

## **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.

Table of Contents

TABLE OF CONTENTS OF SPECIAL PROVISIONS.....	4
CONTRACT TIME AND LIQUIDATED DAMAGES.....	5
NOTICE TO CONTRACTOR – AWARD AND EXECUTION OF CONTRACT .....	12
NOTICE TO CONTRACTOR – POTENTIAL MODIFIED AWARD .....	13
SCHEDULE.....	13
NOTICE TO CONTRACTOR - PRE-BID QUESTIONS AND ANSWERS.....	14
NOTICE TO CONTRACTOR - CONSTRUCTION CONTRACTOR.....	15
DIGITAL SUBMISSIONS .....	15
NOTICE TO CONTRACTOR – FEDERAL WAGE DETERMINATIONS (Davis Bacon Act) .....	16
NOTICE TO CONTRACTOR – MINIMUM CONCRETE COMPRESSIVE STRENGTH.....	17
NOTICE TO CONTRACTOR - PORTLAND CEMENT CONCRETE (PCC) .....	18
MIX CLASSIFICATIONS.....	18
NOTICE TO CONTRACTOR - ARCHITECTURAL AND INDUSTRIAL MAINTENANCE COATINGS .....	19
NOTICE TO CONTRACTOR - PROCUREMENT OF MATERIALS.....	22
NOTICE TO CONTRACTOR – WORK ON OR ABOVE AMTRAK.....	23
PROPERTY .....	23
NOTICE TO CONTRACTOR - RAILROAD SPECIFICATIONS.....	49
UNNOTICE TO CONTRACTOR – RAILROAD INSURANCE .....	50
INFORMATION.....	50
NOTICE TO CONTRACTOR – ALLOWABLE TRACK OUTAGES.....	51
NOTICE TO CONTRACTOR – TRACK MONITORING.....	55
NOTICE TO CONTRACTOR – FEDERAL RAIL SAFETY.....	57
REGULATIONS (49 CFR PART 219) CONCERNING ALCOHOL AND DRUG TESTING .....	57
NOTICE TO CONTRACTOR - UTILITY SPECIFICATIONS.....	58
NOTICE TO CONTRACTOR - RIGHTS OF WAY RESTRICTIONS.....	59
NOTICE TO CONTRACTOR - 1.05 CONTROL OF THE WORK .....	60
NOTICE TO CONTRACTOR - QUALITY CONTROL PROGRAM.....	61
NOTICE TO CONTRACTOR - DETOUR.....	62
NOTICE TO CONTRACTOR – ENVIRONMENTAL INVESTIGATIONS .....	63
NOTICE TO CONTRACTOR – NOANK FIRE DISTRICT WATER.....	67
DEPARTMENT REGULATIONS AND SPECIFICATIONS .....	67
NOTICE TO CONTRACTOR – GEOTECHNICAL REPORT .....	96
D.B.E. SUBCONTRACTORS AND MATERIAL SUPPLIERS OR MANUFACTURERS.....	97
SECTION 1.02 – PROPOSAL REQUIREMENTS AND CONDITIONS .....	109
SECTION 1.03 - AWARD AND EXECUTION OF CONTRACT .....	110
SECTION 1.05 - CONTROL OF THE WORK .....	111
SECTION 1.06 - CONTROL OF MATERIALS .....	114
SECTION 1.07 - LEGAL RELATIONS AND RESPONSIBILITIES.....	115
SECTION 1.08 - PROSECUTION AND PROGRESS.....	121
SECTION 2.86 - DRAINAGE TRENCH EXCAVATION, ROCK IN DRAINAGE TRENCH EXCAVATION .....	124
SECTION 4.06 - BITUMINOUS CONCRETE .....	128
SECTION 5.86 - CATCH BASINS, MANHOLES AND DROP INLETS.....	151
SECTION 6.01 - CONCRETE FOR STRUCTURES.....	155
SECTION 6.03 - STRUCTURAL STEEL.....	181
SECTION 6.86 - DRAINAGE PIPES, DRAINAGE PIPE ENDS.....	182

SECTION 10.00 - GENERAL CLAUSES FOR HIGHWAY .....	186
ILLUMINATION AND TRAFFIC SIGNAL PROJECTS .....	186
SECTION M.03 - PORTLAND CEMENT CONCRETE .....	187
SECTION M.04 - BITUMINOUS CONCRETE MATERIALS .....	195
SECTION M.06 - METALS.....	215
ITEM #0020801A – ASBESTOS ABATEMENT .....	218
ITEM #0020903A – LEAD COMPLIANCE FOR MISCELLANEOUS .....	229
EXTERIOR TASKS .....	229
ITEM #0101000A - ENVIRONMENTAL HEALTH AND SAFETY .....	246
ITEM #0101143A – HANDLING AND DISPOSAL OF REGULATED .....	254
ITEMS .....	254
ITEM #0202315A - DISPOSAL OF CONTROLLED MATERIALS .....	264
ITEM #0406275A - FINE MILLING OF BITUMINOUS CONCRETE (0 TO .....	270
4 INCHES) .....	270
ITEM #0514271A – PRECAST CONCRETE/STEEL COMPOSITE .....	274
SUPERSTRUCTURE.....	274
ITEM #0520041A - PREFORMED JOINT SEAL.....	283
ITEM #0521014A – STEEL-LAMINATED ELASTOMERIC BEARINGS.....	286
ITEM #0522178A - CONSTRUCT CONCRETE KEEPER BLOCKS .....	291
ITEM #0601054A – ULTRA HIGH PERFORMANCE CONCRETE .....	293
ITEM #0601091A - SIMULATED STONE MASONRY .....	299
ITEM #0601107A – HIGH EARLY STRENGTH CONCRETE.....	305
ITEM #0601275A – PRECAST SUBSTRUCTURE ELEMENTS .....	308
ITEM #0601277A – PRECAST CONCRETE BRIDGE COMPONENTS.....	316
ITEM #0601954A – EPOXY INJECTION CRACK REPAIR .....	324
ITEM #0602910A – DRILLING HOLES AND GROUTING DOWELS .....	333
ITEM #0603474A – METALLIZING STRUCTURAL STEEL (SITE NO. 1) .....	335
ITEM #0707009A - MEMBRANE WATERPROOFING (COLD LIQUID .....	342
ELASTOMERIC) .....	342
ITEM #0712021A – GRS ABUTMENT AND WINGWALL.....	348
ITEM #0712023A – REINFORCED SOIL FOUNDATION (RSF) .....	348
ITEM #0712024A – REINFORCED INTEGRATED APPROACH .....	348
ITEM #0728051A – STABILIZED STONE SLOPE PROTECTION.....	355
ITEM #0819002A - PENETRATING SEALER PROTECTIVE COMPOUND .....	356
ITEM #0822005A – TEMPORARY PRECAST CONCRETE BARRIER .....	359
CURB (STRUCTURE) .....	359
ITEM #0822006A – RELOCATED TEMPORARY PRECAST CONCRETE .....	359
BARRIER CURB (STRUCTURE) .....	359
ITEM #0904949A -METAL BRIDGE RAIL (SOLID PANEL) (8' HIGH) .....	363
ITEM #0904953A -METAL BRIDGE RAIL (SOLID PANEL) (7' HIGH) (CURVED .....	366
TOP) .....	366
ITEM #0910600A – 8” X 6” BOX BEAM GUIDE RAILING .....	369
ITEM #0910602A – 8” X 6” BOX BEAM GUIDE RAILING END .....	370
ASSEMBLY .....	370
ITEM #0910610A – 8” X 6” BOX BEAM BRIDGE ATTACHMENT .....	371
ITEM #0913068A – TEMPORARY 6' CHAIN LINK FENCE .....	372
ITEM #0913835A – REMOVE AND RESET CHAIN LINK FENCE .....	374
ITEM #0917010A – REPAIR GUIDERAIL.....	375
ITEM #0921011A – CONCRETE DRIVEWAY .....	377
ITEM #0922503A – GRAVEL DRIVEWAY.....	379
ITEM #0952001A – SELECTIVE CLEARING AND THINNING .....	380
ITEM #0969054A - CONTRACTOR QUALITY CONTROL PROGRAM .....	381
LEVEL 1 .....	381

ITEM #0971001A – MAINTENANCE AND PROTECTION OF TRAFFIC.....389

ITEM #1004302A – ROADWAY LUMINAIRE-HIGH PRESSURE SODIUM.....407

(150 WATT) .....407

ITEM #1015034A - GROUNDING AND BONDING .....409

ITEM #1118101A – TEMPORARY SIGNALIZATION .....413

ITEM #1206023A – REMOVAL AND RELOCATION OF EXISTING SIGNS.....415

ITEM #1208931A – SIGN FACE - SHEET ALUMINUM (TYPE IX .....416

RETROREFLECTIVE SHEETING) .....416

ITEM #1300005A – RELOCATION OF WATER MAINS.....418

ITEM #1301019A – TEMPORARY RELOCATION OF WATER MAINS.....424

ITEM #1504010A - TEMPORARY SUPPORT OF UTILITIES .....431

PERMITS AND/OR REQUIRED PROVISIONS .....433

**AUGUST 21, 2019**  
**FEDERAL AID PROJECT NO. 6058(002)**  
**STATE PROJECT NO. 58-336**

**REHABILITATION OF BRIDGE NO. 03903**  
**MOSHER AVENUE OVER AMTRAK**

**Town of Groton**  
**Federal Aid Project No. 6058(002)**

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 2019 (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. 03903 Mosher Avenue over AMTRAK in the Town of Groton.

**CONTRACT TIME AND LIQUIDATED DAMAGES**

Five Hundred Eighty-Nine (589) calendar days will be allowed for completion of the work on this Contract and the liquidated damages charge to apply will be Two Thousand Four Hundred Dollars (\$2,400.00) per calendar day.

**PROSECUTION OF WORK**

In order to minimize the hazard, cost and inconvenience to the traveling public, pollution of the environment, and the detriment to the commercial and residential area, 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. Traffic operation for vehicles and pedestrians shall be in accordance with the plans and specifications for Maintenance and Protection of Traffic.

The allowable contract time was developed using standard working hours for the length of the Contract, taking into consideration the restrictions in the “Limitation of Operation,” except during the road closure events listed below. There will be no extensions of time granted for weekends, holidays and weather-related shutdowns. The Contractor will be allowed to work during any time period which is not specifically disallowed in this Contract. Traffic disruptions will be permitted only during periods that the specifications allow.

All necessary advance, preparatory work must be completed prior to any Milestone Events that close the bridge to vehicular and/or pedestrian traffic. The Contractor shall notify the Engineer, Town and Noank Water Company Four (4) Weeks in advance of any closure.

### **CONTRACT MILESTONE EVENTS**

The Contract has six Milestone Events with associated Liquidated Damages.

**Milestone 1** is associated with the Installation of Reinforced Soil behind the abutments.

**Milestone 2** is associated with the Temporary Water Main on the north side of the bridge.

**Milestone 3** is associated with the Interruption to the Water Main Service.

**Milestone 4** is associated with the Fabrication of Prefabricated/Precast Components.

**Milestone 5** is associated with the Replacement of the Bridge Superstructure.

**Milestone 6** is associated with the Opening of the Bridge to two lanes of traffic.

The Milestone Events are defined as follows:

#### **Milestone 1: Installation of Reinforced Soil behind Abutments.**

This Milestone is achieved when all of the required work described below is complete and accepted by the Engineer and the road and sidewalk are reopened to 2-way vehicular traffic and pedestrians.

The Contractor shall move the existing utilities that are currently supported by the bridge out of the way to accommodate his work, by installing a temporary utility bridge and moving the existing utilities onto the temporary utility bridge. The utilities will remain in service at all times, except for the allowable outages described elsewhere in these specifications. The Contractor must demonstrate that he has coordinated with Amtrak the dates and times when his operations will impact train service.

The Contractor shall excavate the existing material behind both abutments and then backfill the excavation with reinforced soil. The roadway and sidewalk shall be paved and striped and all required roadside safety features shall be installed and accepted by the Engineer. Two-way vehicular traffic and pedestrian access shall be reestablished across the bridge and through the intersection with Ward Avenue, upon approval from the Engineer.

In order to achieve this Milestone, the Contractor shall fully close the roadway and sidewalks across the bridge and detour vehicular traffic. All necessary signage for the road closure and detour must be in place, prior to the closure.

**Milestone 2: Temporary Water Main Service on the North Side of the Bridge.**

This Milestone is achieved when all of the required work described below is complete and accepted by the Engineer and the water main on the temporary utility bridge is in service and accepted by the Noank Water Company and the Engineer.

The Contractor shall install a temporary at-grade water main outside of his active work area on the North Side of the Bridge. The temporary water main shall be tested and put into service with the approval of the Noank Water Company and the Engineer.

The Contractor shall install a new water main on the temporary utility bridge on the South Side of the Bridge. The new water main shall be tested and put into service with the approval of the Noank Water Company and the Engineer.

In order to achieve this Milestone, the Contractor may shut off flow within the water main for the period of time described below, for each relocation of service. Close coordination with the Noank Water Company is required for all service interruptions.

**Milestone 3: Temporary Interruption of Watermain Service.**

This Milestone is achieved when all of the required work described below is complete and accepted by the Engineer and water main service has been restored across Amtrak with the approval of the Noank Water Company and the Engineer. Close coordination with the Noank Water Company is required for all service interruptions.

The Contractor shall have the majority of the new water main installed, pressure tested, sanitized and accepted by the Noank Water Company and the Engineer, prior to the shutting down of the in-service water main. Written approval must be received by the Noank Water Company before shutting down the in-service water main.

Upon approval of the Noank Water Company and the Engineer, the Contractor shall establish flow through the new water main and shut off the portion of water main to be abandoned. Flow and pressure through the new water main shall be verified, as directed by the Noank Water Company.

**Milestone 4: Fabrication of Prefabricated Bridge Units (PBUs) and Precast Concrete Components.**

This Milestone is achieved when all of the required work described below is complete and accepted by the Engineer and the PBUs and Precast Concrete Components have been fabricated, tested and accepted by the Engineer and the means and schedule to deliver them to the project

site, at the required time, has been determined, approved by the Engineer and confirmed in writing by the Contractor.

The Contractor shall fabricate the PBUs and Precast Concrete Components in accordance with the requirements specified in the Special Provisions for Item Nos. 0514271A, 0601275A and 0601277A. The specific means to deliver the PBUs and Precast Concrete Components to the site, included the shipping route and required permits, and the schedule of delivery shall be submitted to the Engineer for approval.

### **Milestone 5: Replacement of the Bridge Superstructure.**

This Milestone is achieved when all of the required work described below is complete and accepted by the Engineer and the bridge is reopened to 1-way alternating vehicular traffic and pedestrians in a dedicated pathway.

The Contractor shall prepare and submit a detailed schedule of major operations, broken down into daily intervals, or hourly intervals when appropriate, to the Engineer for review and approval, 4 weeks prior to the closure of the bridge. The schedule must be based on allowable track outages and should include contingency time to accommodate instances when anticipated track outages are not granted.

The Contractor shall have all required equipment, materials and ancillary components approved and on site prior to the closure of the bridge. Or the Contractor shall have a plan and schedule to deliver them to the site at the required times, which has been reviewed and approved by the Engineer and confirmed in writing by the Contractor. The Contractor must demonstrate that he has coordinated with Amtrak the dates and times when his operations will impact train service.

The Contractor shall demolish the existing superstructure, modify the existing substructure and install the new PBUs. The new backwalls shall be installed and closure pour concrete shall be placed cured.

The approach roadways shall be paved and striped and all required roadside safety features shall be installed and accepted by the Engineer. Alternating 1-way vehicular traffic and pedestrian access shall be reestablished across the bridge and through the intersection with Ward Avenue, with all necessary traffic control features in place, upon approval from the Engineer.

In order to achieve this Milestone, the Contractor shall fully close the roadway and sidewalk across the bridge and detour vehicular traffic. All necessary signage for the road closure and detour must be in place, prior to the closure.

### **Milestone 6: Completion of the Superstructure and Opening the Bridge to 2-Way Traffic.**



This Milestone is achieved when all of the required work described below is complete and accepted by the Engineer and the road and sidewalk are reopened to 2-way vehicular traffic and pedestrians.

The Contractor shall construct the sidewalk, parapets and protective fence on the bridge. The membrane waterproofing shall be applied, and the bituminous concrete shall be placed and compacted. The approach roadways shall be paved and the bridge joints installed.

The approach roadways shall be striped and all required roadside safety features shall be installed and accepted by the Engineer. Two-way vehicular traffic and pedestrian access shall be reestablished across the bridge and through the intersection with Ward Avenue, with all necessary traffic control features in place, upon approval from the Engineer.

In order to achieve this Milestone, the Contractor shall work behind temporary precast concrete barriers and may shift them in order to achieve wider work areas while maintaining alternating 1-way vehicular traffic and a pedestrian pathway. The Contractor may fully close the bridge to vehicular and pedestrian traffic and detour vehicular traffic, one more time, to apply the membrane waterproofing and install the final paving. All necessary signage for the road closure and detour must be in place, prior to the closure.

### **MILESTONE LIQUIDATED DAMAGES PROVISIONS**

The Contractor is responsible for developing his own phasing plan for the Engineer's review and approval for the project work. A suggested phasing plan, representing one possible sequence, is provided in the Contract Plans for the Contractor's information.

Although the Contractor is responsible for developing his own phasing plan, the Contractor shall comply with the construction milestones and maximum work durations described below. Failure to complete this work within the specified timeframes will result in the assessment of a Liquidated Damage charges, as described herein.

In order to achieve the requirements of the Milestones, the Contractor may need to employ multiple crews working simultaneously, during multiple shifts, and sometimes around the clock, during the road closure events.

#### **Milestone 1: Installation of Reinforced Soil behind Abutments.**

One Hundred, Eight (108) consecutive Hours will be allowed for the road closure to achieve the completion of Milestone 1. The allowable period for this road closure will begin at 8:00 a.m. on Monday and end at 8:00 p.m. on Friday, of the same week. The closure can occur no later than the last full week of October.

The Contractor will be assessed liquidated damages for failure to achieve the completion of Milestone 1 by 8:00 p.m. on Friday, in the amount of One Thousand Dollars (\$1,000) per Hour,

for each hour or any portion thereof, after 9:00 p.m. For Milestone 1, the aggregate amount of the liquidated damage shall not exceed Forty-Eight Thousand Dollars (\$48,000).

**Milestone 2: Temporary Water Main Service on the North Side of the Bridge.**

Eleven (11) consecutive Days will be allowed for the temporary water main to be in service on the north side of the bridge road, allowing for the completion of Milestone 2. For the purposes of this milestone, a Day is defined as the 24-hour period beginning at 12:00 a.m. (midnight) and ending at 11:59 p.m.

The Contractor will be assessed liquidated damages for failure to achieve the completion of Milestone 2 by 11:59 p.m. on the 11<sup>th</sup> day, in the amount of Two Thousand Dollars (\$2,000) per Day, for each day or any portion thereof, after the 11<sup>th</sup> Day. For Milestone 2, the aggregate amount of the liquidated damage shall not exceed Ten Thousand Dollars (\$10,000).

**Milestone 3: Temporary Interruption of Watermain Service.**

Twelve (12) consecutive Hours will be allowed for each occurrence of temporary interruption to the water main service across Amtrak Railroad at Mosher Avenue, allowing for the completion of Milestone 3.

The Contractor will be assessed liquidated damages for failure to achieve the completion of Milestone 3 by the end of the 12<sup>th</sup> hour for each occurrence, in the amount of One Thousand Dollars (\$1,000) per Hour, for each hour or any portion thereof, after the 12<sup>th</sup> Hour. For Milestone 3, the aggregate amount of the liquidated damage shall not exceed Thirty-Six Thousand Dollars (\$36,000), for all occurrences combined.

**Milestone 4: Fabrication of Prefabricated Bridge Units (PBUs) and Precast Concrete Components.**

All prefabricated and precast components, necessary for the modification of the substructure and the replacement of the superstructure, must be complete and approved by 3:00 p.m. on February 1, 2021, to achieve completion of Milestone 4. For the purposes of this milestone, a Day is defined as the 24-hour period beginning at 2:59 p.m. and ending at 3:00 p.m. of the following day.

The Contractor will be assessed liquidated damages for failure to achieve the completion of Milestone 4 by 3:00 p.m. on February 1, 2021, in the amount of Ten Thousand Dollars (\$10,000) per Day, for each day or any portion thereof, after the February 1, 2021. For Milestone 3, the aggregate amount of the liquidated damage shall not exceed Two Hundred, Eighty Thousand Dollars (\$280,000).

**Milestone 5: Replacement of the Bridge Superstructure.**

Eighty-Four (84) consecutive Days will be allowed for the road closure to achieve the completion of Milestone 5. The milestone must be achieved no later than May 23, 2021. For the

purposes of this milestone, a Day is defined as the 24-hour period beginning at 12:00 a.m. (midnight) and ending at 11:59 p.m.

The Contractor will be assessed liquidated damages for failure to achieve the completion of Milestone 5 by 11:59 p.m. on the 84<sup>th</sup> day and by May 23, 2021, in the amount of Ten Thousand Dollars (\$10,000) per Day, for each day or any portion thereof, after the 84<sup>th</sup> Day and May 23, 2021. For Milestone 5, the aggregate amount of the liquidated damage shall not exceed Five Hundred, Sixty Thousand Dollars (\$560,000).

#### **Milestone 6: Completion of the Superstructure and Opening the Bridge to 2-Way Traffic.**

Eighty-Four (84) consecutive Days will be allowed for the use of 1-Way Alternating traffic across the bridge to achieve the completion of Milestone 6. For the purposes of this milestone, a Day is defined as the 24-hour period beginning at 12:00 a.m. (midnight) and ending at 11:59 p.m.

The Contractor will be assessed liquidated damages for failure to achieve the completion of Milestone 6 by 11:59 p.m. on the 84<sup>th</sup> day, in the amount of Two Thousand, Five Hundred Dollars (\$2,500) per Day, for each day or any portion thereof, after the 84<sup>th</sup> Day. For Milestone 6, the aggregate amount of the liquidated damage shall not exceed One Hundred, Forty Thousand Dollars (\$140,000).

#### **MILESTONE LIQUIDATED DAMAGES TERMS AND CONDITIONS**

The milestone liquidated damage provisions shall apply to all circumstances in which the Engineer has not received verification in writing from the Contractor that the Contract work, required to achieve the completion of the milestone, has been completed on or before the Milestone Completion Date, specified above.

If the Contractor does not complete the pertinent work on or before the applicable Milestone Completion Date, the Department will deduct from monies otherwise owed to the Contractor the pertinent milestone liquidated damages amount listed in the “Milestone Liquidated Damages Provisions”.

There will be no Incentive Payment for this work.

These Milestone aggregate amounts shall be considered separate from any Liquidated Damages assessed to the Contractor for failure to complete the total project on time per Section 1.08.09 of the Form 817 Standard Specifications.

**NOTICE TO CONTRACTOR – AWARD AND EXECUTION OF CONTRACT**

Bridge No. 02932 is anticipated to have a Notice to Proceed prior to April 1, 2020. See Section 1.03 – Award and Execution of Contract.

Work anticipated April 1, 2020 to November 30, 2020 includes, but is not limited to, utility work (by others), mobilization, construction staking and layout, clearing and grubbing, shop drawings, fabrication, Prefabricated Bridge Unit (PBU) construction, installing sedimentation and erosion control measures, installing temporary fence, M&PT measures, installing temporary shields, permanent underground utility relocation, temporary above ground utility relocation, demolition of the south overhang, earth stabilization, temporary pavement, installation of the temporary utility bridge, temporary barriers, temporary bituminous sidewalk, and site cleanup.

Work anticipated November 30, 2020 to April 1, 2021 includes, but is not limited to, ground preparation for cranes above temporary earth stabilization, demolition of the north overhang, modification of the shielding, crane mobilization, Placement of PBU Module A, placement of PBU module B, removal of existing deck slab and concrete encasement, temporary bracing of the through-girders, removal of floor beams and stringers, removal of temporary shielding, removal of through-girders.

The bridge is anticipated to be closed Monday through Friday during one (1) week in the Fall of 2020 for the soil reinforcement construction to take place. Work for the soil reinforcement will include excavation of contaminated soils, which shall be direct hauled from the site. Overnight work is anticipated in order to complete the soil reinforcement in the allotted time period. The bridge closure will extend from Monday, 12 A.M. to Friday, 11:59 P.M. of the same week (total of five (5) days). The week chosen for this work shall be approved by the District.

The full bridge closure for the replacement of the superstructure is anticipated to start March 3, 2021 and be complete by May 30, 2021.

**NOTICE TO CONTRACTOR – POTENTIAL MODIFIED AWARD SCHEDULE**

The contractor is hereby given notice that this contract will not be awarded until all State and Federal funding approvals have been received. If funding approvals are not received, this Contract award may be delayed or the Contract may be withdrawn and re-advertised at the discretion of the Department, per section XIII of the Construction Contract Bidding and Award Manual. Any delay to the Contract award or failure to award shall not be the basis for any claims by any bidder.

## **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 - 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). Other deliverables that are required by other special provisions shall be similarly submitted.

Access credentials will be provided to the Contractor by the Department.

The Department will provide the Contractor with a list of email addresses that are to be used for each submittal type.

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 – FEDERAL WAGE DETERMINATIONS (Davis Bacon Act)**

The following Federal Wage Determinations are applicable to this Federal- Aid contract and are hereby incorporated by reference. During the bid advertisement period, it is the bidder’s responsibility to obtain the latest Federal wage rates from the US Department of Labor website, as may be revised 10 days prior to bid opening. Any revisions posted 10 days prior to the bid opening shall be the wage determinations assigned to this contract.

Check Applicable WD# (DOT Use Only)	WD#	Construction Type	Counties
	CT1	Highway	Fairfield, Litchfield, Middlesex, New Haven, Tolland, Windham
XXX	CT2	Highway	New London
	CT3	Highway	Hartford
	CT5	Heavy Dredging (Hopper Dredging)	Fairfield, Middlesex, New Haven, New London
	CT6	Heavy Dredging	Statewide
	CT13	Heavy	Fairfield
	CT14	Heavy	Hartford
	CT15	Heavy	Middlesex, Tolland
	CT16	Heavy	New Haven
	CT17	Heavy	New London
	CT26	Heavy	Litchfield, Windham
	CT18	Building	Litchfield
	CT19	Building	Windham
	CT20	Building	Fairfield
	CT21	Building	Hartford
	CT22	Building	Middlesex
	CT23	Building	New Haven
	CT24	Building	New London
	CT25	Building	Tolland
	CT4	Residential	Litchfield, Windham
	CT7	Residential	Fairfield
	CT8	Residential	Hartford
	CT9	Residential	Middlesex
	CT10	Residential	New Haven
	CT11	Residential	New London
	CT12	Residential	Tolland

The Federal wage rates (Davis-Bacon Act) applicable to this Contract shall be the Federal wage rates that are current on the US Department of Labor website (<http://www.wdol.gov/dba.aspx>) as may be revised 10 days prior to bid opening. The Department will no longer physically include revised Federal wage rates in the bid documents or as part of addenda documents. These applicable Federal wage rates will be incorporated in the final contract document executed by both parties.

If a conflict exists between the Federal and State wage rates, the higher rate shall govern.

To obtain the latest Federal wage rates, go to the US Department of Labor website (link above). Under Davis-Bacon Act, choose “Selecting DBA WDs” and follow the instruction to search the latest wage rates for the State, County and Construction Type.



**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 - PORTLAND CEMENT CONCRETE (PCC) MIX CLASSIFICATIONS**

***SECTIONS 6.01 and M.03 MIX CLASSIFICATION EQUIVALENCY***

Sections 6.01 *Concrete for Structures* and M.03 *Portland Cement Concrete* are herein revised to reflect changes to item names and nomenclature for standard Portland Cement Concrete (PCC) mix classifications. Other Special Provisions, standard specifications, plan sheets and select pay items in this Contract may not reflect this change. Refer to the Concrete Mix Classification Equivalency Table below to associate the Concrete Mix Classifications with Former Mix Classifications that may be present elsewhere in the Contract.

**Concrete Mix Classification Equivalency Table**

New Mix Classification (Class PCCXXYZ <sup>1</sup> )	Former Mix Classification
Class PCC03340	Class “A”
Class PCC03360	Class “C”
Class PCC04460 <sup>2</sup>	Class “F”
Class PCC04462 <sup>2</sup>	High Performance Concrete
Class PCC04481, PCC05581	Class “S”

Table Notes:

1. See Table M.03.02-1, Standard Portland Cement Concrete Mixes, for the new Mix Classification naming convention.
2. Class PCC04462 (low permeability concrete) is to be used for the following cast-in-place bridge components: decks, bridge sidewalks, and bridge parapets.

Where called for in the Contract, **Low Permeability Concrete** shall be used, as specified in Sections 6.01 and M.03. Please pay special attention to the requirements for Class PCC04462, including:

- Submittal of a mix design developed by the Contractor and a concrete supplier **at least 90 days prior to placing the concrete**
- Testing and trial placement of the concrete mix to be developed and discussed with the Department

The Department will not consider any requests for change to eliminate the use of Low Permeability Concrete on this Project.

## **NOTICE TO CONTRACTOR - ARCHITECTURAL AND INDUSTRIAL MAINTENANCE COATINGS**

This Contract includes the application of materials subject to the Volatile Organic Compounds (VOC) content limits stated in the Regulations of Connecticut State Agencies (RCSA) Sections 22a-174-41 and -41a. All architectural and industrial maintenance (AIM) coatings and applications of such coatings must comply with these regulations.

The Contractor shall submit a Material Safety Data Sheet/Safety Data Sheet or Product Technical Data Sheet developed by the manufacturer of each material that may be subject to the Regulations. The submittal must verify both the type of AIM and its VOC Content. VOC content shall be determined based on the formulation data supplied by the materials manufacturer.

The Contractor may only use AIM coatings that contain VOCs below the respective coating category Phase II limits specified in Table 1 if either:

- a) the coating was manufactured on or after May 1, 2018, **or**
- b) the coating is being applied after April 30, 2021.

The Contractor may use AIM coatings that contain VOCs exceeding the respective coating category Phase II limits specified in Table 1 only if all of the following four conditions are met:

- a) the coating is being applied on or before April 30, 2021,
- b) the coating contains VOCs below the applicable Phase I limits specified in Table 1,
- c) the coating was manufactured prior to May 1, 2018, **and**
- d) the coating container(s) are dated (or date coded) as such.

For any coating that is not categorized within Table 1, the Contractor shall classify the coating as follows and apply corresponding limits in Table 1.

- Registers gloss <15 on an 85-degree meter or <5 on a 60-degree meter) – Flat Coating,
- Registers gloss of  $\geq 15$  on an 85-degree meter and  $\geq 5$  on a 60-degree meter) - Nonflat Coating,
- Registers gloss of  $\geq 70$  on a 60-degree meter - Nonflat-High Gloss Coating.

The Contractor must close all containers of coating and solvent when not in use.

Coating container labels must display the date the coating was manufactured, the manufacturer's recommendation regarding thinning with solvent, and the coating's VOC content in grams per liter (g/L) of coating. Certain coating categories as noted in Table 1 have additional labeling requirements.

The Contractor may add additional solvent to a coating only if such addition does not cause the coating to exceed the applicable VOC limit specified Table 1. The Contractor must adhere to type(s) of solvent and maximum amount of solvent recommended by coating manufacturer. VOC content of a thinned coating shall be the VOC content as listed by the manufacturer after thinning in accordance with its recommendation.

<b>TABLE 1</b>		
<b>Coating Category</b>	<b>Phase I</b>	<b>Phase II</b>
	<b>manufactured prior to May 1, 2018 VOC content limit (g/L)</b>	<b>manufactured on or after May 1, 2018 VOC content limit (g/L)</b>
<b>Aluminum roof coating</b>	--- <sup>1</sup>	450
<b>Antenna coating</b>	530	--- <sup>1</sup>
<b>Antifouling coating</b>	400	--- <sup>1</sup>
<b>Basement specialty coating</b>	--- <sup>1</sup>	400
<b>Bituminous roof coating</b>	300	270
<b>Bituminous roof primer</b>	350	350
<b>Bond breaker</b>	350	350
<b>Calcimine recoater</b>	475	475
<b>Clear wood coating - Clear brushing lacquer<sup>2</sup></b>	680	275
<b>Clear wood coating - Lacquer<sup>2,3</sup></b>	550	275
<b>Clear wood coating - Sanding sealer<sup>2,4</sup></b>	350	275
<b>Clear wood coating - Varnish<sup>2</sup></b>	350	275
<b>Concrete curing compound</b>	350	350
<b>Concrete or masonry sealer/ Waterproofing concrete or masonry sealer</b>	400	100
<b>Concrete surface retarder</b>	780	780
<b>Conjugated oil varnish</b>	--- <sup>1</sup>	450
<b>Conversion varnish</b>	725	725
<b>Driveway sealer</b>	--- <sup>1</sup>	50
<b>Dry fog coating</b>	400	150
<b>Faux finishing coating<sup>2</sup></b>	350	350
<b>Fire resistive coating</b>	350	350
<b>Fire retardant coating - Clear</b>	650	--- <sup>1</sup>
<b>Fire retardant coating - Opaque</b>	350	--- <sup>1</sup>
<b>Flat coating</b>	100	50
<b>Floor coating</b>	250	100
<b>Flow coating</b>	420	--- <sup>1</sup>
<b>Form-release compound</b>	250	250
<b>Graphic arts coating (sign paint)</b>	500	500
<b>High temperature coating</b>	420	420
<b>Impacted immersion coating</b>	780	780
<b>Industrial maintenance coating<sup>2</sup></b>	340	250
<b>Industrial maintenance coating</b>	340	250
<b>Low solids coating</b>	120	120
<b>Magnesite cement coating</b>	450	450
<b>Mastic texture coating</b>	300	100
<b>Metallic pigmented coating</b>	500	500
<b>Multi-color coating</b>	250	250

<b>TABLE 1</b>		
<b>Coating Category</b>	<b>Phase I</b>	<b>Phase II</b>
	<b>manufactured prior to May 1, 2018 VOC content limit (g/L)</b>	<b>manufactured on or after May 1, 2018 VOC content limit (g/L)</b>
<b>Nonflat coating</b>	150	100
<b>Nonflat high gloss coating<sup>2</sup></b>	250	150
<b>Nuclear coating</b>	450	450
<b>Pre-treatment wash primer</b>	420	420
<b>Primer, sealer and undercoater</b>	200	100
<b>Quick-dry enamel</b>	250	--- <sup>1</sup>
<b>Quick-dry primer, sealer and undercoater</b>	200	--- <sup>1</sup>
<b>Reactive penetrating carbonate stone sealer<sup>2</sup></b>	--- <sup>1</sup>	500
<b>Reactive penetrating sealer<sup>2</sup></b>	--- <sup>1</sup>	350
<b>Recycled coating</b>	250	250
<b>Roof coating</b>	250	250
<b>Rust preventive coating<sup>2</sup></b>	400	250
<b>Shellac Clear</b>	730	730
<b>Shellac Opaque</b>	550	550
<b>Specialty primer, sealer and undercoater<sup>2</sup></b>	350	100
<b>Stain</b>	250	250
<b>Stone consolidant<sup>2</sup></b>	--- <sup>1</sup>	450
<b>Swimming pool coating</b>	340	340
<b>Thermoplastic rubber coating and mastic</b>	550	550
<b>Traffic marking coating</b>	150	100
<b>Traffic marking coating</b>	150	100
<b>Tub and tile refinish</b>	--- <sup>1</sup>	420
<b>Waterproofing membrane</b>	--- <sup>1</sup>	250
<b>Waterproofing sealer</b>	250	--- <sup>1</sup>
<b>Wood coating<sup>2</sup></b>	--- <sup>1</sup>	275
<b>Wood preservative</b>	350	350
<b>Zinc-rich primer<sup>2</sup></b>	--- <sup>1</sup>	340

1 Classify as follows and apply corresponding limits in Table 1.

- Registers gloss <15 on an 85-degree meter or <5 on a 60-degree meter) – Flat Coating,
- Registers gloss of ≥15 on an 85-degree meter and ≥5 on a 60-degree meter) – Nonflat Coating
- Registers gloss of ≥70 on a 60-degree meter – Nonflat-High Gloss Coating

2 Container must be appropriately labeled. See RCSA 22a-174-41a

3 “Clear Wood Coating – Lacquer” includes lacquer sanding sealer

4 “Clear Wood Coating - Sanding Sealer” does not include lacquer sanding sealer

-END-

## **NOTICE TO CONTRACTOR - PROCUREMENT OF MATERIALS**

Upon award, the Contractor shall proceed with shop drawings, working drawings, procurement of materials, and all other submittals required to complete the work in accordance with the contract documents.

## **NOTICE TO CONTRACTOR – WORK ON OR ABOVE AMTRAK PROPERTY**

The Contractor acknowledges that work to be accomplished under this Contract is to be performed on Railroad territory, which consists of territory owned by the National Railroad Passenger Corporation (Amtrak). The Contractor's work must be accomplished simultaneously with ongoing daily railroad operations. Such operations include, but are not limited to, the passage of trains, storage of trains, flagging, inspection, repair, construction, reconstruction, and maintenance of the railroad right-of-way and facilities and must be in conformance with Amtrak EP3014.

The Contractor will be required to perform the following on or above Amtrak Right of Way:

1. Construct temporary utility support structure
2. Demolish existing structure
3. Construct new structure including, but not limited to:
  - a. Lifting and setting Prefabricated Bridge Units (PBU)
  - b. Placing concrete deck closure pours
  - c. Setting and relocating temporary structure barrier
  - d. Forming and placing cast-in-place parapets and sidewalks on structure
  - e. Installing protective fencing

The Contractor is advised that Amtrak controls all activity and the Department expects that these conditions may cause delays and possibly a complete suspension of construction activity. If the Contractor is delayed or suspended in the completion of work by Amtrak operations or restrictions, the Contractor will be entitled to a time extension for every full day that he can demonstrate that the delays affected the completion date of the contract. This extension of time will be considered non-compensable and the Contractor will not be entitled to any additional compensation for damages incurred for all direct and indirect costs including, but not limited to, all delay and impact costs, and inefficiencies.

There is a potential for limitations on track outages and extraordinary requirements for vehicular access coordination. The Contractor must conduct his work within such limitations. This will require night work and may require premium time (weekend work) or double shifts. The Contractor is fully responsible to complete the contract work.

### **Coordination of Work**

The Contractor shall be responsible for the coordination of the work of his various subcontractors. The Contractor shall coordinate his operations with those of the Railroad in carrying out railroad force account work.

Amtrak will make available railroad protection personnel and other railroad employees to provide various Support Services, including without limitation, protection services, inspection, and other services to ensure the safety of railroad operations and to protect contractor employees during the course of the construction. Notwithstanding any other provision of this contract, no work on the

project in the vicinity of Amtrak property may be performed before all protection services required by Amtrak are in place.

Amtrak will make available railroad construction personnel, to perform construction of Amtrak facilities in accordance with the plans. Specifically, all work involving rails, ties, ballast (uppermost 4" only), communication and signal equipment, and other Amtrak owned appurtenances, unless designated otherwise within the contract, will be performed by Amtrak. The contractor may not remove track unless given prior written approval by Amtrak and the Engineer.

The Contractor must make his own arrangements with Amtrak for the use of railroad equipment or changes in railroad facilities that are requested solely to facilitate the Contractor's operations. Any temporary at-grade crossings required to complete the project, if any, are identified on the plans. Temporary at-grade crossings other than those identified on the plans will not be permitted, except as approved by Amtrak. The expense incurred by making any such arrangement with Amtrak, including temporary at-grade crossings, shall be at the Contractors expense and not a part of this contract.

Some of the Contractor's activities will be required to take place during de-energizing of the catenary system. As the result of the time associated with Amtrak de-energizing and re-energizing the catenary system, there is a potential for limitations on track outages or foul time. The Contractor must conduct his work within such limitations. This may require the Contractor to perform night work, weekend work, or multiple shifts, all of which may be at premium time. The Contractor is fully responsible to complete the contract work.

The Contractor is notified the Contract plans may not reflect the current configuration of the railroad. Furthermore, the existing track structure may differ from the historical configuration of the railroad. It shall be the Contractor's responsibility to prepare a site specific work plan based on railroad facilities in their current configuration.

