same meaning as the term "more stringent" in 45 C.F.R. § 160.202.
  - (12) "This Section of the Contract" refers to the HIPAA Provisions stated herein, in their entirety.
  - (13) "Security Incident" shall have the same meaning as the term "security incident" in 45 C.F.R. § 164.304.
  - (14) "Security Rule" shall mean the Security Standards for the Protection of Electronic Protected Health Information at 45 C.F.R. part 160 and parts 164, subpart A and C.
  - (15) "Unsecured protected health information" shall have the same meaning as the term as defined in section 13402(h)(1)(A) of HITECH. Act. (42 U.S.C. §17932(h)(1)(A)).
- (h) Obligations and Activities of Business Associates.
- (1) Business Associate agrees not to use or disclose PHI other than as permitted or required by this Section of the Contract or as Required by Law.
  - (2) Business Associate agrees to use appropriate safeguards to prevent use or disclosure of PHI other than as provided for in this Section of the Contract.
  - (3) Business Associate agrees to use administrative, physical and technical safeguards that reasonably and appropriately protect the confidentiality, integrity, and availability of electronic protected health information that it creates, receives, maintains, or transmits on behalf of the Covered Entity.
  - (4) Business Associate agrees to mitigate, to the extent practicable, any harmful effect that is known to the Business Associate of a use or disclosure of PHI by Business Associate in violation of this Section of the Contract.

- (5) Business Associate agrees to report to Covered Entity any use or disclosure of PHI not provided for by this Section of the Contract or any security incident of which it becomes aware.
- (6) Business Associate agrees to insure that any agent, including a subcontractor, to whom it provides PHI received from, or created or received by Business Associate, on behalf of the Covered Entity, agrees to the same restrictions and conditions that apply through this Section of the Contract to Business Associate with respect to such information.
- (7) Business Associate agrees to provide access, at the request of the Covered Entity, and in the time and manner agreed to by the parties, to PHI in a Designated Record Set, to Covered Entity or, as directed by Covered Entity, to an Individual in order to meet the requirements under 45 C.F.R. § 164.524.
- (8) Business Associate agrees to make any amendments to PHI in a Designated Record Set that the Covered Entity directs or agrees to pursuant to 45 C.F.R. § 164.526 at the request of the Covered Entity, and in the time and manner agreed to by the parties.
- (9) Business Associate agrees to make internal practices, books, and records, including policies and procedures and PHI, relating to the use and disclosure of PHI received from, or created or received by, Business Associate on behalf of Covered Entity, available to Covered Entity or to the Secretary in a time and manner agreed to by the parties or designated by the Secretary, for purposes of the Secretary determining Covered Entity's compliance with the Privacy Rule.
- (10) Business Associate agrees to document such disclosures of PHI and information related to such disclosures as would be required for Covered Entity to respond to a request by an Individual for an accounting of disclosures of PHI in accordance with 45 C.F.R. § 164.528 and section 13405 of the HITECH Act (42 U.S.C. § 17935) and any regulations promulgated thereunder.
- (11) Business Associate agrees to provide to Covered Entity, in a time and manner agreed to by the parties, information collected in accordance with clause h. (10) of this Section of the Contract, to permit Covered Entity to respond to a request by an Individual for an accounting of disclosures of PHI in accordance with 45 C.F.R. § 164.528 and section 13405 of the HITECH Act (42 U.S.C. § 17935) and any regulations promulgated thereunder. Business Associate agrees at the Covered Entity's direction to provide an accounting of disclosures of PHI directly to an individual in accordance with 45 C.F.R. § 164.528 and section 13405 of the HITECH Act (42 U.S.C. § 17935) and any regulations promulgated thereunder.
- (12) Business Associate agrees to comply with any state or federal law that is more stringent than the Privacy Rule.
- (13) Business Associate agrees to comply with the requirements of the HITECH Act relating to privacy and security that are applicable to the Covered Entity and with the requirements of 45 C.F.R. sections 164.504(e), 164.308, 164.310, 164.312, and 164.316.

- (14) In the event that an individual requests that the Business Associate (a) restrict disclosures of PHI; (b) provide an accounting of disclosures of the individual's PHI; or (c) provide a copy of the individual's PHI in an electronic health record, the Business Associate agrees to notify the covered entity, in writing, within two business days of the request.
- (15) Business Associate agrees that it shall not, directly or indirectly, receive any remuneration in exchange for PHI of an individual without (1) the written approval of the covered entity, unless receipt of remuneration in exchange for PHI is expressly authorized by this Contract and (2) the valid authorization of the individual, except for the purposes provided under section 13405(d)(2) of the HITECH Act,(42 U.S.C. § 17935(d)(2)) and in any accompanying regulations

(16) Obligations in the Event of a Breach

- A. The Business Associate agrees that, following the discovery of a breach of unsecured protected health information, it shall notify the Covered Entity of such breach in accordance with the requirements of section 13402 of HITECH (42 U.S.C. 17932(b) and the provisions of this Section of the Contract.
- B. Such notification shall be provided by the Business Associate to the Covered Entity without unreasonable delay, and in no case later than 30 days after the breach is discovered by the Business Associate, except as otherwise instructed in writing by a law enforcement official pursuant to section 13402 (g) of HITECH (42 U.S.C. 17932(g)) . A breach is considered discovered as of the first day on which it is, or reasonably should have been, known to the Business Associate. The notification shall include the identification and last known address, phone number and email address of each individual (or the next of kin of the individual if the individual is deceased) whose unsecured protected health information has been, or is reasonably believed by the Business Associate to have been, accessed, acquired, or disclosed during such breach.
- C. The Business Associate agrees to include in the notification to the Covered Entity at least the following information:
1. A brief description of what happened, including the date of the breach and the date of the discovery of the breach, if known.
  2. A description of the types of unsecured protected health information that were involved in the breach (such as full name, Social Security number, date of birth, home address, account number, or disability code).
  3. The steps the Business Associate recommends that individuals take to protect themselves from potential harm resulting from the breach.
  4. A detailed description of what the Business Associate is doing to investigate the breach, to mitigate losses, and to protect against any further breaches.
  5. Whether a law enforcement official has advised either verbally or in writing the Business Associate that he or she has determined that notification or notice to

individuals or the posting required under section 13402 of the HITECH Act would impede a criminal investigation or cause damage to national security and; if so, include contact information for said official.

- D. Business Associate agrees to provide appropriate staffing and have established procedures to ensure that individuals informed by the Covered Entity of a breach by the Business Associate have the opportunity to ask questions and contact the Business Associate for additional information regarding the breach. Such procedures shall include a toll-free telephone number, an e-mail address, a posting on its Web site and a postal address. Business Associate agrees to include in the notification of a breach by the Business Associate to the Covered Entity, a written description of the procedures that have been established to meet these requirements. Costs of such contact procedures will be borne by the Contractor.
  - E. Business Associate agrees that, in the event of a breach, it has the burden to demonstrate that it has complied with all notifications requirements set forth above, including evidence demonstrating the necessity of a delay in notification to the Covered Entity.
- (i) Permitted Uses and Disclosure by Business Associate.
- (1) General Use and Disclosure Provisions Except as otherwise limited in this Section of the Contract, Business Associate may use or disclose PHI to perform functions, activities, or services for, or on behalf of, Covered Entity as specified in this Contract, provided that such use or disclosure would not violate the Privacy Rule if done by Covered Entity or the minimum necessary policies and procedures of the Covered Entity.
  - (2) Specific Use and Disclosure Provisions
    - (A) Except as otherwise limited in this Section of the Contract, Business Associate may use PHI for the proper management and administration of Business Associate or to carry out the legal responsibilities of Business Associate.
    - (B) Except as otherwise limited in this Section of the Contract, Business Associate may disclose PHI for the proper management and administration of Business Associate, provided that disclosures are Required by Law, or Business Associate obtains reasonable assurances from the person to whom the information is disclosed that it will remain confidential and used or further disclosed only as Required by Law or for the purpose for which it was disclosed to the person, and the person notifies Business Associate of any instances of which it is aware in which the confidentiality of the information has been breached.
    - (C) Except as otherwise limited in this Section of the Contract, Business Associate may use PHI to provide Data Aggregation services to Covered Entity as permitted by 45 C.F.R. § 164.504(e)(2)(i)(B).
- (j) Obligations of Covered Entity.