The work required to complete the project will require extensive coordination with Amtrak. As such, Amtrak has designated a primary point of contact for the initiative. All construction coordination, including but not limited to, scheduling of protection services, requesting of track outages, review/approval of site specific work plans, and other activities as determined by Amtrak, shall all be made through the designated point of contact. Amtrak's designee is:

Mr. Richard O'Brien  
 Project Manager  
 National Railroad Passenger Corporation  
 Midway Facility  
 101 Industrial Drive  
 Groton, CT 06340  
 Cell No. (267) 353-0304  
[ObrienR@Amtrak.com](mailto:ObrienR@Amtrak.com)

### **Access to Amtrak Property**

Contractors seeking permission to enter Amtrak property in furtherance of the project, or to do work on, over or adjacent to Amtrak property must first execute Amtrak's then-current standard "Temporary Permit to Enter Upon Property (Temporary Permit)" and comply with all requirements



thereto, including but not limited to, all insurance and safety requirements. The current version of the Temporary Permit shall be obtained by the contractor directly from Amtrak.

All matters pertaining to the Amtrak Temporary Permit and Insurance Requirements shall be directed to:

Mr. Michael Kolonauski  
Senior Manager - Engineering  
National Railroad Passenger Corporation  
30<sup>th</sup> Street Station, 4S-027, Mailbox 64  
2955 Market Street  
Philadelphia, PA 19104  
Telephone No. (215) 349-1127  
Michael.Kolonauski@Amtrak.com

### **Amtrak Contractor Safety and Security Training**

The Contractor, Subcontractors, and representative employees must first attend Owner's Safety Orientation Class. They are required to comply with Owner's safety requirements throughout the entire construction period. The Safety Orientation Class will be provided under the jurisdiction of the Project Engineer, who will be responsible to assure that the Contractor, Subcontractors, and the respective employees have completed the Safety Orientation Class. The Safety Orientation class is an online computer based program that is available 24 hours per day / 7 days per week, provided at the sole expense of the Contractor and Subcontractor on a per-person basis at <http://www.amtrakcontractor.com/>. All participants completing this course are required to be able to read, comprehend and demonstrate in English their understanding of the materials presented, as well as all the safety instructions, briefings and warnings. All other costs encountered due to complying with the Owner's safety requirements will be at the sole expense of the Contractor and Subcontractor.

The Contractor should contact the Amtrak Contractor Safety Enrollment Coordinator for information concerning the training class. The coordinator's contact information is as follows:

Mr. Joseph Travaglino  
Project Engineer  
National Railroad Passenger Corporation (AMTRAK)  
MOW Base – Hamden, CT  
255 Welton Street, 2<sup>nd</sup> Floor Rear  
Hamden, CT 0617  
Phone (201) 397-4750  
[Joseph.Travaglino@Amtrak.com](mailto:Joseph.Travaglino@Amtrak.com)

### **Potential Track Outages and Foul Time**

In general, unless otherwise authorized by Amtrak, operations directly over or adjacent to operating right-of-way will be performed during the time periods noted in the "Notice to Contractor – Allowable Track Outages", elsewhere in these special provisions.

Amtrak anticipates that track outages from 11:30pm-3:30am (Mon-Sun) will be available in 2021, however, this is not guaranteed.

Overhead Catenary System (OCS) outages are required, therefore the available time will be reduced by 1 hour on each end to obtain/release the OCS clearance. Amtrak cannot guarantee the availability of any outage at a particular time. It should also be expressly understood that; a) actual length of time for any track outage is contingent upon operating schedules at time of construction; b) programmed Amtrak construction and maintenance work requiring track outage within the same operating block will have priority, therefore contract work requiring track outage, if scheduled within the same time frame, must be coordinated with such work; and c) the potential times for track outages are not guaranteed and are for normal operating conditions. Contractors will be required to submit a two week look ahead schedule to coordinate work outages with other projects. Outages are subject to availability based on Train operations and other Amtrak projects.

As established under the contract, and as detailed under the Standard Specifications (Form 817), this Notice to Contractor, and the additional Amtrak requirements included herein, the Contractor's operations shall be planned and staged to avoid track usage unless absolutely essential. The Contractor's plans for demolition, erection, and any operation adjacent to or within the Railroad Right of Way shall be submitted to the Engineer for Railroad approval, prior to start of work. Further, track usage is granted by Amtrak based on need, not for the convenience of the Contractor.

### **Train Operations**

- Currently, through the project area, there are 38 Amtrak trains Monday – Friday and 24 Saturday and 28 Sunday.
- There is one schedule freight train that runs from Monday through Friday at night, and no freight trains running on Saturday or Sunday day/night. However, this is subject to change.
- The maximum speed of passenger trains is 80 mph (35 mph freight). A “Slow Down Order” will not be in effect through the project site.
- The track(s) through the project site are considered “Main Line”.

### **Amtrak Specifications and Requirements**

The Contractor is hereby notified that the following railroad specifications are included as part of this Notice and shall be made a part of this contract. The Contractor shall be bound to comply with all requirements of these specifications. The requirements and conditions set forth in the subject specifications shall be binding on the Contractor just as any other specification would be.

EP3005 - PIPELINE OCCUPANCY

SECTION 2081A - PIPELINE OCCUPANCY

SECTION 2082A -	ADDITIONAL REQUIREMENTS FOR HORIZONTAL DIRECTIONAL DRILLING (HDD) / DIRECTIONAL BORING
EP3006 -	DESIGN AND CONSTRUCTION CRITERIA FOR OVERHEAD BRIDGES
EP3014 -	MAINTENANCE AND PROTECTION OF RAILROAD TRAFFIC DURING CONTRACTOR OPERATIONS
SECTION 01141A -	SAFETY AND PROTECTION OF RAILROAD TRAFFIC AND PROPERTY
SECTION 01142A -	SUBMISSION DOCUMENTATION REQUIRED FOR AMTRAK REVIEW AND APPROVAL OF PLANS FOR BRIDGE ERECTION, DEMOLITION AND OTHER CRANE/ HOISTING OPERATIONS OVER RAILROAD RIGHT-OF-WAY
SECTION 01520A -	REQUIREMENTS FOR TEMPORARY PROTECTION SHIELDS FOR DEMOLITION AND CONSTRUCTION OF OVERHEAD BRIDGES AND OTHER STRUCTURES
SECTION 02261A -	REQUIREMENTS FOR TEMPORARY SHEETING AND SHORING TO SUPPORT AMTRAK TRACKS
EP3016 -	STORM WATER DRAINAGE AND DISCHARGE FROM ADJACENT PROPERTY ONTO AMTRAK RIGHT OF WAY
SPEC. NO. 150 -	STORMWATER MANAGEMENT POLICY
AED-1	PROCEDURES AND DESIGN CRITERIA TO BE EMPLOYED BY ELECTRIFICATION CONSULTANTS ENGAGED IN THE DESIGN OF ELECTRIFICATION FACILITIES ON THE NATIONAL RAILROAD PASSENGER CORPORATION
CE-4	ELECTRIFIED TERRITORY SPECIFICATION FOR WIRE, CONDUIT AND CABLE OCCUPATIONS

**Contractor Requirements for Work Affecting Amtrak Railroad**

The Contractor shall be governed by the terms of the Contract and the referenced sections of the document entitled “State of Connecticut Department of Transportation, Standard Specifications for Roads, Bridges, and Incidental Construction, Form 817,” dated 2016, and supplemental specifications thereto dated January 2019, with the following additions:

1. All matters requiring National Railroad Passenger Corporation (Amtrak) approval or coordination shall be directed to:

Mr. Michael Kolonauski  
Director I&C Projects  
Amtrak - National Railroad Passenger Corporation  
30<sup>th</sup> Street Station, 4S-027, Box 64  
2955 Market Street  
Philadelphia, PA 19104  
(215) 349-1127

2. In general, unless otherwise authorized by Amtrak, operations directly over or adjacent to operating right-of-way will be performed during the time periods noted in the “Notice to Contractor – Allowable Track Outages”, elsewhere in these special provisions.

Temporary at-grade crossings across any tracks in the project area for vehicles and equipment for ANY purpose shall be approved by AMTRAK. Railroad property shall be accessed as shown on the Contract Plans.

Any work involving rail, ties, and other track components on active tracks, unless specifically designated otherwise within the contract, will be performed by Amtrak employees.

All tracks within the project limits shall be assumed to be operating / live, unless otherwise designated by Amtrak.

### **Protection of Utilities**

All underground utilities, cable, and facilities must be located and protected before any excavating, drilling, boring/direction drilling, ground penetrating activities, or construction takes place. This includes railroad and commercial utilities, cables, duct lines, and facilities. These activities will not be performed in close proximity to the Amtrak duct lines unless monitored by on-site Amtrak Communications and Signal (C&S) department personnel. Hand digging may be required, as directed by Amtrak through the on-site Amtrak C&S support personnel. Amtrak maintains the right to access all existing cables and conduits throughout construction. Amtrak also reserves the right to upgrade and install new cables and conduits in the affected area. The “One-Call” process must be followed. Be aware that Amtrak is not a part of the One-Call process; contact Amtrak Engineering to have all Amtrak underground utilities and assets located. If requested by Amtrak, existing depths of utilities being crossed must be verified through test pits performed by the Contractor as directed by and under the direct supervision of Amtrak C&S support personnel. Precautions must be taken to prevent any interruption to Amtrak’s operation. Precautions must be taken to prevent any interruption to Amtrak’s operation.

### **Insurance Requirements**

Amtrak “Exhibit D Insurance Requirements” are attached to this NTC.

### **Permit to Enter Upon Property**

All contractors must execute the then current version of Amtrak's "Temporary Permit to Enter Upon Property" which requires all persons that are on or adjacent to Amtrak property successfully complete the Contractor Orientation Training. All contractors must carry their "Amtrak Contractor Roadway Worker Protection" card with them at all times while on or adjacent to Amtrak property. Information for Temporary Permits to Enter Upon Amtrak Property (PTE) in the State of CT is attached to this NTC.

### **Clearance Requirements**

This project requires shielding to protect the track(s) and train operations during construction. As far as practical, the shielding shall be designed and constructed to provide a clear envelope around the track(s) that is equal to or greater than the envelope shown in the detail titled "Standard Track Plan Minimum Roadway Clearances" which is included in the Amtrak Specifications and Requirements and attached to this NTC.

This project reuses the existing abutments and therefore does maintains the existing vertical underclearance. Final approval for Design Exception Request 01 (DER-01) was granted by Amtrak on 12/4/2017, and will be part of the approval of the "Site Specific Work Plan". The approved DER-01 is attached to this NTC.

Due to the site constraints on this project, a design exception from Amtrak has been requested allowing a smaller clearance envelope with the dimensions of 21'-4" vertically from the top of the rails to the shielding. Design Exception Request 02 (DER-02) has been applied for and will be part of the approval of the "Site Specific Work Plan" when approved.

EXHIBIT D**INSURANCE REQUIREMENTS**

NATIONAL RAILROAD PASSENGER CORPORATION (AMTRAK) CHICAGO  
 UNION STATION COMPANY (CUSCO)  
 WASHINGTON TERMINAL COMPANY (WTC)  
 Revised as of March **14, 2013**

## DEFINITIONS

In these Insurance Requirements, "Railroad" or "Amtrak" shall mean National Railroad *Passenger* Corporation and, as appropriate, its subsidiaries Chicago Union Station Company ("CUSCO") and Washington Terminal Company ("WTC"). "Contractor" shall mean the party identified as "Permittee" in the Temporary Permit to Enter Upon Property Agreement or the party with whom Amtrak has contracted in another agreement (e.g., Preliminary Engineering Agreement, Design Phase Agreement, Construction Phase Agreement or Force Account Agreement), as well as its officers, employees, agents, servants, contractors, subcontractors, or any other person acting for or by permission of Contractor. "Operations" shall mean activities of or work performed by Contractor. "Agreement" shall mean the Temporary Permit to Enter Upon Property Agreement or other such agreement, as applicable.

## INSURANCE

Contractor shall procure and maintain, at its sole cost and expense, the types of insurance specified below. Contractor shall evidence such coverage by submitting to Amtrak the original Railroad Protective Liability Policy and certificates of insurance evidencing the other required insurance, prior to commencement of Operations. In addition, Contractor agrees to provide certified copies of the insurance policies for the required insurance within 30 days of Amtrak's written request. All *insurance* shall be procured from insurers authorized to do business in the jurisdiction(s) where the Operations are to be performed. Contractor shall require all subcontractors to carry the insurance required herein or Contractor may, at its option, provide the coverage for any or all subcontractors, provided the evidence of insurance submitted by Contractor to Amtrak so stipulates. The insurance shall provide for thirty (30) days prior written notice to Amtrak in the event coverage is substantially changed, canceled or non-renewed. All insurance shall remain in force until all Operations are satisfactorily completed (unless otherwise noted below), all Contractor personnel and equipment have been removed from Railroad property, and any work has been formally accepted. Contractor may provide for the insurance coverages with such deductibles or retained amounts as Amtrak may approve from time to time, except, however, that Contractor shall, at its sole expense, pay for all claims and damages which fall within such deductible or retained amount on the same basis as if there were full commercial insurance in force in compliance with these requirements. Contractor's failure to comply with the insurance requirements set forth herein shall constitute a violation of the Agreement.

1. Workers' Compensation Insurance complying with the requirements of the statutes of the jurisdiction(s) in which the Operations will be performed, covering all employees of Contractor.

Employer's Liability coverage with limits of not less than \$1 million each accident or illness shall be included.

In the event the Operations are to be performed on, over, or adjacent to navigable waterways, a U.S. Longshoremen and Harbor Workers' Compensation Act Endorsement and Outer Continental Lands Act Endorsement are required.

2. Commercial General **Liability** (CGL) Insurance covering liability of Contractor with respect to all operations to be performed and all obligations assumed by Contractor under the terms of the Agreement. Products-completed operations, independent contractors and contractual liability coverages are to be included, with the contractual exclusion related to construction/demolition activity within fifty (50) feet of the railroad deleted and no exclusions for Explosion/Collapse/Underground (X-C-U) applicable or added.

The policy shall name National Railroad Passenger Corporation and, as appropriate CUSCO or WTC, and all commuter agencies and railroads that operate over the property or tracks at issue as additional insureds with respect to the operations to be performed. In addition, the policy shall include an ISO endorsement Form CG 24 17 1001 or its equivalent providing contractual liability coverage for railroads listed as additional insureds. Coverage for such additional insureds shall be primary and non-contributory with respect to any other insurance the additional insureds may carry.

Coverage under this policy shall have limits of liability of not less than \$5 million each occurrence, combined single limit, for bodily injury (including disease or death), personal injury and property damage (including loss of use) liability. Such coverage may be provided by a combination of a primary CGL policy and a following form excess or umbrella liability policy.

3. Automobile **Liability Insurance** covering the liability of Contractor arising out of the use of any vehicles which bear, or are required to bear, license plates according to the laws of the jurisdiction in which they are to be operated, and which are not covered under Contractor's CGL insurance. The policy shall name National Railroad Passenger Corporation and, as appropriate CUSCO or WTC, and all commuter agencies and railroads that operate over the property or tracks at issue as additional insureds with respect to the operations to be performed. Coverage under this policy shall have limits of liability of not less than \$1 million each occurrence, combined single limit, for bodily injury (including disease or death), personal injury and property damage (including loss of use) liability.

In the event Contractor or any subcontractor will be transporting and/or disposing of any hazardous material or waste off of the jobsite, a MCS-90 Endorsement is to be added to this policy and the limits of liability are to be increased to \$5 million each occurrence.

4. **Railroad Protective Liability (RRP) Insurance** covering the Operations performed by Contractor or any subcontractor within fifty (50) feet vertically or horizontally of railroad tracks. The current ISO Occurrence Form (claims-made forms are unacceptable) in the name of National Railroad Passenger Corporation (and as appropriate CUSCO or WTC, and all commuter agencies and railroads that operate over the property or tracks at issue) shall have limits of liability of not less than \$5 million each occurrence, combined single limit, for Coverages A and B, for losses arising out of injury to or death of all persons, and for physical loss or damage to or destruction of property, including the loss of use thereof. A **\$10** million annual aggregate shall apply. Additionally, Policy Endorsement CG 28 31 - Pollution Exclusion Amendment, is required to be

endorsed onto the policy. Further, "Physical Damage to Property" as defined in the policy is to be deleted and replaced by the following endorsement:

"It is agreed that 'Physical Damage to Property' means direct and accidental loss of or damage to all property owned by any named insured and all property in any named insured's care, custody and control."

The original RRP Liability Insurance Policy must be submitted to Amtrak prior to commencement of Operations.

All Risk Property Insurance covering damage to or loss of all remaining personal property of Contractor, its contractors and subcontractors used during Operations including, but not limited to, tools, equipment, construction trailers and their contents and temporary scaffolding at the project site, whether owned, leased, rented or borrowed for the full replacement cost value. Insurance policies of Contractor, its contractors and subcontractors, covering tools, equipment and other personal property will include a waiver of subrogation and any other rights of recovery in favor of Amtrak and Contractor.

6. Contractor's Pollution Liability Insurance covering the liability of Contractor arising out of any sudden and/or non-sudden pollution or impairment of the environment, including clean-up costs and defense, that arise from the Operations of Contractor, with National Railroad Passenger Corporation and, as appropriate CUSCO or WTC, and all commuter agencies and railroads that operate over the property or tracks at issue named as additional insureds. Coverage under this policy shall have limits of liability of not less than \$2 million each occurrence. The coverage shall be maintained during the term of the project, and for at least two (2) years following Amtrak's acceptance of the completion of all Operations to be performed.

7. Pollution Lefial Liability Insurance is required if any hazardous material or waste is to be transported or disposed of off of the jobsite. Contractor, its subcontractor or transporter, as well as the disposal site operator, shall maintain this insurance. Contractor shall designate the disposal site, and must provide a certificate of insurance from the disposal facility to Amtrak. The policy shall name National Railroad Passenger Corporation and, as appropriate CUSCO or WTC, and all commuter agencies and raikoads that operate over the property or tracks at issue as additional insureds, with limits of liability of not less than \$2 million per claim.

Further, any additional insurance coverages, permits, licenses and other forms of documentation required by the United States Department of Transportation, the Environmental Protection Agency and/or related state and local laws, rules and regulations shall be obtained by Contractor.

8. Professional Liability Insurance covering the liability of Contractor for any and all errors or omissions committed by Contractor in the performance of the Operations, regardless of the type of damages. The coverage shall be maintained during the term of the Operations, and for at least three (3) years following completion thereof. The policy shall have a retroactive date that precedes any design work on the project and shall have limits of liability of not less than \$2 million per claim and \$2 million in the annual aggregate. . For a Project scopes which include under grade bridges (bridges which carry trains) the policy shall have limits of liability not less than \$10 million per claim and \$10 million in the annual aggregate.

If Contractor is not performing professional design or engineering services, Contractor may elect to satisfy this requirement through the addition of endorsement CG2279 "Incidental Professional



Liability” to its CGL policy.

9. Waiver of Subrogation As to all insurance policies required herein, Contractor waives all rights of recovery, and its insurers must waive all rights of subrogation of damages against Amtrak and, as appropriate, CUSCO and WTC, and their agents, officers, directors, and employees. The waiver must be stated on the certificate of insurance.
10. Punitive Damages Unless prohibited by law, no liability insurance policies required above shall contain an exclusion for punitive or exemplary damages.
11. Claims-Made Insurance If any liability insurance specified above shall be provided on a claims- made basis then, in addition to coverage requirements above, such policy shall provide that:
  - a. The retroactive date shall coincide with or precede Contractor’s start of Operations (including subsequent policies purchased as renewals or replacements);
  - b. The policy shall allow for the reporting of circumstances or incidents that might give rise to future claims;
  - c. Contractor will use its best efforts to maintain similar insurance under the same terms and conditions that describe each type of policy listed above (e.g., CGL, Professional Liability) for at least three (3) years following completion of the Operations; and
  - d. If insurance is terminated for any reason, Contractor will purchase an extended reporting provision of at least six (6) years to report claims arising from Operations.
12. Evidence of Insurance Contractor shall furnish evidence of insurance as specified above at least fifteen (15) days prior to commencing Operations. Prior to the cancellation, renewal, or expiration of any insurance policy specified above, Contractor shall furnish evidence of insurance replacing the cancelled or expired policies. **THESE DOCUMENTS SHALL INCLUDE A DESCRIPTION OF THE PROJECT AND THE LOCATION ALONG THE RAILROAD RIGHT-OF-WAY (typically given by milepost designation) IN ORDER TO FACILITATE PROCESSING.** The fifteen (15) day advance notice of coverage may be waived by Amtrak in situations where such waiver will benefit Amtrak, but under no circumstances will Contractor begin Operations without providing satisfactory evidence of insurance as approved by Amtrak. Such evidence of insurance coverage shall be sent to:

Director I&C Projects  
National Railroad Passenger Corporation 30th Street  
Station, Mail Box 64 Philadelphia, PA 19104-281 7

**National Railroad Passenger Corporation 30<sup>th</sup>  
Street Station, Mail Box 64  
2955 Market Street  
Philadelphia, PA 19104**

**Temporary Permits to Enter Upon Amtrak Property (PTE) in the State of CT**

Requests for Temporary Permits to Enter Upon Amtrak Property (PTE) in the State of CT must be submitted to Amtrak in writing and include the following information:

*(\*\* for DOT Projects, omit 4-7 and include DOT job number\*\*)*

1. Name of company requesting the permit (include address and telephone number)
2. Who's attention the permit should be addressed to
3. Permittee's e-mail address
4. Exact location of work (including railroad milepost, if known)
5. Specific work activity being performed on railroad property (please provide dollar value of the contract if work being performed is other than surveys or bridge inspections)
6. Projected duration of work being performed on railroad property in days
7. Contact, phone and address where invoices should be sent for payment by Permittee.

**Due to the heavy volume of requests for Temporary Permits to Enter Upon Amtrak Property, the processing time for initial Permit requests is approximately 30 business days.**

***Note:*** *Temporary Permits for performing any environmental or geotechnical tests or studies (e.g., air, soil or water sampling) may be issued subsequent to completion of Amtrak's environmental review and approval process. Requests are reviewed on a case-by-case basis. Depending on the site specific circumstances, a separate Site Access Agreement that addresses environmental liability issues may be required prior to any Temporary Permit.*

---

**All PTE Requests must be submitted to the Amtrak Engineering Construction Department e-mail or mail as noted below:**

- Email to [Kathryn.Haywood@amtrak.com](mailto:Kathryn.Haywood@amtrak.com) or mailed to: Kathryn Haywood,

Project Manager II  
National Railroad Passenger Corporation 30<sup>th</sup> Street  
Station, Mail Box 64  
2955 Market Street  
Philadelphia, PA 19104  
215-349-4367

---

SHEET 1 OF 2

NOTES:

CLEARANCE REQUIREMENTS SHOWN ON THIS PLAN APPLY TO NEW CONSTRUCTION OF RECONSTRUCTION. EXISTING STRUCTURES SHOULD BE MAINTAINED AS IS AND EXTENDED AT PRESENT CLEARANCES, UNLESS OTHERWISE REQUIRED BY LOCAL OR STATE AUTHORITIES.

STRUCTURES MUST NOT BE LOCATED NEARER TO THE TRACK CENTERLINE THAN THE CLEARANCES SHOWN ON THIS PLAN AND THESE DISTANCES SHOULD BE EXCEEDED WHERE POSSIBLE. CONSIDERATION SHOULD BE GIVEN TO CENTER LINES, WIDENING ROADED SHOULDERS AND WIDENING AND DEEPENING DITCHES, AND THE STRUCTURES SHOULD BE LOCATED ACCORDINGLY.

FOR STANDARD DISTANCES BETWEEN TRACK CENTER LINE AND STRUCTURES, SEE SECTION 3.6, LEGAL CLEARANCE. LIMITING OBJECTS ARE LOCATED SEE SECTION 3.6, LEGAL CLEARANCE.

FOR STANDARD DISTANCES BETWEEN TRACK CENTER LINE AND STRUCTURES, SEE SECTION 3.6, LEGAL CLEARANCE. LIMITING OBJECTS ARE LOCATED SEE SECTION 3.6, LEGAL CLEARANCE.

RESTRICTIONS NECESSITATING CLEARANCES CLOSER THAN THOSE SPECIFIED, THE MATTER MUST BE SUBMITTED TO THE ENGINEER FOR ANY MODIFICATIONS AND EXCEPTIONS TO THIS STANDARD.

MINIMUM CLEARANCES SHOWN ON THIS PLAN ARE FOR TANGENT LEVEL TRACK.

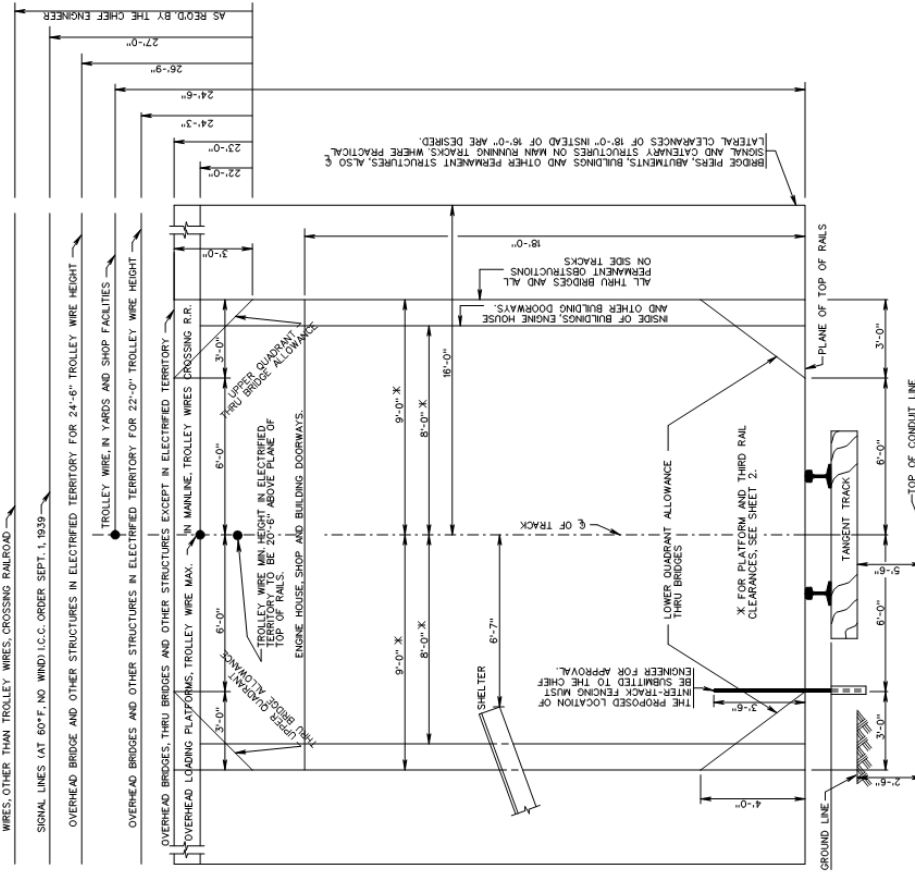
FOR CURVED TRACK THE FOLLOWING PROVISIONS APPLY:

VERTICAL - MEASURED VERTICALLY ABOVE HIGH RAIL EXCEPT FOR PASSENGER AND FREIGHT PLATFORMS WHICH ARE MEASURED PERPENDICULAR TO THE PLANE OF TOP OF RAIL.

LATERAL - OUTSIDE AND INSIDE CLEARANCES SHALL BE MEASURED PERPENDICULAR TO THE PLANE OF TOP OF RAIL.

IN ADDITION, THE INSIDE CLEARANCE FOR STRUCTURES SHALL BE INCREASED BY SIX INCHES FOR EACH INCH OF SUPERELEVATION FOR EACH 5 FEET OF HEIGHT ABOVE TOP OF LOW RAIL.

X FOR STATE CLEARANCE REQUIREMENTS, SEE A.R.E.M.A. MANUAL CHAPTER 28, SECTION 3.6, LEGAL CLEARANCE REQUIREMENTS BY STATES.



No.	Revisions	Date	By
08	ADDED SHEET 2	08-01-16	K.W.

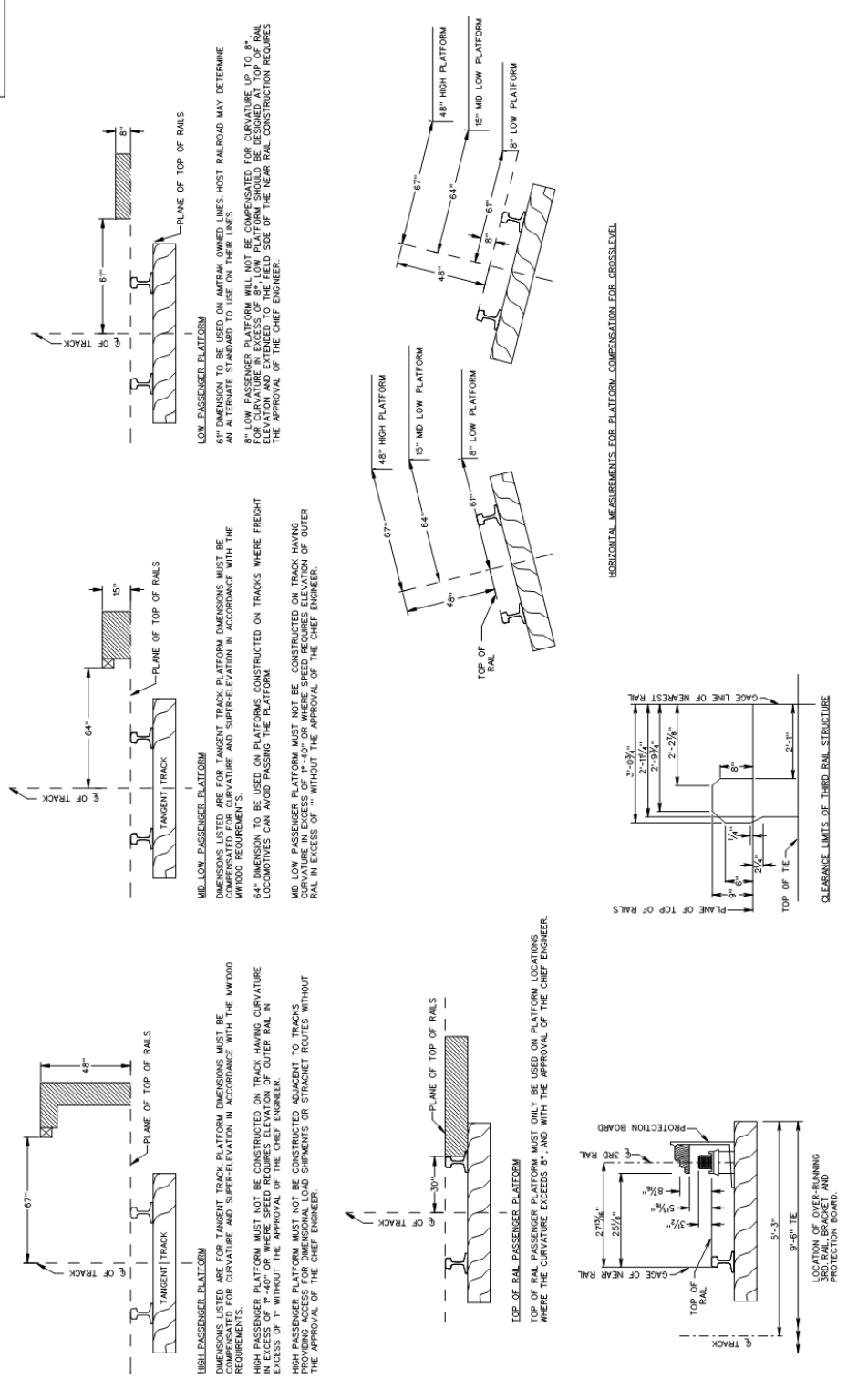
OFFICE OF THE  
**CHIEF ENGINEER OF TRACK**

Date August 1, 2016 Approved



STANDARD TRACK PLAN  
 MINIMUM ROADWAY CLEARANCES

Drawn: TBI-SLC Checked: MT Dotar 08-01-16 [Proj. No.: 70050.001.08]



No.	Revisions	Date	By
08	ADDED SHEET 2	08-01-18	K/W

PHILIP P. A. Date August 1, 2018 Approved  
 OFFICE OF THE CHIEF ENGINEER OF TRACK

**Amtrak**  
Amtrak is a registered trademark of Amtrak Corporation. All other trademarks are the property of their respective owners. © 2018 Amtrak Corporation. All rights reserved.

STANDARD TRACK PLAN  
 MINIMUM ROADWAY CLEARANCES

08-01-18 K/W Designer: Amtrak Drawn: TB-SJC Checked: MT Date: 08-01-18 File No.: 70580.002.02

NATIONAL RAILROAD PASSENGER CORPORATION  
Engineering Department, 30<sup>th</sup> Street Station, 4<sup>th</sup> Floor South Tower, Box 64  
2955 Market Street, Philadelphia, PA 19104



December 4, 2017

Rabih M. Barakat, PE  
Transportation Principal Engineer  
CT Department of Transportation  
2800 Berlin Turnpike  
P.O. Box 317546  
Newington, CT 06131-7546

Subject: Noank, CT, Shore Line, CDOT Project No. 58-336 PE  
Rehabilitation of Mosher Street Bridge No. 03903 (OH 130.31) over Amtrak  
Design Exception Request DER-01, Approved by Amtrak

Dear Mr. Barakat:

Amtrak has reviewed and approved the subject Design Exception Request information provided with your letter dated November 20, 2017.

If you have any questions concerning this matter, please contact Kathy Haywood, Project Manager II, at 215-349-4367.

Sincerely,

A handwritten signature in blue ink, appearing to read "Earl Watson III".

Earl Watson III  
Senior Manager Engineering

Attachment

cc: R. Clark – CME  
M. Piteo – DOT



STATE OF CONNECTICUT  
DEPARTMENT OF TRANSPORTATION



2800 BERLIN TURNPIKE, P.O. BOX 317546  
NEWINGTON, CONNECTICUT 06131-7546

November 20, 2017

AMTRAK

NOV 30 2017

I & C Projects

Mr. Earl Watson, III  
Director – Project Initiation and Development  
South Tower, 3<sup>rd</sup> Floor  
30<sup>th</sup> Street Station  
Philadelphia, Pennsylvania 19104

Dear Mr. Watson:

Subject: Design Exception Request, DER-01  
State Project No. 58-336  
List 29 Bridge Rehabilitation Program  
Bridge No. 03903, Mosher Avenue over Amtrak  
Town of Groton

This letter is in reference to State Project No. 58-336, the rehabilitation of Bridge No. 03903, which carries Mosher Avenue over Amtrak in Groton, Connecticut (OH 130.31). The bridge is located near the intersection of Mosher Avenue and Ward Avenue. The existing superstructure of the bridge, which is a non-redundant steel through-girder type bridge, needs to be replaced due to its poor structural condition. The existing substructure is in fair condition, and will be repaired and reused. The low chord of the current superstructure is 21 feet-5 inches, which is below Amtrak’s requirement of 24 feet-3 inches for bridges in electrified territory with a 22 foot trolley wire height.

The Connecticut Department of Transportation (CTDOT) has researched the option of a superstructure replacement that would meet Amtrak’s required vertical underclearance of 24 feet-3 inches. This would result in an approximate 3 foot increase to the Mosher Avenue roadway profile at the end of the bridge. The change in profile would require approximately 500 feet of Ward Avenue to be regraded and reconstructed, as well as a 150 foot portion of Mosher Avenue to the west of the bridge.

The effects of regrading Ward Avenue include design and reconstruction of four private driveways. Three of these driveways already exceed the recommended maximum slope of 12 percent and could not be regraded without making them steeper. The alternative to making the driveways steeper would be to make extensive modifications to the properties.

For two of these properties, modifications would involve raising the existing detached garages, providing new grading and constructing permanent retaining walls. The third driveway leads to a garage that is part of the lower story of the property owner’s home. Therefore, this garage could no longer be used and would require the construction of a new garage with a higher floor and new associated grading. Based on current Department practices, the State would determine the required compensation, and the work would be undertaken by the property owner. Modification of these properties would require extensive cooperation from property owners and preferably would be completed before the State bridge project began. The coordination of contracting the required work and the inconvenience of extensive construction on their property would be an unwelcome burden to the property owners.

*An Equal Opportunity Employer*  
Printed on Recycled or Recovered Paper

Mr. Earl Watson, III

-2-

November 20, 2017

If the property owners objected to the compensation offered by the State, the State would likely face strong public objection. Noank is a small, close-knit community that would likely support the property owners in a conflict with the State. Additionally, any legal action by the property owners would likely delay the project, and delays to the project would have a significant impact to the community.

Project schedule delays have other impacts as well. Currently the sidewalk supports, which frame into the main through-girders, are in poor condition. These supports were evaluated by the Department's Bridge Safety unit recently because there was a concern about the safety of the sidewalk. Ultimately, the decision was made to keep the sidewalk open based on the anticipated service life which fits with the current project schedule. However, continued deterioration of the supports could lead to the closure of the sidewalk, and delays to the project make it more likely that this could occur.

The safety of pedestrians would be greatly reduced by the closure of the sidewalk. Spicer Park is located to the west of the bridge and Noank Play Area, a recreation area with basketball courts and a playground, are located to the east of the bridge. The sidewalk on the bridge provides a safe passage from Spicer Park to Noank Play Area. A protected area on the inside of the through-girders could be created if the sidewalk were closed. However, this would result in much narrower lanes, which is unfeasible because of the use of this bridge by tractor-trailers and trucks towing boats and the available turning radius at Ward Avenue would be greatly reduced.

With the closure of the bridge sidewalk, pedestrians would need to be more cautious of trucks with wide turning radii maneuvering through the intersection of Mosher Avenue and Ward Avenue. Additionally, it would worsen existing sub-standard site distances, putting both pedestrians and motorists at greater risk for accidents. For these reasons, delays to the project need to be avoided.

Additional construction impacts, associated with the significant raising of the profile, include the gas station to the south of the bridge on Ward Avenue. The roadway at the gas station would need to be raised approximately 3 inches at the curb line, requiring regrading of the gas station driveways and parking areas. Due to the age of the gas station and the hazardous nature of gasoline, the State would be at risk for the possibility of encountering contaminated soil during the excavation to reconstruct the driveway.

The Noank Fire Department driveway leading to the garage bays would also require redesign and reconstruction. This would have to be carefully coordinated so as not to prevent emergency personnel from responding to calls. Additionally, the sidewalk on the east side of Ward Avenue would be removed and reconstructed. Finally, the regrading could affect utility poles within the project limits that would need to maintain minimum vertical clearance below electric, communications and telephone cables. The effected properties, and the extent of the full depth reconstruction, are shown in the attached sketch.

These effects are both cost prohibitive and cause the Department, motorists and pedestrians unreasonable risk. For these reasons, the Department is requesting a design exception to Amtrak's vertical clearance standard. A design exception request form and the corresponding "Amtrak Standard Track Plan, Minimum Roadway Clearances Drawing No. 70050.001.08" have been included with this letter.

Mr. Earl Watson, III

-3-

November 20, 2017

In order to minimize the detrimental effects listed above, the Department has opted to replace the superstructure while maintaining the substructure geometry. The proposed vertical clearance is 21 feet-6 inches. Connecticut General Statute 13b-251 allows the State to maintain the existing vertical clearance over a railroad when the superstructure is being replaced and the abutments are being retained. The vertical profile of Mosher Avenue will still need to be raised to accommodate the slight increase in the superstructure depth due to the new structurally redundant cross-section. However, this increase will only require approximately 125 feet of Ward Avenue, and the intersection of Ward Avenue and Mosher Avenue, to be regraded and reconstructed. This option eliminates the impacts to the private driveways, the Noank Fire Department driveway, the driveway leading into the gas station, and the sidewalk on the east side of Mosher Avenue.

It is the Department's intent to proceed with the superstructure replacement maintaining the existing vertical underclearance. Additionally, temporary construction easements will need to be obtained to construct the new superstructure and repair the existing substructure. A response from Amtrak with any comments by November 16, 2017 would be much appreciated.

If you have any questions concerning this matter, please contact Mr. Andrew Cardinali, Project Manager, at (860) 594-3315.

Very truly yours,



Rabih M. Barakat P.E.  
2017.11.20  
10:47:03-05'00'

Rabih M. Barakat, P.E.  
Transportation Principal Engineer  
Bureau of Engineering and Construction

Enclosures



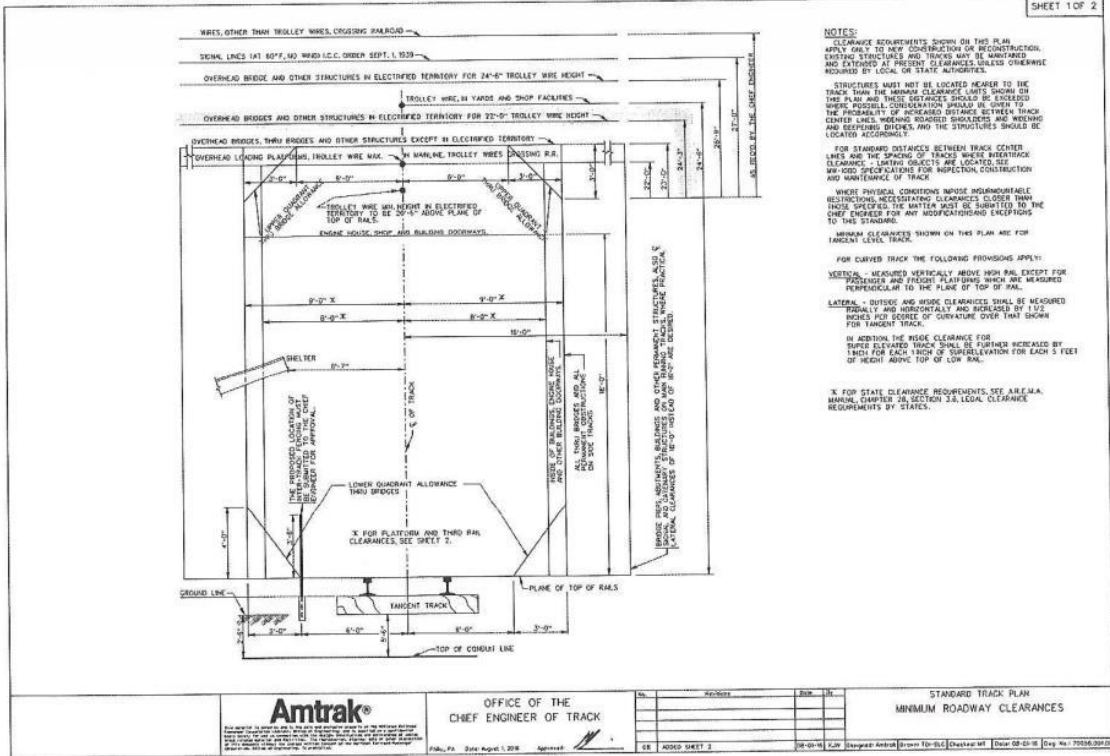
**DESIGN EXCEPTION REQUEST (DER)** 

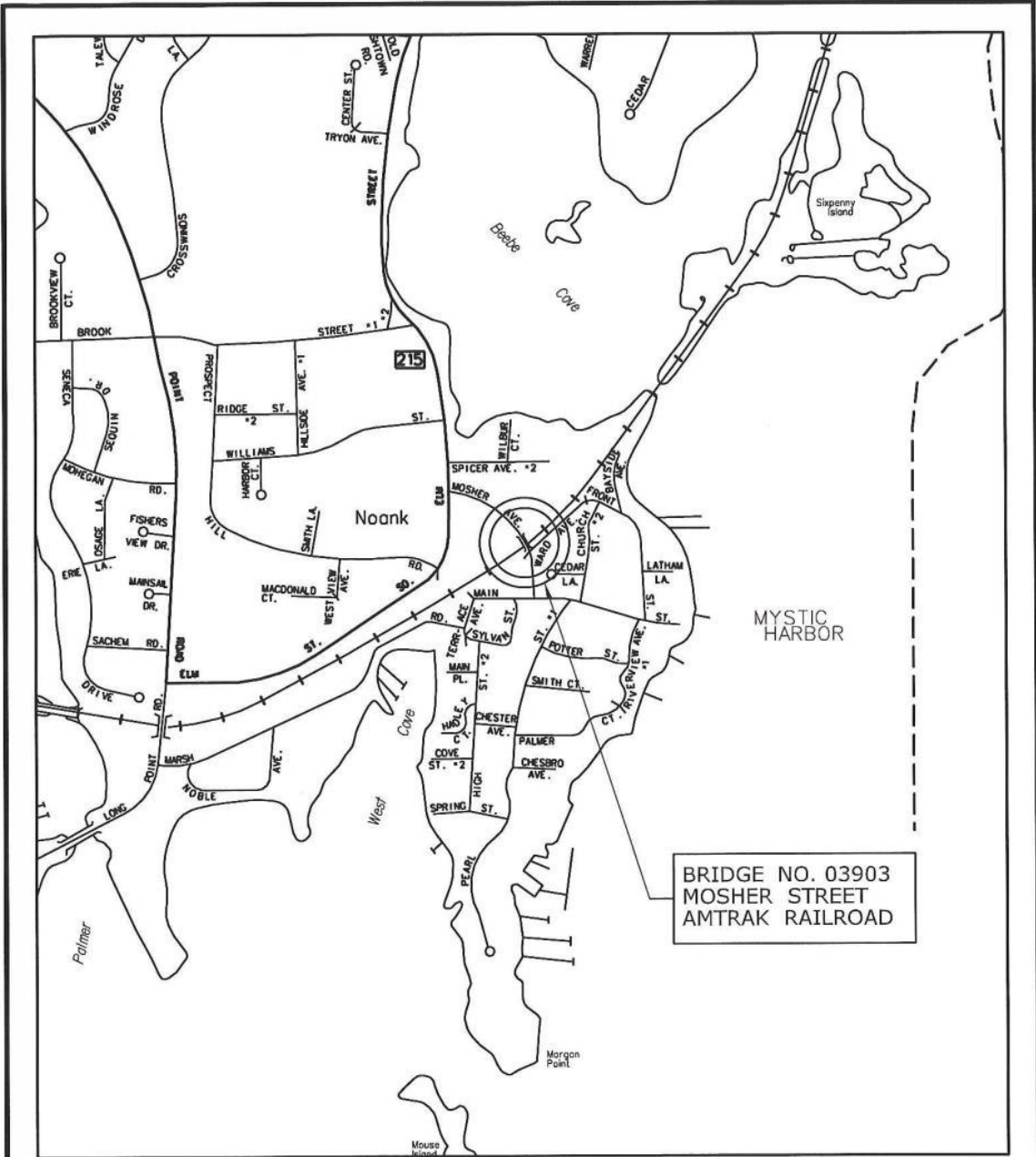
This form is to be used when a project warrants an exception to established design standards. Complete Section 1 and 2 and attach supporting documents prior to submission to Amtrak for consideration.

<b>Section 1: Request Information</b>			
Project Name	CTDOT Project No. 058-336; Rehabilitation of Bridge No. 03903 in Groton, CT		
Project DER No.	DER-01	Date	9/6/2017
Exception Location	Mosher Avenue over Amtrak; Groton, CT (OH 130.31)		
Requesting Agency	CTDOT	Requester	Rabih Barakat Principal Engineer
<b>Section 2: Design Exception Description (Provide brief concise statements)</b>			
Excepted Design Standard and section No.	70050.001.08 Minimum Roadway Clearances		
Attach Design Standard, <u>unless</u> it is an Amtrak or AREMA Standard			
Description of Exception	We are requesting a permanent Design Exception for substandard vertical underclearance over an electrified railroad for Bridge No. 03903 Mosher Avenue over Amtrak in Groton, CT. (OH 130.31)		
Reason for Request	<p>The existing minimum vertical underclearance from the top of the rail to the bottom of the superstructure of Bridge No. 03903 is noted as 21'-5" (see clearance diagram for Bridge No. 03903), which is less than the Amtrak standard of 24'-3". The bridge is in need of a superstructure replacement, while the substructure remains in fair and usable condition. Replacing the superstructure at the Amtrak standard of 24'-3" would result in an approximate 3' increase in the Mosher Avenue roadway profile at the end of the bridge, where Mosher Avenue intersects Ward Avenue. The effects of regrading Ward Avenue include design and reconstruction of four private driveways, which would make them steeper. Three of these driveways already exceed the recommended maximum slope of 12% and could not be regraded without making them steeper. The Noank Fire Department driveway leading to the garage bays would also require redesign and reconstruction. The roadway at the gas station would have to be raised approximately 3 inches at the curb line, requiring regrading of the gas station driveways and parking areas. Additionally, the sidewalk on the east side of Ward Avenue would be removed and reconstructed. Finally, the regrading could affect utility poles within the project limits that would need to maintain minimum vertical clearance below electric, communications and telephone cables. Affected properties, and the extent of the full depth reconstruction, are shown in the attached drawings. These effects are both cost prohibitive and cause CTDOT unreasonable risk due to the possibility of encountering contaminated soil at the gas station.</p>		
The potential impacts of a DER on: safety, capital costs, life cycle costs, future maintenance, or the right-of-way should be described in the Reason for Request field. Additional pages may be attached.			


DESIGN EXCEPTION REQUEST (DER) | 


Section 3: Amtrak Review Comments				
Comments and Recommendation	NO EXCEPTION			
Reviewer Name		Title	Sp. Engineer Clearances	
Section 4: Amtrak Approval / Denial Status				
APPROVE or DENY	Signature		Date	12/4/17
	Name	ALFRED J. CLAVIER	Title	DCE TRACK
APPROVE or DENY	Signature		Date	
	Name		Title	





STATE PROJECT NO.:  
 58-336  
 CITY/TOWN:  
 GROTON

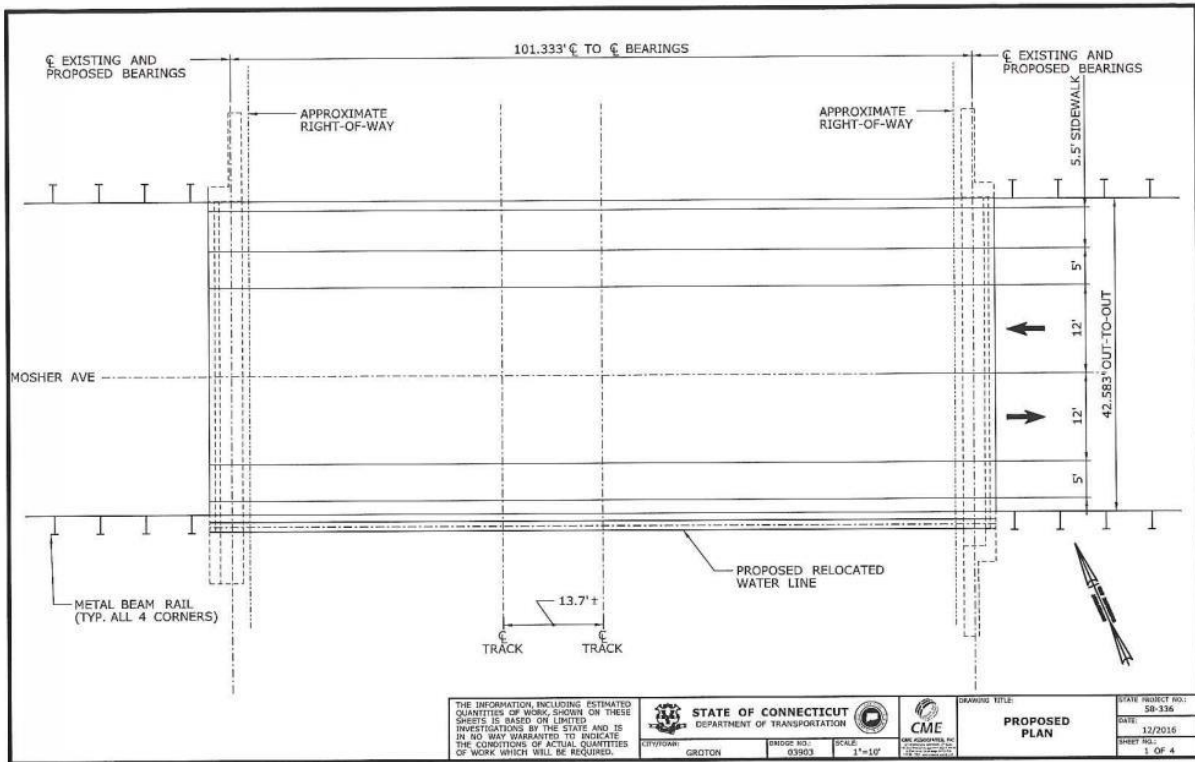

**STATE OF CONNECTICUT**  
 DEPARTMENT OF TRANSPORTATION



**BRIDGE NO. 03903**  
**LOCATION MAP**

  
**CME**  
CME ASSOCIATES, INC.  
 35 Cedar Lane, Groton, CT 06340  
 815 Colburn Drive, East Granby, CT 06036  
 40 Elm Street, Eastford, VT 05728  
 888.801.3237 www.cmeassoc.com

DATE:  
 12/4/2015  
 SHEET NO.:  
 1 OF 1



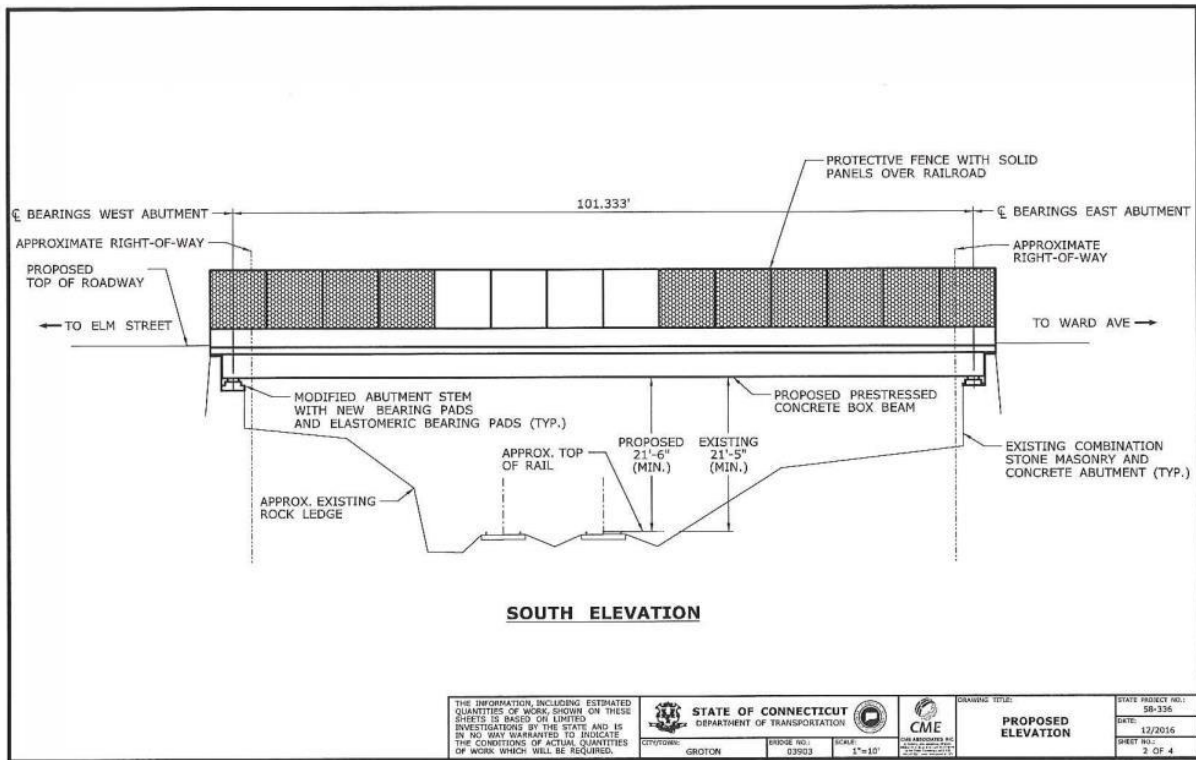
THE INFORMATION, INCLUDING ESTIMATED QUANTITIES OF WORK, SHOWN ON THESE SHEETS IS BASED ON LIMITED INVESTIGATIONS BY THE STATE AND IS IN NO WAY WARRANTED TO INDICATE THE CONDITIONS OF ACTUAL QUANTITIES OF WORK WHICH WILL BE REQUIRED.

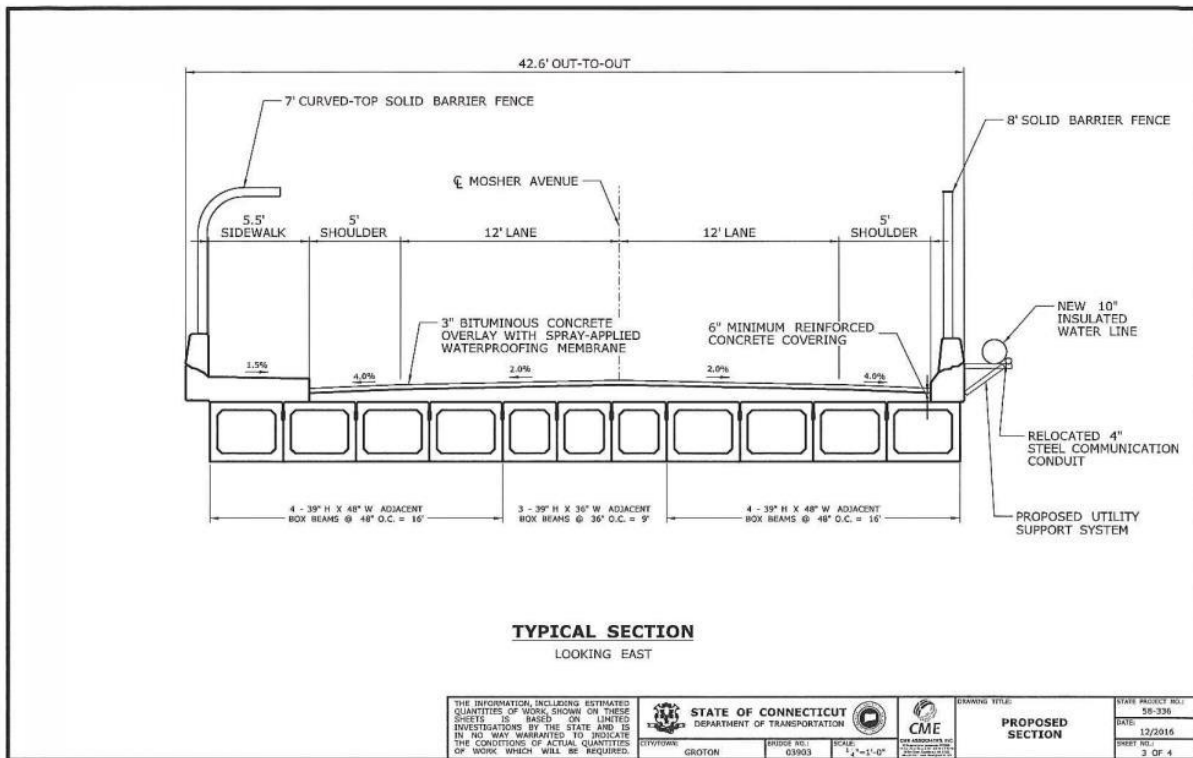
STATE OF CONNECTICUT  
DEPARTMENT OF TRANSPORTATION

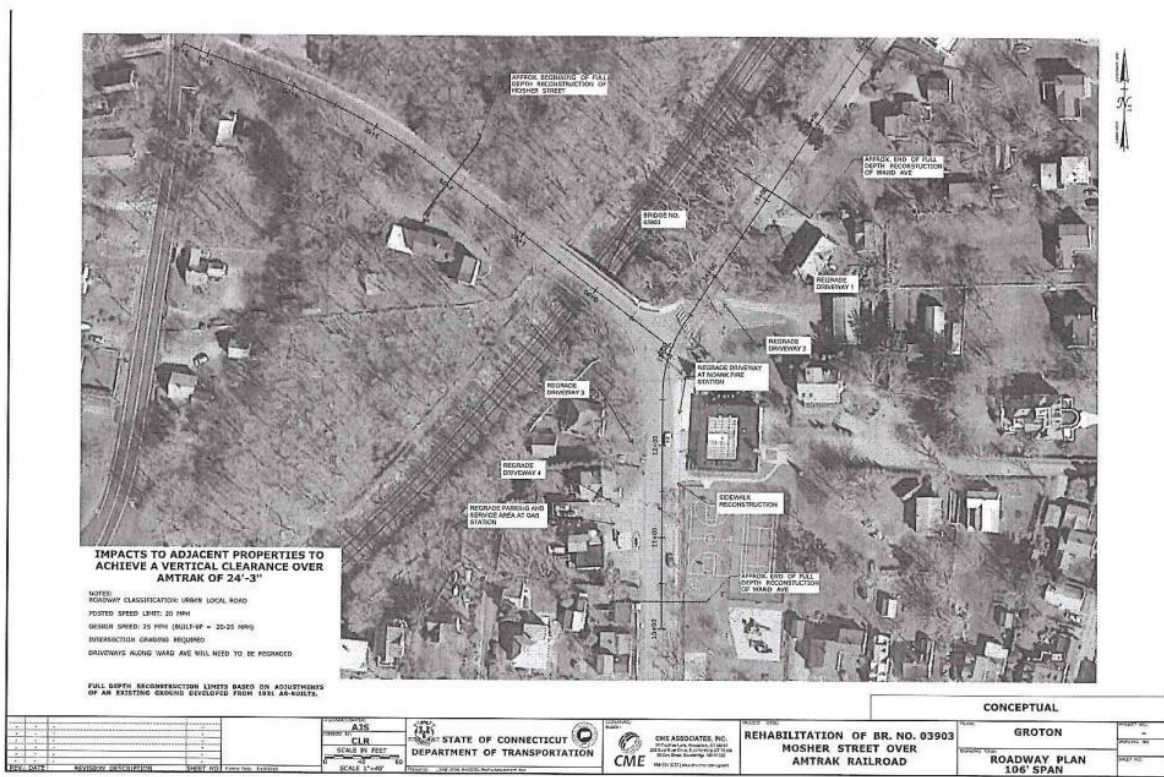
CITY/TOWN: GROTON GROUP NO.: 03903 SCALE: 1"=10'

CME  
CONSULTANTS, INC.  
1000 MAIN STREET  
GROTON, CT 06340

DRAWING TITLE:	STATE PROJECT NO.:
<b>PROPOSED PLAN</b>	SB-336
	DATE:
	12/2016
	SHEET NO.:
	1 OF 4







**IMPACTS TO ADJACENT PROPERTIES TO ACHIEVE A VERTICAL CLEARANCE OVER AMTRAK OF 24'-3"**

NOTES:  
 ROADWAY CLASSIFICATION: URBAN LOCAL ROAD  
 POSTED SPEED LIMIT: 20 MPH  
 DESIGN SPEED: 25 MPH (BULL-UP = 20-25 MPH)  
 INTERSECTION GRADING REQUIRED  
 DRIVEWAYS ALONG WARD AVE WILL NEED TO BE REGRADED

FULL DEPTH RECONSTRUCTION LIMITS BASED ON ADJUSTMENTS OF AN EXISTING GROUND DEVELOPED FROM 1991 AS-BUILTS.

PROJECT NO. 03903 SHEET NO. 106 DATE 10/09/18			CONCEPTUAL		
DESIGNER: A3S CLIENT: CTLR SCALE: 1"=40' DATE: 10/09/18			STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION CME		
PROJECT: REHABILITATION OF BR. NO. 03903 SHEET: MOSHER STREET OVER AMTRAK RAILROAD			GROTON ROADWAY PLAN 106' SPAN		



## **NOTICE TO CONTRACTOR - RAILROAD SPECIFICATIONS**

The contractor is hereby notified that all railroad specifications contained elsewhere herein shall be made a part of this contract, and that the contractor shall be bound to comply with all requirements of such specifications. The requirements and conditions set forth in the subject specifications shall be binding on the contractor just as any other specification would be.

Temporary Shielding as required per the enclosed Specifications and as shown on the Contract Plans shall be considered incidental to the work over Amtrak Railroad and will not be measured separately for payment.

**NOTICE TO CONTRACTOR – RAILROAD INSURANCE INFORMATION**

**GENERAL INSURANCE INFORMATION**

This construction project is over two track main line railroad territory with a high frequency of passenger and freight train passage. The bridge structure crosses the railroad right of way at mile post MP 130.31.

Normal speed of passenger trains south of MP 130.31 is 80 MPH and north of MP 130.31 is 80 MPH.

Normal Speed of freight south of MP 130.31 is 35 MPH and north of MP 130.31 is 35 MPH.

In the project area, there are in a 24 hour weekday period:

<u>37</u>	Scheduled Amtrak Weekday Trains
<u>Unknown</u>	Anticipated Extra Trains *
<u>1</u>	Freight Trains (Each Train makes 2 moves through the Area)
<u>Unknown</u>	Other Trains (Single Direction Maintenance Movements)

\* - Quantity may vary

## **NOTICE TO CONTRACTOR – ALLOWABLE TRACK OUTAGES**

Portions of this construction project are over a double track main line railroad territory with a high frequency of passenger and freight train passage. In order to complete the work, the Contractor will need to use a combination of Track Out of Service and Foul Time granted by the railroad.

It should be expressly understood that: a) actual length of time for any track usage is contingent upon operating schedules at time of construction, other third-party project work, operational issues on the Northeast Corridor, resources, planned and unplanned maintenance work; b) programmed Amtrak construction and maintenance work requiring track usage within the same operating block will have priority, therefore contract work requiring track usage, if scheduled within the same time frame must be coordinated with such work; and c) the potential times for track usage are not guaranteed and are for normal operating conditions.

### General Requirements:

Unless otherwise authorized by the Railroad, operations directly over or adjacent to operating right-of-way will be performed as follows:

1. The Contractor's operations shall be planned and staged to avoid track usage unless absolutely necessary. Track usage is granted by Amtrak based on need, not for the convenience of the Contractor.
2. Tracks may be made available for track outages dependent upon the work required and as railroad operating conditions allow. The hours of track availability are varied, limited and change depending on operating constraints and other requirements. Every effort will be made to support the Contractor's requirements. However, because of the limited availability of track outage time, the Contractor is to plan operations to minimize required track outages.
3. All track outages are subject to Amtrak approval and must be requested from Amtrak at least 2 weeks in advance. Decisions regarding track outages are subject to review by Amtrak.
4. Any delays resulting from deviation from the indicated times will be considered excusable but non-compensable delays.
5. No track outages will be permitted on weekends either immediately before or after major holidays, as defined elsewhere in these specifications.
6. The Contractor is required to execute Amtrak's current Temporary Permit to Enter Upon Property. Attached for reference is a copy of Amtrak's Temporary Permit which includes Amtrak's Safety and Insurance requirements. All requests for a Temporary Permit should be directed to:

Amtrak Engineering Construction Department

By Mail to:

Director I&C Projects  
Amtrak - National Railroad Passenger Corporation  
30th Street Station, 4S-027, Mail Box 64  
2955 Market Street  
Philadelphia, PA 19104  
(215) 349-1393

By Fax or Email to:

(215) 349-3550 or MCGRATM@AMTRAK.COM

7. All Contractor employees who will work on Amtrak property are required to attend “Amtrak Contractor Roadway Worker Protection” safety training, and the Railroad require appropriate evidence of insurance in accordance with the attached requirements prior to entry on Amtrak’s property.
8. The Contractor shall plan to perform all construction activities during railroad Foul Time. Foul time will be granted by the Railroad between the passage of regularly scheduled trains and will be dependent on the type of work proposed and the ability of the Contractor to clear the track within the time frame specified by the railroad.
9. In the event that the Contractor requires a Track Out of Service to perform work, it is anticipated that track outages of significant duration will only be available to the Contractor from approximately 11:30pm to 3:30am.

Amtrak  
Engineering Construction  
4th Floor - South Tower  
30th Street Station (Mail Box 64)  
Philadelphia, PA 19104

---

**Temporary Permits to Enter Upon Amtrak Property (PTEs)**

Requests for Temporary Permits to Enter Upon Amtrak Property (PTEs) must be submitted to Amtrak in writing and include the following information:

1. Name of company requesting the permit (include address and telephone number)
2. Who's attention the permit should be addressed to
3. Permittee's e-mail address
4. Exact location of work (including railroad milepost, if known)
5. Specific work activity being performed on railroad property (please provide dollar value of the contract if work being performed is other than surveys or bridge inspections)
6. Projected duration of work being performed on railroad property
7. Contact, phone and address where invoices should be sent for payment by Permittee.

**Note:** *Temporary Permits for performing any environmental or geotechnical tests or studies (e.g., air, soil or water sampling) may be issued subsequent to completion of Amtrak's environmental review and approval process. Requests are reviewed on a case-by-case basis. Depending on the site specific circumstances, a separate Site Access Agreement that addresses environmental liability issues may be required prior to any Temporary Permit.*

---

All PTE Requests must be submitted to the Amtrak Engineering Construction Department by fax, e-mail or mail as noted below:

- Faxed to (215) 349-3550 or [MCGRATM@AMTRAK.COM](mailto:MCGRATM@AMTRAK.COM)
- Email to [mcgratm@amtrak.com](mailto:mcgratm@amtrak.com)
- Mailed to the following address:

Director I&C Projects  
National Railroad Passenger Corporation  
30<sup>th</sup> Street Station (Mail Box 64)  
Philadelphia, PA 19104

---

*Due to the heavy volume of requests for Temporary Permits to Enter Upon Amtrak Property, the processing time for initial Permit requests is approximately 30 business days.*

Rev. 10/22/08

GENERAL



**AMTRAK**  
HR – Employee Development  
30th and Market Streets – 3 North – Box 1  
Philadelphia, PA 19104  
Fax Number 215-349-3731

### Contractor Orientation Training Request

This is in response to your request for Amtrak's Contractor Orientation Training. Note: Our training delivery has changed. Starting October 1, 2012, Instructor Led classroom training will no longer be offered and has been replaced with a computer based training program that is available 24 hours / 7 days per week. Offered at a cost of \$18.00 per person, this training can be completed at [www.amtrakcontractor.com](http://www.amtrakcontractor.com) and requires participants to register on the website before accessing the course. Participants completing this course are required to be able to Read, Comprehend and Demonstrate in English their understanding of the materials presented, as well as all the safety instructions, briefings and warnings. Before taking this course, participants will be required to provide a current photo and have the capability of uploading the photo electronically. At the end of this course, participants are required to pass a comprehensive test to receive a temporary certificate that is valid for three weeks. A Photo ID card, which is valid for one calendar year from the date of issue, will be mailed to the participant. Each participant will be given three (3) opportunities to pass the test. If unable to pass on the 3rd attempt, the participant will be unable to retake the test for 30 days.

The safety of Amtrak's passengers and all employees working on the property (Amtrak and Contractor personnel) remains our highest priority. For your protection, Amtrak requires that your employees comply with all safety regulations ("Specifications Regarding Safety and Protection of the Railroad Traffic Property").

All contractors must notify the Amtrak Project Manager or Engineer assigned to your project before entering onto railroad property and before coming within twenty-five (25 feet) of the centerline of the track or energized wire. Amtrak's Project Manager or Engineer assigned to your project will assist you with obtaining a temporary "Permit to Enter upon Property" and will arrange for protection if needed. Safety violations will result in the immediate suspension of work within the railroad's property limits.

Thank You

HR - Employee Development

Rev.9/28/12

— —  
GENERAL

## **NOTICE TO CONTRACTOR – TRACK MONITORING**

If any work that could potentially affect the stability of the track is occurring within 50 feet of a track, or within the influence line of a track, then monitoring points shall be established by the contractor along the track and the position of the track shall be monitored by the Contractor. The influence line descends from a point one foot horizontally away from the outside end of the tie bottom one unit vertically for every unit and a half horizontally.

The Contractor shall develop a monitoring plan and submit it to Amtrak for approval prior to the start of construction. The Contractor may not begin any work that may affect the stability of the track until the plan has been approved by the Railroad. The monitoring plan must include plans of all proposed monitoring points and shall include a construction schedule for the work that may affect the track. The Contractor shall submit the monitoring plan 30 days in advance of planned construction and shall provide schedule updates for changes to the plan not less than two weeks in advance of construction.

The costs of developing a monitoring plan for the approval of the Railroad, establishing monitoring points, and monitoring the track position shall not be directly compensated. The costs shall be considered as incidental to the construction and included in the general cost of the project and the items for which monitoring may be necessary.

All work close enough to foul a track must only be performed under the direction of qualified railroad personnel. People performing track monitoring are classified as Roadway Workers and must be trained in “Amtrak Contractor Roadway Worker Protection”.

**Monitoring:** Each location shall include a point on the top of rail marked with paint or crayon on the field side of the rail and used for vertical measurements, and a point on the tie for horizontal measurements. In wood ties, the point shall be marked with a PK nail or similar surveyor’s marker; on concrete or steel ties the point shall be marked with paint.

Reference points shall be established along the track beginning at the point where the work is closest to the track. Points shall continue to be placed at intervals of 50 feet along the track to the point where the work ends or does not meet the conditions outlined above, and then at 50 feet, 100 feet, and 200 feet away from the end point(s). Where more than one track may be affected, points shall be established on each track that could be affected.

Monitoring points shall be established to within 0.001 feet, and monitoring shall be done to 0.01 feet.

Monitoring shall be performed at the beginning and end of every shift of work, Points shall be measured, the measurements recorded, and the numbers compared with previous measurements. All points shall be measured each time monitoring occurs, except for the points 200 feet away from the end of work; these points shall only be measured if any of the other measurements

exceeds an allowable deviation. Monitoring records shall be submitted weekly to the Resident Engineer, unless the track is found to have moved (see below).

**Notifications:** If track is found to have moved either vertically or horizontally by more than one half of the Amtrak Maintenance limits as specified in the table below (from Amtrak’s MW-1000) for the particular class of track involved, then all work shall cease immediately and the contractor shall immediately notify the designated Amtrak Project Engineer, Work may not resume until the designated Amtrak Project Engineer has inspected the site and approved. The contractor’s submitted

**Track Maintenance:** Deficiencies in track surface and alignment caused by construction activities shall be corrected solely by Amtrak forces at the Contractor’s expense.

TRACK CLASS	MAX. PASSENGER SPEED (MPH)	CROSS LEVEL (INCHES) The Difference in Cross Level Between Any Two Points Less Than		DEVIATION FROM UNIFORM PROFILE (INCHES)		DEVIATION FROM HORIZONTAL ALIGNMENT (INCHES)	DEVIATION FROM HORIZONTAL ALIGNMENT (INCHES)
		10'	62'	31' CHORD	62' CHORD	31' CHORD	62' CHORD
<b>MAINTENANCE LIMITS</b>							
1	15	1	2 1/4	N/A	2 1/4	2 3/4	3 3/4
2	30	1	1 5/8	N/A	2	1 1/2	2 1/4
3	60	1	1 1/2	N/A	1 5/8	7/8	1 1/4
4	80	1	1 1/4	N/A	1 1/2	3/4	1
5	90	1	1 1/8	N/A	1	3/8	1/2
6	110	3/4	1	3/4	3/4	3/8	1/2
7	125	3/4	1	3/4	3/4	3/8	3/8
8	160	3/4	1	3/4	3/4	3/8	3/8
9	200	3/4	1	3/4	3/4	3/8	3/8
<b>1/2 MAINTENANCE LIMITS</b>							
1	15	1/2	1 1/8	N/A	1 1/8	1 3/8	1 7/8
2	30	1/2	4/5	N/A	1	3/4	1 1/8
3	60	1/2	3/4	N/A	4/5	4/9	5/8
4	80	1/2	5/8	N/A	3/4	3/8	1/2
5	90	1/2	4/7	N/A	1/2	1/5	1/4
6	110	3/8	1/2	3/8	3/8	1/5	1/4
7	125	3/8	1/2	3/8	3/8	1/5	1/5
8	160	3/8	1/2	3/8	3/8	1/5	1/5
9	200	3/8	1/2	3/8	3/8	1/5	1/5



**NOTICE TO CONTRACTOR – FEDERAL RAIL SAFETY  
REGULATIONS (49 CFR PART 219) CONCERNING ALCOHOL AND  
DRUG TESTING**

On October 16, 2008, the United States Congress enacted the Rail Safety Improvement Act of 2008 (RSIA). RSIA directs the Federal Railroad Administration (FRA) to promulgate new safety regulations related to railroad safety. This NTC is to notify you of certain requirements recently promulgated by the FRA that may be applicable to work you may perform under this Contract for the Connecticut Department of Transportation (Department).

Any Contractor or Contractor employees performing "Roadway Worker" services under this Contract which require "Fouling" of railroad tracks are required to comply with on-track safety program rules, as outlined in 49 CFR Part 219—Control of Alcohol and Drug Use.

"Roadway Worker" in this case means any employee of a contractor whose duties include work on or near track, or with the potential of fouling a track. "Fouling a track," means the placement of an individual or an item of equipment in such proximity to a track that the individual or equipment could be struck by a moving train or on-track equipment, or in any case is within four (4) feet of the field side of the near running rail. For more information related to the requirements, please refer to:

<https://www.ecfr.gov/cgi-bin/text-idx?rgn=div5&node=49:4.1.1.1.14>

Among other requirements, FRA requires Contractors employing Roadway Workers to submit a Part 219 Compliance Plan to FRA. For the purposes of this Project, the Contractor must provide proof to the Assistant District Engineer (ADE) of the District administering the project, that they have submitted the Part 219 compliance plan to the FRA prior to beginning the physical work on the Project. Subsequently, the Contractor must provide proof of FRA approval or acceptance of their Part 219 Compliance Plan to the ADE. Although approval or acceptance of the plan is not required prior to beginning the physical work, it may be required by the track authority prior to approval to foul the tracks.

Please consult the following link to download the model drug and alcohol plan prepared by the FRA for guidance:

<https://www.fra.dot.gov/eLib/details/L02814>

There will be no direct payment for any costs associated with compliance with 49 CFR Part 219, but the cost thereof shall be considered as included in the general cost of the work. Delay to the project due to the contractor's failure to comply or anticipate the time requirement for compliance with 49 CFR Part 219 shall not be a reason for a time extension or claim for additional compensation.

Any questions regarding the FRA Regulations concerning Drug and Alcohol Testing should be directed to: Mr. Gerald Powers, Drug and Alcohol Program Manager, Office of Safety Enforcement, Federal Railroad Administration, 1200 New Jersey Avenue SE, Mail Stop 25, Washington, DC 20590 or via telephone (202)493-6313.

## **NOTICE TO CONTRACTOR - UTILITY SPECIFICATIONS**

The contractor is hereby notified that all utility specifications contained elsewhere herein shall be made a part of this contract, and that the contractor shall be bound to comply with all requirements of such specifications. The requirements and conditions set forth in the subject specifications shall be binding on the contractor just as any other specification would be.

## **NOTICE TO CONTRACTOR - RIGHTS OF WAY RESTRICTIONS**

The Contractor is hereby advised that at the time of advertising for bids not all the property may be acquired by the State, certain residences and/or business establishments had not been vacated, and asbestos removal by others from buildings to be disposed of had not been completed. A complete listing of the affected properties and the anticipated dates that they will become available is hereinafter provided. The Contractor is further advised that limitations, as enumerated herein below, are imposed which may interfere with the physical construction of the project. Following are statements which will set forth the restrictions on the right of entrance to property and conditions governing construction of the project.

1) The Contractor shall not occupy properties that are unacquired, perform any work thereon, or inhibit access thereto until the properties have been acquired and right of possession has been obtained. If the Contractor is allowed to proceed with the physical construction of the project, no action will be taken that will result in unnecessary inconvenience such as the discontinuance of utilities, the prevention of ingress and egress to the property, or will result in disproportionate injury or any action coercive in nature to occupants of residences (businesses, farms, or non-profit organization) who have not yet moved from the right-of-way.

2) It should be anticipated that each of the properties listed herein may be considered to have an effect upon construction operations.

3) The Contractor shall be aware that extensions of time will be granted, if necessary, for delays in construction operations caused by continued occupancy of residences, properties being unacquired or asbestos abatement concluding beyond the estimated time period.

The following is a complete listing of properties which have not been acquired, vacated and asbestos abated as of August 21, 2019 with the anticipated dates such properties will be acquired and/or vacated and abated.

**Property Map Serial Nos.**

1, 2, 3, 4 & 5

**Anticipated Acquisition Date**

January 24, 2020

**NOTICE TO CONTRACTOR - 1.05 CONTROL OF THE WORK**

**1.05.03 - CONFORMITY WITH PLANS AND SPECIFICATIONS (INCLUDING QUALITY CONTROL)**

The Contractor is hereby notified that a Quality Management Plan will be required for this Project in conformance with Standard Specifications (Supplemented January 2019) Article 1.05.03 – “Conformity with Plans and Specifications (including Quality Control).”