- (1) Covered Entity shall notify Business Associate of any limitations in its notice of privacy practices of Covered Entity, in accordance with 45 C.F.R. § 164.520, or to the extent that such limitation may affect Business Associate's use or disclosure of PHI.
  - (2) Covered Entity shall notify Business Associate of any changes in, or revocation of, permission by Individual to use or disclose PHI, to the extent that such changes may affect Business Associate's use or disclosure of PHI.
  - (3) Covered Entity shall notify Business Associate of any restriction to the use or disclosure of PHI that Covered Entity has agreed to in accordance with 45 C.F.R. § 164.522, to the extent that such restriction may affect Business Associate's use or disclosure of PHI.
- (k) Permissible Requests by Covered Entity. Covered Entity shall not request Business Associate to use or disclose PHI in any manner that would not be permissible under the Privacy Rule if done by the Covered Entity, except that Business Associate may use and disclose PHI for data aggregation, and management and administrative activities of Business Associate, as permitted under this Section of the Contract.
- (l) Term and Termination.
- (1) Term. The Term of this Section of the Contract shall be effective as of the date the Contract is effective and shall terminate when the information collected in accordance with clause h. (10) of this Section of the Contract is provided to the Covered Entity and all of the PHI provided by Covered Entity to Business Associate, or created or received by Business Associate on behalf of Covered Entity, is destroyed or returned to Covered Entity, or, if it is infeasible to return or destroy PHI, protections are extended to such information, in accordance with the termination provisions in this Section.
  - (2) Termination for Cause Upon Covered Entity's knowledge of a material breach by Business Associate, Covered Entity shall either:
    - (A) Provide an opportunity for Business Associate to cure the breach or end the violation and terminate the Contract if Business Associate does not cure the breach or end the violation within the time specified by the Covered Entity; or
    - (B) Immediately terminate the Contract if Business Associate has breached a material term of this Section of the Contract and cure is not possible; or
    - (C) If neither termination nor cure is feasible, Covered Entity shall report the violation to the Secretary.
  - (3) Effect of Termination
    - (A) Except as provided in (l)(2) of this Section of the Contract, upon termination of this Contract, for any reason, Business Associate shall return or destroy all PHI received from Covered Entity, or created or received by Business Associate on behalf of Covered Entity. Business Associate shall also provide the information collected in accordance with clause h. (10) of this Section of the Contract to the Covered Entity

within ten business days of the notice of termination. This provision shall apply to PHI that is in the possession of subcontractors or agents of Business Associate. Business Associate shall retain no copies of the PHI.

(B) In the event that Business Associate determines that returning or destroying the PHI is infeasible, Business Associate shall provide to Covered Entity notification of the conditions that make return or destruction infeasible. Upon documentation by Business Associate that return or destruction of PHI is infeasible, Business Associate shall extend the protections of this Section of the Contract to such PHI and limit further uses and disclosures of PHI to those purposes that make return or destruction infeasible, for as long as Business Associate maintains such PHI. Infeasibility of the return or destruction of PHI includes, but is not limited to, requirements under state or federal law that the Business Associate maintains or preserves the PHI or copies thereof.

(m) Miscellaneous Provisions.

- (1) Regulatory References. A reference in this Section of the Contract to a section in the Privacy Rule means the section as in effect or as amended.
- (2) Amendment. The Parties agree to take such action as is necessary to amend this Section of the Contract from time to time as is necessary for Covered Entity to comply with requirements of the Privacy Rule and the Health Insurance Portability and Accountability Act of 1996, Pub. L. No. 104-191.
- (3) Survival. The respective rights and obligations of Business Associate shall survive the termination of this Contract.
- (4) Effect on Contract. Except as specifically required to implement the purposes of this Section of the Contract, all other terms of the Contract shall remain in force and effect.
- (5) Construction. This Section of the Contract shall be construed as broadly as necessary to implement and comply with the Privacy Standard. Any ambiguity in this Section of the Contract shall be resolved in favor of a meaning that complies, and is consistent with, the Privacy Standard.
- (6) Disclaimer. Covered Entity makes no warranty or representation that compliance with this Section of the Contract will be adequate or satisfactory for Business Associate's own purposes. Covered Entity shall not be liable to Business Associate for any claim, civil or criminal penalty, loss or damage related to or arising from the unauthorized use or disclosure of PHI by Business Associate or any of its officers, directors, employees, contractors or agents, or any third party to whom Business Associate has disclosed PHI contrary to the provisions of this Contract or applicable law. Business Associate is solely responsible for all decisions made, and actions taken, by Business Associate regarding the safeguarding, use and disclosure of PHI within its possession, custody or control.

(7) Indemnification. The Business Associate shall indemnify and hold the Covered Entity harmless from and against any and all claims, liabilities, judgments, fines, assessments, penalties, awards and any statutory damages that may be imposed or assessed pursuant to HIPAA, as amended or the



August 2015

HITECH Act, including, without limitation, attorney's fees, expert witness fees, costs of investigation, litigation or dispute resolution, and costs awarded thereunder, relating to or arising out of any violation by the Business Associate and its agents, including subcontractors, of any obligation of Business Associate and its agents, including subcontractors, under this section of the contract, under HIPAA, the HITECH Act, the Privacy Rule and the Security Rule.

## Notice to Executive Branch State Contractors and Prospective State Contractors of Campaign Contribution and Solicitation Limitations

This notice is provided under the authority of Connecticut General Statutes §9-612(g)(2), as amended by P.A. 10-1, and is for the purpose of informing state contractors and prospective state contractors of the following law (*italicized words are defined on the reverse side of this page*).

### CAMPAIGN CONTRIBUTION AND SOLICITATION LIMITATIONS

No *state contractor, prospective state contractor, principal of a state contractor or principal of a prospective state contractor*, with regard to a *state contract or state contract solicitation* with or from a state agency in the executive branch or a quasi-public agency or a holder, or principal of a holder of a valid prequalification certificate, shall make a contribution to (i) an exploratory committee or candidate committee established by a candidate for nomination or election to the office of Governor, Lieutenant Governor, Attorney General, State Comptroller, Secretary of the State or State Treasurer, (ii) a political committee authorized to make contributions or expenditures to or for the benefit of such candidates, or (iii) a party committee (which includes town committees).

In addition, no holder or principal of a holder of a valid prequalification certificate, shall make a contribution to (i) an exploratory committee or candidate committee established by a candidate for nomination or election to the office of State senator or State representative, (ii) a political committee authorized to make contributions or expenditures to or for the benefit of such candidates, or (iii) a party committee.

On and after January 1, 2011, no state contractor, prospective state contractor, principal of a state contractor or principal of a prospective state contractor, with regard to a state contract or state contract solicitation with or from a state agency in the executive branch or a quasi-public agency or a holder, or principal of a holder of a valid prequalification certificate, shall **knowingly solicit** contributions from the state contractor's or prospective state contractor's employees or from a *subcontractor or principals of the subcontractor* on behalf of (i) an exploratory committee or candidate committee established by a candidate for nomination or election to the office of Governor, Lieutenant Governor, Attorney General, State Comptroller, Secretary of the State or State Treasurer, (ii) a political committee authorized to make contributions or expenditures to or for the benefit of such candidates, or (iii) a party committee.

### DUTY TO INFORM

State contractors and prospective state contractors are required to inform their principals of the above prohibitions, as applicable, and the possible penalties and other consequences of any violation thereof.