**NOTICE TO CONTRACTOR - QUALITY CONTROL PROGRAM**

**ITEM #0969054A CONTRACTOR QUALITY CONTROL PROGRAM LEVEL 1**

This Contract includes the above-noted item and special provision for Contractor Quality Control Program, developed to supplement Article 1.05.03 of the standard specifications.

A minimum lump sum bid amount is included within the special provision.

The Contractor must be aware that the special provision requires that a Quality Control Manager (QCM) be proposed to the Department within thirty (30) days after Contract Award and that the written QC Program be submitted to the Department within forty-five (45) days after Contract Award.

The Contractor must also be aware of the staffing, inspection, reporting and all other requirements of the special provision.

## **NOTICE TO CONTRACTOR - DETOUR**

The Contractor is hereby notified that to facilitate the replacement of Bridge No. 03903 over Amtrak, the Contractor will be allowed to close Mosher Avenue and detour traffic. The Contractor shall be allowed to detour traffic for a single week during the Advance Season work, for 12 consecutive weeks during Season 2 phased construction bridge rehabilitation activities, and for a single week to complete paving and approach roadway activities.

**The Contractor will not be permitted to close the bridge during the City Memorial Day parade 5/31/2021. The Contractor must provide at a minimum an alternating one-way traffic lane with pedestrian access beginning at 5:00 am on Friday 5/27/21.**

The Contractor shall also be permitted to close the bridge during the Fall of Season 1, after Labor Day, to facilitate the advanced abutment stabilization work required prior to phased construction activities. The Contractor shall only close the bridge during the weekday period and will not be permitted to close the bridge on weekends. The Contractor shall be responsible to maintain/cover the detour signing until it is required for the phased construction of the bridge replacement in the following Spring.

The Contractor shall also be permitted to close the bridge during the Fall of Season 2, after Labor Day, to facilitate the final paving activities. The Contractor shall only close the bridge during the weekday period and will not be permitted to close the bridge on weekends.

A schedule of special events shall be requested through the City of Groton Police Department, and Connecticut State Police, and shall form the basis of the Contractor's schedule for limited construction operations. Ongoing special events coordination throughout the construction project shall be the responsibility of the Contractor. **The Contractor must schedule work activities around any special event.**

The Detour Route is designed to accommodate AASHTO WB-40 design truck traffic, with a trailer length of 33 feet. The Contractor shall be responsible for providing flaggers on an on-demand basis to direct oversized truck traffic through the detour route. Trucks larger than WB-40 may not access the Sylvan Street one-way loop and instead shall be directed north on to Terrace Ave to access Main Street. Traffic shall be halted at Marsh and Terrace and Ward and Main to facilitate travel against the one-way signage. The cost of providing flaggers shall be paid for under Item No. 0970007A "Trafficperson (Uniformed Flagger)".

## **NOTICE TO CONTRACTOR – ENVIRONMENTAL INVESTIGATIONS**

Environmental site investigations were conducted that included the sampling and laboratory analysis of soil collected from various locations and depths within the Project limits. Results of the environmental investigations indicated the following within the Project limits:

- Semi-volatile organic compounds (SVOCs) and leachable lead at concentrations exceeding the CTDEEP Remediation Standard Regulations (RSR) numeric criteria in soil.

Based on the findings of the environmental investigation, one (1) Site-Wide Soil Area of Environmental Concern (AOEC) exists within the Project limits. The Contractor is hereby notified that all soil excavated within the project will require special management and/or disposal procedures. Pavement structures, concrete, and subbase are not considered Controlled Material.

Excess Controlled Material excavated from the Project that cannot be reused will require off-site disposal and shall be loaded directly into vehicles for immediate transport to the Contractor-selected disposal facility.

**Contractor Take Note:** In-situ waste characterization of the Controlled Material will be completed by the Engineer prior to the start of any excavation work. The Engineer will provide the Contractor with the waste characterization analytical data. Before beginning excavation, the Contractor shall utilize the waste characterization analytical data to obtain acceptance of the Controlled Material for disposal at the facility selected by the Contractor from the list of approved facilities provided in Item No. 0202315A – Disposal of Controlled Materials. **It is the responsibility of the Contractor to verify that a facility will be available and capable of handling the volume as well as the chemical and physical characteristics of material generated by the Project.**

The CTDEEP groundwater classification beneath the Projects limits is GA. Groundwater was not encountered during the environmental investigation and is not anticipated to be encountered during construction.

All removed railroad ties shall be loaded and transported for disposal to any processing facility on the DEEP Construction & Demolition Material Processing Facilities list permitted to accept creosote-treated wood. An alternate facility can be used; however, the Contractor must provide the Engineer a copy of the operating permit indicating the facility can accept treated wood.

The Contractor will be required to implement appropriate health and safety measures for all construction activities to be performed within the Project. These measures shall include, but are not limited to, air monitoring, engineering controls, personal protective 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 following Specifications shall be reviewed by the Contractor and include, but are not limited to:

- Item No. 0101000A – Environmental Health and Safety
- Item No. 0202315A – Disposal of Controlled Materials

An environmental consultant will be on site for excavation activities within the Project to collect soil samples (if necessary) and to observe site conditions for the State.

Information pertaining to the results of the environmental investigation can be found in the document listed below and shall be available for review electronically. The results contained in the environmental investigation reports listed below show levels of various contaminants that the Contractor may encounter during construction. Actual levels found during construction may vary and such variations will not be considered a change in condition provided the material can still be disposed as non-hazardous at one or more of the disposal facilities listed in Item No. 0202315A - Disposal of Controlled Materials.

- Task 210 Subsurface Site Investigation Report, Replacement of Bridge No. 03903, Mosher Avenue Over Amtrak Railroad, Groton, Connecticut, BL Companies, April 2019.



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

A limited hazardous materials site investigation has been conducted at Bridge No. 03903, Mosher Street over Amtrak Railroad in Groton, Connecticut. The scope of inspection was limited to the representative components projected for impact.

Results of the survey identified lead paint to be present on the metal road barriers, metal pipe/conduit along south side sidewalk, structural steel/metal bridge components and the wooden sidewalk fence of Bridge No. 03903.

Results obtained from TCLP waste stream sampling and analysis for leachable lead from the paint on metal road barrier, metal pipe/conduit along south side sidewalk and structural steel/metal bridge components characterized those paint waste streams as **CTDEEP/RCRA hazardous waste**. Lead waste characterization sampling and testing of the green painted wood sidewalk fence found it to be non-hazardous construction & demolition (C&D) bulky 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.

Grey brittle caulking on metal water pipe/conduits (C2) was sampled and found to contain asbestos. White hard caulking on the metal road barriers (C1) & hard tan caulking patch caulking (PC1) were sampled and found to contain no detectable amounts of asbestos. The water line pipe that runs along the south side sidewalk was covered in sheet metal and fiberglass insulation (non-suspect for asbestos).

Blood-borne pathogens (BBP) concerns (homeless activity, potential human feces, etc.) were identified at Bridge No. 03903.

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
- Item No. 0603222A – Asbestos Abatement
- Item No. 0101143A – Handling and Disposal of Regulated Items

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 electronically.

- HazMat Inspection Letter, Bridge No. 03903, Mosher Street over Amtrak Railroad, Groton, CT, TRC Environmental Corporation, June 19, 2019.

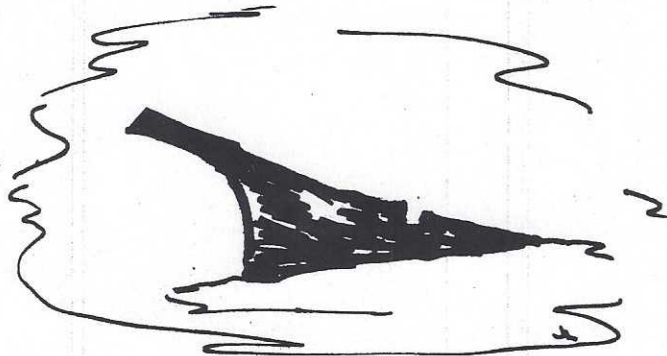
**NOTICE TO CONTRACTOR – NOANK FIRE DISTRICT WATER  
DEPARTMENT REGULATIONS AND SPECIFICATIONS**

The Contractor is hereby notified that the existing regulations and specifications for installation of water mains and appurtenances in Noank Fire District has been provided for reference.

**NOANK FIRE DISTRICT  
WATER DEPARTMENT**

*Effective 6/25/73 - b m*

**REGULATIONS AND SPECIFICATIONS  
FOR  
INSTALLATION OF WATER MAINS  
AND APPURTENANCES IN  
SUBDIVISION TRACTS**



**LENARD ENGINEERING**  
Storrs, Connecticut

# Noank Water Department

Noank, Connecticut 06340

June 25, 1973

From: Executive Committee, Noank Fire District

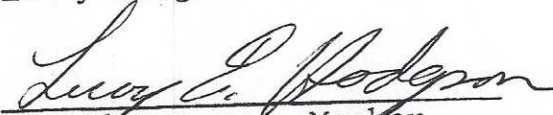
To Whom It May Concern.

Subject: Regulations and Specifications for Installation  
of Water Mains and Appurtenances In Subdivision  
Tracks.

1. The subject regulations, as proposed by the Noank Water Department, have been reviewed and are hereby approved.
2. As of this date, subject regulations are effective and are applicable to all future subdivisions and developments in the Noank Fire District.
3. Appended to this letter is a copy of the subject regulations.

  
Walter R. Palmer, Chairman

  
Leroy Hodgson - Member

  
Samuel Carson - Member

## TABLE OF CONTENTS

	<u>Page Nos.</u>
SECTION I. DEVELOPERS' CODE FOR THE INSTALLATION OF WATER MAINS AND APPURTENANCES IN SUBDIVISION TRACTS	I-1-4
GROUP A	I-2
GROUP B	I-2
GROUP C	I-2-3
GENERAL INFORMATION	I-3-4
SECTION II. STANDARD SPECIFICATIONS FOR MATERIALS FURNISHED BY DEVELOPERS FOR SUBDIVISION WATER DISTRIBUTION SYSTEMS	II-1-4
A. Asbestos Cement Pipe	II-2
B. Fittings	II-2
C. Gate Valves	II-3
D. Valve Boxes	II-3
E. Service Material	II-3
F. Hydrants	II-4
G. Anchor Pipe - Hydrant Branches and Valved Outlets	II-4
H. Tapping Sleeves For Asbestos Cement Pipe	II-4
I. Casing Pipe	II-4
SECTION III. STANDARD SPECIFICATIONS FOR INSTALLATION OF WATER MAINS AND APPURTENANCES BY DEVELOPERS	III-1-8
Section A. Work To Be Done	III-2
Section B. The Engineer	III-2
Section C. Trench Excavation	III-2
Section D. Rock Excavation	III-2
Section E. Installation of Pipe and Appurtenances	III-3
Section F. Installation of Push-On-Joints	III-3
Section G. Installation of Mechanical Joints	III-3
Section H. Installation of Valves and Valve Boxes	III-3-4
Section I. Installation of Hydrants and Branches	III-4
Section J. Installation of Services	III-4-5
Section K. Backfilling	III-5-6
Section L. Concrete Thrust Blocking	III-6
Section M. Boring and Installing Casing Pipe	III-6
Section N. Testing	III-6-7
Section O. Disinfection and Flushing	III-7
Section P. Loaming and Seeding	III-7-8
Section Q. Maintenance	III-8
Section R. Pavement Removal and Replacement	III-8
APPENDIX I. MAIN EXTENSION AGREEMENT	Appendix 1-4
APPENDIX II. TYPICAL CONSTRUCTION DETAILS AND RECORDS	Appendix 5
Figure 1. Typical Trench Detail	
Figure 2. Typical Sewer and Drain Crossing	
Figure 3. Typical Valve Connection	
Figure 4. Typical Gate Valve	
Figure 5. Typical Hydrant and Valve Detail	
Figure 6. Manual Air Release Valve	
Figure 7. Typical Service Installation	

SECTION 1.

DEVELOPERS' CODE FOR THE  
INSTALLATION OF WATER MAINS  
AND APPURTENANCES IN  
SUBDIVISION TRACTS

NOANK FIRE DISTRICT - WATER DEPARTMENT

## DEVELOPERS' CODE FOR THE INSTALLATION OF WATER MAINS AND APPURTENANCES IN SUBDIVISION TRACTS

"Department" shall mean the Water Department of the Noank Fire District acting through its properly authorized officers, agents or employees, each acting within the scope of the particular duties entrusted to each one.

The Developer shall be the one solely responsible for complying with the following items when installing water mains and appurtenances in new subdivision tracts. These items are divided into three groups which indicate the order for completion.

Group A consists of items which must be completed prior to the issuance of a main extension agreement. Group B consists of items which must be completed prior to the beginning of the construction of water mains and appurtenances. Group C consists of items which must be completed following the construction of water mains and appurtenances and prior to final acceptance by the Department.

### GROUP A

1. Submit two (2) reproducible prints of subdivision drawings showing proposed water main installations to the Department. These drawings shall bear the seal of a Professional Engineer, registered in the State of Connecticut. One print will be returned to developer's engineer marked either for approval or for correction.
2. Should the aforementioned drawings require changes with respect to water main installations, submit two (2) reproducible prints of revised drawings to the Department for review and approval.

### GROUP B

1. Enter into a Main Extension Agreement with the Department and make the required deposit at the time said agreement is executed. This deposit consists of an engineering review cost and connection fee. The engineering review cost is based on \$10.00 per lot with a minimum payment of \$150.00 and a maximum payment of \$500.00. The connection fee is contained in the Rules and Regulations of the Department.
2. Contact the Department for all taps to existing mains and all tie-in connections to ends of existing main stubs. These connections shall be made by the Developer's contractor under the supervision of a Department representative or by Department personnel, at Developer's cost at the option of the Department.
3. Furnish the required insurance certificate as stipulated in the Main Extension Agreement.
4. Furnish to the Department the name of the contractor who will be installing the water mains and appurtenances.
5. Notify the Department of the starting date of water main construction, in writing, five (5) days in advance of construction.
6. Establish lines and grades in the field such that following completion of the subdivision there will be a minimum of 4 ft. of cover on all water mains and services, such that all fire hydrants are set with nozzles at proper elevations, and such that the locations of water mains and appurtenances conform to the drawings as approved by the Department.

### GROUP C

1. Adhere to specifications when installing water mains and appurtenances as stipulated in Section III, Standard Specifications for Installation of Water Mains and Appurtenances by Developer, of these regulations.
2. Pressure test all new water mains and appurtenances in accordance with the appropriate specification in Section III, Standard Specifications for Installation of Water Mains and Appurtenances by Developers, of these regulations.



3. Disinfect all new water mains and appurtenances in accordance with the appropriate specification in Section III, Standard Specifications for Installation of Water Mains and Appurtenances by Developers, of these regulations.

4. Contact the Department when water is needed for filling, flushing and testing new water mains and appurtenances. Department personnel shall be the only ones allowed to open valves off existing water mains which are in service. It is important that no water be allowed to flow from unapproved mains into existing mains which are in service.

5. Furnish to the Department a maintenance bond in form satisfactory to the Department and issued by a carrier satisfactory to the Department in the amount of \$10,000.00. Said bond shall cover a period of 24 months following completion of the installation of water mains and appurtenances. This completion date shall be established as the date of completion of satisfactory pressure test. A letter of credit in the aforementioned amount and covering the aforementioned period of time shall be acceptable in lieu of a maintenance bond.

6. Furnish to the Department the following items pertaining to the installation, testing and disinfection of new water mains and appurtenances within four (4) weeks after a satisfactory pressure test.

a) Signed and sealed statement by the developer's engineer addressed to the Department stating that all work involved with the installation of water mains and appurtenances was completed in accordance with drawings approved by the Department and in accordance with the specifications contained in Section III, Standard Specifications for Installation of Water Mains and Appurtenances by Developers, of these regulations; that all valves and hydrants are open and in satisfactory operating condition; that all water mains and appurtenances have met the required pressure test; that all water mains and appurtenances have been satisfactorily disinfected.

b) Service tap and hydrant forms completely filled out. (The Department will furnish the Developer with a supply of blank forms for this purpose).

c) One (1) print of the record drawing, scale 1" = 40', showing the constructed location of all water mains with ties to all fittings and valves and marked "As Built" and stamped with the developer's engineer's PE license number and seal.

7. Furnish to the Department within eight (8) weeks after a satisfactory pressure test the total cost of water mains and appurtenances broken down into the various items so installed.

8. Contact the Department for turning on each water service. It shall be the responsibility of the developer to make this contact prior to the need for any water at any individual premises. It shall further be the responsibility of the developer to notify the Department when a house is ready for occupancy.

### GENERAL INFORMATION

1. Lots in new subdivision tracts which are to receive water service from existing mains will not be included in the main extension agreement. Applications for these services are to be made individually as each lot or house is sold.

2. Inasmuch as many of the aforementioned items are of an engineering nature, the required information, certificates, etc., may be submitted by the developer's engineer. It must be emphasized, however, that the developer is responsible for seeing that all requirements are fulfilled.

3. The Department is to be notified promptly if any revisions are made to a subdivision after the Department has approved the original drawings.

Such notification is to be made by submitting two (2) prints of the revised drawings for approval. One (1) print will be returned with either the Department's approval or comments for corrections. If corrections are required, two (2) revised prints are to be re-submitted, one (1) of which will be returned with the Department's approval. It will not be necessary to re-submit the original drawings inasmuch as they have previously been signed.

A revised Main Extension Agreement will be forwarded to the Developer if the changes in the subdivision require such action. This would be the case if there is an increase or decrease in the number of lots.

It must be clearly understood that the Department cannot be responsible for any water distribution systems which are revised after approval of the original drawings unless proper notifi-

cation is received as outlined above.

4. The Department has approved the use of copper tubing for residential service installations.

If the water requirement is 20 gpm or less, the service shall be classified as a 3/4" service.

If the water requirement is 20 - 30 gpm, the service shall be classified as a 1" service.

Corporation stops, valves, service lines and curb stops between the main and the premises shall be adequately sized according to the water requirement of the house or building to be serviced.

SECTION II.

STANDARD SPECIFICATIONS  
FOR MATERIALS FURNISHED BY DEVELOPERS  
FOR SUBDIVISION WATER DISTRIBUTION SYSTEMS

STANDARD SPECIFICATIONS FOR MATERIALS  
FURNISHED BY DEVELOPERS FOR SUBDIVISION  
WATER DISTRIBUTION SYSTEMS

A. - ASBESTOS CEMENT PIPE

Asbestos-cement pipe shall conform to the requirements of ASTM Standard Specifications for Asbestos-Cement Pressure Pipe, Designation C296-67 for Type II pipe. Unless otherwise indicated, all pipe shall be Class 150. Johns-Manville Transite Ring-Tite Pressure Pipe is preferred.

All asbestos-cement pipe shall be cured by the autoclave process. Minimum autoclave time shall be 16 hours process.

Joints shall be made with asbestos-cement couplings and rubber gaskets. The couplings shall be of the same quality as the pipe with which they are to be used and shall provide tight joints when subjected to the same hydrostatic test as designated for the pipe. Couplings and gaskets shall be provided in sufficient quantity to allow for breakage and loss.

Pipe shall be furnished in 13-ft. lengths; however, enough half lengths, short lengths, and fully-machined lengths shall be provided for use as short lengths at connections, fittings, structures, and appurtenances.

Sworn certificates of the specified mill tests of the pipe shall be submitted in duplicate to the Superintendent.

A. LINING. The inside of pipe and couplings shall be given a vinyl seal coat which consists of a thermoplastic vinyl resin base approved by the United States Food and Drug Administration for use in contact with edible solids and liquids.

B. The resin shall be odorless and tasteless and shall have no deleterious effect upon the quality, color, taste or odor of potable water. When immersed in distilled water for (7) days, it shall impart no color, taste or odor to the water and shall inhibit increase in hardness and alkalinity of the water. It shall adhere tenaciously to the pipe wall and shall show no separation after one month immersion in distilled water.

C. A sample of vinyl coated pipe shall be bedded on end in a shallow pan of melted paraffin. The pipe shall be filled with distilled water and allowed to stand for (7) days. At the end of the period, the water shall be tested and shall be free from objectionable color, taste, and odor, and from increase in hardness and alkalinity within the limits as set forth in the AWWA C104-64, Section 4-14.3.

D. A sample of vinyl coated pipe shall be immersed in a vat of distilled water for a period of one month. Following this, it shall be examined and shall show no separation of the coating from the pipe wall.

B. FITTINGS

- A. Fittings shall be cast iron conforming to A.S.A. specification A21.10-1964 and shall have all-bell mechanical joint ends.
- B. Mechanical joints shall conform to A.S.A. specifications A21.11-1964.
- C. Fittings shall be cement lined in accordance with A.S.A. specification A21.4 and coated inside and outside with a coal tar bituminous coating. Cement lining thicknesses shall be as specified for pipe in Article 1 above.
- D. Fittings shall meet pressure requirements as specified under A.S.A. specification A21.10-1964 (Class 250).
- E. Fittings shall be provided with sufficient quantities of accessories conforming to A.S.A. specification A21.11-1964.
- F. The developer may, if he so desires, use "Push-On" type fittings instead of "Mechanical Joint" fittings on all locations except the main line tees and fittings for hydrant branches which must be mechanical joint. The "Push-On" fittings shall be gray iron, Class 250, with body thicknesses and radii of curvature conforming to A.S.A. specification A21.10-1964 and joints in accordance with Sec. 11-2.3 of A.S.A. specification A21.11-1964. "Push-On" fittings shall be cement lined as specified above.

Fittings for use with asbestos-cement pressure pipe shall be gasket type bell-end joints designed to take the asbestos-cement pipe and conforming to USA Standard Specifications for Cast-Iron Fittings, 2-In. Through 48-In., for Water and Other Liquids (A21.10-1964). Fittings shall be of a pressure classification at least equal to that of the piping with which they are to be used.

## C. GATE VALVES

### A. LARGER THAN 3 IN. IN SIZE

Buried gate valves shall be nonrising stem, iron-body, bronze-mounted, double disk gate valves having mechanical, flanged, or bell-and-spigot ends as necessary to match connecting pipe. The valves shall be suitable for 175 psi. working pressure for 3- to 12-in. sizes and shall conform to the AWWA Standard for Gate Valves for Ordinary Water Works Service, designation C500-61, insofar as applicable. Valves shall be made by the Darling Valve and Mfg. Co., Williamsport, Pa., or shall be of the New York Metropolitan Pattern.

They shall in addition meet the following requirements:

Gate valves shall be inside-screw, with operating nut.

Bronze gate-rings shall be fitted into grooves of dovetail or similar shape in the gates. For grooves of other shapes the rings shall be firmly attached to the gates with bronze rivets.

Stuffing box follower bolts shall be of steel and the nuts shall be of bronze.

O-ring stuffing boxes shall be used.

All valves furnished shall open counter-clockwise.

The design and machining of the valves shall be such as to permit packing the valves without undue leakage while they are wide open and in service.

### B. SMALLER THAN 3 IN. IN SIZE

Gate valves 3 in. and smaller shall be standard, bronze, single-wedge, rising stem-type gate valves with screwed ends for 125-lb. working steam pressure, conforming to Federal Specification WW-V-54b, for Valves, Gate; Bronze, 125- and 150-Pound, Screwed and Flanged (For Land Use). They shall have silicon-bronze stems and Composition 2 (ASTM B62) bodies and bonnets.

## D. VALVE BOXES

Valve boxes shall be three-section cast iron, adjustable screw type, heavy pattern. The lower section of the box shall be designed to enclose the operating nut and stuffing box of the valve and rest on the backfill. The length shall be as necessary to suit the ground elevation. The inside diameter of the boxes shall be at least 4-1/2 in., including cover.

## E. SERVICE MATERIAL

- A. The minimum service pipe diameter shall be 3/4 inch.
- B. Corporation cocks shall be of bronze with a lapped, ground key. The inlet thread shall be of steep taper type. Outlet connections shall be as required to suit the type of pipe or tubing connected. The cocks shall be the approved equal of those made by Mueller Co. or Hays Mfg. Co.
- C. Curb stops shall be as follows:
  - 3/4" Copper to Copper - Hays 5046CF
  - 1" Copper to Copper - Hays Nuseal #4008, or Ford Type 300 ball valve
  - 1 1/2" Copper to Copper - Hays Nuseal #4008, or Ford type 300 ball valve
  - 2" Copper to Copper - Hays Nuseal #4008 or Ford type 300 ball valve
- D. Couplings shall be as follows:
  - 3/4" Copper to Copper - Hays 5615CF
  - 1", 1 1/2", 2" Copper to Copper - Mueller #H-15405 and #H-15400 or Hays #5610 and #5615
  - 1", 1 1/2", 2" Copper to Iron - Mueller #H-15425 and #H-15450, or Hays #5605 and #5600
- E. Copper tubing shall be Type K virgin copper conforming to ASTM Specification B88-47.
- F. Curb boxes shall be Buffalo type 95E with 45" rods, rings and brass pins, extension 48" to 66", Mueller #H-10306, extension 54"-66", with #84154 rod, or Hays #5802.

## F. HYDRANTS

Hydrants shall be Breakaway type Standard AWWA hydrants conforming to the applicable requirements of the AWWA Standard Specification for Fire Hydrants for Ordinary Water Works Service Designation C502-54. Hydrants shall be furnished with one pumper and two hose connections. The size of connections and the threads shall be as required by the Department. Operating nuts shall turn counter clockwise to open the hydrants. For purposes of standardization, hydrants shall be Darling hydrants manufactured by the Darling Valve and Mfg. Co., Williamsport, Pa., and shall have a 5-in. valve and a 6-in. inlet connection. Hydrants, valves and connecting piping shall be rated for a working water pressure of at least 150 psi.

## G. ANCHOR PIPE - HYDRANT BRANCHES AND VALVED OUTLETS

Anchoring pipes shall be Clow Model F-1216, or approved equal, and shall be cement lined in accordance with A.S.A. specifications A21.4 and coated inside and outside with a coal tar bituminous coating. All anchoring pipes shall meet pressure requirements equivalent to that for pipe.

## H. TAPPING SLEEVES FOR ASBESTOS CEMENT PIPE

Tapping sleeves for asbestos cement pipe shall be caulked type and shall be Mueller #H-611, or approved equal.

## I. CASING PIPE

Casing pipe shall be steel, Grade B seamless, with welded joints. Pipe shall conform to the following schedule of minimum diameters and wall thicknesses:

<u>Carrier Pipe Dia.</u>	<u>Casing Pipe Dia.</u>	<u>Casing Pipe Wall Thickness</u>
6"	14"	3/8"
8"	16"	3/8"
12"	20"	3/8"

The casing pipe shall be coated inside and outside with Coal-Tar Enamel as specified in American Water Works Association Standard AWWA C203-62.

SECTION III.

STANDARD SPECIFICATIONS  
FOR INSTALLATION OF WATER MAINS AND  
APPURTENANCES BY DEVELOPERS

NOANK FIRE DISTRICT, WATER DEPARTMENT

STANDARD SPECIFICATIONS  
FOR INSTALLATION OF WATER MAINS AND  
APPURTENANCES BY DEVELOPERS

SECTION A.- WORK TO BE DONE

These detailed specifications, as prepared by the Department, are included in the work to be done under the main extension agreement. These specifications are to be included in the contract agreement between the Developer and his Contractor.

SECTION B. - THE ENGINEER

The Developer's Engineer shall be designated by the Developer as his Consulting Engineer who prepares the drawings and inspects all construction. He shall act on behalf of the Developer in furnishing the necessary statements and completion records as stipulated in Section I, Developers' Code for the Installation of Water Mains and Appurtenances in Subdivision Tracts.

The Department's Representative shall be the Superintendent or his designated Representative. During construction he shall act as the Inspector, and shall act for, and on behalf of, the Department in the determination of the Developer and Contractor's obligations under the terms of the Specifications and the Main Extension Agreement. He shall have the power to interpret and enforce the Specifications on behalf of the Department for any or all work done. The cost of such Inspection Services shall be reimbursed by the Developer.

SECTION C. - TRENCH EXCAVATION

All trenches shall be excavated to the lines and grades specified on the drawings and/or established in the field by the Developer's Engineer. The width of the trench shall be made as narrow as practicable consistent with easy handling and laying of the various size water mains. The sides of the trenches, between the horizontal center line of the pipe and an elevation of 1' above the top of the pipe, shall be vertical. The depth of the trench shall be sufficient to provide a cover over the top of the pipe of at least 4' after all finish grading of lawns and roadways has been completed.

The trench, or section of trench being excavated, shall be kept free from water during the time pipe joints are being made.

Bell holes shall be provided at each joint to permit the joint to be made properly. If the bottom of any excavation is taken out beyond the limit indicated or prescribed, the resulting void shall be backfilled with thoroughly compacted run-of-bank gravel.

If, in the opinion of the Inspector, material unsuitable for foundation is found at or below the grade to which excavation would normally be carried in accordance with the drawing and/or specification, such material shall be removed to the required width and depth and replaced with thoroughly compacted run-of-bank gravel.

SECTION D. - ROCK EXCAVATION

Should rock be encountered, the trenches shall be excavated such that the remaining rock will be not less than 6" from the pipe after it has been laid.

Rock shall be excavated to the lines and grades indicated on the drawings or as directed by the Developer's Engineer. Following excavation and before placement of the pipe, the trench shall be backfilled to the correct subgrade with thoroughly compacted, suitable material.

Backfilling of trenches where rock has been excavated shall be as specified in SECTION K, BACKFILLING.

If blasting is required to loosen any rock encountered, all permits shall be obtained from the appropriate agencies and insurance coverage shall be in effect. Said coverage shall be a part of the insurance certificate furnished with the main extension agreement.



## SECTION E. - INSTALLATION OF PIPE AND APPURTENANCES

Care shall be taken in handling pipe to prevent the cement lining and any protective coating from becoming damaged. All pipe shall be carefully examined for defects and no pipe shall be laid which is known to be defective. If any defective pipes shall be discovered after having been laid, they shall be removed and replaced with sound ones.

All interior surfaces of pipes shall be thoroughly cleaned before they are laid and shall be kept clean until accepted by the Inspector. Exterior surfaces and bell and spigot ends shall also be thoroughly cleaned prior to making joints.

Suitable watertight end caps or plugs shall be used for capping the ends of pipe when pipe laying is not actually in progress. Materials such as burlap, canvas or plywood will not be acceptable for this purpose. Water standing in the trench when work is resumed shall be pumped out prior to removal of a cap or plug.

## SECTION F. - INSTALLATION OF PUSH-ON-JOINTS

The gasket and the gasket seat in the socket of Push-On Joint Pipe shall be wiped clean with a cloth. The gasket shall be flexed and placed in the socket with the large round end entering first and sprung into the gasket seat so that the groove fits over the bead of the seat. A thin film of non-toxic gasket lubricant shall be applied to the inside surface of the gasket. Lubricant other than that furnished by the pipe manufacturer shall not be used.

The plain end of the pipe shall be wiped clean, aligned, and carefully started into the socket so that it comes in contact with the gasket. In some cases it may be desirable to lubricate the outside of the plain end for about an inch back from the end of the pipe.

The joint shall be made up by exerting sufficient force on the entering pipe so that its plain end is moved past the gasket until it makes contact with the base of the socket. Power equipment may be used to move the plain end past the gasket. However, extreme care must be exercised when using power equipment in order not to damage the pipe. If proper assembly is not accomplished with the application of reasonable force, the plain end shall be removed to check for proper positioning of the gasket.

The maximum allowable deflection for asbestos-cement pipe per foot shall be no more than one inch per foot.

## SECTION G. - INSTALLATION OF MECHANICAL JOINTS

The joint gasket and surfaces against which the gasket will come in contact shall be thoroughly cleaned prior to assembly of the joint. The gasket, bell, and spigot shall be lubricated by being washed with soapy water. The gland and gasket, in that order, shall be slipped over the spigot, and the spigot shall be inserted into the bell until it is correctly seated. The gasket shall then be seated evenly in the bell at all points, centering the spigot, and the gland shall be pressed firmly against the gasket. After all bolts have been inserted and the nuts have been made up fingertight, diametrically opposite nuts shall be progressively and uniformly tightened all around the joint to the proper tension, by means of a torque wrench.

The correct range of torque as indicated by a torque wrench shall not exceed 60-90 ft.-lb.

If effective sealing of the joint is not attained at the maximum torque indicated above, the joint shall be disassembled and thoroughly cleaned, then reassembled. Bolts shall not be overstressed to tighten a leaking joint.

## SECTION H. - INSTALLATION OF VALVES AND VALVE BOXES

The Developer and his Contractor shall furnish all materials, labor, plant, tools and equipment required for excavating, setting of the valves to lines and grades, joining to the pipe lines, and setting the valve boxes to lines and grades and backfilling.

Unless otherwise directed by the Department, all gate valves shall be set with their stems truly vertical. The valves shall be joined to the pipe line with mechanical joints. The tops of the valve boxes shall be set neatly to the grade of the street or the surface of the existing

ground. The valve boxes shall be set so there is a uniform space around the operating nut, and the sides of the valve box shall be parallel to the axis of the stem of the valve.

Valve box tops shall be maintained at road grade or ground surface for a period of twenty-four (24) months after the completion of each project.

## SECTION I. - INSTALLATION OF HYDRANTS AND BRANCHES

The Developer and/or his Contractor shall furnish all materials, labor, tools, and equipment for excavating, setting hydrant, auxiliary valve and valve box, and installing branch and backfilling trench. The hydrant shall be set vertical at proper elevation and braced in position. An 8" x 16" x 4" concrete building bloc or equivalent shall be placed under the base of the hydrant as approved by the Department. The Developer and his Contractor shall furnish the block for the hydrant support.

The excavation for the hydrant shall end sufficiently below the base of the hydrant to allow for setting of the 8" x 16" x 4" concrete building block or equivalent and gravel drain bed, and the hydrant shall be firmly set on the concrete block. The hydrant and branch shall be installed and secured with anchoring pipes as specified in Article VII of Section II, Standard Specifications for Materials to be Furnished by Developers.

Hydrants shall be set truly vertical and plumb, and they shall be flushed out after they are set to make sure branch valves are open and that hydrants close and drain properly into a sufficient size gravel bed. Gravel shall be thoroughly tamped to prevent settlement of hydrant.

The Developer and/or his Contractor shall be responsible for clean up around the hydrant and along the excavation for the branch. The Developer and his Contractor shall also be responsible for maintenance of backfilled areas and hydrant elevations with respect to ground surfaces for a period of twenty-four (24) months following completion of the work.

The Developer and/or his Contractor shall further be responsible for painting each hydrant following installation and clean up with one coat of finish paint. The paint shall be applied after all loose scale, rust, dirt, grease, and other foreign matter have been removed completely from the hydrant. One coat of paint, Sta Cote, Federal Yellow, as manufactured by the Murphy Paint Company, or approved equal, shall then be applied in accordance with manufacturer's instructions.

## SECTION J. - INSTALLATION OF SERVICES

The Developer and/or his Contractor shall furnish all labor, materials, tools and equipment for trenching, making taps, laying copper pipe, installing curb stops and boxes, and backfilling for service connections.

Services shall be installed from the main to the street right-of-way line with curb stops and boxes being placed on the right-of-way line. All taps, pipe, connections, curb stops and boxes shall be installed in accordance with standards of good workmanship.

Services that cross streets where pavement is in place shall be installed by drilling. Pavement shall be cut only, when in the opinion of the Developer's Engineer, it is impossible to drill pipe through the soil.

All excavations, both in and out of pavement, shall be properly tamped to eliminate future settlement. Tamping shall be done as the excavations are backfilled. Excavations shall not be considered properly compacted if they are completely filled before any tamping is done.

During winter months, no frozen material shall be placed back in the trench until one (1) foot of suitable, unfrozen material has been placed over the pipe. Frozen material shall be known to conform to the Standards under SECTION K, BACKFILLING. Any excess material shall be hauled away from the job site by the Developer and his Contractor.

Taps shall be made with the corporation stop in the upper half of the main and making an approximate 22 1/2° angle with the horizontal axis of the main. The service pipe shall then be goosenecked downward in such a manner that the pipe rests firmly on undisturbed soil. The gooseneck shall extend over a sufficient length of pipe to preclude any possibility of failure due to settlement of the main.

There shall be a minimum of 4 feet of cover over the service pipe. All curb boxes shall be set vertically and as near to finished grade as possible. Curb boxes shall be staked for proper identification to protect said boxes from damage by equipment being used to construct new houses.

Tap cards for service installations shall be furnished to the Developer by the Department. It shall be the responsibility of the Developer or his Engineer to furnish on the cards all requested information plus a sketch showing the exact location of the curb box in accordance with samples in SECTION I, DEVELOPERS' CODE. Completed tap cards shall be returned to the Department within four (4) weeks after approval of water samples. Under no circumstances shall there be any deviation in complying with this specification. All service connections from the main to the curb box as well as from the curb box to the house shall be inspected by the Department prior to backfilling.

## SECTION K - BACKFILLING

- a. Zone Around Pipe. The space between the pipe and bottom side of the trench shall be packed full by hand shovel with sand. In placing the material, care shall be taken that stones do not strike the pipe. The backfill under the pipe shall be thoroughly compacted using curved tamping bars. Sand backfill at the sides and up to the top of the pipe shall be compacted using approved hand tampers. Sand backfill up to a level of 1 ft. above the top of the pipe shall be placed in 6-in. layers, leveled along the length and width of the trench, and thoroughly compacted using approved tampers. No sand shall be placed above the top of the pipe until the sand under and at the sides of the pipe has been compacted. Care shall be taken in the use of mechanical or other tampers not to injure or move the pipe or to cause the pipe to be supported unevenly.
- b. Materials. The nature of the materials will govern both their acceptability for backfill and the methods best suited for their placement and compaction in the backfill. In general, material used for backfilling trenches and excavations shall be suitable material which was removed in the course of making the construction excavations.

No stone or rock fragment larger than 12 in. in greatest dimension shall be placed in the backfill nor shall large masses of backfill material be dropped into the trench in such a manner as to endanger the pipeline. If necessary, a timber grillage shall be used to break the fall of material dropped from a height of more than 5 ft. Pieces of bituminous pavement shall be excluded from the backfill unless their use is expressly permitted, in which case they shall be broken up.

- c. Remainder of Trench. The remainder of the trench above the zone around the pipe shall be compacted by waterjetting, puddling, or tamping, in accordance with the nature of the material. Waterjetting or puddling shall be used wherever the material does not contain so much clay or loam as to delay or prevent satisfactory drying.
- d. Waterjetting. If the backfill is to be compacted by waterjetting, the material shall be placed in uniform layers not exceeding 4 ft. deep. Before the succeeding layer is placed, each layer shall be thoroughly saturated throughout its full depth and at frequent intervals across and along the trench until all slumping ceases. To accomplish this, the Contractor shall furnish one or more jet pipes, each of sufficient length to reach to the specified depth and of sufficient diameter (not less than 1 1/4 in.) to supply an adequate flow of water to compact the material. The jet pipe shall be equipped with a quick-acting valve and be supplied through a fire hose from a hydrant or a pump having adequate pressure and capacity.
- e. Tamping. If the material is unsuitable for jetting or puddling, compaction shall be accomplished by tamping or, under appropriate circumstances, rolling. The material shall be deposited and spread in uniform, parallel layers not exceeding 8 in. thick before compaction. Before the next layer is placed, each layer shall be tamped as required so as to obtain a thoroughly compacted mass. If necessary, the Contractor shall furnish and use an adequate number of power-driven tampers, each weighing at least 20 lbs., for this purpose. Care shall be taken that the material close to the bank, as well as in all other portions of the trench, is thoroughly compacted. When the trench width and the depth to which backfill has been placed are sufficient to make it feasible, and it can be done effectively and without damage to the pipe, backfill may, on approval, be compacted by the use of suitable rollers, tractors, or similar powered equipment, instead of by tamping. For compaction by tamping (or rolling), the rate at which backfill material is deposited in the trench shall not exceed that permitted by the facilities for its spreading, leveling, and compacting as furnished by the Contractor.

If necessary to ensure proper compaction by tamping (or rolling), the material shall first be wet by sprinkling. However, no compaction by tamping (or rolling) shall be done when the material is too wet either from rain or too great an application of water to be compacted properly; at such times the work shall be suspended until the previously placed and new materials have dried out sufficiently to permit proper compacting, or such other precautions shall be taken as may be necessary to obtain proper compaction.

- f. Miscellaneous Requirements. Whatever method of compacting backfill is used, care shall be taken that stones and lumps shall not become nested and that all voids between stones shall be completely filled with fine material. Only approved quantities of stones and rock fragments shall be used in the backfill.

Where excavations are made through existing permanent highway or street pavements, curbs, driveways, or sidewalks, backfilling shall conform to the requirements of the particular agency or highway department involved. In general, run-of-bank gravel shall be used and placed in 6" layers and thoroughly compacted with approved power tampers.

### SECTION L - CONCRETE THRUST BLOCKING

All tees, tapping sleeves, plugs and bends are to be restrained from movement with thrust blocks formed of 2,500 psi concrete. Concrete shall be furnished and delivered by approved transit-mix companies. The concrete shall be poured between the fitting and undisturbed soil. The size of thrust block shall be as indicated in the following schedule. Thrust blocks for tapping sleeves shall include a cradle for vertical support.

AREA, IN SQUARE FEET, OF THRUST BLOCKS  
AGAINST UNDISTURBED SOIL

PIPE SIZE	FITTINGS				
	11 1/4° BEND	22 1/2° BEND	45° BEND	90° BEND	TEE, PLUG TAPPING SLEEVE
6"	2	2	3	6	4
8"	2	3	6	10	8
12"	3	6	12	22	16

### SECTION M - BORING AND INSTALLING CASING PIPE

This section shall apply when the highway authorities who grant permission to cross a highway specify that the water main being installed be encased in another pipe.

Casing pipe shall be steel as specified in Article XI, Casing Pipe, of Section II, Standard Specifications for Materials to be Furnished by Developers.

Boring shall be done in a manner not to damage any existing structures. The minimum diameter required for the bore shall be ample to provide for the insertion of the casing pipe. The bore shall be true to lines and grades as determined by the Developer's Engineer and as shown on the drawings, and shall be made after all existing structures have been located. Any damage to existing structures shall be repaired, or structures replaced, at the Developer's expense.

Care shall be taken in handling the carrier pipe to prevent the protective coating and cement lining from becoming damaged. This shall be done by banding wooden blocks to the carrier pipe before pushing same through the casing pipe. Banding material and blocks shall be as shown on the drawings.

After the water pipe has been successfully laid in the casing pipe, the space between the outside of the carrier pipe and the casing shall be completely filled with sand by methods approved by the Inspector. Sand fill shall be a well-graded granular material of which all will pass a No. 4 sieve but not more than 5 percent will pass a No. 200 sieve.

The Developer and/or his Contractor shall make all necessary excavations for boring and shall backfill same in accordance with SECTION K, BACKFILLING, of SECTION III, STANDARD SPECIFICATIONS FOR INSTALLATION OF WATER MAINS AND APPURTENANCES BY DEVELOPERS.

All of the above applies only to boring and installing casing pipe under highways. Should it be necessary to bore and encase a water main under railroad tracks, the specifications and requirements of the particular railroad company shall apply.

### SECTION N. - TESTING

Existing water mains shall not be used to directly fill any new line. The new line shall be filled from a hydrant through a 1" corporation check valve. This is to prevent any possibility of contamination of existing water mains.

All mains and appurtenances shall be pressure tested after services have been installed in accordance with the following procedures:

The pressure in the new system shall be raised, by pumping, to a pressure of 150 pounds per square inch based on the elevation at the lowest point of the section under test and corrected in accordance with gauge location. If the specified pressure cannot be achieved and maintained for a period of two (2) hours, the section under test shall be considered as failing the pressure test.

If the aforementioned pressure can be achieved and then maintained without further pumping for a period of two (2) hours, the section under test shall be accepted without further testing. If, however, after achieving the aforementioned pressure, additional pumping is required to maintain the specified pressure, then the amount of water required to maintain this pressure shall be measured during the two (2) hour period. This measured quantity of water shall be classified leakage and shall be compared with allowable leakage in the table which follows. Should the actual leakage exceed the allowable, then the section under test shall be considered as failing the test. If, however, the actual leakage is less than the allowable, then the section under test shall be approved.

### PRESSURE TESTING OF WATER MAINS

MAXIMUM ACCEPTABLE LOSS IN GALLONS/2 HRS.  
Rate is based on 10 gal/inch dia/24 hrs/mile

<u>Length of Pipe</u>	<u>6" Pipe</u>	<u>8" Pipe</u>	
100	0.69	.12	
200	.18	.25	.125 gallon = 1 pint
300	.28	.38	.25 gallon = 2 pints = 1 quart
400	.37	.50	.375 gallons = 3 pints
500	.47	.63	.500 gallons = 4 pints = 2 quarts
600	.56	.76	.625 gallons = 5 pints
700	.65	.89	.75 gallons = 6 pints = 3 quarts
800	.75	1.01	.875 gallons = 7 pints
900	.84	1.14	1.00 gallon = 8 pints = 4 quarts
1000	.94	1.26	
1500	1.03	1.89	
2000	1.89	2.52	
2500	2.36	3.16	
3000	2.84	3.79	

### SECTION O. - DISINFECTION AND FLUSHING

After a section of the main has been pressure tested and found acceptable, it shall be flushed thoroughly by the Department. Upon completion of flushing operations, the Department shall disinfect the main with a chlorine solution. The strength of this solution shall be such that a residual of 25 ppm. of chlorine shall be retained in the main after at least 24 hours. Disinfection shall be in accordance with the AWWA Standard Specifications for Disinfecting Water Mains, Designation C601-54, Section 1 to 15, inclusive.

Following disinfection, all treated water shall be thoroughly flushed from the main until approved by the Department.

### SECTION P. - LOAMING AND SEEDING

The Developer and/or his Contractor shall furnish all labor, materials, and equipment necessary to do all loaming and seeding in existing lawn areas which are disturbed during the installation of water mains and appurtenances for new subdivisions.

Loam shall be a natural, fertile soil typical of productive soils in the vicinity of placement and containing no substances harmful to grass growth.

Seed shall be of an approved mixture, new crop, clean, high in germinating value and low in weed seed.

Soil conditioners and fertilizers shall be spread and thoroughly worked into the loam.

Seeding shall be accomplished in an approved manner and shall conform to all standards of good workmanship. Seed shall be sown at an approved rate during suitable, approved weather conditions.

Seed shall be raked lightly into the soil to a depth of 1/4 inch and rolled with a roller weighing not more than 100 lb. per linear foot of tread.

The Developer and/or his Contractor shall maintain and protect seeded areas as necessary to produce a dense, healthy growth of perennial lawn grass. At the beginning of the next planting season after that in which the permanent grass crop is sown, the seeded areas will be inspected. Any section not showing dense, vigorous growth at that time shall be promptly reseeded by the Developer and his Contractor at his own expense.

### SECTION Q. - MAINTENANCE

The Developer shall be responsible for any breaks or leaks that may occur on a main extension or appurtenance for a period of twenty-four (24) months after the particular installation or project has been placed in service. All such breaks or leaks shall be repaired immediately and to the satisfaction of the Department, at the Developer's expense. Should such breaks or leaks not be repaired immediately or to the satisfaction of the Department, Department personnel will undertake said repairs. All expenses involved for repairs made by Department personnel shall be promptly reimbursed by the Developer.

Trenches and pavement shall be maintained by the Developer for a period of at least twenty-four (24) months after the installation and pressure testing of water mains, and for a longer period to be determined by the Department if weather conditions, Contractor's delays, etc., prevent the Developer and his Contractor from properly restoring the ground or pavement to its original condition within the twenty-four (24) month period following satisfactory pressure test. The Developer and his Contractor shall restore the ground and pavement to their original conditions to the satisfaction of the Town of Groton Public Works Department immediately after the completion of the installation or project or as soon thereafter as weather conditions permit.

In addition to the above, settlement of trenches backfilled without complete compaction (ref: SECTION K, BACKFILLING) shall be repaired by the Developer after the aforementioned 24 month period if, in the opinion of the Department and the Developer's Engineer, settlement was caused by incomplete compaction of earth backfill.

### SECTION R. - PAVEMENT REMOVAL AND REPLACEMENT

The Developer and/or his Contractor shall furnish all materials, labor, plant, tools and equipment and shall do all work necessary to replace street pavement, driveways, gutters, curbs, and walks removed or damaged in the installation of water mains and appurtenances.

All pavement replacement, except driveways, shall be done in accordance with the regulations and specifications of the public authorities of the Town or State Highway Departments having jurisdiction, and the Developer and his Contractor shall respect the orders of the inspecting engineers from said departments during the period that the project is in progress.

All sidewalks, gutters, and curbs which have been damaged or removed shall be restored to a condition at least equal to that in which they were found immediately prior to the beginning of operations. Materials and methods for all restoration shall be subject to approval of the inspecting engineers representing the particular agencies involved.

Driveways which have been damaged or removed shall be restored to a condition at least equal to that in which they were found immediately prior to the beginning of operations. Materials and methods for restoration shall be as approved by the Inspector.

APPENDIX I

MAIN EXTENSION AGREEMENT

NOAK FIRE DISTRICT - WATER DEPARTMENT

Appendix -187

## MAIN EXTENSION AGREEMENT

AGREEMENT between Noank Fire District, having its principal place of business at the Fire House in Noank, Connecticut 06335, hereinafter referred to as the "Fire District"

and \_\_\_\_\_

of \_\_\_\_\_  
hereinafter referred to as the "Developer."

Whereas the Developer is interested in the development and sale of a tract of land situated in the Noank Fire District, Town of Groton \_\_\_\_\_, Connecticut, and desires to install water mains therein, which when completed, in accordance with the terms of this Agreement, will be accepted by the Fire District as a part of its system. The mains proposed to be constructed are described as follows:

NOW, THEREFORE, in consideration of the mutual promises herein contained, the parties agree as follows:

1. The Developer will simultaneously with the execution and delivery of this Agreement pay to the Fire District the sum of \_\_\_\_\_ (\$ \_\_\_\_\_)

representing the engineering review cost of the proposed extension described above and the service charges.

2. The Developer shall provide his own materials. Installations shall be completed in conformity with plans prepared by the Developer's Licensed Professional Engineer and submitted to the Fire District for review and approval.

The Developer and the Developer's professional engineer shall take sole responsibility for the proper completion of the extension and the work done in connection therewith in a workmanlike and proper manner according to the terms hereof and for preventing injuries to persons and damage to property and utilities. The Developer guarantees that the work done, and the workmanship and materials and equipment used in the construction of the same, shall be free from defects or flaws, that each item of equipment shall be in accordance with approved plans and specifications, that the strength of all parts of manufactured equipment shall be adequate and that the performance test requirements of approved specifications shall be fulfilled. The guarantee shall be for a period of 24 months after the date of completion of the work and acceptance thereof by the Fire District. The Fire District shall repair or replace as required, at the expense of the Developer, all work, equipment and material, or parts thereof, which fail to meet the above guarantee within the 24 month period. The Developer will promptly reimburse the Fire District for any expenses for such repairs or replacements. Neither inspection, approval or acceptance of the work done by the Fire District nor possession taken by the Fire District shall operate as a waiver of the provisions of this Contract.

3. Simultaneously with the execution of this Agreement, the Developer shall make application for and pay in advance to the Fire District the sum of \$100 for each lot as partial payment for the service charges for the connection of water service to each of the lots as shown on the map of the subdivision in accordance with the Fire District's "Rules and Regulations." Installation of service connections to individual lots must be done with pressure applied to the new main. Such work may be done by the Developer but must be inspected by the Noank Water Department and the exact location of each curb stop must be furnished by properly executed tap forms. The installation of and the materials used in such service connections shall conform with the requirements set forth in the Fire District's "Regulations and Specifications for Installation of Water Mains and Appurtenances in Subdivision Tracts," hereinafter referred to by the short title, "REGS AND SPECS."

4. Upon completion of the main or mains laid and the commencement of a regular supply of water into and through the main or mains by the Fire District, the main or mains laid shall thereafter be and remain the property of the Fire District, its successors and assigns, and the Fire District shall have the right to extend in or to other land, streets or avenues any such main or mains.

Appendix - 2-



5. The Developer shall notify the Superintendent, Noank Water Dept., in writing, five (5) days in advance of the start of construction of the new water main.

6. The Developer shall provide a maintenance bond in form satisfactory to the Fire District and issued by a carrier satisfactory to the Fire District. Such bond shall be in the amount of \$10,000.00 and shall cover a period of 24 months following completion of the project. The completion date will be the date of approval of the water sample taken by the Connecticut State Health Department.

A letter of credit for the same amount and period will be acceptable in lieu of the maintenance bond.

7. The Fire District reserves the right to make all connections to existing mains and charge Developer for same, these charges to be in addition to the above amount.

8. The Developer agrees that all service "turn-ons" are to be made by Fire District personnel.

9. The Developer agrees that all work shall conform with the "REGS and SPECS" currently in effect at the date of signing of this Agreement by the Fire District, copies of which are attached hereto and made a part hereof.

10. The Developer shall assume the defense of all claims of whatsoever character against the Fire District or the Developer and indemnify and save harmless the Fire District, its officers, employees and agents against all claims, suits, losses, judgments, demands, actions and recoveries for injury to persons, corporation or property arising, directly or indirectly, out of the work done by the Developer, his contractors, agents, servants, employees or officers, or any one under the control or supervision of any of the foregoing, and against all claims, suits, losses, judgments, demands, actions and recoveries relating to labor and materials furnished or used, and against all claims, suits, losses, judgments, demands, actions and recoveries arising out of any act or omission on the part of the Developer, his contractors, agents, servants, employees or officers, or anyone under the control or supervision of any of the foregoing.

11. The Developer shall provide the Fire District simultaneously with the execution and delivery of this Agreement with a Certificate of Contractual Liability Insurance covering the liability assumed by the Developer under the foregoing indemnity provisions of this paragraph in form and amount satisfactory to the Fire District. Such insurance shall be in force until the completion of the guarantee period.

12. The Developer, and every contractor and subcontractor engaged in any part of the work shall secure and maintain until the end of the guarantee period insurance policies insuring against claims for bodily injuries, death or property damage which may arise out of the work and Workmen's Compensation Insurance required by applicable law. Liability insurance shall consist of General Public Liability and Contractor's Protective Liability and Property Damage Insurance, Completed Works Insurance and Automobile Liability and Property Damage Insurance for operation of owned and non-owned vehicles (bodily injury or death: \$100,000 each accident, \$300,000 aggregate; Property Damage: \$50,000 each accident, \$100,000 aggregate). Certificates of such insurance shall be filed with the Fire District prior to commencement of any construction. Said certificate of insurance shall contain provisions that the Fire District shall be given 10 days notice of cancellation or change of coverage of the policies.

13. The Developer shall be responsible for installing a 3/4" service from the curb box to the house as set forth in "REGS and SPECS."

14. The Developer and his contractors, if any, shall be solely responsible for the compliance with all federal, state and municipal statutes, rules, regulations, orders, and ordinances applicable to the work performed.

IN WITNESS WHEREOF, each corporate body has caused its corporate seal to be hereunto affixed and this Agreement to be signed by its duly authorized officer; or, if Developer is an individual or partnership, has signed and sealed this Agreement this \_\_\_\_\_ day of \_\_\_\_\_, 19\_\_.

NOANK FIRE DISTRICT, WATER DEPARTMENT

By \_\_\_\_\_  
SUPERINTENDENT

By \_\_\_\_\_

STATE OF CONNECTICUT :

: SS:

TOWN OF :

On the \_\_\_\_\_ day of \_\_\_\_\_, 19\_\_\_\_, before me personally came \_\_\_\_\_, to me known, who being by me duly sworn, did depose and say that he resides in \_\_\_\_\_, that he is the Superintendent of the Noank

Fire District, Water Department, the corporation described in and which executed the foregoing Agreement; that he knows the seal of said corporation; that the seal affixed to said Agreement is such corporate seal; that it was so affixed by order of the Board of Directors of said corporation, and that he signed his name thereto by like order.

\_\_\_\_\_  
Notary Public

STATE OF CONNECTICUT :

: SS:

TOWN OF :

On the \_\_\_\_\_ day of \_\_\_\_\_, 19\_\_\_\_, before me personally came \_\_\_\_\_, to me known, who being by me duly sworn, did depose and say that he resides in \_\_\_\_\_, that he is the \_\_\_\_\_

of \_\_\_\_\_, the corporation described in and which executed the foregoing Agreement; that he knows the seal of said corporation; that the seal affixed to said Agreement is such corporate seal; that it was so affixed by order of the Board of Directors of said corporation, and that he signed his name thereto by like order.

\_\_\_\_\_  
Notary Public

APPENDIX II.

TYPICAL CONSTRUCTION DETAILS

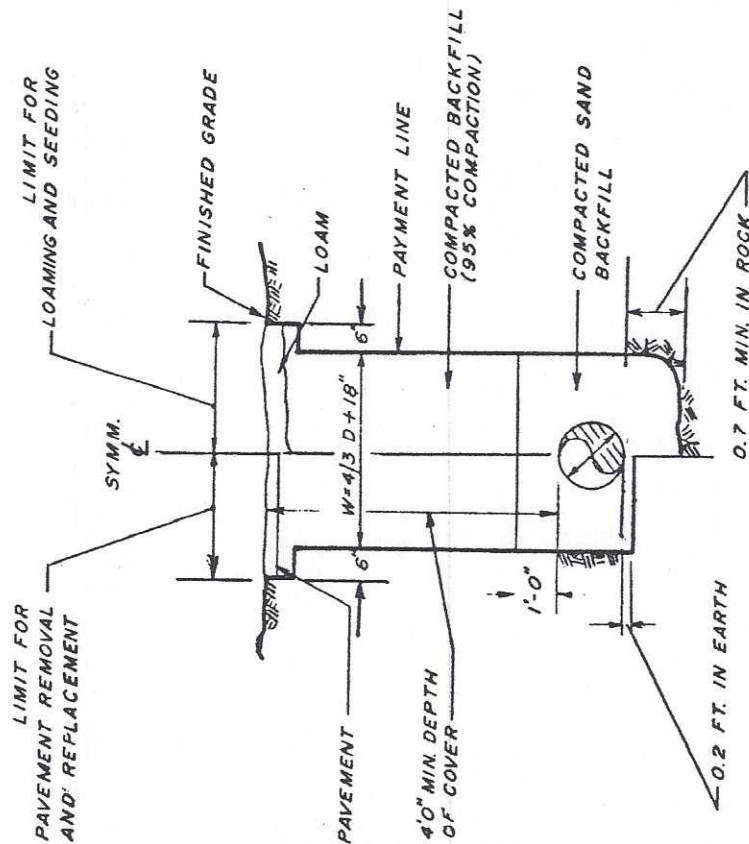
AND

RECORDS

NOANK FIRE DISTRICT - WATER DEPARTMENT

Appendix - 5 -

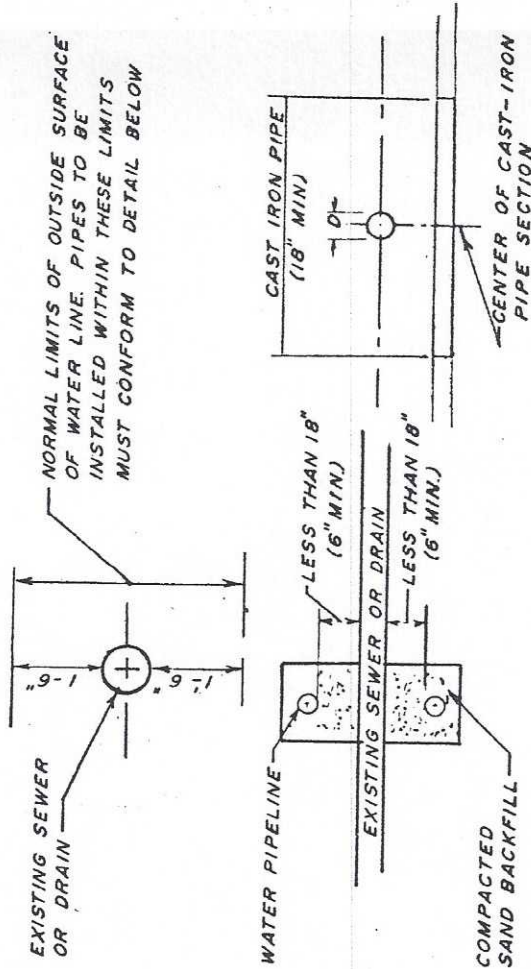
FIGURE 1



TYPICAL TRENCH DETAIL

NOT TO SCALE

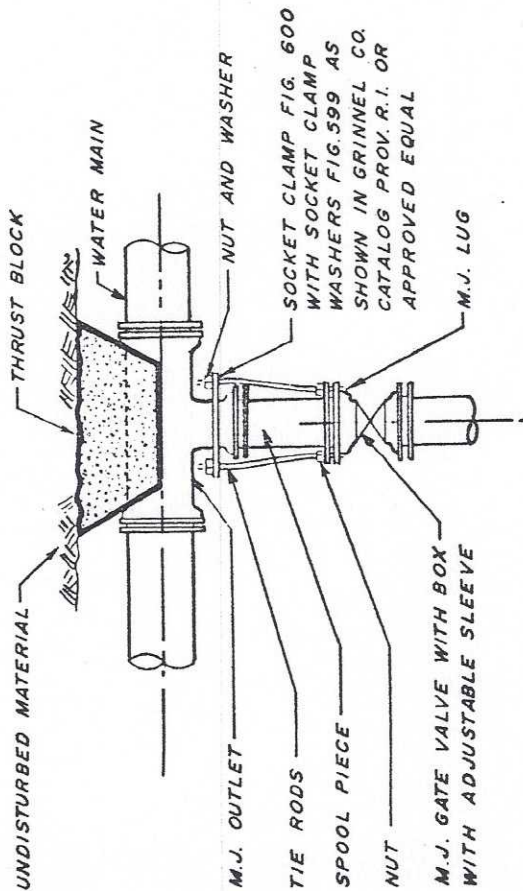
FIGURE 2



TYPICAL SEWER AND DRAIN CROSSING

NOT TO SCALE

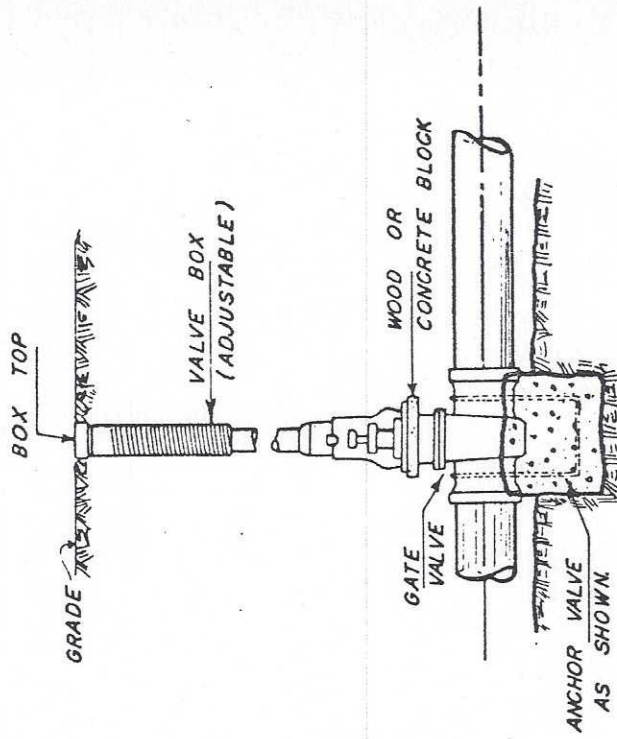
FIGURE 3



**TYPICAL VALVE CONNECTION**

PLAN ( NOT TO SCALE )

FIGURE 4



**TYPICAL GATE VALVE**

SIDE VIEW ( NOT TO SCALE )

FIGURE 5

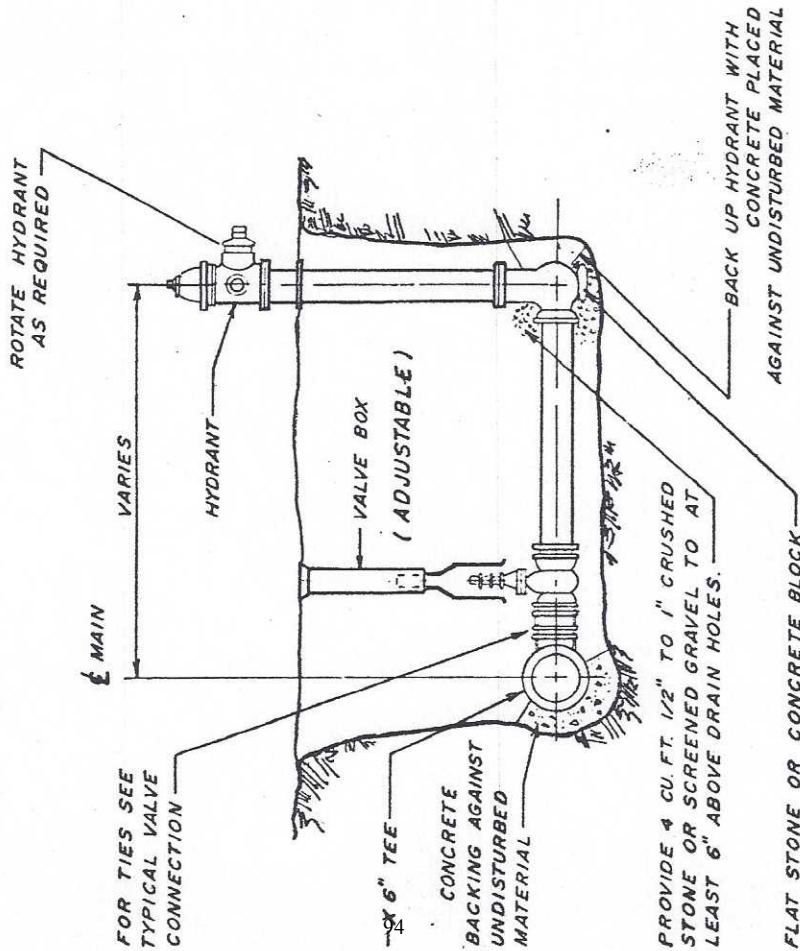
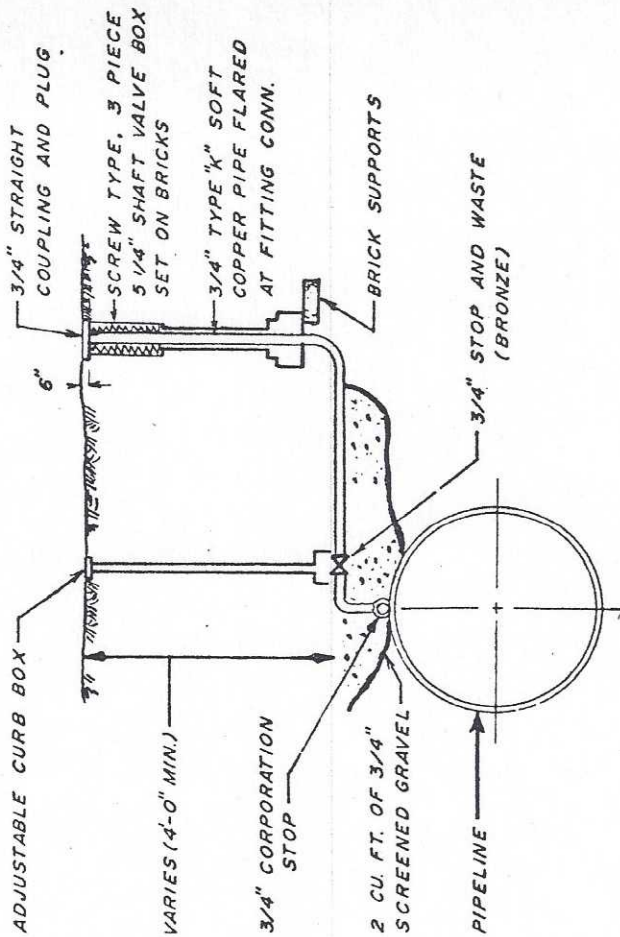
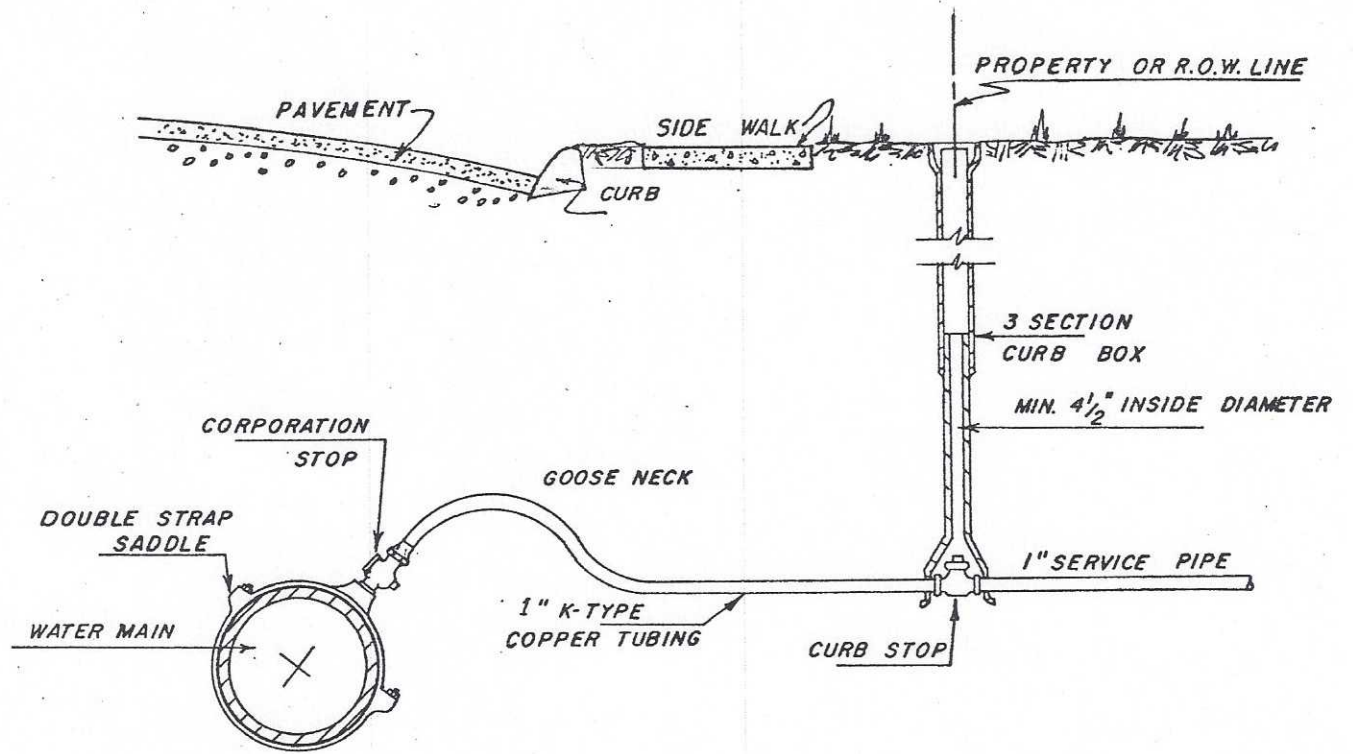


FIGURE 6





TYPICAL SERVICE INSTALLATION

NOT TO SCALE

FIGURE 7.

---

NOANK FIRE DISTRICT, GROTON, CONNECTICUT  
WATER DEPARTMENT

---

7-3-2019

## **NOTICE TO CONTRACTOR – GEOTECHNICAL REPORT**

Please be advised that during the design phase, a subsurface investigation was conducted at this site and a geotechnical report was prepared. If you would like a copy of this report, please contact [DOTContracts@ct.gov](mailto:DOTContracts@ct.gov).



**D.B.E. SUBCONTRACTORS AND MATERIAL SUPPLIERS OR MANUFACTURERS**

**January 2013**

**I. ABBREVIATIONS AND DEFINITIONS AS USED IN THIS SPECIAL PROVISION**

A. *CTDOT* means the Connecticut Department of Transportation.

B. *USDOT* means the U.S. Department of Transportation, including the Office of the Secretary, the Federal Highway Administration (“FHWA”), the Federal Transit Administration (“FTA”), and the Federal Aviation Administration (“FAA”).

C. *Broker* means a party acting as an agent for others in negotiating Contracts, Agreements, purchases, sales, etc., in return for a fee or commission.

D. *Contract, Agreement or Subcontract* means a legally binding relationship obligating a seller to furnish supplies or services (including but not limited to, construction and professional services) and the buyer to pay for them. For the purposes of this provision, a lease for equipment or products is also considered to be a Contract.

E. *Contractor* means a consultant, second party or any other entity under Contract to do business with CTDOT or, as the context may require, with another Contractor.

F. *Disadvantaged Business Enterprise (“DBE”)* means a for profit small business concern:

1. That is at least 51 percent owned by one or more individuals who are both socially and economically disadvantaged or, in the case of a corporation, in which 51 percent of the stock is owned by one or more such individuals; and
2. Whose management and daily business operations are controlled by one or more of the socially and economically disadvantaged individuals who own it; and
3. Certified by CTDOT under Title 49 of the Code of Federal Regulations, Part 26, (Title 49 CFR Part 23 of the Code of Federal Regulations for Participation of Disadvantaged Business Enterprise in Airport Concessions)

G. *USDOT-assisted Contract* means any Contract between CTDOT and a Contractor (at any tier) funded in whole or in part with USDOT financial assistance.

H. *Good Faith Efforts (“GFE”)* means all necessary and reasonable steps to achieve a DBE goal or other requirement which by their scope, intensity, and appropriateness to the objective, can reasonably be expected to fulfill the program requirement.

I. *Small Business Concern* means, with respect to firms seeking to participate as DBEs in USDOT-assisted Contracts, a small business concern as defined pursuant to Section 3 of the Small Business Act and Small Business Administration (“SBA”) regulations implementing it (13 CFR Part 121) that also does not exceed the cap on average annual gross receipts in 49 CFR Part 26, Section 26.65(b).

J. *Socially and Economically Disadvantaged Individual* means any individual who is a citizen (or lawfully admitted permanent resident) of the United States and who is:

1. Any individual who CTDOT finds, on a case-by-case basis, to be a socially and economically disadvantaged individual.
2. Any individuals in the following groups, members of which are rebuttably presumed to be socially and economically disadvantaged:
  - “Black Americans”, which includes persons having origins in any of the Black racial groups of Africa;
  - “Hispanic Americans”, which includes persons of Mexican, Puerto Rican, Cuban, Dominican, Central or South American, or other Spanish or Portuguese culture or origin, regardless of race;
  - “Native Americans”, which includes persons who are American Indians, Eskimos, Aleuts, or Native Hawaiians.
  - “Asian-Pacific Americans”, which includes persons whose origins are from Japan, China, Taiwan, Korea, Burma (Myanmar), Vietnam, Laos, Cambodia (Kampuchea), Thailand, Malaysia, Indonesia, the Philippines, Brunei, Samoa, Guam, the U.S. Trust Territories of the Pacific Islands (Republic of Palau), the Commonwealth of the Northern Marianas Islands, Macao, Fiji, Tonga, Kiribati, Juvalu, Nauru, or Federated States of Micronesia;
  - “Subcontinent Asian Americans”, which includes persons whose origins are from India, Pakistan, Bangladesh, Bhutan, the Maldives Islands, Nepal or Sri Lanka;
  - Women;
  - Any additional groups whose members are designated as socially and economically disadvantaged by the SBA, at such time as the SBA designation becomes effective.

K. *Commercially Useful Function (“CUF”)* means the DBE is responsible for the execution of the work of the contract and is carrying out its responsibilities by actually performing, managing, and supervising the work involved with its own forces and equipment. The DBE must be responsible for procuring, determining quantity, negotiating price, determining quality and paying for all materials (where applicable) associated with their work. The DBE must also perform at least 30% of the total cost of its contract with its own workforce.

## **II. ADMINISTRATIVE REQUIREMENTS**

### **A. General Requirements**

A DBE goal percentage equaling **Twelve Percent (12%)** of the Contract value has been established for this Contract. This DBE goal percentage will be applied to the final Contract value to ultimately determine the required DBE goal. If additional work is required, DBE firms should be provided the appropriate opportunities to achieve the required DBE goal.

In order to receive credit toward the Contract DBE goal, the firms utilized as DBE subcontractors or suppliers must be certified as DBEs in the type of work to be counted for credit by CTDOT’s Office of Contract Compliance prior to the date of the execution of the subcontract. Neither CTDOT nor the State of Connecticut’s Unified Certification Program (UCP) makes any representation as to any DBE’s technical or financial ability to perform the work. Prime contractors are solely responsible for performing due diligence in hiring DBE subcontractors.

All DBEs shall perform a CUF for the work that is assigned to them. The Contractor shall monitor and ensure that the DBE is in compliance with this requirement. The Connecticut DBE UPC Directory of certified firms can

be found on the CTDOT website <http://www.ct.gov/dot>. The directory lists certified DBE firms with a description of services that they are certified to perform. Only work identified in this listing may be counted towards the project's DBE goal. A DBE firm may request to have services added at any time by contacting CTDOT's Office of Contract Compliance. No credit shall be counted for any DBE firm found not to be performing a CUF.

Once a Contract is awarded, all DBEs that were listed on the pre-award DBE commitment document must be utilized. The Contractor is obligated to provide the value and items of the work originally established in the pre-award documentation to the DBE firms listed in the pre-award documentation. Any modifications to the pre-award commitment must follow the procedure established in Section II-C.

The Contractor shall designate a liaison officer who will administer the Contractor's DBE program. Upon execution of this Contract, the name of the liaison officer shall be furnished in writing to CTDOT's unit administering the Contract, CTDOT's Office of Contract Compliance and CTDOT's Office of Construction ("OOC"). Contact information for the designated liaison officer shall be furnished no later than the scheduled date for the pre-construction meeting.

**The Contractor shall submit a bi-monthly report to the appropriate CTDOT unit administering the Contract. This report shall indicate what work has been performed to date, with the dollars paid and percentage of DBE goal completed.**

**Verified payments made to DBEs shall be included in this bi-monthly report. A sample form is included on the CTDOT website.**

In addition, the report shall include:

1. A projected time frame of when the remaining work is to be completed for each DBE.
2. A statement by the Contractor either confirming that the approved DBEs are on schedule to meet the Contract goal, or that the Contractor is actively pursuing a GFE.
3. If retainage is specified in the Contract specifications, then a statement of certification that the subcontractors' retainage is being released in accordance with 1.08.01 (Revised or supplemented).

Failure by the Contractor to provide the required reports may result in CTDOT withholding an amount equal to one percent (1%) of the monthly estimate until the required documentation is received.

The Contractor shall receive DBE credit when a DBE, or any combination of DBEs, perform work under the Contract in accordance with this specification.

Only work actually performed by and/or services provided by DBEs which are certified for such work and/or services, as verified by CTDOT, can be counted toward the DBE goal. Supplies and equipment a DBE purchases or leases from the Contractor or its affiliate cannot be counted toward the goal.

Monitoring of the CUF will occur by CTDOT throughout the life of the project. If it is unclear that the DBE is performing the work specified in its subcontract with the prime Contractor, further review may be required. If it is determined that the DBE is not performing a CUF, then the work performed by that DBE will not be counted towards the DBE goal percentage.

## **B. Subcontract Requirements**

The Contractor shall submit to CTDOT's OOC all requests for subcontractor approvals on the standard CLA-12 forms provided by CTDOT. The dollar amount and items of work identified on the CLA-12 form must, at minimum, equal the dollar value submitted in the pre-award commitment. CLA-12 forms can be found at <http://www.ct.gov/dot/construction> under the "Subcontractor Approval" section. All DBE subcontractors must be identified on the CLA-12 form, regardless of whether they are being utilized to meet a Contract goal percentage. A copy of the legal Contract between the Contractor and the DBE subcontractor/supplier, a copy of the Title VI Contractor Assurances and a copy of the Required Contract Provision for Federal Aid Construction Contracts (Form FHWA-1273) (Federal Highway Administration projects only) must be submitted along with a request for subcontractor approval. These attachments cannot be substituted by reference.

If retainage is specified in the Contract specifications, then the subcontract agreement must contain a prompt payment mechanism that acts in accordance with Article 1.08.01 (Revised or supplemented).

If the Contract specifications do not contain a retainage clause, the Contractor shall not include a retainage clause in any subcontract agreement, and in this case, if a Contractor does include a retainage clause, it shall be deemed unenforceable.