### PENALTIES FOR VIOLATIONS

Contributions or solicitations of contributions made in violation of the above prohibitions may result in the following civil and criminal penalties:

**Civil penalties**—Up to \$2,000 or twice the amount of the prohibited contribution, whichever is greater, against a principal or a contractor. Any state contractor or prospective state contractor which fails to make reasonable efforts to comply with the provisions requiring notice to its principals of these prohibitions and the possible consequences of their violations may also be subject to civil penalties of up to \$2,000 or twice the amount of the prohibited contributions made by their principals.

**Criminal penalties**—Any knowing and willful violation of the prohibition is a Class D felony, which may subject the violator to imprisonment of not more than 5 years, or not more than \$5,000 in fines, or both.

### CONTRACT CONSEQUENCES

In the case of a state contractor, contributions made or solicited in violation of the above prohibitions may result in the contract being voided.

In the case of a prospective state contractor, contributions made or solicited in violation of the above prohibitions shall result in the contract described in the state contract solicitation not being awarded to the prospective state contractor, unless the State Elections Enforcement Commission determines that mitigating circumstances exist concerning such violation.

The State shall not award any other state contract to anyone found in violation of the above prohibitions for a period of one year after the election for which such contribution is made or solicited, unless the State Elections Enforcement Commission determines that mitigating circumstances exist concerning such violation.

Additional information may be found on the website of the State Elections Enforcement Commission, [www.ct.gov/seec](http://www.ct.gov/seec). Click on the link to "Lobbyist/Contractor Limitations."

## DEFINITIONS

“State contractor” means a person, business entity or nonprofit organization that enters into a state contract. Such person, business entity or nonprofit organization shall be deemed to be a state contractor until December thirty-first of the year in which such contract terminates. “State contractor” does not include a municipality or any other political subdivision of the state, including any entities or associations duly created by the municipality or political subdivision exclusively amongst themselves to further any purpose authorized by statute or charter, or an employee in the executive or legislative branch of state government or a quasi-public agency, whether in the classified or unclassified service and full or part-time, and only in such person’s capacity as a state or quasi-public agency employee.

“Prospective state contractor” means a person, business entity or nonprofit organization that (i) submits a response to a state contract solicitation by the state, a state agency or a quasi-public agency, or a proposal in response to a request for proposals by the state, a state agency or a quasi-public agency, until the contract has been entered into, or (ii) holds a valid prequalification certificate issued by the Commissioner of Administrative Services under section 4a-100. “Prospective state contractor” does not include a municipality or any other political subdivision of the state, including any entities or associations duly created by the municipality or political subdivision exclusively amongst themselves to further any purpose authorized by statute or charter, or an employee in the executive or legislative branch of state government or a quasi-public agency, whether in the classified or unclassified service and full or part-time, and only in such person’s capacity as a state or quasi-public agency employee.

“Principal of a state contractor or prospective state contractor” means (i) any individual who is a member of the board of directors of, or has an ownership interest of five per cent or more in, a state contractor or prospective state contractor, which is a business entity, except for an individual who is a member of the board of directors of a nonprofit organization, (ii) an individual who is employed by a state contractor or prospective state contractor, which is a business entity, as president, treasurer or executive vice president, (iii) an individual who is the chief executive officer of a state contractor or prospective state contractor, which is not a business entity, or if a state contractor or prospective state contractor has no such officer, then the officer who duly possesses comparable powers and duties, (iv) an officer or an employee of any state contractor or prospective state contractor who has *managerial or discretionary responsibilities with respect to a state contract*, (v) the spouse or a *dependent child* who is eighteen years of age or older of an individual described in this subparagraph, or (vi) a political committee established or controlled by an individual described in this subparagraph or the business entity or nonprofit organization that is the state contractor or prospective state contractor.

“State contract” means an agreement or contract with the state or any state agency or any quasi-public agency, let through a procurement process or otherwise, having a value of fifty thousand dollars or more, or a combination or series of such agreements or contracts having a value of one hundred thousand dollars or more in a calendar year, for (i) the rendition of services, (ii) the furnishing of any goods, material, supplies, equipment or any items of any kind, (iii) the construction, alteration or repair of any public building or public work, (iv) the acquisition, sale or lease of any land or building, (v) a licensing arrangement, or (vi) a grant, loan or loan guarantee. “State contract” does not include any agreement or contract with the state, any state agency or any quasi-public agency that is exclusively federally funded, an education loan, a loan to an individual for other than commercial purposes or any agreement or contract between the state or any state agency and the United States Department of the Navy or the United States Department of Defense.

“State contract solicitation” means a request by a state agency or quasi-public agency, in whatever form issued, including, but not limited to, an invitation to bid, request for proposals, request for information or request for quotes, inviting bids, quotes or other types of submittals, through a competitive procurement process or another process authorized by law waiving competitive procurement.

“Managerial or discretionary responsibilities with respect to a state contract” means having direct, extensive and substantive responsibilities with respect to the negotiation of the state contract and not peripheral, clerical or ministerial responsibilities.

“Dependent child” means a child residing in an individual’s household who may legally be claimed as a dependent on the federal income tax of such individual.

“Solicit” means (A) requesting that a contribution be made, (B) participating in any fund-raising activities for a candidate committee, exploratory committee, political committee or party committee, including, but not limited to, forwarding tickets to potential contributors, receiving contributions for transmission to any such committee or bundling contributions, (C) serving as chairperson, treasurer or deputy treasurer of any such committee, or (D) establishing a political committee for the sole purpose of soliciting or receiving contributions for any committee. Solicit does not include: (i) making a contribution that is otherwise permitted by Chapter 155 of the Connecticut General Statutes; (ii) informing any person of a position taken by a candidate for public office or a public official, (iii) notifying the person of any activities of, or contact information for, any candidate for public office; or (iv) serving as a member in any party committee or as an officer of such committee that is not otherwise prohibited in this section.

“Subcontractor” means any person, business entity or nonprofit organization that contracts to perform part or all of the obligations of a state contractor’s state contract. Such person, business entity or nonprofit organization shall be deemed to be a subcontractor until December thirty first of the year in which the subcontract terminates. “Subcontractor” does not include (i) a municipality or any other political subdivision of the state, including any entities or associations duly created by the municipality or political subdivision exclusively amongst themselves to further any purpose authorized by statute or charter, or (ii) an employee in the executive or legislative branch of state government or a quasi-public agency, whether in the classified or unclassified service and full or part-time, and only in such person’s capacity as a state or quasi-public agency employee.

“Principal of a subcontractor” means (i) any individual who is a member of the board of directors of, or has an ownership interest of five per cent or more in, a subcontractor, which is a business entity, except for an individual who is a member of the board of directors of a nonprofit organization, (ii) an individual who is employed by a subcontractor, which is a business entity, as president, treasurer or executive vice president, (iii) an individual who is the chief executive officer of a subcontractor, which is not a business entity, or if a subcontractor has no such officer, then the officer who duly possesses comparable powers and duties, (iv) an officer or an employee of any subcontractor who has managerial or discretionary responsibilities with respect to a subcontract with a state contractor, (v) the spouse or a dependent child who is eighteen years of age or older of an individual described in this subparagraph, or (vi) a political committee established or controlled by an individual described in this subparagraph or the business entity or nonprofit organization that is the subcontractor.

**EXHIBIT E**

(state wages will be inserted here)

Project: Rehabilitation Of Bridge Number 00722 On West Rocks Road Over Route 15

**Minimum Rates and Classifications  
for Heavy/Highway Construction**

ID#: H 23992

**Connecticut Department of Labor  
Wage and Workplace Standards Division**

By virtue of the authority vested in the Labor Commissioner under provisions of Section 31-53 of the General Statutes of Connecticut, as amended, the following are declared to be the prevailing rates and welfare payments and will apply only where the contract is advertised for bid within 20 days of the date on which the rates are established. Any contractor or subcontractor not obligated by agreement to pay to the welfare and pension fund shall pay this amount to each employee as part of his/her hourly wages.

Project Number:

Project Town: Norwalk

FAP Number: 0102-0356

State Number: 102-356

Project: Rehabilitation Of Bridge Number 00722 On West Rocks Road Over Route 15

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**CLASSIFICATION**

**Hourly Rate**

**Benefits**

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01) Asbestos/Toxic Waste Removal Laborers: Asbestos removal and encapsulation (except its removal from mechanical systems which are not to be scrapped), toxic waste removers, blasters. \*\*See Laborers Group 5 and 7\*\*

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1) Boilermaker	33.79	34% + 8.96
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1a) Bricklayer, Cement Masons, Cement Finishers, Plasterers, Stone Masons	33.48	30.21
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2) Carpenters, Piledrivermen	32.60	25.34
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As of: Monday, September 11, 2017

Project: Rehabilitation Of Bridge Number 00722 On West Rocks Road Over Route 15

2a) Diver Tenders	32.60	25.34
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3) Divers	41.06	25.34
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03a) Millwrights	33.14	25.74
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4) Painters: (Bridge Construction) Brush, Roller, Blasting (Sand, Water, etc.), Spray	48.55	20.45
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4a) Painters: Brush and Roller	32.72	20.45
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4b) Painters: Spray Only	35.72	20.45
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4c) Painters: Steel Only	34.72	20.45
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*As of:* Monday, September 11, 2017

Project: Rehabilitation Of Bridge Number 00722 On West Rocks Road Over Route 15

4d) Painters: Blast and Spray	35.72	20.45
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4e) Painters: Tanks, Tower and Swing	34.72	20.45
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5) Electrician (Trade License required: E-1,2 L-5,6 C-5,6 T-1,2 L-1,2 V-1,2,7,8,9)	38.27	25.00+3% of gross wage
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6) Ironworkers: Ornamental, Reinforcing, Structural, and Precast Concrete Erection	35.47	33.39 + a
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7) Plumbers (Trade License required: (P-1,2,6,7,8,9 J-1,2,3,4 SP-1,2) and Pipefitters (Including HVAC Work) (Trade License required: S-1,2,3,4,5,6,7,8 B-1,2,3,4 D-1,2,3,4 G-1, G-2, G-8, G-9)	41.62	30.36
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---LABORERS----

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8) Group 1: Laborer (Unskilled), Common or General, acetylene burner, concrete specialist	29.25	19.50
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*As of:* Monday, September 11, 2017

Project: Rehabilitation Of Bridge Number 00722 On West Rocks Road Over Route 15

9) Group 2: Chain saw operators, fence and guard rail erectors, pneumatic tool operators, powdermen	29.50	19.50
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10) Group 3: Pipelayers	29.75	19.50
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11) Group 4: Jackhammer/Pavement breaker (handheld); mason tenders (cement/concrete), catch basin builders, asphalt rakers, air track operators, block paver, curb setter and forklift operators	29.75	19.50
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12) Group 5: Toxic waste removal (non-mechanical systems)	31.25	19.50
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13) Group 6: Blasters	31.00	19.50
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Group 7: Asbestos/lead removal, non-mechanical systems (does not include leaded joint pipe)	30.25	19.50
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Group 8: Traffic control signalmen	16.00	19.50
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Project: Rehabilitation Of Bridge Number 00722 On West Rocks Road Over Route 15

Group 9: Hydraulic Drills	29.30	18.90
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---LABORERS (TUNNEL CONSTRUCTION, FREE AIR). Shield Drive and  
Liner Plate Tunnels in Free Air.----

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13a) Miners, Motormen, Mucking Machine Operators, Nozzle Men, Grout Men, Shaft & Tunnel Steel & Rodmen, Shield & Erector, Arm Operator, Cable Tenders	32.22	19.50 + a
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13b) Brakemen, Trackmen	31.28	19.50 + a
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---CLEANING, CONCRETE AND CAULKING TUNNEL----

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14) Concrete Workers, Form Movers, and Strippers	31.28	19.50 + a
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15) Form Erectors	31.60	19.50 + a
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Project: Rehabilitation Of Bridge Number 00722 On West Rocks Road Over Route 15

---ROCK SHAFT LINING, CONCRETE, LINING OF SAME AND TUNNEL  
IN FREE AIR:----

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16) Brakemen, Trackmen, Tunnel Laborers, Shaft Laborers	31.28	19.50 + a
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17) Laborers Topside, Cage Tenders, Bellman	31.17	19.50 + a
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18) Miners	32.22	19.50 + a
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---TUNNELS, CAISSON AND CYLINDER WORK IN COMPRESSED  
AIR: ----

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18a) Blaster	38.53	19.50 + a
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19) Brakemen, Trackmen, Groutman, Laborers, Outside Lock Tender, Gauge Tenders	38.34	19.50 + a
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Project: Rehabilitation Of Bridge Number 00722 On West Rocks Road Over Route 15

20) Change House Attendants, Powder Watchmen, Top on Iron Bolts	36.41	19.50 + a
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21) Mucking Machine Operator	39.11	19.50 + a
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---TRUCK DRIVERS---(\*see note below)

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Two axle trucks	29.13	22.32 + a
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Three axle trucks; two axle ready mix	29.23	22.32 + a
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Three axle ready mix	29.28	22.32 + a
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Four axle trucks, heavy duty trailer (up to 40 tons)	29.33	22.32 + a
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*As of:* Monday, September 11, 2017

Project: Rehabilitation Of Bridge Number 00722 On West Rocks Road Over Route 15

Four axle ready-mix	29.38	22.32 + a
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Heavy duty trailer (40 tons and over)	29.58	22.32 + a
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Specialized earth moving equipment other than conventional type on-the road trucks and semi-trailer (including Euclids)	29.38	22.32 + a
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---POWER EQUIPMENT OPERATORS---		
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Group 1: Crane handling or erecting structural steel or stone, hoisting engineer (2 drums or over), front end loader (7 cubic yards or over), Work Boat 26 ft. & Over, Tunnel Boring Machines. (Trade License Required)	39.30	24.05 + a
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Group 2: Cranes (100 ton rate capacity and over); Excavator over 2 cubic yards; Piledriver (\$3.00 premium when operator controls hammer); Bauer Drill/Caisson. (Trade License Required)	38.98	24.05 + a
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Group 3: Excavator/Backhoe under 2 cubic yards; Cranes (under 100 ton rated capacity), Gradall; Master Mechanic; Hoisting Engineer (all types of equipment where a drum and cable are used to hoist or drag material regardless of motive power of operation), Rubber Tire Excavator (Drott-1085 or similar); Grader Operator; Bulldozer Fine Grade (slopes, shaping, laser or GPS, etc.). (Trade License Required)	38.24	24.05 + a
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Project: Rehabilitation Of Bridge Number 00722 On West Rocks Road Over Route 15

Group 4: Trenching Machines; Lighter Derrick; Concrete Finishing Machine; CMI Machine or Similar; Koehring Loader (Skooper) 37.85 24.05 + a

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Group 5: Specialty Railroad Equipment; Asphalt Paver; Asphalt Spreader; Asphalt Reclaiming Machine; Line Grinder; Concrete Pumps; Drills with Self Contained Power Units; Boring Machine; Post Hole Digger; Auger; Pounder; Well Digger; Milling Machine (over 24" Mandrell) 37.26 24.05 + a

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Group 5 continued: Side Boom; Combination Hoe and Loader; Directional Driller. 37.26 24.05 + a

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Group 6: Front End Loader (3 up to 7 cubic yards); Bulldozer (rough grade dozer). 36.95 24.05 + a

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Group 7: Asphalt Roller; Concrete Saws and Cutters (ride on types); Vermeer Concrete Cutter; Stump Grinder; Scraper; Snooper; Skidder; Milling Machine (24" and Under Mandrel). 36.61 24.05 + a

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Group 8: Mechanic, Grease Truck Operator, Hydroblaster, Barrier Mover, Power Stone Spreader; Welder; Work Boat under 26 ft.; Transfer Machine. 36.21 24.05 + a

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Group 9: Front End Loader (under 3 cubic yards), Skid Steer Loader regardless of attachments (Bobcat or Similar); Fork Lift, Power Chipper; Landscape Equipment (including hydroseeder). 35.78 24.05 + a