In addition, the following documents are to be included with the CLA-12, if applicable:

- An explanation indicating who will purchase material.
- A statement explaining any method or arrangement for utilization of the Contractor's equipment.

The subcontract must show items of work to be performed, unit prices and, if a partial item, the work involved by all parties. If the subcontract items of work or unit prices are modified, the procedure established in Section II-C must be followed.

Should a DBE subcontractor further sublet items of work assigned to it, only lower tier subcontractors who are certified as a DBE firm will be counted toward the DBE goal. If the lower tier subcontractor is a non-DBE firm, the value of the work performed by that firm will not be counted as credit toward the DBE goal.

The use of joint checks between a DBE firm and the Contractor is acceptable, provided that written approval is received from the OOC prior to the issuance of any joint check. Should it become necessary to issue a joint check between the DBE firm and the Contractor to purchase materials, the DBE firm must be responsible for negotiating the cost, determining the quality and quantity, ordering the material and installing (where applicable), and administering the payment to the supplier. The Contractor should not make payment directly to suppliers.

Each subcontract the Contractor signs with a subcontractor must contain the following assurance:

"The subcontractor/supplier/manufacture shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The contractor shall carry out applicable requirements of 49 CFR Part 26 in the award and administration of DOT-assisted contracts. Failure by the contractor/subcontractor/supplier/manufacture to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy as the recipient deems appropriate."

## **C. Modification to Pre-Award Commitment**

Contractors may not terminate for convenience any DBE subcontractor or supplier that was listed on the pre-award DBE commitment without prior written approval of the OOC. This includes, but is not limited to, instances

in which a Contractor seeks to perform work originally designated for a DBE subcontractor with its own forces or those of an affiliate, a non-DBE firm, or with another DBE firm. Prior to approval, the Contractor must demonstrate to the satisfaction of the OOC, that it has good cause, as found in 49CFR Part 26.53 (f)(3), for termination of the DBE firm.

Before transmitting its request for approval to terminate pre-award DBE firms to the OOC, the Contractor must give written notice to the DBE subcontractor and include a copy to the OOC of its notice to terminate and/or substitute, and the reason for the notice.

The Contractor must provide five (5) days for the affected DBE firm to respond. This affords the DBE firm the opportunity to advise the OOC and the Contractor of any reasons why it objects to the termination of its subcontract and why the OOC should not approve the Contractor's action.

Once the Contract is awarded, should there be any amendments or modifications of the approved pre-award DBE submission other than termination of a DBE firm, the Contractor shall follow the procedure below that best meets the criteria associated with the reason for modification:

1. If the change is due to a scope of work revision or non-routine quantity revision by CTDOT, the Contractor must notify CTDOT's OOC in writing or via electronic mail that their DBE participation on the project may be impacted as soon as they are aware of the change. In this case, a release of work from the DBE firm may not be required; however the Contractor must concurrently notify the DBE firm in writing, and copy the OOC for inclusion in the project DBE file. This does not relieve the Contractor of its obligation to meet the Contract specified DBE goal, or of any other responsibility found in this specification.
2. If the change is due to a factor other than a CTDOT directive, a request for approval in writing or via electronic mail of the modification from the OOC must be submitted, along with an explanation of the change(s), prior to the commencement of work. The Contractor must also obtain a letter of release from the originally named DBE indicating their concurrence with the change, and the reason(s) for their inability to perform the work. In the event a release cannot be obtained, the Contractor must document all efforts made to obtain it.
3. In the event a DBE firm that was listed in the pre-award documents is **unable** or **unwilling** to perform the work assigned, the Contractor shall:
  - Notify the OOC Division Chief immediately and make efforts to obtain a release of work from the firm.
  - Submit documentation that will provide a basis for the change to the OOC for review and approval prior to the implementation of the change.
  - Use the DBE Directory to identify and contact firms certified to perform the type of work that was assigned to the unable or unwilling DBE firm. The Contractor should also contact CTDOT's Office of Contract Compliance for assistance in locating additional DBE firms to the extent needed to meet the contract goal.

Should a DBE subcontractor be terminated or fail to complete work on the Contract for any reason, the Contractor must make a GFE to find another DBE subcontractor to substitute for the original DBE. The DBE replacement shall be given every opportunity to perform at least the same amount of work under the Contract as the original DBE subcontractor.

If the Contractor is unable to find a DBE replacement:

- The Contractor should identify other contracting opportunities and solicit DBE firms in an effort to meet the Contract DBE goal requirement, if necessary, and provide documentation to support a GFE. (Refer to GFE in Section III.)
- The Contractor must demonstrate that the originally named DBE, who is unable or unwilling to perform the work assigned, is in default of its subcontract, or identify other issues that affected the DBE firm's ability to perform the assigned work. **The Contractor's ability to negotiate a more advantageous agreement with another subcontractor is not a valid basis for change.**

### **III. GOOD FAITH EFFORTS**

The DBE goal is **NOT** reduced or waived for projects where the Contractor receives a Pre-Award GFE determination from the Office of Contract Compliance prior to the award of the Contract. It remains the responsibility of the Contractor to make a continuing GFE to achieve the specified Contract DBE goal. The Contractor shall pursue every available opportunity to obtain additional DBE firms and document all efforts made in such attempts.

At the completion of all Contract work, the Contractor shall submit a final report to CTDOT's unit administering the Contract indicating the work done by and the dollars paid to DBEs. Only verified payments made to DBEs performing a CUF will be counted towards the Contract goal.

Goal attainment is based on the total Contract value, which includes all construction orders created during the Contract. If the Contractor does not achieve the specified Contract goal for DBE participation or has not provided the value of work to the DBE firms originally committed to in the pre-award submission, the Contractor shall submit documentation to CTDOT's unit administering the Contract detailing the GFE made during the performance of the Contract to satisfy the goal.

A GFE should consist of the following, where applicable (CTDOT reserves the right to request additional information):

1. A detailed statement of the efforts made to replace an unable or unwilling DBE firm, and a description of any additional subcontracting opportunities that were identified and offered to DBE firms 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 bids from certified DBEs, including the names, addresses, and telephone numbers of each DBE firm contacted; the date of contact and a description of the information provided to each DBE regarding the scope of services and anticipated time schedule of work items proposed to be subcontracted and the response from firms contacted.
3. Provide a detailed explanation for each DBE that submitted a subcontract proposal which the Contractor considered to be unacceptable stating the reason(s) for this conclusion.
4. Provide documentation, if any, to support contacts made with CTDOT requesting assistance in satisfying the specified Contract goal.

5. Provide documentation of all other efforts undertaken by the Contractor to meet the defined goal. Additional documentation of efforts made to obtain DBE firms may include but will not be limited to:
  - Negotiations held in good faith with interested DBE firms, not rejecting them without sound reasons.
  - Written notice provided to a reasonable number of specific DBE firms in sufficient time to allow effective participation.
  - Those portions of work that could be performed by readily available DBE firms.

**In instances where the Contractor can adequately document or substantiate its GFE and compliance with other DBE Program requirements, the Contractor will have satisfied the DBE requirement and no administrative remedies will be imposed.**

#### **IV. PROJECT COMPLETION**

At the completion of all Contract work, the Contractor shall:

1. Submit a final report to CTDOT's unit administering the Contract indicating the work done by, and the dollars paid to DBEs.
2. Submit verified payments made to all DBE subcontractors for the work that was completed.
3. Submit documentation detailing any changes to the DBE pre-award subcontractors that have not met the original DBE pre-award commitment, including copies of the Department's approvals of those changes.
4. Retain all records for a period of three (3) years following acceptance by CTDOT of the Contract and those records shall be available at reasonable times and places for inspection by authorized representatives of CTDOT and Federal agencies. If any litigation, claim, or audit is started before the expiration of the three (3) year period, the records shall be retained until all litigation, claims, or audit findings involving the records are resolved.

If the Contractor does not achieve the specified Contract goal for DBE participation in addition to meeting the dollar value committed to the DBE subcontractors identified in the pre-award commitment, the Contractor shall submit documentation to CTDOT's unit administering the Contract detailing the GFE made during the performance of the Contract to satisfy the goal.

#### **V. SHORTFALLS**

##### **A. Failure to meet DBE goals**

**As specified in (II-A) above, attainment of the Contract DBE goal is based on the final Contract value.** The Contractor is expected to achieve the amount of DBE participation originally committed to at the time of award; however, additional efforts must be made to provide opportunities to DBE firms in the event a Contract's original value is increased during the life of the Contract.

The Contractor is expected to utilize the DBE subcontractors originally committed in the DBE pre-award documentation for the work and dollar value that was originally assigned.

If a DBE is terminated or is unable or unwilling to complete its work on a Contract, the Contractor shall make a GFE to replace that DBE with another certified DBE to meet the Contract goal.

The Contractor shall immediately notify the OOC of the DBE's inability or unwillingness to perform, and provide reasonable documentation and make efforts to obtain a release of work from the firm.

If the Contractor is unable to find a DBE replacement, then the Contractor should identify other contracting opportunities and solicit DBE firms in an effort to meet the Contract DBE goal requirement, if necessary, and provide documentation to support a GFE.

When a DBE is unable or unwilling to perform, or is terminated for just cause, the Contractor shall make a GFE to find other DBE opportunities to increase DBE participation to the extent necessary to at least satisfy the Contract goal.

For any DBE pre-award subcontractor that has been released appropriately from the project, no remedy will be assessed, provided that the Contractor has met the criteria described in Section II-C.

#### **B. Administrative Remedies for Non-Compliance:**

In cases where the Contractor has failed to meet the Contract specified DBE goal or the DBE pre-award commitment, and where no GFE has been demonstrated, then one or more of the following administrative remedies will be applied:

1. A reduction in Contract payments to the Contractor as determined by CTDOT, not to exceed the shortfall amount of the **DBE goal**. The maximum shortfall will be calculated by multiplying the Contract DBE goal (adjusted by any applicable GFE) by the final Contract value, and subtracting any verified final payments made to DBE firms by the Contractor.
2. A reduction in Contract payments to the Contractor determined by CTDOT, not to exceed the shortfall amount of the **pre-award commitment**. The maximum shortfall will be calculated by subtracting any verified final payments made by the Contractor to each DBE subcontractor from the amount originally committed to that subcontractor in the pre-award commitment.
3. A reduction in Contract payments to the Contractor determined by CTDOT for any pre-award DBE subcontractor who has not obtained the dollar value of work identified in the DBE pre-award commitment and has not followed the requirements of Section II-C or for any DBE firm submitted for DBE credit that has not performed a CUF.
4. The Contractor being required to submit a written DBE Program Corrective Action Plan to CTDOT for review and approval, which is aimed at ensuring compliance on future projects.
5. The Contractor being required to attend a Non-Responsibility Meeting on the next contract where it is the apparent low bidder.
6. The Contractor being suspended from bidding on contracts for a period not to exceed six (6) months.



## **VI. CLASSIFICATIONS OTHER THAN SUBCONTRACTORS**

### **A. Material Manufacturers**

Credit for DBE manufacturers is 100% of the value of the manufactured product. A manufacturer is a firm that operates or maintains a factory or establishment that produces on the premises the materials or supplies obtained by the Contractor.

If the Contractor elects to utilize a DBE manufacturer to satisfy a portion of, or the entire specified DBE goal, the Contractor must provide the OOC with:

- Subcontractor Approval Form (CLA-12) indicating the firm designation,
- An executed "Affidavit for the Utilization of Material Suppliers or Manufacturers" (sample attached), and
- Substantiation of payments made to the supplier or manufacturer for materials used on the project.

### **B. Material Suppliers (Dealers)**

Credit for DBE dealers/suppliers is limited to 60% of the value of the material to be supplied, provided such material is obtained from an approved DBE dealer/supplier.

In order for a firm to be considered a regular dealer, the firm must own, operate, or maintain a store, warehouse, or other establishment in which the materials, supplies, articles or equipment of the general character described by the specifications and required under the contract are bought, kept in stock, and regularly sold or leased to the public in the usual course of business. At least one of the following criteria must apply:

- To be a regular dealer, the firm must be an established, regular business that engages, as its principal business and under its own name, in the purchase and sale or lease of the products in question.
- A person may be a regular dealer in such bulk items as petroleum products, steel, cement, gravel, stone, or asphalt without owning, operating or maintaining a place of business if the person both owns and operates distribution equipment for the products. Any supplementing of the regular dealers' own distribution equipment shall be by long term lease agreement, and not on an ad hoc or contract to contract basis.
- Packers, brokers, manufacturers' representatives, or other persons who arrange or expedite transactions are not regular dealers within the meaning of this paragraph.

If the Contractor elects to utilize a DBE supplier to satisfy a portion or the entire specified DBE goal, the Contractor must provide the OOC with:

- Subcontractor Approval Form (CLA-12) indicating the firm designation,
- An executed "Affidavit for the Utilization of Material Suppliers or Manufacturers" (sample attached), and
- Substantiation of payments made to the supplier or manufacturer for materials used on the project.

### **C. Brokering**

- Brokering of work for DBE firms who have been listed by the Department as certified brokers is allowed. Credit for those firms shall be applied following the procedures in Section VI-D.
- Brokering of work by DBEs who have been approved to perform subcontract work with their own workforce and equipment is not allowed, and is a Contract violation.

- Firms involved in the brokering of work, whether they are DBEs and/or majority firms who engage in willful falsification, distortion or misrepresentation with respect to any facts related to the project shall be referred to the U.S. DOT, Office of the Inspector General for prosecution under Title 18, U.S. Code, Part I, Chapter 47, Section 1020.

#### **D. Non-Manufacturing or Non-Supplier DBE Credit**

Contractors may count towards their DBE goals the following expenditures with DBEs that are not manufacturers or suppliers:

- 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 materials or supplies necessary for the performance of the Contract, provided that the fee or commission is determined by the OOC to be reasonable and consistent with fees customarily allowed for similar services.
- The fees charged only for delivery of materials and supplies required on a job site when the hauler, trucker, or delivery service is a DBE, and not the manufacturer, or regular dealer of the materials and supplies, and provided that the fees are determined by the OOC to be reasonable and not excessive as compared with fees customarily allowed for similar services.
- The fees or commissions charged for providing bonds or insurance specifically required for the performance of the Contract, provided that the fees or commissions are determined by CTDOT to be reasonable and not excessive as compared with fees customarily allowed for similar services.

#### **E. Trucking**

While technically still considered a subcontractor, the rules for counting credit for DBE trucking firms are as follows:

- The DBE must own and operate at least one fully licensed, insured, and operational truck used on the Contract.
- The DBE receives credit for the total value of the transportation services it provides on the Contract using trucks it owns, insures and operates using drivers it employs.
- The DBE may lease trucks from another DBE firm, including an owner-operator who is certified as a DBE. The DBE who leases trucks from another DBE receives credit for the total value of the transportation services the lessee DBE provides on the Contract.
- The DBE may lease trucks from a non-DBE firm; however the DBE may only receive credit for any fees or commissions received for arranging transportation services provided by the non-DBE firms. Additionally, the DBE firm must demonstrate that they are in full control of the trucking operation for which they are seeking credit.

#### **VII. Suspected DBE Fraud**

In appropriate cases, CTDOT will bring to the attention of the USDOT any appearance of false, fraudulent, or dishonest conduct in connection with the DBE program, so that USDOT can take the steps, e.g. referral to the

Department of Justice for criminal prosecution, referral to USDOT Inspector General, action under suspension and debarment or Program Fraud and Civil Penalties rules provided in 49 CFR Part 31.

**CONNECTICUT DEPARTMENT OF TRANSPORTATION  
(OFFICE OF CONSTRUCTION)  
BUREAU OF ENGINEERING AND CONSTRUCTION**

This affidavit must be completed by the State Contractor's DBE notarized and attached to the contractor's request to utilize a DBE supplier or manufacturer as a credit towards its DBE contract requirements; failure to do so will result in not receiving credit towards the contract DBE requirement.

State Contract No.

Federal Aid Project No.

Description of Project

I, \_\_\_\_\_, acting in behalf of \_\_\_\_\_,  
(Name of person signing Affidavit) (DBE person, firm, association or corporation)

of which I am the \_\_\_\_\_ certify and affirm that \_\_\_\_\_  
(Title of Person) (DBE person, firm, association or corporation)

is a certified Connecticut Department of Transportation DBE. I further certify and affirm that I have read and understand 49 CFR, Sec. 26.55(e)(2), as the same may be revised.

I further certify and affirm that \_\_\_\_\_ will assume the actual and  
(DBE person, firm, association or Corporation)

for the provision of the materials and/or supplies sought by \_\_\_\_\_.

If a manufacturer, I operate or maintain a factory or establishment that produces, on the premises, the materials, supplies, articles or equipment required under the contract an of the general character described by the specifications.

If a supplier, I perform a commercially useful function in the supply process. As a regular dealer, I, at a minimum, own and operate the distribution equipment for bulk items. Any supplementing of my distribution equipment shall be by long-term lease agreement, and not on an ad hoc or contract-by-contract basis.

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

(Name of Corporation or Firm)

(Signature & Title of Official making the Affidavit)

Subscribed and sworn to before me, this \_\_\_\_\_ day of \_\_\_\_\_ 20 \_\_\_\_\_.

Notary Public (Commissioner of the Superior Court)

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

**CERTIFICATE OF CORPORATION**

I, \_\_\_\_\_, certify that I am the \_\_\_\_\_  
(Official) (President)

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)

## **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 1.03 - AWARD AND EXECUTION OF CONTRACT**

### **Article 1.03.08 - Notice to Proceed and Commencement of Work:**

Change the first paragraph to read as follows:

"The Contractor shall commence and proceed with the Contract work on the date specified in a written notice to proceed issued by the Engineer to the Contractor. The date specified will be no later than 45 calendar days after the date of the execution of the Contract by the Department".

## **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.

a. Working Drawings for Permanent Construction: 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.

b. Working Drawings for Temporary Construction: The Contractor shall submit drawings, calculations, procedures and other supporting data to the Assistant District Engineer.

**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 1.06 - CONTROL OF MATERIALS**

### **Article 1.06.07 - Certified Test Reports and Materials Certificates:**

After Article 1.06.07-1 add the following:

1) For the materials in the following items, a Certified Test Report will be required confirming their conformance to the requirements set forth in these plans or specifications or both. Should the consignee noted on a Certified Test Report be other than the Prime Contractor, then Materials Certificates shall be required to identify the shipment.

- Item No. 0712021A “GRS Abutment and Wingwall”
- Item No. 0712023A “Reinforced Soil Foundation”
- Item No. 0712024A “Reinforced Integrated Approach”
- Item No. 1300005A “Relocation of Water Mains”
- Item No. 1301019A “Temporary Relocation of Water Mains”

After Article 1.06.07-2 add the following:

2) For the materials in the following items, a Materials Certificate will be required confirming their conformance to the requirements set forth in these plans or specifications or both.

- Item No. 1008019 “4” Rigid Metal Conduit – Surface”
- Item No. 1008119 “4” Rigid Metal Conduit In Trench”
- Item No. 0904949A “Metal Bridge Rail (Solid Panel) (8’ High)
- Item No. 0904953A “Metal Bridge Rail (Solid Panel) (7’ High) (Curved Top)
- Item No. 1300005A “Relocation of Water Mains”
- Item No. 1301019A “Temporary Relocation of Water Mains”

## **SECTION 1.07 - LEGAL RELATIONS AND RESPONSIBILITIES**

*Delete Article 1.07.07 in its entirety and replace it with the following:*

**1.07.07—Safety and Public Convenience:** The Contractor shall conduct the Project work at all times in such a manner as to ensure the least possible obstruction to traffic. In a manner acceptable to the Engineer, the Contractor shall provide for the convenience and interests of the general public; the traveling public; parties residing along or adjacent to the highway or Project Site; and parties owning, occupying or using property adjacent to the Project Site, such as commuters, workers, tenants, lessors and operating agencies.

Notwithstanding any other Contract provision, the Contractor shall not close to normal pedestrian or vehicular traffic any section of road, access drive, parking lot, sidewalk, station platform, railroad track, bus stop, runway, taxiway, occupied space within a Site, or occupied space within a building, except with the written permission of the Engineer.

All equipment, materials, equipment or material storage areas, and work areas must be placed, located, and used in ways that do not create a hazard to people or property, especially in areas open to public pedestrian or vehicular traffic. All equipment and materials shall be placed or stored in such a way and in such locations as will not create a hazard to the traveling public or reduce sight lines. In an area unprotected by barriers or other means, equipment and materials must not be stored within 30 feet of any traveled way.

The Contractor must always erect barriers and warning signs between any of its work or storage areas and any area open to public, pedestrian, or vehicular traffic. Such barriers and signs must comply with all laws and regulations, including any applicable codes.

The Contractor must arrange for temporary lighting, snow and ice removal, security against vandalism and theft, and protection against excessive precipitation runoff within its Project work and storage areas, and within other areas specifically designated in the Contract.

In addition to meeting the requirements of Section 9.71, the Contractor shall take all precautions necessary and reasonable for the protection of all persons, including, but not limited to, employees of the Contractor or the Department, and for the protection of property, until the Engineer notifies the Contractor in writing that the Project or the pertinent portion of the Project has been completed to the Engineer's satisfaction.

The Contractor shall comply with the safety provisions of applicable laws, including building and construction codes and the latest edition of the CFR. The Contractor must make available for reference in its field office, throughout the duration of the Project, a copy of the latest edition and all supplements of the CFR pertaining to OSHA.

The Contractor shall make available to the Contractor's employees, subcontractors, the Engineer, and the public, all information pursuant to OSHA 29 CFR Part 1926.59 and The Hazard Communication Standard 29 CFR 1910.1200, and shall also maintain a file on each job site containing all MSDS for products in use at the Project. These MSDS shall be made available to the Engineer upon request.

The Contractor shall observe all rules and regulations of the Federal, State, and local health officials. Attention is directed to Federal, State, and local laws, rules, and regulations concerning construction safety and health standards. The Contractor shall not require any worker to work in surroundings or under conditions that are unsanitary, hazardous, or dangerous to the worker's health or safety.

**Safety Plan:** Before starting work on the Project, the Contractor shall submit to the Engineer a written Safety and Health Plan (hereinafter referred to as the "Plan"). The Plan shall meet or exceed the minimum requirements of this Subsection and any applicable State or Federal regulations.

The Plan shall apply to any work under the Contract whether such work is performed, by way of example and not limitation, by the Contractor's forces, subcontractors, suppliers, or fabricators.

The Plan shall be prepared by the Contractor and submitted to the Engineer for review before the actual start of work on the Project. Within ten (10) calendar days of receipt, the Engineer will determine whether or not the Plan meets the requirements of this Specification. If the Plan does not meet the requirements of this Specification, it will be returned for revision. Work on the Project may not proceed until the Engineer has accepted the Plan. Nothing herein shall be construed, however, to relieve the Contractor from responsibility for the prosecution of the Project.

The Plan shall conform to the following general format:

**1. General Introduction.**

- a. Description.** The general introduction of the Plan shall include a statement by the Contractor describing its commitment to maintain a safe work environment for its employees, Department representatives, and the public. Implementation procedures and company policies relative to safety shall be summarized or referenced in the Plan.
  - i. The Plan shall include the names, addresses, and telephone numbers of the Contractor's Project Manager, Project superintendent and/or its designee for safety oversight, all competent persons, and the traffic control coordinator. Any changes to the safety management and oversight for the Project shall be promptly communicated to all concerned.
  - ii. The Plan shall provide guidelines for protecting all personnel from hazards associated with Project operations and activities.

- iii. The Plan shall establish the policies and procedures that are necessary for the Project to be in compliance with the requirements of OSHA and other State and Federal regulatory agencies with jurisdiction, rules, regulations, standards, or guidelines in effect at the time the work is in progress.
  - b. Responsibility, Identification of Personnel, and Certifications.** The Contractor is solely responsible for creating, implementing, and monitoring the Plan.
    - i. The Contractor shall identify and designate on-site supervisory level personnel who shall be responsible for implementing and monitoring the Plan at all times throughout the duration of the Project and shall have authority to take prompt corrective measures to eliminate hazards including the ability to stop work activities.
    - ii. Documentation of training provided to the on-site supervisory level personnel shall be included as part of the Plan.
    - iii. For any work activities wherein the Contractor has identified a competent person as defined by OSHA, that person shall be capable of identifying existing and predictable hazards and have the authority to take prompt corrective measures to eliminate the hazards, including the ability to stop work activities.
    - iv. Documentation of the qualifications of such competent persons identified, including any certifications received, shall be included as part of the Plan.
    - v. The Contractor shall further identify the qualified safety professional responsible for developing the Plan and shall provide that person's qualifications for developing the Plan which shall include, but not be limited to, education, training, certifications, and experience in developing this type of Plan.
    - vi. The Plan shall contain a certification executed by the qualified safety professional that developed the Plan, stating that the Plan complies with OSHA and other applicable State and Federal regulatory agencies with jurisdiction, rules, regulations, standards, or guidelines in effect at the time the work is in progress.
- 2. Elements of the Plan.** The Plan shall address, but not be limited to, the following elements:
- a. Management Safety Policy and Implementation Statement.**
    - i. The Plan shall describe in detail the means by which the Contractor shall implement and monitor the Plan. Implementation and monitoring shall also mean that the Plan shall be a document with provision for change to update the Plan with new information on a yearly basis at a minimum and shall include new practices or procedures, changing site and environmental conditions, or other situations that could adversely affect site personnel. The Plan shall provide guidelines for protecting all personnel from hazards associated with Project operations and activities.
  - b. Emergency Telephone Numbers.**
  - c. Personnel Responsibilities.**
    - i. Management responsibilities
    - ii. Responsibilities of Supervisor(s)
    - iii. Site safety officer(s) responsibilities

- iv. Employee responsibilities
- v. Competent person(s) as defined by OSHA responsibilities
- d. Training.**
  - i. Regulatory
  - ii. Documentation
  - iii. Site hazard assessment -Daily employee awareness of site operations
- e. Safety Rules.**
  - i. General safety rules
  - ii. Personal protective equipment
  - iii. Housekeeping
- f. Safety Checklists.**
  - i. Project safety-planning checklist
  - ii. Emergency plans and procedures checklist
  - iii. Documentation checklist
  - iv. Protective materials and equipment checklist
- g. Traffic Control Coordinator Inspections.**
  - i. Responsible person
  - ii. Frequency
  - iii. Documentation of actions taken
- h. Record Keeping.**
  - i. OSHA 200 log
- i. Reporting.**
  - i. Accident(s)
  - ii. On site
  - iii. Legal notice requirement
  - iv. Public liability
  - v. Property damage
  - vi. Department of Labor
  - vii. Hazard Communications
- j. Additional Procedures for Project Specific Situations as Applicable.**
  - i. Compressed gas cylinders
  - ii. Confined spaces
  - iii. Cranes
  - iv. Crystalline silica (stone, masonry, concrete, and brick dust)
  - v. Electrical
  - vi. Equipment operators
  - vii. Fall protection
  - viii. Hand and power tools
  - ix. Hearing conservation
  - x. Highway safety
  - xi. Lead health and safety plan
  - xii. Lock out/tag out
  - xiii. Materials handling, storage, use, and disposal
  - xiv. Areas of environmental concern

- xv. Night work
- xvi. Personal protective equipment
- xvii. Project entry and exit
- xviii. Respiratory protection
- xix. Sanitation
- xx. Signs, signals, and barricades
- xxi. Subcontractors
- xxii. Trenching

**3. Appendix for Environmental Health and Safety Plan (HASP).** If environmental hazards are identified in the Contract, an Environmental HASP shall be included in an appendix to the Plan, or in a separate document. References to any Environmental HASP shall be included within the Plan, where appropriate.

The Plan shall be kept on the site and shall apply and be available to all workers and all other authorized persons entering the work site. Copies of all updates to the Plan shall be promptly supplied to the Engineer.

If at any time during the Project the Engineer determines that the Contractor is not complying with the requirements of this provision or the updated Plan, the Contractor shall correct such deficiencies immediately. Failure to remediate such deficiencies may result in suspension of the Contractor's operations until the deficiencies have been corrected. Suspensions ordered due to safety deficiencies will not be considered compensable or excusable delays.

The Contractor is responsible for implementation of the Plan. Pursuant to Article 1.07.10, the Contractor shall indemnify, and save harmless the State from any and all liability related to the Plan in proportion to the extent that the Contractor is held liable for same by an arbiter of competent jurisdiction.

The Contractor shall allow onto the Project site any inspector of OSHA or other legally responsible agency involved in safety and health administration upon presentation of proper credentials, without delay and without the presentation of an inspection warrant.

**Article 1.07.11 Opening of Section of project to Traffic or Occupancy:**

*Add the following sentence to the last paragraph:*

“In cases in which guiderail is damaged by the traveling public, repair or replacement will be reimbursable as contained elsewhere herein.”



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

### **Article 1.08.03 - Prosecution of Work:**

*Add the following:*

The Contractor will not be allowed to install traffic signal or pedestrian heads until the controllers are on hand and ready for installation. Once installation of this equipment commences, the Contractor shall complete this work in a most expeditious manner.

### **Sequence of Construction/Operations**

- Advance Stage 1 – Relocate utilities along approach roadways. Install protective shielding below bridge. Install temporary surface water main and demolish south overhang including water main.
- Advance Stage 2 – Install detour signing. Close Mosher Avenue to traffic, implement detour and perform abutment stabilization work. Install temporary utility support to south of bridge and connect temporary water main. End detour, maintain/cover the detour signing until required for subsequent stages.
- Stage 1A – Initiate construction work that can be completed prior to the official start of the construction season. Perform work in the off-peak hours to limit impacts to traffic. No Permanent work zone and lane closures will be established in this stage.
- Stage 1B – Close bridge to pedestrian traffic 1-week prior to full bridge closure and demolish the north overhang and sidewalk.
- Stage 2 – Close Mosher Avenue to all traffic, implement detour and install initial PBUs.
- Stage 3 – Demolish existing bridge deck and barriers.
- Stage 4 – Install remaining PBUs.
- Stage 5 – Install pre-cast backwall, place C.I.P. deck end closure pour. Install permanent GRS integrated approach zone behind new backwall and place temporary pavement.
- Stage 6 – Remove detour, install temporary one-way signalization and implement temporary signalization measures. Construct north side bridge parapet and sidewalk. Install permanent utilities mounted to north parapet. Prior to Stage 6 install northeast permanent sidewalk and crosswalk ramps on Mosher Avenue and Ward Avenue to maintain pedestrian access in Stage 7.
- Stage 7 – Revise TPCBC, signing, pavement markings and temporary signalization to facilitate construction of south bridge parapet. Remove temporary utility support structure.
- Post Stage 7 – Remove temporary signalization and utilize short term lane shifts and lane closures to facilitate remaining roadway and sidewalk construction work.
- Stage 8 – Complete approach work. Implement the full detour for 5 weekdays to complete full depth and final paving of Mosher and Ward Avenues. Stripe roadways and install roadway signage.

**AMTRAK**

Power and/or track outages will be limited to a window of 11:30 pm to 3:30 am (Foul Time). This time includes de-energizing and re-energizing line.

**Article 1.08.04 – Limitations 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 that will interfere with the described traffic operations on all project roadways as follows:

**Mosher Avenue**

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.

During a consecutive 5-day period in the Fall of both Season 1 and Season 2, the Contractor shall be allowed to close Mosher Avenue Bridge and implement a detour as shown on the detour.

During a consecutive 12-week period in Season 2, the Contractor shall be allowed to close Mosher Avenue Bridge to facilitate superstructure replacement and implement a detour as shown on the detour.

The Contractor shall notify the Engineer at least 14 days in advance of the start of the closure.

Mosher Avenue shall be open to vehicular and pedestrian traffic prior to Friday of the Memorial Day Weekend.

During the bridge replacement, the Contractor will be allowed to maintain an alternating one-way traffic operation controlled by Temporary Signalization for a duration not to exceed 84 consecutive days

The Contractor will be allowed to halt Mosher Avenue traffic for a period not to exceed 10 minutes to perform necessary work, as approved by the Engineer, between 12:01 a.m. and 5:00 a.m. on all non-Holiday days.

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

**Article 1.08.07 - Determination of Contract Time:**

*Delete the second, third and fourth paragraphs and replace them with the following:*

When the contract time is on a calendar day basis, it shall be the number of consecutive calendar days stated in the contract, INCLUDING the time period from December 1 through March 31 of each year. The contract time will begin on the effective date of the Engineer’s order to commence work, and it will be computed on a consecutive day basis, including all Saturdays, Sundays, Holidays, and non-work days.

**1.08.08 - Extension of Time:**

*Delete the sixth paragraph, “If an approved extension of Contract time.... the following April 1”.*

**Article 1.08.09 - Failure to Complete Work on Time:**

*Delete the second paragraph, "If the last day...the project is substantially completed" and replace it with "Liquidated damages as specified in the Contract shall be assessed against the Contractor per calendar day from that day until the date on which the project is substantially completed."*

## **SECTION 2.86 - DRAINAGE TRENCH EXCAVATION, ROCK IN DRAINAGE TRENCH EXCAVATION**

### **2.86.01—Description**

### **2.86.03—Construction Methods**

### **2.86.04—Method of Measurement**

### **2.86.05—Basis of Payment**

**2.86.01—Description:** Drainage trench excavation consists of the excavation necessary for the proper installation of drainage structures, pipes, pipe ends and any other incidental drainage items.

It shall include earth and rock excavation, removal of existing pipes, dewatering, backfill, and disposal of materials; to the trench limits described herein, to the dimensions shown on the plans, or as directed by the Engineer.

#### **Classifications:**

- (1) **Drainage Trench Excavation** will include only the excavation necessary for the construction of the drainage items and the removals specified above.
- (2) **Rock in Drainage Trench Excavation**, insofar as it applies to drainage trench excavation, shall be defined as **1/2 cubic yard or more** in volume of the following obstructions removed from the limits of the drainage trench:
  - (a) rock in definite ledge formation
  - (b) boulders, or portions of boulders
  - (c) cement masonry structures
  - (d) concrete or reinforced concrete structures
  - (e) reinforced concrete pipe
  - (f) subsurface concrete pavement or concrete base

The removal shall be as indicated or directed from within the limits defined in 2.86.03 for drainage trench excavation.

#### **2.86.03—Construction Methods:**

##### **(1) Drainage Trench Excavation Limits:**

*Horizontal Limits:* Trench widths for pipes, pipe ends, pipe-arches, and drainage structures shall be as follows:

- (a) 2 feet greater than the nominal inside diameter of circular pipe or nominal inside span of elliptical pipe or pipe-arch for such diameters or spans of less than 30 inches
- (b) 3 feet greater than the nominal inside diameter of circular pipe or the nominal inside span of elliptical pipe or pipe-arch for such diameters or spans that are 30 inches or greater
- (c) 4 feet greater than the nominal inside diameter or nominal horizontal inside span for pipe-arches fabricated from structural plates
- (d) 2 feet beyond the neat lines of all exterior or foundation walls of drainage structures

*Vertical Limits:* Trench depths shall extend vertically as follows:

- (a) From the bottom of the trench to the bottom of the roadway excavation, or in areas away from roadway excavation, to the top of existing ground surface.

(b) Where drainage pipe is to be laid in a fill area, the embankment shall be placed and compacted to a minimum elevation 12 inches above the top of the proposed pipe, whereupon the drainage trench excavation shall be performed and the pipe installed.

- (2) **Drainage Trench Excavation:** Drainage trench excavation shall be made in conformity with the requirements of the plans, or as directed by the Engineer. The Contractor shall furnish and employ such shores, braces, pumps, or ancillary equipment as needed for the proper protection of property, proper completion of the work, as well as safety of the public and employees of both the Contractor and the Department. All bracing and shoring shall be removed when no longer required for the construction or safety of the work. When required, the Contractor shall provide or have on the Site at all times any OSHA certification for equipment to be used, per 1.07.07. For support of trenches greater than 10 feet in depth, working drawings shall be submitted, in accordance with 1.05.02. The Contractor shall control erosion and sedimentation at trench locations and ensure that pumped water from the drainage excavation is discharged in accordance with the requirements of 1.10.

Where a firm foundation is not encountered at the grades established due to unsuitable material, such as soft, spongy, or unstable soil, the unsuitable material shall be removed and replaced with approved backfill, thoroughly compacted in lifts not to exceed 6 inches, for the full trench width. The Engineer shall be notified prior to removal of the unsuitable material in order to determine the depth of removal necessary.

After the excavation is complete, the Contractor shall notify the Engineer and no drainage structure or material shall be placed in the excavated area until the Engineer has approved the depth of excavation and the character of the foundation material.

- (3) **Rock in Drainage Trench Excavation:**

(a) Rock in Drainage Trench Excavation - Ledge: When rock in definite ledge form is encountered, the Contractor shall excavate a minimum of 12 inches below the bottom of the proposed pipe or drainage structure; and this depth shall be filled with bedding material (as specified in M.08.03-1) below the proposed pipe; or granular fill (as specified in M.02.01) below the proposed drainage structure, which shall be thoroughly compacted in lifts not to exceed 6 inches.

(b) Rock in Drainage Trench Excavation - Boulders: When boulders are encountered, the Contractor shall remove them from the trench and if backfill is required, the void shall be filled with bedding material, surplus excavated material (as specified in 2.02.03-8) or granular fill which shall be thoroughly compacted in lifts not to exceed 6 inches.

(c) Rock in Drainage Trench Excavation –Structures: When cement masonry, concrete or reinforced concrete structures are encountered within the drainage trench limits, the Contractor shall remove the structure in its entirety or as directed by the Engineer, and if backfill is required, the void shall be filled with bedding material, surplus excavated material or granular fill which shall be thoroughly compacted in lifts not to exceed 6 inches.

- (4) **Backfill:** Suitable material excavated from the drainage trench shall be used as backfill material prior to consideration of using any other source of backfill. Backfill material used shall be of a quality satisfactory to the Engineer and shall be free from large or frozen lumps, wood and other extraneous material. Rock fill or stones larger than 5 inches shall not be placed within 1 foot of the drainage structure or pipe. The grading shall be

completed to the lines shown on the plans, or as ordered, by refilling to the required elevation with approved material, placed in layers not to exceed 6 inches in depth after compaction, which shall be thoroughly compacted with equipment approved by the Engineer.

All surplus or unsuitable material shall be removed and disposed of as directed. Should additional material be required for backfilling, it may be obtained from the Project surplus excavation in accordance with 2.02.03-8 or from borrow pits, gravel pits, or elsewhere as directed by the Engineer.

#### **2.86.04—Method of Measurement:**

**Drainage Trench Excavation:** Drainage trench excavation will not be measured for payment.

If granular fill or borrow is required to replace unsuitable material it will be measured for payment as directed by the Engineer.

**Rock in Drainage Trench Excavation:** If any material meeting the definition of Rock in Drainage Trench Excavation is encountered, the Contractor shall strip it of sufficient overlying material to allow for proper measurement and shall then notify the Engineer that the rock surface is ready for measurement. If the Contractor fails to give such notice, the Engineer will presume that the measurements taken at the time the Engineer first saw the material in question will give the true quantity of excavation.

Rock in Drainage Trench Excavation will be measured according to the classification provided in 2.86.01 and within the drainage trench excavation limits provided in 2.86.03.

For the removal of underground obstructions, as classified in 2.86.01-2, the measurement shall be the actual volume of rock removed (1/2 cubic yard or more) as approved by the Engineer.

Rock in Drainage Trench Excavation will not be measured for payment in fills.

Bedding Material or other suitable fill, as specified in 2.86.03(3), used to fill voids after rock is excavated will not be measured for payment.

#### **2.86.05—Basis of Payment:**

**Drainage Trench Excavation:** There will be no direct payment for drainage trench excavation required for the installation of drainage pipes, pipe ends, catch basins, drop inlets, manholes, and other drainage structures, or any other incidental drainage work including materials, tools, equipment and labor necessary to complete the drainage trench excavation in conformity with the plans or as directed by the Engineer.

There will be no direct payment for backfill or disposal of surplus material necessary for the satisfactory completion of this work.

There will be no direct payment made for shoring, bracing, dewatering, or for material or equipment necessary for the satisfactory completion of the work.

Where called for on the plans to install temporary earth retaining systems for the support of existing facilities, pavement, utilities, or for other constraints, payment will be made in accordance with such items in the Contract.

If granular fill or borrow is used to replace unsuitable material, payment will be made at the respective Contract unit prices, or in the absence of such items in the Contract, as Extra Work in accordance with 1.04.05.