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Project: Rehabilitation Of Bridge Number 00722 On West Rocks Road Over Route 15

Group 10: Vibratory Hammer, Ice Machine, Diesel and Air Hammer, etc. 33.74 24.05 + a

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Group 11: Conveyor, Earth Roller; Power Pavement Breaker (whiphammer), Robot Demolition Equipment. 33.74 24.05 + a

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Group 12: Wellpoint Operator. 33.68 24.05 + a

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Group 13: Compressor Battery Operator. 33.10 24.05 + a

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Group 14: Elevator Operator; Tow Motor Operator (Solid Tire No Rough Terrain). 31.96 24.05 + a

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Group 15: Generator Operator; Compressor Operator; Pump Operator; Welding Machine Operator; Heater Operator. 31.55 24.05 + a

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Group 16: Maintenance Engineer/Oiler 30.90 24.05 + a

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Project: Rehabilitation Of Bridge Number 00722 On West Rocks Road Over Route 15

Group 17: Portable asphalt plant operator; portable crusher plant operator; portable concrete plant operator.	35.21	24.05 + a
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Group 18: Power Safety Boat; Vacuum Truck; Zim Mixer; Sweeper; (minimum for any job requiring CDL license).	32.79	24.05 + a
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\*\*NOTE: SEE BELOW

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---LINE CONSTRUCTION---(Railroad Construction and Maintenance)---

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20) Lineman, Cable Splicer, Technician	47.14	6.5% + 20.98
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21) Heavy Equipment Operator	42.43	6.5% + 18.84
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22) Equipment Operator, Tractor Trailer Driver, Material Men	40.07	6.5% + 18.27
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*As of:* Monday, September 11, 2017

Project: Rehabilitation Of Bridge Number 00722 On West Rocks Road Over Route 15

23) Driver Groundmen	25.93	6.5% + 8.53
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23a) Truck Driver	35.36	6.5% + 16.88
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---LINE CONSTRUCTION---

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24) Driver Groundmen	30.92	6.5% + 9.70
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25) Groundmen	22.67	6.5% + 6.20
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26) Heavy Equipment Operators	37.10	6.5% + 10.70
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27) Linemen, Cable Splicers, Dynamite Men	41.22	6.5% + 12.20
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*As of:* Monday, September 11, 2017



Project: Rehabilitation Of Bridge Number 00722 On West Rocks Road Over Route 15

28) Material Men, Tractor Trailer Drivers, Equipment Operators 35.04 6.5% + 10.45

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Project: Rehabilitation Of Bridge Number 00722 On West Rocks Road Over Route 15

*Welders: Rate for craft to which welding is incidental.*

*\*Note: Hazardous waste removal work receives additional \$1.25 per hour for truck drivers.*

*\*\*Note: Hazardous waste premium \$3.00 per hour over classified rate*

***ALL Cranes: When crane operator is operating equipment that requires a fully licensed crane operator to operate he receives an extra \$4.00 premium in addition to the hourly wage rate and benefit contributions:***

***1) Crane handling or erecting structural steel or stone; hoisting engineer (2 drums or over)***

***2) Cranes (100 ton rate capacity and over) Bauer Drill/Caisson***

***3) Cranes (under 100 ton rated capacity)***

*Crane with 150 ft. boom (including jib) - \$1.50 extra*

*Crane with 200 ft. boom (including jib) - \$2.50 extra*

*Crane with 250 ft. boom (including jib) - \$5.00 extra*

*Crane with 300 ft. boom (including jib) - \$7.00 extra*

*Crane with 400 ft. boom (including jib) - \$10.00 extra*

All classifications that indicate a percentage of the fringe benefits must be calculated at the percentage rate times the "base hourly rate".

Apprentices duly registered under the Commissioner of Labor's regulations on "Work Training Standards for Apprenticeship and Training Programs" Section 31-51-d-1 to 12, are allowed to be paid the appropriate percentage of the prevailing journeymen hourly base and the full fringe benefit rate, providing the work site ratio shall not be less than one full-time journeyman instructing and supervising the work of each apprentice in a specific trade.

*~~Connecticut General Statute Section 31-55a: Annual Adjustments to wage rates by contractors doing state work ~~*

*The Prevailing wage rates applicable to this project are subject to annual adjustments each July 1st for the duration of the project.*

*Each contractor shall pay the annual adjusted prevailing wage rate that is in effect each July 1st, as posted by the Department of Labor.*

*It is the contractor's responsibility to obtain the annual adjusted prevailing wage rate increases directly from the Department of Labor's website.*

*The annual adjustments will be posted on the Department of Labor's Web page: [www.ct.gov/dol](http://www.ct.gov/dol).*

*The Department of Labor will continue to issue the initial prevailing wage rate schedule to the Contracting Agency for the project.*

*All subsequent annual adjustments will be posted on our Web Site for contractor access.*

*Contracting Agencies are under no obligation pursuant to State labor law to pay any increase due to the annual adjustment provision.*

**As of:** Monday, September 11, 2017

Project: Rehabilitation Of Bridge Number 00722 On West Rocks Road Over Route 15

*Effective October 1, 2005 - Public Act 05-50: any person performing the work of any mechanic, laborer, or worker shall be paid prevailing wage*

All Person who perform work ON SITE must be paid prevailing wage for the appropriate mechanic, laborer, or worker classification.

All certified payrolls must list the hours worked and wages paid to All Persons who perform work ON SITE regardless of their ownership i.e.: (Owners, Corporate Officers, LLC Members, Independent Contractors, et. al)

Reporting and payment of wages is required regardless of any contractual relationship alleged to exist between the contractor and such person.

**~~Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clause (29 CFR 5.5 (a) (1) (ii)).**

Please direct any questions which you may have pertaining to classification of work and payment of prevailing wages to the Wage and Workplace Standards Division, telephone (860)263-6790.

*As of:* Monday, September 11, 2017

Connecticut Department of Labor  
Wage and Workplace Standards Division  
FOOTNOTES

Please Note: If the “Benefits” listed on the schedule for the following occupations includes a letter(s) (+ a or + a+b for instance), refer to the information below.

Benefits to be paid at the appropriate prevailing wage rate for the listed occupation.

If the “Benefits” section for the occupation lists only a dollar amount, disregard the information below.

**Bricklayers, Cement Masons, Cement Finishers, Concrete Finishers, Stone Masons**  
(Building Construction) and  
(Residential- Hartford, Middlesex, New Haven, New London and Tolland Counties)

- a. Paid Holiday: Employees shall receive 4 hours for Christmas Eve holiday provided the employee works the regularly scheduled day before and after the holiday. Employers may schedule work on Christmas Eve and employees shall receive pay for actual hours worked in addition to holiday pay.

**Elevator Constructors: Mechanics**

- a. Paid Holidays: New Year’s Day, Memorial Day, Independence Day, Labor Day, Veterans’ Day, Thanksgiving Day, Christmas Day, plus the Friday after Thanksgiving.
- b. Vacation: Employer contributes 8% of basic hourly rate for 5 years or more of service or 6% of basic hourly rate for 6 months to 5 years of service as vacation pay credit.

**Glaziers**

- a. Paid Holidays: Labor Day and Christmas Day.

**Power Equipment Operators**  
(Heavy and Highway Construction & Building Construction)

- a. Paid Holidays: New Year’s Day, Good Friday, Memorial day, Independence Day, Labor Day, Thanksgiving Day and Christmas Day, provided the employee works 3 days during the week in which the holiday falls, if scheduled, and if scheduled, the working day before and the working day after the holiday. Holidays falling on Saturday may be observed on Saturday, or if the employer so elects, on the preceding Friday.

### **Ironworkers**

- a. Paid Holiday: Labor Day provided employee has been on the payroll for the 5 consecutive work days prior to Labor Day.

### **Laborers (Tunnel Construction)**

- a. Paid Holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day and Christmas Day. No employee shall be eligible for holiday pay when he fails, without cause, to work the regular work day preceding the holiday or the regular work day following the holiday.