**Rock in Drainage Trench Excavation:** When rock, conforming to the description in 2.86.01 is encountered within the limits of drainage trench excavation, its removal will be classified and

paid for at the Contract unit price per cubic yard for "Rock in Drainage Trench Excavation 0' – 10' Deep," or "Rock in Drainage Trench Excavation 0' – 20' Deep," as the case may be.

Those portions of drainage trench excavation classified and paid for as "Rock in Drainage Trench Excavation" of the various depths will be the actual volumes of rock excavated within the limits for drainage trench excavation, at the applicable bottom depth price.

Where no item or items for "Rock in Drainage Trench Excavation" at the applicable depth appear in the proposal and rock is encountered in drainage trench excavation, its removal will be paid for as Extra Work in accordance with 1.04.05.

When excavation is necessary in fill, no such excavation will be paid for as "Rock in Drainage Trench Excavation."

**When excavation is necessary for any purpose other than drainage-related items, no such excavation will be paid under this item.**

Bedding material or any other suitable material used to fill voids vacated by excavated rock will not be paid for but shall be included in the unit price per cubic yard for "Rock in Drainage Trench Excavation."

Pay Item	Pay Unit
Rock in Drainage Trench Excavation 0' - 10' Deep	c.y.
Rock in Drainage Trench Excavation 0' - 20' Deep	c.y.

## **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**

- 1. Material Documentation**
- 2. Transportation of Mixture**
- 3. Paving Equipment**
- 4. Test Section**
- 5. Transitions for Roadway Surface**
- 6. Spreading and Finishing of Mixture**
- 7. Longitudinal Joint Construction Methods**
- 8. Contractor Quality Control (QC) Requirements**
- 9. Temperature and Seasonal Requirements**
- 10. Field Density**
- 11. Acceptance Sampling and Testing**
- 12. Density Dispute Resolution Process**
- 13. Corrective Work Procedure**
- 14. Protection of the Work**
- 15. Cut Bituminous Concrete Pavement**

### **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 a uniform textured, non-segregated, smooth bituminous concrete pavement to the grade and cross section shown on the plans.

The following terms 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 which are:

PWL density lots = When the project total estimated quantity per mixture is larger than 3,500 tons

Simple Average density lots = When the project total estimated quantity per mixture is 3,500 tons or less

**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 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 CTDOT 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 meet 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, “-W” must be listed following the mixture designation.
- 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 of 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 and project 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 1 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 material 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%, 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 strictly 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 clear of areas paved or to be paved. Before any such equipment and tools are cleaned, they shall be moved 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 (minimum length 20 feet).

**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. 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 psi 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 are 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**

<b>Option</b>	<b>Fixture Configuration</b>	<b>Fixture Quantity</b>	<b>Requirement</b>
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 minimum output of 50,000 lumens and emit light equally in all directions.

**Material Transfer Vehicle (MTV):** A MTV shall be used when placing bituminous concrete surface course (a lift or multiple lifts) as indicated in the Contract except as noted on the plans or as directed by the Engineer. In addition, continuous paving lengths of less than 500 feet may not require the use of a MTV as determined by the Engineer.

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:

1. The make and model of the MTV.
2. The individual axle weights and axle spacing for each piece of paving equipment (haul vehicle, MTV and paver).
3. 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 meet 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 ends shall meet the following length requirements:

Posted Speed Limit	Permanent Transition Length Required
> 35 mph	30 feet per inch of elevation change
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: Defined as a transition that does not remain a permanent part of the work.

All temporary transitions shall meet the following length requirements:

Posted Speed Limit	Temporary Transition Length Required
> 50 mph	Leading Transition: 15 feet per inch of vertical change (thickness) Trailing Transition: 6 feet per inch of vertical change (thickness)
40, 45 or 50 mph	Leading and Trailing: 4 feet per inch of vertical change (thickness)
35 mph or less	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 meet 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.

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 gal./s.y. for a non-milled surface and an application rate of 0.05 to 0.07 gal./s.y. 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 gal /s.y. The Engineer must approve the equipment and the method of measurement prior to use. The material for tack coat shall be heated to  $160^{\circ}\text{F} \pm 10^{\circ}\text{F}$  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 upper and lower surfaces 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 mixture temperature will be verified by means of a probe or infrared type of thermometer. The placement temperature range shall be listed in the quality control plan (QCP) for placement and meet the requirements of Table M.04.03-4. Any HMA material that falls outside the specified temperature range as measured by a probe thermometer may be rejected.

The Contractor shall inspect the newly placed pavement for defects in 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 impracticable 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**

Mixture Designation	Lift Tolerance
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 Section.

- 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 Article 4.06.04.
- c) Delivered Weight of Mixture: When the delivery ticket shows that the truck 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 4.06.04 and eliminate all roller marks without displacement, shoving cracking, or aggregate breakage.

When placing a lift with a specified thickness less than 1 1/2 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.

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 1/4 inch from a Contractor-supplied 10 foot straightedge. For all other lifts of bituminous concrete, the tolerance shall be 3/8 inch. Such tolerance will apply to all paved areas.

Any surface that 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 1 1/2 inches to 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 1 1/2 inches or greater than 3 inches. 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 1/4 inch at any location.

**Method I - 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 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

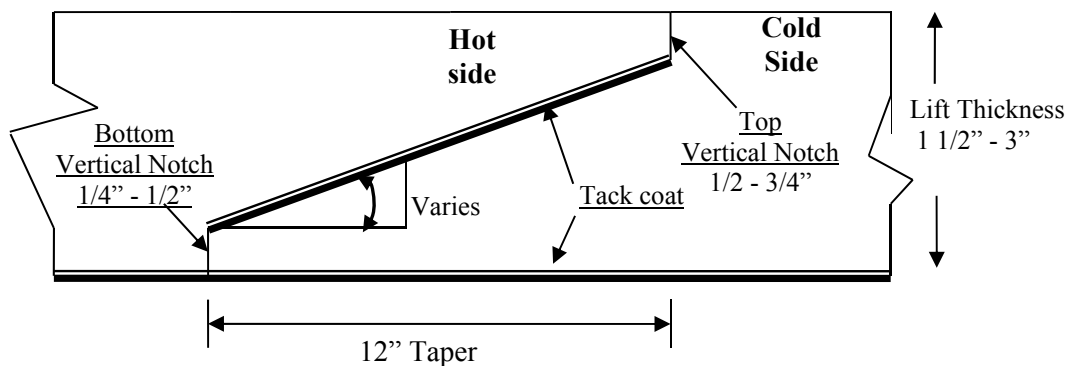
the Engineer.

The taper portion of the wedge joint shall be evenly compacted using equipment other than the paver or notch wedge joint device. The compaction device shall be the same width as the taper and not reduce the angle of the wedge or ravel the top notch of the joint during compaction.

When placed on paved surfaces, the area below the sloped section of the joint shall be treated with tack coat. The top surface of the sloped section of the joint shall be treated with tack coat prior to placing the completing pass.

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

**Figure 4.06-1: Notched Wedge Joint (Not to Scale)**



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.

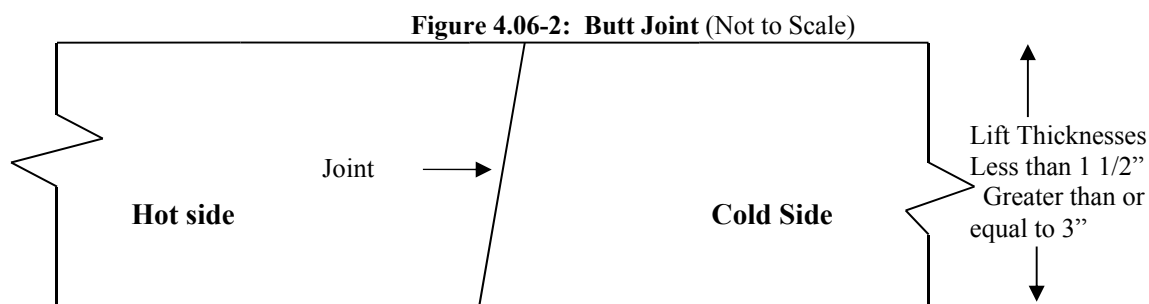
If Method I cannot be used on those lifts which are 1 ½ inches to 3 inches, Method III may be substituted according to the requirements below for “Method III - Butt Joint with Hot Poured Rubberized Asphalt Treatment.”

**Method II - Butt Joint:**

When adjoining passes are placed, the Contractor shall use the end gate to create 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). During placement of multiple lifts, the longitudinal joint shall be constructed in such a manner that it is located at least 6 inch from the joint in the lift immediately below. The joint in the final lift shall be at the centerline or at lane lines. 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.”

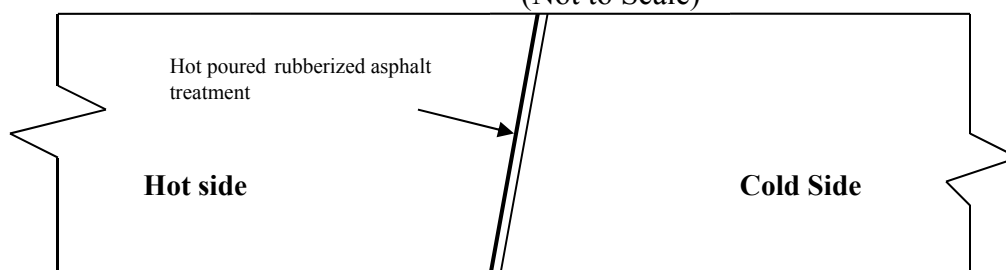




**Method III - Butt Joint with Hot Poured Rubberized Asphalt Treatment:**

If Method I 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 use Method III as a substitution in those locations. There shall be no additional measurement or payment made when Method III is substituted for Method I. 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  
(Not to Scale)**



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 D6690, 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 (QCP) and must 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 3 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 4.06.03-9 “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.

The QCPs shall also include the name and qualifications of any outside testing laboratory performing any QC functions on behalf of the Contractor. The QC Technician performing in-place density testing shall be NETTCP certified as a paving inspector.

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 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 bituminous concrete 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 1 mat core and 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’s 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 Subarticle 4.06.03-10.

**9. Temperature and Seasonal Requirements:** Paving, including placement of temporary pavements, shall be divided into 2 seasons, “In-Season” and “Extended-Season.” In-Season paving occurs from May 1 to October 14, and Extended Season paving occurs from October 15 to April 30. The following requirements shall apply unless otherwise authorized or directed by the Engineer:

- Mixtures shall not be placed when the air or subbase 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. Field Density** The Contractor shall obtain cores for the determination of mat and longitudinal joint density of bituminous concrete pavements. Within five calendar days of placement, mat and joint cores shall be extracted on each lift with a specified thickness of 1 1/2 inches or more. Joint cores shall not be extracted on HMA S1.0 lifts.

The Contractor shall extract cores from random locations determined by the Engineer in accordance with ASTM D3665. Four (4) or six (6) inch diameter cores shall be extracted for S0.25, S0.375 and S0.5 mixtures; 6 inch diameter cores shall be required for S1.0 mixtures. The Contractor shall coordinate with the Engineer to witness the extraction, labeling of cores, and filling of the core holes.

Each lift will be separated into lots as follows:

- a. **Simple Average Density Lots:** For total estimated quantities below 2,000 tons, the lift will be evaluated in one lot which will include the total paved tonnage of the lift and all longitudinal joints between the curb lines.  
For total estimated quantities between 2,000 and 3,500 tons, the lift will be evaluated in two lots in which each lot will include approximately half of the total tonnage placed for the full paving width of a lift including all longitudinal joints between the curb lines.
- b. **PWL Density Lots:** Mat density lots will include each 3,500 tons of mixture placed within 30 calendar days. Joint density lots will include 14,000 linear feet of constructed joints. Bridge density lots will always be analyzed using simple average lot methodology.
- c. **Partial Density Lot (For PWL only):** A mat density lot with less than 3,500 tons or a joint density lot with less than 14,000 linear feet due to:
  - completion of the course; or
  - a lot spanning 30 calendar days.

Prior to paving, the type and number of lot(s) will be determined by the Engineer.

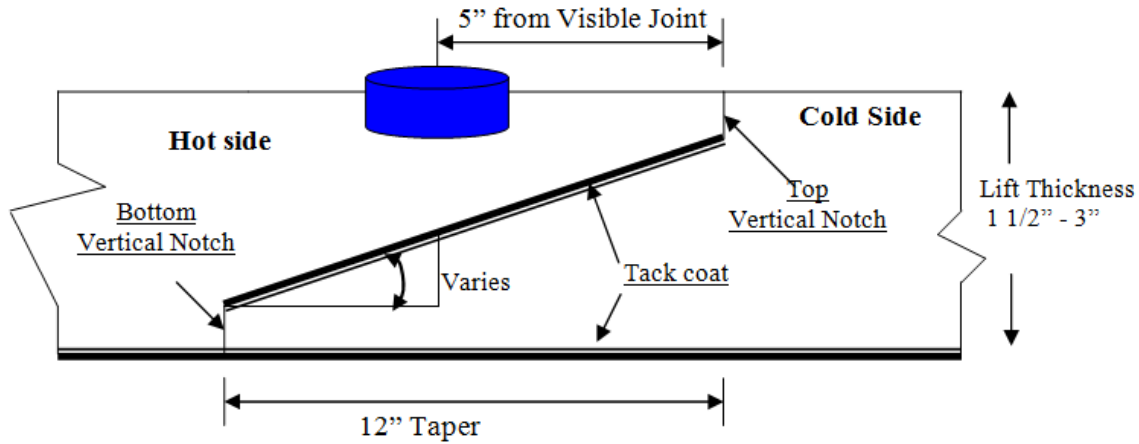
Noncontiguous areas such as highway ramps may be combined to create one lot.

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 shall 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 1 foot from the edge of a paver pass. If a random number locates a core less than 1 foot from any edge, the location will be adjusted by the Engineer so that the outer edge of the core is 1 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 4.06-4).

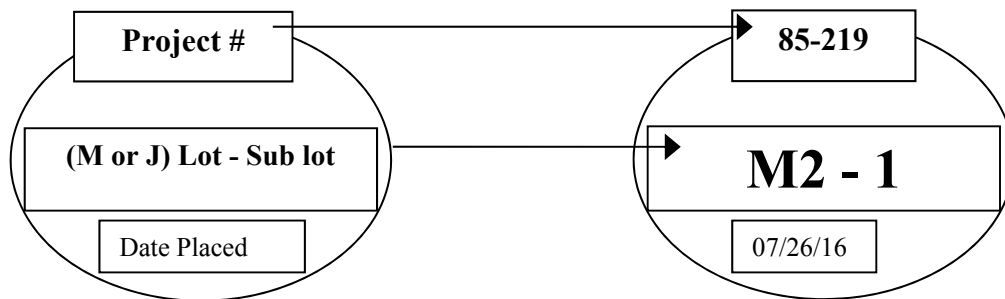
**Figure 4.06-4: Notched Wedge Joint Cores (Not to Scale)**



When Method II or Method III Butt Joint is used, 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. For example, a mat core from the first lot and the first sub-lot shall be labeled with "M1 - 1." A mat core from the second lot and first sub-lot shall be labeled "M2-1" (see Figure 4.06-5). 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 security seals at the removable hinges(s) and at the lid opening(s). The security seals' identification number must be documented on the MAT-109. All sealed containers shall be delivered to the Department's Central Lab within two working days from time of extraction. Central Lab personnel will break the security seal and take possession of the cores.

**Figure 4.06-5: Labeling of Cores**



Each core hole shall be filled within 4 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.

**Simple Average Density Lots:**

A standard simple average density lot is the quantity of material placed within the defined area excluding any bridge decks.

A combo simple average density lot is the quantity of material placed within the defined area including bridge decks less than or equal to 500 feet long.

A bridge simple average density lot is the quantity of material placed on a bridge deck longer than 500 feet.

The number of cores per lot shall be determined in accordance with Table 4.06-4. If a randomly selected mat or joint core location is on a bridge deck, the core is to be obtained on the bridge deck in addition to the core(s) required on the bridge deck.

The number of cores per lot shall be determined in accordance with Table 4.06-5. Multiple bridge decks can be combined into one lot if the paving and underlying conditions are comparable. If multiple bridge decks are combined into a single bridge lot, at least one mat and joint core shall be obtained on each bridge.

The longitudinal locations of mat cores within a standard, combo, or bridge lot containing multiple paving passes will be determined using the combined length of the paving passes within the lot.

**TABLE 4.06-4: Number of Cores per Lot (Simple Average)**

Lot Type	No. of Mat Cores		No. of Joint Cores	
Standard Lot < 500 Tons	3		3	
Standard Lot ≥ 500 Tons	4		4	
Combo Lot < 500 Tons	2 plus	1 per bridge (≤ 300')	2 plus	1 per bridge (≤ 300')
Combo Lot ≥ 500 Tons <sup>(1)</sup>	4 plus	2 per bridge (301' – 500')	4 plus	2 per bridge (301' – 500')

**TABLE 4.06-5: Number of Core per Bridge Density Lot (Simple Average)**

Length of Bridge(s) (Feet)	Minimum No. of Mat Cores	Minimum No. of Joint Cores
< 500	2	2
501 – 1,500	3	3
1,501 – 2,500	4	4
2,501 and greater	5	5

**PWL Density Lots:**

A PWL mat density lot is 3,500 tons of material placed within the defined area excluding any bridges. One mat core will be obtained per every 500 tons placed.

A PWL joint density lot is 14,000 linear feet of longitudinal joint excluding any joints on bridge decks. One joint core will be obtained per every 2,000 linear feet of joint.

Bridge density lots will always be analyzed as using the simple average lot methodology. The number of cores per lot shall be determined in accordance with Table 4.06-5. Multiple bridge decks can be combined into one lot if the paving and underlying conditions are comparable. If multiple bridge decks are combined into a single bridge lot, at least one mat and joint core shall be obtained on each bridge.

**11. Acceptance Sampling and Testing:** Sampling shall be performed in accordance with ASTM D3665 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 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's 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 five calendar days of the notification of the test results. No request for dispute resolution will be allowed unless the Contractor provides quality control results from samples taken prior to and after finish rolling, and within the timeframe described in 4.06.03-8 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 core or set of core samples per disputed lot. The core samples must be extracted no later than seven calendar days from the date of the Engineer's authorization. All such core samples shall be extracted and the core hole filled using the procedure outlined in 4.06.03-10.

a) **Simple Average Lots:** The Contractor may only dispute any simple average lot that is adjusted at or below 95 percent payment. 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. The dispute resolution results shall be combined with the original results and averaged for determining the final in-place density value.

b) **PWL Lots:** The Contractor may dispute any PWL subplot when the PWL falls below 50%

calculated in accordance with section 4.06.04.2.b. An additional random core in the subplot may be taken to validate the accuracy of the core in question. The Department will verify the additional core test result and may average the original test result with the additional core result for purpose of calculating adjustments.

**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 completion.

**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 bituminous concrete 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\*:** Bituminous concrete will be measured for payment as the amount of material in tons placed as determined by the net weight on the delivered tickets and adjusted by area, thickness and weight as follows:

Quantity Adjustments: Adjustments may be applied to the placed bituminous concrete quantities that will be measured for payment using the following formulas:

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

**Actual Area (SY)** = [(Measured Length (ft)) x (Avg. of width measurements (ft))] ÷ 9 s.f./SY

**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 (inch) of the lift being placed.

**Quantity 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:

$$\text{Quantity Adjusted for Thickness (T}_T\text{)} = A \times t_{\text{adj}} \times 0.0575 = (-) \text{ tons}$$

Where: A = Area =  $\{[L \times (\text{Design width} + \text{tolerance (lift thickness)/12})] / 9\}$   
 $t_{\text{adj}}$  = Adjusted thickness =  $[(D_t + \text{tolerance}) - \text{Actual thickness}]$   
 $D_t$  = 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:

$$\text{Quantity Adjusted for Weight (T}_W\text{)} = \text{GVW} - \text{DGW} = (-) \text{ tons}$$

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

## 2. Bituminous Concrete Adjustment Cost:

- a) Production Lot Adjustment: An adjustment may be applied to each production lot as follows:

- i. Non-PWL Production Lot (less than 3,500 tons):

The adjustment values in Tables 4.06-6 and 4.06-7 will 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 as follows:

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

Where: AdjAV<sub>t</sub>: Percent adjustment for air voids

AdjPB<sub>t</sub>: Percent adjustment for asphalt binder

Tons: Weight of material (tons) in the lot adjusted by 4.06.4-1

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

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

AdjAV<sub>i</sub> = Adjustment value from Table 4.06-6 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

Percent Adjustment for Asphalt Binder = AdjPB<sub>t</sub> = [(AdjPB<sub>1</sub> + AdjPB<sub>2</sub> + AdjPB<sub>i</sub> + ... + AdjPB<sub>n</sub>)] / n

Where: AdjPB<sub>t</sub> = Total percent liquid 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**

Adjustment Value (AdjAV <sub>i</sub> ) (%)	<u>S0.25, S0.375, S0.5, S1</u> Pb
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 will be calculated using PWL methodology based on AV, VMA, and PB test results. The results will be considered as being normally distributed and all applicable equations in AASHTO R 9 and AASHTO R 42 Appendix X4 will apply.

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

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

For PWL between 50 and 90%: Adj(AV<sub>t</sub> or PB<sub>t</sub> or VMA<sub>t</sub>) = (55 + 0.5 PWL) - 100

For PWL at and above 90%: Adj(AV<sub>t</sub> or PB<sub>t</sub> or VMA<sub>t</sub>) = (77.5 + 0.25 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

A lot with PWL less than 50% in any of the 3 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:

**Tons Adjusted for Superpave Design (T<sub>SD</sub>)** = [(0.5AdjAV<sub>t</sub> + 0.25AdjPB<sub>t</sub> + 0.25 AdjVMA<sub>t</sub>) / 100] X Tons

Where Tons: Weight of material (tons) in the lot adjusted by 4.06.4-1

iii. Partial Lots:

Lots with less than 4 sub lots 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.a)i.

Lots with 4 or more sub lots will be calculated as indicated in 4.06.04-2.a)ii.

**Production Lot Adjustment:  $T_{SD} \times \text{Unit Price} = \text{Est. (Pi)}$**

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

Est. ( Pi)= Pay Unit in dollars representing incentive or disincentive per lot

b) Density Lot Adjustment: An adjustment may be applied to each density lot as follows:

i. Simple Average Density Lot (less than 3500 tons) and Bridge Lots:

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 ( $T_D$ )** =  $[\{(P_{AM} \times 0.50) + (P_{AJ} \times 0.50)\} / 100] \times \text{Tons}$

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

$P_{AM}$  = Mat density percent adjustment from Table 4.06-8

$P_{AJ}$  = Joint density percent adjustment from Table 4.06-9

Tons: Weight of material (tons) in the lot adjusted by 4.06.4-1

**TABLE 4.06-8: 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)

**Notes:**

<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 round 1.667 to 1.67.

**TABLE 4.06-9: Adjustment Values for Pavement Joint Density**

Average Core Result	Percent Adjustment (Bridge and Non-Bridge) <sup>(1)(2)</sup>
Percent Joint Density	
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)

**Notes:**

<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 round 1.667 to 1.67

Additionally, any subplot with a density result below 87% will be evaluated under 1.06.04.

ii. PWL Density Lot (3,500 tons or more):

For each lot, the adjustment values will be calculated using PWL methodology based on mat and joint density test results. Only one result will be included for each subplot. The results will be considered as being normally distributed and all applicable equations in AASHTO R 9 and AASHTO R 42 Appendix X4 will apply.

The specification limits for the PWL determination are as follows:

Mat Density: 91.5-98%

Joint Density: 90-98%

For mat and joint density, the individual percent adjustment (PA) will be calculated as follows:

For PWL between 50 and 90%:  $PA_{(M \text{ or } J)} = 0.25 * PWL - 22.50$

For PWL at and above 90%:  $PA_{(M \text{ or } J)} = 0.125 * PWL - 11.25$

Where:  $PA_M$  = Total percent mat density adjustment value for the PWL mat density lot

$PA_J$  = Total percent joint density adjustment value for the PWL joint density lot

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.

A lot with PWL less than 50% will be evaluated under 1.06.04.

The total adjustment for each PWL mat density lot will be computed as follows:

**Tons Adjusted for Mat Density ( $T_{MD}$ ) =  $(PA_M / 100) \times \text{Tons}$**

Where: Tons= Weight of material (tons) in the lot adjusted by 4.06.4-1.

The total adjustment for each PWL joint density lot will be computed as follows:

**Tons Adjusted for Joint Density ( $T_{JD}$ ) =  $(PA_J / 100) \times J\_Tons$**

Tons Adjusted for Joint Density will be calculated at the end of each project or project phase.

Where:  $J\_Tons = Tons \text{ in project or phase adjusted by } 4.06.4 - 1 \times \frac{\text{Lot joint length}}{\text{Joint length in project or phase}}$

All bridge density lot adjustments will be evaluated in accordance with 4.06.04-2.b)i.

Additionally, any subplot with a density result below 87% will be evaluated under 1.06.04.

iii. Partial Lots:

Lots with less than 4 sub lots will be combined with the prior lot. If there is no prior lot with equivalent material and placement conditions or if the last test result of the prior lot is over 30 calendar days old, the mat and joint individual adjustments will be calculated in accordance to Tables 4.06-8 and 4.06-9.  $T_{MD}$  and  $T_{JD}$  will be calculated as indicated in 4.06.04-2.b)i.

Lots with 4 or more sub lots will be calculated as indicated in 4.06.04-2.b)ii.

**Density Lot Adjustment (Simple Average Lots):  $T_D \times \text{Unit Price} = \text{Est. (Di)}$**

**Density Lot Adjustment (PWL Lots):  $(T_{MD} \text{ or } T_{JD}) \times \text{Unit Price} = \text{Est. (DMi or DJi)}$**

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

Est. (Di)= Pay Unit in dollars representing incentive or disincentive per simple average density lot

Est. (DMi)= Pay Unit in dollars representing incentive or disincentive per PWL mat lot

Est. (DJi)= Pay Unit in dollars representing incentive or disincentive per PWL joint lot

Additionally, any subplot with a density result below 87% will be evaluated under 1.06.04.

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

The quantity of material used for the installation of temporary transitions will 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 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 4.06.03.

- a. Container Method – Material furnished in a container will be measured to the nearest 1/2 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 1/2 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:

Tack Coat (gallons at 60°F) = Measured Weight (pounds) / Weight per gallon at 60°F

Tack Coat (gallons at 60°F) = 0.996 x Measured Weight (pounds) / Weight per gallon at 77°F

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

Tack Coat (gallons at 60°F) = 0.976 x Measured Volume (gallons).

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

**Production Lot:  $\Sigma \text{ Est (Pi)} = \text{Est. (P)}$**

**Density Lot (Simple Average Lots):  $\Sigma \text{ Est (Di)} = \text{Est. (D)}$**

**Density Lot (PWL):  $\Sigma \text{ Est (DMi)} + \Sigma \text{ (DJi)} = \text{Est. (D)}$**

**Bituminous Concrete Adjustment Cost= Est. (P) + Est. (D)**

Where: Est. ( )= Pay Unit in dollars representing incentive or disincentive in each production or density lot calculated in 4.06.04-2

The Bituminous Concrete Adjustment Cost item, if included in the bid proposal or estimate, 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 estimated cost will be used for the Contract.

**3. Transitions for Roadway Surface:** The installation of permanent transitions will be paid under the appropriate item used in the formation of the transition. The quantity of material used for the installation of temporary transitions will 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 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 "Material Transfer Vehicle."

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

## **SECTION 5.86 - CATCH BASINS, MANHOLES AND DROP INLETS**

### **5.86.01—Description**

### **5.86.02—Materials**

### **5.86.03—Construction Methods**

### **5.86.04—Method of Measurement**

### **5.86.05—Basis of Payment**

**5.86.01—Description:** The work under this Section shall consist of furnishing, preparing, and installing catch basins, manholes and drop inlets (and also the removal, abandonment, alteration, reconstruction, or conversion of such existing structures) in conformity with the lines, grades, dimensions and details shown on the plans.

This Section shall also include resetting or replacing catch basin tops as well as manhole frames and covers.

**5.86.02—Materials:** The materials for this work shall meet the following requirements:

Drainage structures shall meet the requirements of M.08.02 and shall utilize concrete with a 28-day minimum compressive strength of 4000 psi.

Galvanizing shall meet the requirements of M.06.03.

Mortar shall meet the requirements of M.11.04.

Butyl rubber joint seal shall meet the requirements of ASTM C990.

Granular fill, if necessary, shall meet the requirements of M.02.01.

Protective compound material shall be a type appearing on the Department's Qualified Products List and be acceptable to the Engineer, as specified in M.03.09.

**5.86.03—Construction Methods:** Drainage trench excavation, including rock in drainage trench excavation and backfilling, shall be performed in accordance with 2.86.03 and the requirements of the plans.

Where a drainage structure is to be installed below the surface, a drainage trench shall be excavated to the required depth, the bottom of which shall be graded to the elevation of the bottom of the proposed drainage structure or to ensure a uniform foundation for the structure.

Where a firm foundation is not encountered at the grades established due to unsuitable material, such as soft, spongy, or unstable soil, the unsuitable material shall be removed and replaced with approved granular fill, thoroughly compacted in lifts not to exceed 6 inches. The Engineer shall be notified prior to removal of the unsuitable material in order to determine the depth of removal necessary.

When rock, as defined in 2.86.01-2, is encountered, work shall be performed in accordance with 2.86.03 and the requirements of the plans.

When a drainage structure outside of proposed drainage trench limits is to be removed, it shall be completely removed and all pipes shall be removed or plugged with cement masonry.

When a drainage structure is to be abandoned, the structure shall be removed to a depth 2 feet below the subgrade or as directed by the Engineer. The floor of the structure shall be broken and all pipes shall be plugged with cement masonry.

Drainage structures shall be constructed in accordance with the plans and the requirements contained herein for the character of the work involved. The provisions of 6.02.03 pertaining to bar reinforcement shall apply except that shop drawings need not be submitted for approval unless called for in the plans, Contract or directed by the Engineer. Welding shall be performed in accordance with the applicable sections of the AWS Structural Welding Code, D1.1.

When it becomes necessary to increase the horizontal dimensions of manholes, catch basins and drop inlets to sizes greater than those shown on the plans in order to provide for multiple pipe installations, large pipes or for other reasons, the Contractor shall construct such manholes, catch basins and drop inlets to modified dimensions as directed by the Engineer.

The surfaces of the tops of all catch basins, and drop inlets shall be given a coat of protective compound material, at the manufacturer's recommended application rate, immediately upon completion of the concrete curing period.

All masonry units shall be laid in full mortar beds.

Metal fittings for catch basins, manholes or drop inlets shall be set in full mortar beds or otherwise secured as shown on the plans.

All inlet and outlet pipes shall be set flush with the inside face of the wall of the drainage structure as shown on the plans. The pipes shall extend through the walls for a sufficient distance beyond the outside surface to allow for satisfactory connections, and the concrete or masonry shall be constructed around them neatly to prevent leakage along their outer surfaces.

When constructing a new drainage structure within a run of existing pipe, the section of existing pipe disturbed by the construction shall be replaced with new pipe of identical type and size extending from the drainage structure to the nearest joint of the existing pipe in accordance with 6.86.03 or as directed by the Engineer.

Backfilling shall be performed in accordance with 2.86.03.

Frames, covers and tops which are to be reset shall be removed from their present beds, the walls or sides shall be rebuilt to conform to the requirements of the new construction and the frames, covers and tops shall be reset as shown on the plans or as directed by the Engineer.

#### **5.86.04—Method of Measurement:**

**Drainage Trench Excavation:** In accordance with 2.86.04, excavation for drainage trench will not be measured for payment but shall be included in the Contract unit price for the type of structure being installed.

**Rock in Drainage Trench Excavation:** Rock in Drainage Trench Excavation will be measured in accordance with the drainage trench excavation limits described in 2.86.03.

**Manholes, Catch Basins and Drop Inlets** will be measured as separate units.

**Resetting of Manholes, Catch Basins and Drop Inlets** will be measured as separate units.

**Replacement of frames, covers, and tops** will be measured as a unit for catch basin top or manhole frame and cover.

**Conversion of drainage structures** as specified on the plans, or as directed by the Engineer, including structure reconstruction will be measured for payment as a unit.

**Removal or abandonment of drainage structures** outside of drainage trench excavation limits, as defined in 2.86.03, will be measured as separate units.

There will be no measurement or direct payment for the application of the protective compound material, the cost of this work shall be considered as included in the general cost of the work.



Measurement for payment for work and materials involved with installing pipes to connect new drainage structures into a run of existing pipe will be as provided for under the applicable Contract items in accordance with 6.86.04.

There will be no measurement or direct payment for plugging existing pipes with cement masonry, the cost of this work will be considered as included in the general cost of the work.

**5.86.05—Basis of Payment:**

**Drainage Trench Excavation** for the installation of proposed structures described herein will be paid for under the respective drainage Contract item(s) for which the excavation is being performed, in accordance with the provisions of 2.86.05.

**Rock in Drainage Trench Excavation** will be paid for in accordance with the provisions of 2.86.05.

**Manholes and Catch Basins** will be paid for at the Contract unit price for each "Manhole," or "Catch Basin," of the type specified, at "0' to 10' Deep" or "0' to 20' Deep," complete in place, which price shall include all excavation, backfill, materials, equipment, tools and labor incidental thereto.

**Drop Inlets** will be paid for at the Contract unit price for each "Drop Inlet," of the type specified, complete in place, which price shall include all excavation, backfill, materials, equipment, tools and labor incidental thereto.

**Manholes, Catch Basins and Drop Inlets** constructed to modified dimensions as directed by the Engineer, will be paid for as follows:

Where the interior floor area has to be increased to accommodate existing field conditions, as measured horizontally at the top of the base of the completed structure, and does not exceed 125% of the interior floor area as shown on the plans for that structure, then the structure shall be paid for at the Contract unit price for each "Manhole," "Catch Basin," or "Drop Inlet" of the type specified. Where the floor area is greater than 125%, the increase in the unit price for the individual structure shall be in direct proportion to the increase of the completed structure interior floor area as compared to the interior floor area as shown on the plans for that structure. Such increased unit price shall include all excavation, materials, equipment, tools, and labor incidental to the completion of the structure.

**Reset Units** will be paid for at the Contract unit price each for "Reset Manhole," "Reset Catch Basin," or "Reset Drop Inlet," of the type specified, respectively, complete in place, which price shall include excavation, cutting of pavement, removal and replacement of pavement structure, and all materials, equipment, tools and labor incidental thereto, except when the work requires reconstruction greater than 3 feet, measured vertically, then the entire cost of resetting the unit will be paid for as Extra Work in accordance with the provisions of 1.04.05.

**Frames, Covers, and Tops** when required in connection with reset units, will be paid for at the Contract unit price each for such "Manhole Frame and Cover" or "(Type) Catch Basin Top," complete in place, including all incidental expense; or when no price exists, the furnishing and placing of such material will be paid for as Extra Work in accordance with the provisions of 1.04.05.

When the catch basin top has a stone or granite curb in its design, the curb or inlet shall be included in the cost of the "(Type) Catch Basin Top."

**Conversion of drainage structures** will be paid for at the Contract unit price each for "Convert Catch Basin to (Type) Catch Basin," "Convert Catch Basin to (Type) Manhole," or

"Convert Manhole to (Type) Catch Basin," complete in place, which price shall include excavation, cutting of pavement, removal and replacement of pavement, backfill, all alterations to existing structure, all materials including catch basin frame and grate of the type specified, or manhole frame and cover, all equipment, tools and labor incidental thereto.

The maximum change in elevation of frame under these items shall not exceed 3 feet. Greater depth changes, if required, shall be paid for as Extra Work, in accordance with 1.04.05.

**Removal or abandonment of drainage structures** outside of drainage trench excavation limits as defined in 2.86.03 will be paid for at the Contract unit price each for "Remove Drainage Structure – 0' to 10' Deep," "Remove Drainage Structure – 0' to 20' Deep," or "Abandon Drainage Structure," which price shall include excavation, cutting of pavement, removal and replacement of pavement, backfill, and all equipment, tools and labor incidental thereto.

Pay Item	Pay Unit
(Type) Catch Basin – 0' to 10' Deep	ea.
(Type) Catch Basin – 0' to 20' Deep	ea.
Manhole (Size) – 0' to 10' Deep	ea.
Manhole (Size) – 0' to 20' Deep	ea.
(Type) Drop Inlet	ea.
Reset Catch Basin	ea.
Reset Manhole	ea.
Reset Drop Inlet	ea.
Convert Catch Basin to (Type) Catch Basin	ea.
Convert Catch Basin to (Type) Manhole	ea.
Convert Manhole to (Type) Catch Basin	ea.
Manhole Frame and Cover	ea.
(Type) Catch Basin Top	ea.
Remove Drainage Structure – 0' to 10' Deep	ea.
Remove Drainage Structure – 0' to 20' Deep	ea.
Abandon Drainage Structure	ea.

## **SECTION 6.01 - CONCRETE FOR STRUCTURES**

*Replace Section 6.01 in its entirety with the following:*

### **6.01.01—Description**

### **6.01.02—Materials**

### **6.01.03—Construction Methods**

### **6.01.04—Method of Measurement**

### **6.01.05—Basis of Payment**

**6.01.01—Description:** This item shall include concrete for use in new construction, surface repair or structural repair of bridges and culverts, walls, catch basins, drop inlets and other incidental construction. The concrete shall be composed of Portland cement, pozzolans, fine and coarse aggregate, admixtures and water, prepared and constructed in accordance with these specifications, at the locations and of the form dimensions and class shown on the plans, or as directed by the Engineer.

The use of concrete from dry batch or central mixed plants is permitted for all concrete mixtures.

**6.01.02—Materials:** The materials for this work shall meet the requirements of M.03. Surface or structural repair concrete shall be documented on the delivery ticket, as required in 6.01.03-II-3(a), as having the plastic properties necessary for confined placement to ensure appropriate workability for consolidation within the forms.

### **6.01.03—Construction Methods:**

**I. Concrete Quality Control (QC) Requirements:** For all bridge deck and bridge parapet construction, the Contractor must demonstrate to the Engineer that the materials and work that will be provided by their field staff, subcontractors, and suppliers meets Contract specification requirements.

This effort shall be documented with a **Concrete Quality Control Plan (CQCP)** and shall address the communication with all parties, on-site inspection, sampling and testing frequency necessary to keep the production, placement and finishing operations in control, to determine when an operation has gone out of control and anticipated procedure to correct the situation in a timely manner.

1. General – provide an overview of the means and methods anticipated to perform the work including any anticipated conditions that may need additional attention (such as seasonal conditions requiring heating or cooling of concrete)
2. Contractor Organization – address authority levels/duties by position and name of persons holding those positions; include those who have decision making authority with regard to quality control, materials, sampling and testing who can be contacted by the Engineer
3. Concrete Mix Design – identify concrete supplier(s); provide copies of all applicable mix designs to field staff; and address submittal timeframe
4. Transportation and Delivery of Concrete – identify the supplier’s plant capacity and ability to ensure continuous delivery to the Project to meet the requirements of the mix design and a corrective procedure if it does not meet Project requirements; include a provision for the addition of admixtures and follow up testing
5. Placement and Finishing of Concrete – identify and describe:

- (a) placement equipment
  - (b) placement method(s) to be used (chute, pump, hopper or other)
  - (c) starting point and direction of placement (logistical sequencing)
  - (d) slip forming, formwork, stay-in-place forms or other forming method(s)
  - (e) joint construction method(s)
  - (f) process and documentation that the elevations, base, forms, reinforcement (including support chairs and ties), utility inserts or any other appurtenance installations have been inspected by the Contractor prior to concrete placement
  - (g) equipment and method(s) to be used for vibrating and consolidating concrete
  - (h) procedure for verifying adequate consolidation and how segregation will be addressed
  - (i) schedule and method(s) to be used for finishing all exposed surfaces
6. Curing of Concrete – describe schedule and method(s) for curing of concrete and how the method(s) will be monitored and maintained
7. Contractor QC testing – identify person(s) or firms responsible for Contractor QC testing and provide copies of their certification(s) (see 6.01.03-5), and testing facility location(s). In addition, describe the process used for communication between the QC testing personnel and the Contractor project staff; describe what measures will be taken when test results are out of compliance; this shall include what increased frequency of testing is to be performed to verify that concrete properties are in compliance; the threshold at which time placement ceases; describe what protective measures will be used in case of unforeseen weather
8. The CQCP shall include the name and qualifications of a Quality Control Manager (QCM) provided by the Contractor. The QCM shall be responsible for the administration of the CQCP, and any modifications that may become necessary. The QCM shall have the ability to direct all Contractor personnel on the Project during concreting operations and must communicate directly with the concrete supplier. At a minimum the QCM shall be certified as a **Concrete Transportation Construction Inspector by the American Concrete Institute (ACI)**.
9. The CQCP must include a provision for pre-placement meeting(s) to be held with representatives of the Engineer, the concrete supplier, the QCM and the Contractor’s field staff supervising the work.
- (a) Timing and number of the meeting(s) will be determined by the complexity of the mix design or placement.
  - (b) Non-Standard mix designs that require trial placements will be discussed at the Preconstruction Meeting to remind the Contractor of the time needed for testing. Additional meeting(s) should be scheduled at least 90 days prior to first use of non-standard mix designs, to allow suppliers to perform trial batches and testing.
  - (c) Discussions shall include the configuration and specific application that the concrete will be used for, plastic properties and workability, any mix design challenges, trial placement procedures and subsequent trial results, timing and quantities. Refer to 6.01.03-II-6(e) for additional requirements.
10. The CQCP shall be submitted to the Engineer and concrete supplier for review and comment a minimum of 30 days prior to production or placement. Production and placement shall not occur until all comments of the Engineer and supplier have been addressed by the Contractor. Changes to the CQCP based on data not available at time of submittal may be added via addendum.