### **Roofers**

- a. Paid Holidays: July 4<sup>th</sup>, Labor Day, and Christmas Day provided the employee is employed 15 days prior to the holiday.

### **Sprinkler Fitters**

- a. Paid Holidays: Memorial Day, July 4th, Labor Day, Thanksgiving Day and Christmas Day, provided the employee has been in the employment of a contractor 20 working days prior to any such paid holiday.

### **Truck Drivers**

(Heavy and Highway Construction & Building Construction)

- a. Paid Holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, Christmas day, and Good Friday, provided the employee has at least 31 calendar days of service and works the last scheduled day before and the first scheduled day after the holiday, unless excused.

## Information Bulletin

### *Occupational Classifications*

The Connecticut Department of Labor has the responsibility to properly determine "job classification" on prevailing wage projects covered under C.G.S. Section 31-53.

*Note: This information is intended to provide a sample of some occupational classifications for guidance purposes only. It is not an all-inclusive list of each occupation's duties. This list is being provided only to highlight some areas where a contractor may be unclear regarding the proper classification.*

**Below are additional clarifications of specific job duties performed for certain classifications:**

- **ASBESTOS WORKERS**

Applies all insulating materials, protective coverings, coatings and finishes to all types of mechanical systems.

- **ASBESTOS INSULATOR**

Handle, install apply, fabricate, distribute, prepare, alter, repair, dismantle, heat and frost insulation, including penetration and fire stopping work on all penetration fire stop systems.

- **BOILERMAKERS**

Erects hydro plants, incomplete vessels, steel stacks, storage tanks for water, fuel, etc. Builds incomplete boilers, repairs heat exchanges and steam generators.

- **BRICKLAYERS, CEMENT MASONS, CEMENT FINISHERS, MARBLE MASONS, PLASTERERS, STONE MASONS, PLASTERERS. STONE MASONS, TERRAZZO WORKERS, TILE SETTERS**

Lays building materials such as brick, structural tile and concrete cinder, glass, gypsum, terra cotta block. Cuts, tools and sets marble, sets stone, finishes concrete, applies decorative steel, aluminum and plastic tile, applies cements, sand, pigment and marble chips to floors, stairways, etc.

- **CARPENTERS, MILLWRIGHTS. PILEDRIVERMEN. LATHERS. RESILIENT FLOOR LAYERS, DOCK BUILDERS, DIKERS, DIVER TENDERS**

Constructs, erects, installs and repairs structures and fixtures of wood, plywood and wallboard. Installs, assembles, dismantles, moves industrial machinery. Drives piling into ground to provide foundations for structures such as buildings and bridges, retaining walls for earth embankments, such as cofferdams. Fastens wooden, metal or rockboard lath to walls, ceilings and partitions of buildings, acoustical tile layer, concrete form builder. Applies firestopping materials on fire resistive joint systems only. Installation of curtain/window walls only where attached to wood or metal studs. Installation of insulated material of all types whether blown, nailed or attached in other ways to walls, ceilings and floors of buildings. Assembly and installation of modular furniture/furniture systems. Free-standing furniture is not covered. This includes free standing: student chairs, study top desks, book box desks, computer furniture, dictionary stand, atlas stand, wood shelving, two-position information access station, file cabinets, storage cabinets, tables, etc.

- **CLEANING LABORER**

The clean up of any construction debris and the general cleaning, including sweeping, wash down, mopping, wiping of the construction facility, washing, polishing, dusting, etc., prior to the issuance of a certificate of occupancy falls under the *Labor classification*.

- **DELIVERY PERSONNEL**

If delivery of supplies/building materials is to one common point and stockpiled there, prevailing wages are not required. If the delivery personnel are involved in the distribution of the material to multiple locations within the construction site then they would have to be paid prevailing wages for the type of work performed: laborer, equipment operator, electrician, ironworker, plumber, etc.

An example of this would be where delivery of drywall is made to a building and the delivery personnel distribute the drywall from one "stockpile" location to further sub-locations on each floor. Distribution of material around a construction site is the job of a laborer/tradesman and not a delivery personnel.

- **ELECTRICIANS**

Install, erect, maintenance, alteration or repair of any wire, cable, conduit, etc., which generates, transforms, transmits or uses electrical energy for light, heat, power or other purposes, including the Installation or maintenance of telecommunication, LAN wiring or computer equipment, and low voltage wiring.

**\*License required per Connecticut General Statutes: E-1,2 L-5,6 C-5,6 T-1,2 L-1,2 V-1,2,7,8,9.**

- **ELEVATOR CONSTRUCTORS**

Install, erect, maintenance and repair of all types of elevators, escalators, dumb waiters and moving walks. **\*License required by Connecticut General Statutes: R-1,2,5,6.**

- **FORK LIFT OPERATOR**

Laborers Group 4) Mason Tenders - operates forklift solely to assist a mason to a maximum height of nine (9) feet only.

Power Equipment Operator Group 9 - operates forklift to assist any trade, and to assist a mason to a height over nine (9) feet.

- **GLAZIERS**

Glazing wood and metal sash, doors, partitions, and 2 story aluminum storefronts. Installs glass windows, skylights, store fronts and display cases or surfaces such as building fronts, interior walls, ceilings and table tops and metal store fronts. Installation of aluminum window walls and curtain walls is the "joint" work of glaziers and ironworkers which requires either a blended rate or equal composite workforce.

- **IRONWORKERS**

Erection, installation and placement of structural steel, precast concrete, miscellaneous iron, ornamental iron, metal curtain wall, rigging and reinforcing steel. Handling, sorting, and installation of reinforcing steel (rebar). Metal bridge rail (traffic), metal bridge handrail, and decorative security fence installation. Installation of aluminum window walls and curtain walls is the "joint" work of glaziers and ironworkers which requires either a blended rate or equal composite workforce. Insulated metal and insulated composite panels are still installed by the Ironworker.

- **INSULATOR**

Installing fire stopping systems/materials for "Penetration Firestop Systems": transit to cables, electrical conduits, insulated pipes, sprinkler pipe penetrations, ductwork behind radiation, electrical cable trays, fire rated pipe penetrations, natural polypropylene, HVAC ducts, plumbing bare metal, telephone and communication wires, and boiler room ceilings. Past practice using the applicable licensed trades, Plumber, Sheet Metal, Sprinkler Fitter, and Electrician, is not inconsistent with the Insulator classification and would be permitted.



- **LABORERS**

Acetylene burners, asphalt rakers, chain saw operators, concrete and power buggy operator, concrete saw operator, fence and guard rail erector (except metal bridge rail (traffic), metal bridge handrail, and decorative security fence installation.), hand operated concrete vibrator operator, mason tenders, pipelayers (installation of storm drainage or sewage lines on the street only), pneumatic drill operator, pneumatic gas and electric drill operator, powermen and wagon drill operator, air track operator, block paver, curb setters, blasters, concrete spreaders.

- **PAINTERS**

Maintenance, preparation, cleaning, blasting (water and sand, etc.), painting or application of any protective coatings of every description on all bridges and appurtenances of highways, roadways, and railroads. Painting, decorating, hardwood finishing, paper hanging, sign writing, scenic art work and drywall hhg for any and all types of building and residential work.

- **LEAD PAINT REMOVAL**

Painter's Rate

1. Removal of lead paint from bridges.
2. Removal of lead paint as preparation of any surface to be repainted.
3. Where removal is on a Demolition project prior to reconstruction.

Laborer's Rate

1. Removal of lead paint from any surface NOT to be repainted.
2. Where removal is on a *TOTAL* Demolition project only.

- **PLUMBERS AND PIPEFITTERS**

Installation, repair, replacement, alteration or maintenance of all plumbing, heating, cooling and piping. ***\*License required per Connecticut General Statutes: P-1,2,6,7,8,9 J-1,2,3,4 SP-1,2 S-1,2,3,4,5,6,7,8 B-1,2,3,4 D-1,2,3,4.***

- **POWER EQUIPMENT OPERATORS**

Operates several types of power construction equipment such as compressors, pumps, hoists, derricks, cranes, shovels, tractors, scrapers or motor graders, etc. Repairs and maintains equipment. **\*License required, crane operators only, per Connecticut General Statutes.**

- **ROOFERS**

Covers roofs with composition shingles or sheets, wood shingles, slate or asphalt and gravel to waterproof roofs, including preparation of surface. (tear-off and/or removal of any type of roofing and/or clean-up of any and all areas where a roof is to be relaid)

- **SHEETMETAL WORKERS**

Fabricate, assembles, installs and repairs sheetmetal products and equipment in such areas as ventilation, air-conditioning, warm air heating, restaurant equipment, architectural sheet metal work, sheetmetal roofing, and aluminum gutters.

Fabrication, handling, assembling, erecting, altering, repairing, etc. of coated metal material panels and composite metal material panels when used on building exteriors and interiors as soffits, fascia, louvers, partitions, wall panel siding, canopies, cornice, column covers, awnings, beam covers, cladding, sun shades, lighting troughs, spires, ornamental roofing, metal ceilings, mansards, copings, ornamental and ventilation hoods, vertical and horizontal siding panels, trim, etc.

The sheet metal classification also applies to the vast variety of coated metal material panels and composite metal material panels that have evolved over the years as an alternative to conventional ferrous and non-ferrous metals like steel, iron, tin, copper, brass, bronze, aluminum, etc. Insulated metal and insulated composite panels are still installed by the Iron Worker. Fabrication, handling, assembling, erecting, altering, repairing, etc. of architectural metal roof, standing seam roof, composite metal roof, metal and composite bathroom/toilet partitions, aluminum gutters, metal and composite lockers and shelving, kitchen equipment, and walk-in coolers.

- **SPRINKLER FITTERS**

Installation, alteration, maintenance and repair of fire protection sprinkler systems.

**\*License required per Connecticut General Statutes: F-1,2,3,4.**

- **TILE MARBLE AND TERRAZZO FINISHERS**

Assists and tends the tile setter, marble mason and terrazzo worker in the performance of their duties.

- **TRUCK DRIVERS**

**Definitions:**

1) “Site of the work” (29 Code of Federal Regulations (CFR) 5.2(l)(b) is the physical place or places where the building or work called for in the contract will remain and any other site where a significant portion of the building or work is constructed, provided that such site is established specifically for the performance of the contract or project;

(a) Except as provided in paragraph (l) (3) of this section, job headquarters, tool yards, batch plants, borrow pits, etc. are part of the “site of the work”; provided they are dedicated exclusively, or nearly so, to the performance of the contract or project, and provided they are adjacent to “the site of work” as defined in paragraph (e)(1) of this section;

(b) Not included in the “site of the work” are permanent home offices, branch plant establishments, fabrication plants, tool yards etc, of a contractor or subcontractor whose location and continuance in operation are determined wholly without regard to a particular State or political subdivision contract or uncertain and indefinite periods of time involved of a few seconds or minutes duration and where the failure to count such time is due to consideration justified by industrial realities (29 CFR 785.47)

2) “Engaged to wait” is waiting time that belongs to and is controlled by the employer which is an integral part of the job and is therefore compensable as hours worked. (29 CFR 785.15)

3) “Waiting to be engaged” is waiting time that an employee can use effectively for their own purpose and is not compensable as hours worked. (29 CFR 785.16)

4) “De Minimus” is a rule that recognizes that unsubstantial or insignificant periods of time which cannot as a practical administrative matter be precisely recorded for payroll purposes, may be disregarded. This rule applies only where there are uncertain and indefinite periods of time involved of a short duration and where the failure to count such time is due to consideration justified by worksite realities. For example, with respect to truck drivers on prevailing wage sites, this is typically less than 15 minutes at a time.

**Coverage of Truck Drivers on State or Political subdivision Prevailing Wage Projects**

**Truck drivers are covered for payroll purposes under the following conditions:**

- Truck Drivers for time spent working on the site of the work.
- Truck Drivers for time spent loading and/or unloading materials and supplies on the site of the work, if such time is not de minimus

- Truck drivers transporting materials or supplies between a facility that is deemed part of the site of the work and the actual construction site.
- Truck drivers transporting portions of the building or work between a site established specifically for the performance of the contract or project where a significant portion of such building or work is constructed and the physical places where the building or work outlined in the contract will remain.

*For example: Truck drivers delivering asphalt are covered under prevailing wage while “engaged to wait” on the site and when directly involved in the paving operation, provided the total time is not “de minimus”*

**Truck Drivers are not covered in the following instances:**

- Material delivery truck drivers while off “the site of the work”
- Truck Drivers traveling between a prevailing wage job and a commercial supply facility while they are off the “site of the work”
- Truck drivers whose time spent on the “site of the work” is de minimus, such as under 15 minutes at a time, merely to drop off materials or supplies, including asphalt.

*These guidelines are similar to U.S. Labor Department policies. The application of these guidelines may be subject to review based on factual considerations on a case by case basis.*

**For example:**

- Material men and deliverymen are not covered under prevailing wage as long as they are not directly involved in the construction process. If, they unload the material, they would then be covered by prevailing wage for the classification they are performing work in: laborer, equipment operator, etc.
- Hauling material off site is not covered provided they are not dumping it at a location outlined above.
- Driving a truck on site and moving equipment or materials on site would be considered covered work, as this is part of the construction process.

*Any questions regarding the proper classification should be directed to:*

*Public Contract Compliance Unit  
Wage and Workplace Standards Division  
Connecticut Department of Labor  
200 Folly Brook Blvd, Wethersfield, CT 06109  
(860) 263-6543*

# Statute 31-55a

Last Updated: June 02, 2008

You are here: [DOL Web Site](#) ▶ [Wage and Workplace Issues](#) ▶ Statute 31-55a

## - Special Notice -

To All State and Political Subdivisions, Their Agents, and Contractors

Connecticut General Statute 31-55a - Annual adjustments to wage rates by contractors doing state work.

*Each contractor that is awarded a contract on or after October 1, 2002, for (1) the construction of a state highway or bridge that falls under the provisions of section 31-54 of the general statutes, or (2) the construction, remodeling, refinishing, refurbishing, rehabilitation, alteration or repair of any public works project that falls under the provisions of section 31-53 of the general statutes shall contact the Labor Commissioner on or before July first of each year, for the duration of such contract, to ascertain the prevailing rate of wages on an hourly basis and the amount of payment or contributions paid or payable on behalf of each mechanic, laborer or worker employed upon the work contracted to be done, and shall make any necessary adjustments to such prevailing rate of wages and such payment or contributions paid or payable on behalf of each such employee, effective each July first.*

- The prevailing wage rates applicable to any contract or subcontract awarded on or after October 1, 2002 are subject to annual adjustments each July 1st for the duration of any project which was originally advertised for bids on or after October 1, 2002.
- Each contractor affected by the above requirement shall pay the annual adjusted prevailing wage rate that is in effect each July 1st, as posted by the Department of Labor.
- It is the *contractor's* responsibility to obtain the annual adjusted prevailing wage rate increases directly from the Department of Labor's Web Site. The annual adjustments will be posted on the Department of Labor Web page: [www.ctdol.state.ct.us](http://www.ctdol.state.ct.us). For those without internet access, please contact the division listed below.
- The Department of Labor will continue to issue the initial prevailing wage rate schedule to the Contracting Agency for the project. All subsequent annual adjustments will be posted on our Web Site for contractor access.

Any questions should be directed to the Contract Compliance Unit, Wage and Workplace

Standards Division, Connecticut Department of Labor, 200 Folly Brook Blvd.,  
Wethersfield, CT 06109 at (860)263-6790.

[Workplace Laws](#)

Published by the Connecticut Department of Labor, Project Management Office

November 29, 2006

**Notice**  
**To All Mason Contractors and Interested Parties**  
**Regarding Construction Pursuant to Section 31-53 of the**  
**Connecticut General Statutes (Prevailing Wage)**

The Connecticut Labor Department Wage and Workplace Standards Division is empowered to enforce the prevailing wage rates on projects covered by the above referenced statute.

Over the past few years the Division has withheld enforcement of the rate in effect for workers who operate a forklift on a prevailing wage rate project due to a potential jurisdictional dispute.

The rate listed in the schedules and in our Occupational Bulletin (see enclosed) has been as follows:

**Forklift Operator:**

- **Laborers (Group 4) Mason Tenders** - operates forklift solely to assist a mason to a maximum height of nine feet only.
- **Power Equipment Operator (Group 9)** - operates forklift to assist any trade and to assist a mason to a height over nine feet.

The U.S. Labor Department conducted a survey of rates in Connecticut but it has not been published and the rate in effect remains as outlined in the above Occupational Bulletin.

*Since this is a classification matter and not one of jurisdiction, effective January 1, 2007 the Connecticut Labor Department will enforce the rate on each schedule in accordance with our statutory authority.*

Your cooperation in filing appropriate and accurate certified payrolls is appreciated.

# **Informational Bulletin**

## **THE 10-HOUR OSHA CONSTRUCTION SAFETY AND HEALTH COURSE**

(applicable to public building contracts entered into *on or after July 1, 2007*, where the total cost of all work to be performed is at least \$100,000)

- (1) This requirement was created by Public Act No. 06-175, which is codified in Section 31-53b of the Connecticut General Statutes (pertaining to the prevailing wage statutes);
- (2) The course is required for public building construction contracts (projects funded in whole or in part by the state or any political subdivision of the state) entered into on or after July 1, 2007;
- (3) It is required of private employees (not state or municipal employees) and apprentices who perform manual labor for a general contractor or subcontractor on a public building project where the total cost of all work to be performed is at least \$100,000;
- (4) The ten-hour construction course pertains to the ten-hour Outreach Course conducted in accordance with federal OSHA Training Institute standards, and, for telecommunications workers, a ten-hour training course conducted in accordance with federal OSHA standard, 29 CFR 1910.268;
- (5) The internet website for the federal OSHA Training Institute is [http://www.osha.gov/fso/ote/training/edcenters/fact\\_sheet.html](http://www.osha.gov/fso/ote/training/edcenters/fact_sheet.html);
- (6) The statutory language leaves it to the contractor and its employees to determine who pays for the cost of the ten-hour Outreach Course;
- (7) Within 30 days of receiving a contract award, a general contractor must furnish proof to the Labor Commissioner that all employees and apprentices performing manual labor on the project will have completed such a course;
- (8) Proof of completion may be demonstrated through either: (a) the presentation of a *bona fide* student course completion card issued by the federal OSHA Training Institute; *or* (2) the presentation of documentation provided to an employee by a trainer certified by the Institute pending the actual issuance of the completion card;
- (9) Any card with an issuance date more than 5 years prior to the commencement date of the construction project shall not constitute proof of compliance;



- (10) Each employer shall affix a copy of the construction safety course completion card to the certified payroll submitted to the contracting agency in accordance with Conn. Gen. Stat. § 31-53(f) on which such employee's name first appears;
- (11) Any employee found to be in non-compliance shall be subject to removal from the worksite if such employee does not provide satisfactory proof of course completion to the Labor Commissioner by the fifteenth day after the date the employee is determined to be in noncompliance;
- (12) Any such employee who is determined to be in noncompliance may continue to work on a public building construction project for a maximum of fourteen consecutive calendar days while bringing his or her status into compliance;
- (13) The Labor Commissioner may make complaint to the prosecuting authorities regarding any employer or agent of the employer, or officer or agent of the corporation who files a false certified payroll with respect to the status of an employee who is performing manual labor on a public building construction project;
- (14) The statute provides the minimum standards required for the completion of a safety course by manual laborers on public construction contracts; any contractor can exceed these minimum requirements; and
- (15) Regulations clarifying the statute are currently in the regulatory process, and shall be posted on the CTDOL website as soon as they are adopted in final form.
- (16) Any questions regarding this statute may be directed to the Wage and Workplace Standards Division of the Connecticut Labor Department via the internet website of <http://www.ctdol.state.ct.us/wgwkstnd/wgemenu.htm>; or by telephone at (860)263-6790.

**THE ABOVE INFORMATION IS PROVIDED EXCLUSIVELY AS AN EDUCATIONAL RESOURCE, AND IS NOT INTENDED AS A SUBSTITUTE FOR LEGAL INTERPRETATIONS WHICH MAY ULTIMATELY ARISE CONCERNING THE CONSTRUCTION OF THE STATUTE OR THE REGULATIONS.**

**Sec. 31-53b. Construction safety and health course. Proof of completion required for employees on public building projects. Enforcement. Regulations.** (a) Each contract entered into on or after July 1, 2007, for the construction, remodeling, refinishing, refurbishing, rehabilitation, alteration or repair of any public building project by the state or any of its agents, or by an political subdivision of the state or any of its agents, where the total cost of all work to be performed by all contractors and subcontractors in connection with the contract is at least one hundred thousand dollars, shall contain a provision requiring that, not later than thirty days after the date such contract is awarded, each contractor furnish proof to the Labor Commissioner that all employees performing manual labor on or in such public building, pursuant to such contract, have completed a course of at least ten hours in duration in construction safety and health approved by the federal Occupational Safety and Health Administration or, in the case of telecommunications employees, have completed at least ten hours of training in accordance with 29 CFR 1910.268.

(b) Any employee required to complete a construction safety and health course required under subsection (a) of this section who has not completed the course shall be subject to removal from the worksite if the employee does not provide documentation of having completed such course by the fifteenth day after the date the employee is found to be in noncompliance. The Labor Commissioner or said commissioner's designee shall enforce this section.

(c) Not later than January 1, 2007, the Labor Commissioner shall adopt regulations, in accordance with the provisions of chapter 54, to implement the provisions of subsections (a) and (b) of this section. Such regulations shall require that the ten-hour construction safety and health courses required under subsection (a) of this section be conducted in accordance with federal Occupational Safety and Health Administration Training Institute standards, or in accordance with 29 CFR 1910.268, as appropriate. The Labor Commissioner shall accept as sufficient proof of compliance with the provisions of subsection (a) or (b) of this section a student course completion card issued by the federal Occupational Safety and Health Administration Training Institute, or such other proof of compliance said commissioner deems appropriate, dated no earlier than five years before the commencement date of such public works project.

(d) For the purposes of this section, "public building" means a structure, paid for in whole or in part with state funds, within a roof and within exterior walls or fire walls, designed for the housing, shelter, enclosure and support or employment of people, animals or property of any kind, including, but not limited to, sewage treatment plants and water treatment plants, "Public building" does not include site work, roads or bridges, rail lines, parking lots or underground water, sewer or drainage systems including pump houses or other utility systems.

CONNECTICUT DEPARTMENT OF LABOR  
WAGE AND WORKPLACE STANDARDS DIVISION

**CONTRACTORS WAGE CERTIFICATION FORM**

I, \_\_\_\_\_ of \_\_\_\_\_  
Officer, Owner, Authorized Rep. Company Name

do hereby certify that the \_\_\_\_\_  
Company Name

\_\_\_\_\_  
Street

\_\_\_\_\_  
City

and all of its subcontractors will pay all workers on the

\_\_\_\_\_  
Project Name and Number

\_\_\_\_\_  
Street and City

the wages as listed in the schedule of prevailing rates required for such project (a copy of which is attached hereto).

\_\_\_\_\_  
Signed

Subscribed and sworn to before me this \_\_\_\_\_ day of \_\_\_\_\_, 2004.

\_\_\_\_\_  
Notary Public

 Return to:

Connecticut Department of Labor  
Wage & Workplace Standards Division  
200 Folly Brook Blvd.  
Wethersfield, CT 06109