**11.** The Contractor shall provide the Engineer QC test results within 48 hours after testing or inspection in a format acceptable to the Engineer. The Contractor shall also maintain complete records of all QC tests.

Review of the CQCP does not relieve the Contractor of its responsibility to comply with the Project specifications. The Contractor may modify the CQCP 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.

## **II. New Construction:**

**1. Falsework and Forms:** Falsework is considered to be any temporary structure which supports structural elements of concrete, steel, masonry or other material during the construction or erection. Forms are to be considered to be the enclosures or panels which contain the fluid concrete and withstand the forces due to its placement and consolidation. Forms may in turn be supported on falsework.

This work shall consist of the construction and removal of falsework and forms that are designed by the Contractor in the execution of the work, and whose failure to perform properly could adversely affect the character of the Contract work or endanger the safety of adjacent facilities, property, or the public. Forms shall be mortar tight. Forms and falsework shall be of sufficient rigidity and strength to safely support all loads imposed and to produce in the finished structure the lines and grades indicated in the Contract documents. Forms shall also impart the required surface texture and rustication and shall not detract from the uniformity of color of the formed surfaces. Forms shall be made of wood, steel or other material approved by the Engineer.

**(a) Design:** The design of falsework and formwork shall conform to the *AASHTO Guide Design Specifications for Bridge Temporary Works*, or to other established and generally accepted design codes such as ACI Standard *ACI 347-Recommended Practice for Concrete Formwork* or specific form or falsework manufacturer specifications. When other than new or undamaged materials are used, appropriate reductions in allowable stresses, and decreases in resistance factors or imposed loads shall be used for design.

**(b) Loads:** The design of the falsework and forms shall be based on load factors specified in the *AASHTO LRFD Bridge Design Specifications* and all applicable load combinations shall be investigated. The design load for falsework shall consist of the sum of appropriate dead and live vertical loads and any horizontal loads.

As a minimum, dead loads shall include the weight of the falsework and all construction material to be supported. The combined unit weight of concrete, reinforcing and pre-stressing steel, and forms that is supported shall be assumed to be not less than:

1. Normal-weight concrete: 0.16 kip/ft<sup>3</sup>
2. Lightweight concrete: 0.13 kip/ft<sup>3</sup>

Live loads shall consist of the actual weight of any equipment to be supported, applied as concentrated loads at the points of contact and a uniform load of not less than 0.02 kip/ft<sup>2</sup> applied over the area supported, plus 0.075 kip/ft applied at the outside edge of deck overhangs.

The horizontal load used for the design of the falsework bracing system shall be the sum of the horizontal loads due to equipment; construction sequence including unbalanced hydrostatic forces from fluid concrete and traffic control devices; stream flow, when

applicable; and an allowance for wind. However, in no case shall the horizontal load to be resisted in any direction be less than 2% of the total dead load.

For post-tensioned structures, the falsework shall also be designed to support any increase in or redistribution of loads caused by tensioning of the structure. Loads imposed by falsework onto existing, new, or partially completed structures shall not exceed those permitted in 6.01.03-II-12, Application of Loads.

- (c) **Working Drawings:** The working drawings for falsework and formwork shall be prepared in accordance with 1.05.02 whenever the falsework or formwork exceeds 14.0 feet high or whenever vehicular, marine, or pedestrian traffic may travel under or adjacent to the falsework or formwork. Working drawings shall include the sequence, method and rate of placement of the concrete.

Manufacturer catalog cuts or written installation procedures shall be provided for any clips, braces, hangers or other manufactured parts used with the formwork or falsework.

- (d) **Construction:** Forms and falsework shall be built true to lines and grades shall be strong, stable, firm, mortar-tight and adequately braced or tied, or both. They shall be designed and constructed to withstand all loads and pressures including those imposed by plastic concrete, taking full account of the stresses due to the rate of placement, effect of vibration and conditions brought about by construction methods. Forms and falsework shall be constructed to compensate for variations in camber of supporting members and allow for deflections.

Falsework and formwork shall be chamfered at all sharp corners, unless otherwise ordered or permitted, and shall be given a slight bevel or draft in the case of projections to ensure satisfactory removal. Materials for falsework and formwork and their supports, ties and bracing, shall be of the type, quality and strength to achieve the structural requirements. Form material in contact with concrete shall provide the finished concrete surface smoothness as specified in 6.01.03-II-10, Finishing Concrete Surfaces, and shall have a uniform appearance.

Falsework and formwork shall be treated with form oil or other release agent approved by the Engineer before the reinforcing steel is placed or self-releasing forms approved by the Engineer may be used. Release agents which will adhere to or discolor the concrete shall not be used.

Falsework and formwork for concrete surfaces exposed to view shall produce a smooth surface of uniform texture, free of voids, indentations, protrusions and bulges. Panels lining falsework and formwork shall be arranged so that the joint lines form a symmetrical pattern conforming to the general lines of the structure. The same type of form-lining material shall be used throughout each element of a structure. Falsework and formwork shall be sufficiently rigid so that the undulation of the concrete surface shall not exceed 1/4 inch when checked with a 4 foot straightedge or template.

For non-exposed surfaces the falsework and formwork shall be sufficiently rigid so that the undulation of the concrete surface shall not exceed 1/2 inch when checked with a 4 foot straightedge or template.

Metal ties and anchors to hold the falsework and formwork in alignment and location shall be so constructed that the metal work can be removed to a depth of at least 2 inches from the concrete surface without damage to the concrete. All cavities resulting from the removal of metal ties shall be filled after removal of forms with cement mortar of the same

proportions used in the body of the work or other materials approved by the Engineer, and the surface finished smooth and even, and if exposed in the finished work, shall be similar in texture and color of adjacent surfaces. With permission of the Engineer, the Contractor need not remove from the underneath side of bridge decks portions of metal devices used to support reinforcing steel providing such devices are of material, or are adequately coated with material, that will not rust or corrode. When coated reinforcing steel is required, all metal ties, anchorages, or spreaders that remain in the concrete shall be of corrosion-resistant material or coated with a dielectric material.

Forms shall be clean and clear of all debris. For narrow walls and columns where the bottom of the form is inaccessible, an access opening will be allowed in the form and falsework for cleaning out extraneous material.

**(e) Vacant**

- (f) Bridge Decks:** After erection of beams and prior to placing falsework and forms, the Contractor shall take elevations along the top of the beam at the points shown on the plans or as directed by the Engineer. The Contractor shall calculate the haunch depths and provide them to the Engineer a minimum of 7 days prior to installing the falsework and forms. The Contractor shall also provide calculations for the setting of the overhang brackets based on the final beam deflection. These calculations shall be based on the final proposed deck grade and parapet elevations.

Falsework or formwork for deck forms on girder bridges shall be supported directly on the girders so that there will be no appreciable differential settlement during placing of the concrete. Girders shall be either braced and tied to resist any forces that would cause rotation or torsion in the girders caused by the placing of concrete for diaphragms or decks, or shown to be adequate for those effects. Unless specifically permitted, welding of falsework support brackets or braces to structural steel members or reinforcing steel shall not be allowed.

- (g) Stay-In-Place Metal Forms for Bridge Decks:** These forms may be used if shown in the Contract documents or approved by the Engineer. Prior to the use of such forms and before fabricating any material, the Contractor shall submit working drawings to the Engineer for review in accordance with 1.05.02. These drawings shall include the proposed method of form construction, erection plans including placement plans, attachment details, weld procedure(s), material lists, material designation, gage of all materials, and the details of corrugation. Also, copies of the form design computations shall be submitted with the working drawings. Any changes necessary to accommodate stay-in-place forms, if approved, shall be at no cost to the Department.

The metal forms shall be designed on the basis of the dead load of the form, reinforcement and the plastic concrete, including the additional weight of concrete [considered to be equivalent to the weight imposed by an additional concrete thickness equal to 3% of the proposed deck thickness, but not to exceed 0.3 inch] due to the deflection of the metal forms, plus 50 psf for construction loads. The allowable stress in the corrugated form and the accessories shall not be greater than 0.725 times the yield strength of the furnished material and the allowable stress shall not exceed 36,000 psi. The span for design and deflection shall be the clear distance between edges of the beams or girders less 2 inches and shall be measured parallel to the form flutes. The maximum deflection under the weight of plastic concrete, reinforcement, and forms shall not exceed 1/180 of the form

span or 0.5 inches, whichever is less. In no case shall the loading used to estimate this deflection be less than 120 psf. The permissible form camber shall be based on the actual dead load condition. Camber shall not be used to compensate for deflection in excess of the foregoing limits. The form support angles shall be designed as a cantilever and the horizontal leg of the form support angle shall not be greater than 3 inches.

No stay-in-place metal forms shall be placed over or be directly supported by the top flanges of beams or girders. The form supporting steel angles may be supported by or attached to the top flanges.

Stay-in-place metal forms shall not be used in bays where longitudinal slab construction joints are located, under cantilevered slabs such as the overhang outside of fascia members, and bridges where the clearance over a salt-laden body of water is less than 15 feet above mean high water level.

Welding to the top flanges of steel beams and girders is not permitted in the areas where the top flanges are in tension, or as indicated on the plans. Alternate installation procedures shall be submitted addressing this condition.

Drilling of holes in pre-stressed concrete beams or the use of power-actuated tools on the prestressed concrete beams for fastening of the form supports to the pre-stressed concrete beams will not be permitted. Welding of the reinforcing steel to the pre-stressed units is not permitted.

All edges of openings cut for drains, pipes, and similar appurtenances shall be independently supported around the entire periphery of the opening. All fabricated stay-in-place metal forms shall be unloaded, stored at the Project Site at least 4 inches above the ground on platforms, skids or other suitable supports and shall be protected against corrosion and damage and handled in such a manner as to preclude damage to the forms. Damaged material shall be replaced at no additional cost to the State.

Any exposed form or form support metal where the galvanized coating has been damaged, shall be thoroughly cleaned, wire brushed, then coated with 2 coats of Zinc Dust – Zinc Oxide primer, FS No. TT-P-641d, Type II or another product acceptable to the Engineer.

The forms shall be installed from the topside in accordance with the manufacturer's recommended installation procedures. The form supports shall ensure that the forms retain their correct dimensions and positions during use at all times. Form supports shall provide vertical adjustment to maintain design slab thickness at the crest of corrugation, to compensate for variations in camber of beams and girders and to allow for deflections. Stay-in-place metal forms shall have a minimum depth of the form valley equal to 2 inches. The forms shall have closed tapered ends. Lightweight filler material shall be used in the form valleys.

All field cutting shall be done with a steel cutting saw or shears including the cutting of supports, closures and cutouts. Flame cutting of forms is not permitted.

All welding shall be performed by Department-certified welders in accordance with the Welding subarticle in 6.03. Welding of forms to supports is not permitted.

The steel form supports shall be placed in direct contact with the flange of stringer or floor beam flanges and attached by bolts, clips, welding where permitted, or other approved means. Form sheets shall not be permitted to rest directly on the top of the stringer or floor beam flanges. The forms shall be securely fastened to form supports with self-drilling fasteners and shall have a minimum bearing length of 1 inch at each end. In the areas



where the form sheets lap, the form sheets shall be securely fastened to one another by fasteners at a maximum spacing of 18 inches. The ends of the form sheets shall be securely attached to the support angles with fasteners at a maximum spacing of 18 inches or 2 corrugation widths, whichever is less.

The depth of the concrete slab shall be as shown on the plans and the corrugated forms shall be placed so that the top of the corrugation will coincide with the bottom of the deck slab. No part of the forms or their supports shall protrude into the slab. All reinforcement in the bottom reinforcement mat shall have a minimum concrete cover of 1 inch unless noted otherwise on the plans.

The completed stay-in-place metal form system shall be sufficiently tight to prevent leakage of mortar. Where forms or their installation are unsatisfactory in the opinion of the Engineer, either before or during placement of the concrete, the Contractor shall correct the defects before proceeding with the work.

- (h) **Construction Joints:** Construction joints other than those shown on the plans will not be permitted without prior approval of the Engineer. In joining fresh concrete to concrete that has already set, the work already in place shall have all loose and foreign material removed, and the surface roughened and thoroughly drenched with water.

All reinforcing steel shall extend continuously through joints. Where unplanned construction joints may be needed, they shall be constructed as directed by the Engineer.

- (i) **Expansion and Contraction Joints:** Expansion and contraction joints shall be constructed at the locations and in accordance with the details specified in the Contract. The forming of joint openings shall be dimensioned in accordance with the joint manufacturer's design requirements. Joints include open joints, filled joints, joints sealed with sealants, joints reinforced with steel armor plates or shapes, paraffin coated joints, and joints with combinations of these features.

Open joints shall be placed at locations designated on the plans and shall be formed by the insertion and subsequent removal of templates of wood, metal or other suitable material. The templates shall be so constructed that their removal may be readily accomplished without damage to the work.

Filled joints shall be made with joint filler, the materials for which shall meet the requirements of the plans and of these specifications.

For mechanical joint systems, the concrete shall be placed in such a manner that does not interfere with the movement of the joint.

- (j) **Pipes, Conduits and Utility Installations:** The Contractor shall coordinate the installation of pipes, conduits and utilities as shown on the plans and in accordance with the Contract or as directed by the Engineer. The openings accommodating such pipe, conduit and utility installations shall be incorporated into the formwork by the Contractor.
- (k) **Anchorage:** Anchor bolts and systems shall be set to the requirements of the plans and Contract. Anchor bolts and systems shall be clean and free of dirt, moisture or other foreign materials at the time of installation. The anchor bolts and systems shall be installed prior to placing concrete.

With the Engineer's approval, the Contractor may install anchorages after placement and setting of the concrete or in formed holes. The anchorages shall be installed into drilled or formed holes having a diameter and a depth suitable to receive the bolts in accordance with the grout manufacturer's requirements. Such holes shall be located to avoid damage to the

existing reinforcement. All holes shall be perpendicular to the plane surface. The Contractor shall take every precaution necessary to prevent damage to the concrete due to freezing of water or grout in anchor bolt holes.

- (l) **Ornament or Reverse Moulds:** Ornamental work, when so noted on the plans, shall be formed by the use of reverse moulds. These moulds shall be produced by a qualified manufacturer approved by the Engineer. They shall be built in accordance with the general dimensions and appearance shown on the plans. The Contractor shall submit all detailed drawings, models, or carvings for review by the Engineer before the moulds are made.

The Contractor shall be responsible for their condition at all times, and shall be required to remove and replace any damaged or defective moulds at no additional cost to the State.

The surfaces of the moulds shall be given a coating of form release agent to prevent the adherence of concrete. Any material which will adhere to or discolor the concrete shall not be used.

Form Liners, if required, shall be installed as specified elsewhere.

- (m) **Removal of Falsework and Forms:** The Contractor shall consider the location and character of the structure, the weather, the materials used in the mix, and other conditions influencing the early strength of the concrete when removing forms and falsework.

Methods of removal likely to cause damage to the concrete surface shall not be used.

Supports shall be removed in such a manner as to permit the structure to uniformly and gradually take the stresses due to its own weight. For structures of 2 or more spans, the sequence of falsework release shall be as specified in the Contract or approved by the Engineer.

Removal shall be controlled by field-cured cylinder tests. The removal shall not begin until the concrete has achieved 75% of the design compressive strength. To facilitate finishing, side forms carrying no load may be removed after 24 hours with the permission of the Engineer, but the curing process must be continued for 7 days.

When the results of field-cured cylinder tests are unavailable, the time periods listed in Table 6.01.03-1, exclusive of days when the temperature drops below 40°F, may govern the removal of forms.

**Table 6.01.03-1 Time Restrictions for Removal of Formwork**

Structure Element	Minimum Time Period
Arch Centers, centering under beams, pier caps, and unsupported elements	14 days
Slabs on grade, Abutments and Walls	24 hours
Columns	2 days
Bridge Decks	28 days

The Contractor may submit for review and approval by the Engineer, alternate methods to determine the in-place strength of the concrete for removal of forms and falsework.

- 2. Protection from Environmental Conditions:** The concrete shall be protected from damage due to weather or other environmental conditions during placing and curing periods. In-place concrete that has been damaged by weather conditions shall be either repaired to an acceptable condition or removed and replaced as determined by the Engineer.

- (a) **Rain Protection:** The placement of concrete shall not commence or continue unless

adequate protection satisfactory to the Engineer is provided by the Contractor.

- (b) Hot Weather Protection:** When the ambient air temperature is above 90°F, the forms, which will come in contact with the mix shall be cooled to below 90°F for a minimum of 1 hour prior to and 1 hour after completion of the concrete placement by means of a water spray or other methods satisfactory to the Engineer.
- (c) Cold Weather Protection:** When there is a probability of ambient air temperature below 40°F during placement and curing, a Cold-Weather Concreting Plan shall be submitted to the Engineer for review and comment. The Plan shall detail the methods and equipment, including temperature measuring devices that will be used to ensure that the required concrete and air temperatures are maintained.
1. **Placement:** The forms, reinforcing steel, steel beam flanges, and other surfaces which will come in contact with the mix shall be heated to a minimum of 40°F, by methods satisfactory to the Engineer, for a minimum of 1 hour prior to, and maintained throughout, concrete placement.
  2. **Curing:** For the first 6 days, considered the initial cure period, the concrete shall be maintained at a temperature of not less than 45°F and the air temperature surrounding the structure shall be maintained at a temperature of not less than 60°F. When the concrete mix includes pozzolans or slag, the initial cure period shall be increased to 10 days. After the initial cure period, the air surrounding the structure shall be maintained above 40°F for an additional 8 days. If external heating is employed, the heat shall be applied and withdrawn gradually and uniformly so that no part of the concrete surface is heated to more than 90°F or caused to change temperature by more than 20°F in 8 hours. The Engineer may reduce or increase the amount of time that the structure must be protected or heated based on an indication of in-place concrete strength acceptable to the Engineer.
- (d) Additional Requirements for Bridge Decks:** Prior to the application of curing materials, all the concrete placed on bridge decks shall be protected from damage due to rapid evaporation by methods acceptable to the Engineer. During periods of low humidity (less than 60% relative humidity), sustained winds of 25 mph or more, or ambient air temperatures greater than 80°F the Contractor shall provide written details of additional measures to be taken during placement and curing.
- Protection may include increasing the humidity of the surrounding air with fog sprayers and employing wind-breaks or sun-shades. Additional actions may include reduction of the temperature of the concrete prior to placement, scheduling placement during the cooler times of days or nights, or any combination of these actions.
- (e) Concrete Exposed to Salt Water:** No Construction joints shall be formed between the levels of extreme low water and extreme high water or the upper limit of wave action as determined by the Engineer.
- 3. Transportation and Delivery of Concrete:** All material delivered to the Project shall be supplied by a producer qualified in accordance with M.03. The producer shall have sufficient plant capacity and trucks to ensure continuous delivery at the rate required to prevent the formation of cold joints.
- (a) Material Documentation:** All vendors producing concrete must have their weigh scales and mixing plant automated to provide a detailed ticket. Delivery tickets must include the following information:

1. State of Connecticut printed on ticket
2. Name of producer, identification of plant
3. Date and time of day
4. Type of material
5. Cubic yards of material loaded into truck
6. Project number, purchase order number, name of Contractor (if Contractor other than producer)
7. Truck number for specific identification of truck
8. Individual aggregate, cement, water weights and any admixtures shall be printed on plant tickets
9. Water/cement ratio, and
10. Additional water allowance in gallons based on water/cement ratio for mix

A State inspector may be present to monitor batching or weighing operations.

The Contractor shall notify the Engineer immediately if, during the production day, there is a malfunction of the recording system in the automated plant or weigh scales.

Manually written tickets containing all required information may be allowed for up to 1 hour after malfunction provided they are signed by an authorized representative of the producer.

- (b) Transportation of Mixture:** Trucks delivering concrete shall be qualified in accordance with M.03.

If the concrete mix arrives at the Project with a slump lower than allowed by specification, water may be considered as a means to temper concrete to bring the slump back to within specification. This tempering may only be done prior to discharge with the permission of the Engineer. The quantity of water in gallons added to the concrete cannot exceed the allowance shown on the delivery ticket.

The concrete shall be completely discharged into the forms within 1-1/2 hours from the batch time stamped on the delivery ticket. This time may be extended if the measured temperature of the concrete is below 90°F. This time may also be reduced if the temperature of the concrete is over 90° F. Rejected concrete shall be disposed of by the Contractor at no cost to the State.

The addition of chemical admixtures or air entrainment admixtures at the Project Site, to increase the workability or to alter the time of set, will only be permitted if prior approval has been granted by the Engineer. The addition of air entrainment admixtures at the Project Site will only be permitted by the producer's quality control staff. The Contractor is responsible for follow-up quality control testing to verify compliance with the Specifications.

**4. Acceptance Testing and Test Specimens:** The Contractor shall furnish the facilities and concrete required for sampling, transport to the testing location in the field, performing field testing and for casting sample cylinders for compressive-strength determinations. The Department will furnish personnel for sampling and casting Acceptance specimens and the number of specimens required will be determined by the Engineer. The equipment for the Department's testing is provided for elsewhere in the Contract.

- (a) Temperature, Air Content and Slump:** Field testing in accordance with AASHTO T-23, "Making and Curing Concrete Test Specimens in the Field" will be performed at the point of placement and at a frequency determined by the Engineer.

- (b) Acceptance Testing and Compressive Strength Specimens:** Concrete samples are to be taken at the point of placement into the forms or molds. Representatives of the Engineer will sample the mix.

**Table 6.01.03-2 Plastic Properties of Portland Cement Concrete**

Standard Mix Class	Air Content	Slump <sup>3</sup>	Concrete Temperature
PCC0334Z <sup>1</sup> (3300 psi)	6.0 +/- 1.5%	As submitted	60°-90° F
PCC0336Z <sup>1</sup> (3300 psi)			
PCC0446Z <sup>1</sup> (4400 psi)			
PCCXXX8Z <sup>1</sup>	7.5 +/- 1.5%	As submitted	
Modified Standards <sup>2</sup>	6.0 +/- 1.5% <sup>2</sup>	As submitted	
Special Provision Mix <sup>4</sup>	As specified	As submitted	
<sup>1</sup> "Z" denotes the Exposure Factor 0, 1 or 2 as described in Table M.03.02-1a			
<sup>2</sup> Modifications to Standard Mixes, including mixes placed by pumping, shall be reviewed by the Engineer prior to use. These include but are not limited to the use of chemical admixtures such as high range water reducing (HRWR) admixtures and the use of coarse aggregate sizes for that class not specified in M.03.			
<sup>3</sup> If the <u>only</u> modification is the addition of HRWR, the maximum allowable slump shall be 7 inches.			
<sup>4</sup> All concrete mixes with a mix design strength not shown in the table must be approved by the Engineer on a case-by-case basis. Limits on the plastic properties and strength requirements of these mixes are listed in the Specifications.			

The Contractor shall provide and maintain facilities on the Project Site, acceptable to the Engineer, for sampling, transporting the initial sample, casting, safe storage and initial curing of the concrete test specimens as required by AASHTO T-23. This shall include but not be limited to a sampling receptacle, a means of transport of the initial concrete sample from the location of the concrete placement to the testing location, a level and protected area of adequate size to perform testing, and a specimen storage container capable of maintaining the temperature and moisture requirements for initial curing of Acceptance specimens. The distance from the location of concrete placement to the location of testing and initial curing shall be 100 feet or less, unless otherwise approved by the Engineer.

The specimen storage container described in this section is in addition to the concrete cylinder curing box provided for elsewhere in the Contract.

After initial curing, the test specimens will be transported by Department personnel and stored in the concrete cylinder curing box until they can be transported to the Division of Materials Testing for strength evaluation.

- (c) Sampling Procedure for Pumping:** It is the responsibility of the Contractor to provide concrete that meets specification at the point of placement.

Samples of concrete shall be taken at the discharge end of the pump at the point of placement with the exception of underwater concrete. The Contractor may submit an alternate location to provide a sample from the discharge end of the pump with verification showing that the characteristics of the mix will not be altered from that of which would have been attained at the point of placement. The Engineer will review the documentation and other extenuating circumstances when evaluating the request.

In the case of underwater concrete the Contractor shall submit the proposed sampling location with the submittals required in 6.01.03-II-6(f).

**(d) Additional field testing:** Additional field testing such as density and yield measurements may be required at the time of placement as determined by the Engineer.

**5. Progression Cylinders and Compressive Strength Specimens:** Progression Cylinders outlined in this section are field cured compressive strength specimens taken for information related to when a structure or segment of a structure can be loaded or put into service, adequacy of curing and protection of concrete in the structure, or when formwork or shoring may be removed from the structure. The information produced from strength results of Progression Cylinders will not be considered for acceptance of the concrete.

The personnel, equipment, and molds for sampling, casting, curing and testing of Progression Cylinders shall be furnished by the Contractor at no expense to the Department.

Sampling, casting, and field curing of the specimens shall be performed in accordance with AASHTO T23 by an ACI Concrete Field Testing Technician Grade 1 or higher and will be witnessed by a representative of the Department.

The sample shall be taken at the point of placement into the forms or molds from 1 or more of the same truck loads that an Acceptance sample is taken from.

A minimum of 2 of cylinder results will be used to determine in-place strength.

Compression testing shall be performed in accordance with AASHTO T 22 by personnel approved by the Engineer.

A Certified Test Report in accordance with 1.06.07 shall be provided to the Engineer reporting the Progression Cylinder test results. A copy of the results of the compressive strength testing shall be provided to the Engineer at least 24 hours prior to any Project activity that the results may control.

**6. Handling and Placing Concrete:** Concrete shall be handled, placed, and consolidated by methods acceptable to the Engineer that will not segregate the mix and shall result in a dense homogeneous concrete. The methods used shall not cause displacement of reinforcing steel or other materials to be embedded in the concrete. Concrete shall not be placed until the forms and all materials have been inspected by the Engineer. All mortar from previous placements, debris, and foreign material shall be removed from the forms and steel prior to commencing placement. The forms and subgrade shall be thoroughly moistened with water immediately before concrete is placed. All water that has ponded within the forms shall also be removed. Temporary form spreader devices shall not be left in place.

All laitance or unsound material shall be removed before placing substructure concrete onto the surface of any concrete placed underwater.

Placement of concrete for each section of the structure shall be performed continuously between construction or expansion joints as shown on the plans. The delivery rate, placing sequence and methods shall be such that fresh concrete is always placed and consolidated against previously placed concrete before initial set has occurred. The temperature of the concrete mixture during placement shall be maintained between 60°F and 90°F. During and after placement of concrete, care shall be taken not to damage the concrete or break the bond with reinforcing steel. Platforms for workers and equipment shall not be supported directly on any reinforcing steel. Forces that may damage the concrete shall not be applied to the forms or reinforcing steel.

- (a) Sequence of Placement:** The sequence of placement shall be in accordance with the Contract or as permitted by the Engineer.

Concrete for integral horizontal members, such as caps, slabs, or footings shall not be placed until the concrete for the columns, substructure, culvert walls and similar vertical members has achieved sufficient strength as stated in 6.01.03-II-1(m).

The concrete in arches shall be placed in such a manner as to load the formwork uniformly and symmetrically.

The base slab or footings of cast-in-place box culverts shall reach sufficient strength before the remainder of the culvert is constructed.

- (b) Placement Methods:** The Contractor shall notify the Engineer at least 24 hours in advance of intention to place concrete.

Vibrators shall not be used to shift the fresh concrete horizontally. Vibrators shall be adequate to consolidate the concrete and integrate it with the previous lift.

The rate of concrete placement must not produce loadings that exceed those considered in the design of the forms.

The use of chutes and pipes for conveying concrete into the forms must be reviewed by the Engineer. Chutes shall be clean, lined with smooth watertight material and, when steep slopes are involved, shall be equipped with baffles or reverses. When the discharge must be intermittent, a hopper or other device for regulating the discharge shall be provided.

Aluminum shall not be permanently incorporated into the concrete unless otherwise specified.

When placing operations involve dropping the concrete more than 5 feet, the Contractor shall take action to prevent segregation of the mix and spattering of mortar on steel and forms above the elevation of the lift being placed. This restriction shall not apply to cast-in-place pilings.

When using stay-in-place forms, concrete shall not be dropped more than 3 feet above the top of the forms, and the concrete shall be discharged directly over the beams or girders.

- (c) Pumping:** The Contractor shall use equipment specifically manufactured to pump concrete mixes and that meets the needs of the specific concrete placement.

- (d) Consolidation:** Unless otherwise specified, all concrete, except concrete placed under water, shall be sufficiently consolidated by mechanical vibration immediately after placement.

The Contractor shall provide a sufficient number of commercially available mechanical immersion type vibrators to properly consolidate the concrete immediately after it is placed in the forms unless external form vibrators are used. The Contractor shall have an adequate number of operable vibrators available in case of breakdown.

External form vibrators may be used if submitted prior to concrete placement and reviewed by the Engineer.

Vibration shall not be applied directly to the reinforcement or hardened concrete. Special care shall be taken in placing and consolidating concrete around ornamental moulds, form liners and other embedded items. The vibrator shall not touch these items at any time.

- (e) Additional Requirements for Bridge Decks:** At least 15 days before the erection of the screed rails, the Contractor shall submit screed erection plans, grades and sequence of concrete placement and proposed rate of placing concrete for review by the Engineer.

These plans shall include details of equipment to be used in the placement and finishing of the concrete, including the number and type of personnel who will be engaged in placing the concrete. The screed equipment shall be a commercially available vibratory system. The use of wooden screeds is prohibited.

When setting screed rails for mechanical finishing, the Contractor shall take into consideration and make proper allowances for the deflection of the bridge superstructure due to all operations.

Screed and runway supports shall not be located on any stay-in-place metal form sheets, form supports or reinforcing steel. The Contractor shall operate the mechanical screed at least 24 hours prior to actual placement of the concrete to verify deck survey and equipment operations to the satisfaction of the Engineer.

A Pre-Placement Meeting shall be held on the project site with Contractor, Engineer and concrete supplier 48 hours before the concrete deck pour. The Pre-Placement Meeting will document and include discussion on the following topics:

**1. Schedule:**

- (a) Deck pour sequence
- (b) Daily start and finish times for concrete delivery
- (c) Anticipated completion time

**2. Key Personnel:**

- (a) Concrete placement foreman
- (b) Total number of personnel involved in deck pour and their roles during the pour
- (c) Concrete supplier
- (d) Concrete pump truck operator/service
- (e) Discuss QC/QA

**3. Placement:**

- (a) List of approved delivery trucks per pour
- (b) Pre-wetting forms prior to placement
- (c) Placement sequence
- (d) Rate of concrete placement and vibrator process
- (e) Monitor concrete temperature during placement
- (f) Transverse joint bulkheads
- (g) Approved concrete low-permeability mix design

**4. Curing:**

- (a) Curing materials (burlap, quilted blankets, etc.)
- (b) Means for pre-soaking curing materials.
- (c) Foggers
- (d) Soaker hoses
- (e) White Plastic Sheeting
- (f) Water source and supply tanks

Concrete shall be deposited in a uniform manner across the entire width being placed, and only 2 passes of the transverse screed will be permitted over a given deck area, unless otherwise allowed by the Engineer.

If the Contractor proposes to place concrete outside of daylight hours, an adequate lighting system must be provided.



Concrete shall be deposited in accordance with the placement sequence as noted on the plans. If no sequence is indicated, the Contractor shall provide a placement sequence to the Engineer for review. The placement sequence shall proceed in such a manner that the total deflection or settlement of supporting members, and the final finishing of the surface will occur before the initial set of the concrete takes place.

At construction joints, concrete shall not be placed against the previously placed concrete for at least 12 hours unless otherwise allowed by the Engineer.

- (f) Underwater Placement:** Concrete may only be placed under water within a cofferdam unless otherwise specified in the Contract or allowed by the Engineer. Placement shall begin following inspection and acceptance of the depth and character of the foundation material by the Engineer.

Underwater concrete mixes are considered non-standard designs and shall be submitted to the Engineer for approval. Typically a minimum of 10% additional cement than comparable non-underwater mixes will be required.

Underwater concrete shall be placed continuously with the surface of the concrete kept as horizontal as practical. To ensure thorough bonding, each succeeding layer shall be placed before the preceding layer has taken initial set. For large concrete placements, more than 1 tremie or pump shall be used to ensure compliance with this requirement.

Mass concrete placement requirements, outlined in 6.01.03-II-6(g), do not apply to underwater concrete.

To prevent segregation, underwater concrete shall be placed in a compact mass, in its final position, by means of a tremie, concrete pump, or other approved method and shall not be disturbed. Still water shall be maintained at the point of deposit. Cofferdams shall be vented during the placement and curing of the concrete to equalize the hydrostatic pressure and thus prevent flow of water through the concrete.

If a tremie is used, the method of depositing the concrete shall be detailed in a submission to the Engineer as a working drawing for review. The tube shall have watertight couplings and shall permit the free movement of the discharge end over the area of the work.

- (g) Mass concrete placement:** Mass concrete placement shall be defined as any placement, excluding underwater concrete placement, in which the concrete being cast has dimensions of 5 feet or greater in each of 3 different directions. For placements with a circular cross-section, a mass concrete placement shall be defined as any placement that has a diameter of 6 feet or greater and a height of 5 feet or greater. For all mass concrete placements, the mix temperature shall not exceed 85°F as measured at point of discharge into the forms.

Any special concrete mix design proposed by the Contractor to meet the above temperature requirements shall be submitted to the Engineer for review.

**7. Finishing Plastic Concrete:** Unless otherwise specified in the Contract, after concrete has been consolidated and prior to final curing, all surfaces of concrete that are not placed against forms shall be struck-off to the planned elevation or slope. The surface shall be finished by floating with an acceptable tool. While the concrete is still in a workable state, all construction and expansion joints shall be tooled with an edger. Joint filler shall be left exposed. For requirements on float finish, refer to 6.01.03-II-10, Finishing Concrete Surfaces.

After completion of the placing and finishing operation and for at least 12 hours after the concrete has set, the Contractor shall not operate any equipment in the immediate vicinity of the

freshly placed concrete if, in the opinion of the Engineer, it could cause excessive vibration, movement or deflection of the forms.

The addition of water to the surface of the concrete to assist in finishing operations will not be permitted.

**(a) Bridge Decks:** After the concrete has been consolidated and brought to the proper elevation by the screed machine, it shall be finished by use of a suitable float. The Contractor shall not disturb the fresh concrete after it has been finished. All finishing work, including the application of the fog spray and placement of the curing mats, shall be performed from work bridges supported above the deck surface. A work bridge shall be made available to the Engineer for inspection of the concrete work.

Surfaces that are to be covered with a waterproofing membrane shall be finished to a smooth surface, free of mortar ridges and other projections and in accordance with the membrane manufacturer's recommendations.

Unless otherwise noted in the Contract, the concrete wearing surfaces shall be given a skid-resistant texture by dragging, brooming, tining, or by a combination of these methods. These methods shall be done after floating and at such time and in such manner that the desired texture will be achieved while minimizing displacement of the larger aggregate particles.

1. Dragging: The surface shall be finished by dragging a seamless strip of damp burlap over the surface. The burlap to be dragged shall consist of sufficient layers and have sufficient length in contact with the concrete to slightly groove the surface. The burlap shall be drawn longitudinally along the surface in a slow manner so as to leave an even texture. The burlap shall be kept damp, clean, and free of particles of hardened concrete. The Contractor may propose an alternate material for the Engineer's consideration.
2. Tining: Tining shall be in a transverse direction using a wire broom, comb, or float having a single row of tines or fins. The tining grooves shall be between 1/16 inch and 3/16 inch wide and between 1/8 inch and 3/16 inch deep, spaced 1/2 inch to 3/4 inch on centers. Tining shall be discontinued 12 inches from the curb line on bridge decks. The area adjacent to the curbs shall be given a light broom finish longitudinally. As an alternative, tining may be achieved using a machine designed specifically for tining or grooving concrete pavements.

The transverse grooving shall be performed when the grooves can be formed to a maximum depth of 3/16 inch with relative ease and without the walls of the grooves closing in on each other. The tining shall be aligned so as to prevent overlapping of grooves in any 2 successive transverse passes. The Contractor shall measure the depth of the grooves in the presence of the Engineer with an appropriate device to ensure compliance.

**(b) Surface Testing and Correction:** The completed surface shall be constructed in accordance with grades and cross slopes shown on the plans. The entire surface shall be checked by the Contractor in the presence of the Engineer, with an acceptable 10 foot straightedge.

1. The surface shall not vary more than +/- 1/8 inch over 10 feet for decks which will not be covered with an overlay.
2. The surface shall not vary more than +/- 1/4 inch over 10 feet for decks which will be

covered with an overlay.

Variations greater than these, which, in the opinion of the Engineer, may adversely affect the riding qualities of the surface shall be corrected, and this shall be done at the expense of the Contractor. The Contractor shall submit a corrective procedure to the Engineer for review and approval. The procedure shall correct such irregularities by methods such as, but not limited to, concrete planing or grooving.

**8. Bearing Surfaces:** Concrete surfaces under metallic masonry plates and elastomeric bearings shall have a float finish. After the concrete has set, the area which will be in contact with the masonry plate shall be ground as necessary to provide full and even bearing. The finished surface shall not vary from a straightedge laid on the surface in any direction within the limits of the masonry plate by more than 0.0625 inch. Surfaces which fail to conform shall be ground or filled until acceptable to the Engineer.

**9. Curing Concrete:** All newly placed concrete shall be cured so as to prevent loss of water by use of the methods specified. The Engineer may request that the Contractor furnish a curing plan.

The duration of the initial and final curing period in total shall continue uninterrupted for a minimum of 7 days.

**(a) Curing Methods:**

1. Forms-In-Place Method: Formed surfaces of concrete may be cured by retaining the forms in place without loosening. During periods of hot weather, water shall be applied to the forms until the Engineer determines that it is no longer required.
2. Water Method: Exposed concrete surfaces shall be kept continuously wet by ponding, spraying, or covering with materials that are kept continuously and thoroughly wet. Such materials may consist of cotton mats, multiple layers of burlap, or other approved materials that do not discolor or otherwise damage the concrete.
3. Waterproof Cover Method: This method shall consist of covering exposed surfaces with a waterproof sheet material to prevent moisture loss from the concrete. The concrete shall be wet at the time the cover is installed. The sheets shall be of the widest practicable width and adjacent sheets shall overlap a minimum of 6.0 inches to form a waterproof cover of the entire concrete surface and shall be adequately secured. Broken or damaged sheets shall be immediately repaired and the concrete shall be remoistened.

**(b) Additional Requirements for Bridge Decks:**

Curing Plan: The Contractor shall submit to the Engineer, at least 14 days prior to the placement of concrete for the bridge deck, a detailed curing plan that describes the following:

- A. the initial and final curing durations,
- B. equipment and materials to be used for curing concrete and monitoring concrete temperature,
- C. and proposed primary and secondary water and heat sources
  1. Initial Curing Period: A water fog spray shall be used by the Contractor from the time of initial placement until the final curing period begins. The amount of fog spray shall be strictly controlled so that accumulations of standing or flowing water on the surface of the concrete shall not occur.

Should atmospheric conditions render the use of fog spray impractical, the Contractor shall request approval from the Engineer to use a curing compound that meets the requirements of M.03 in lieu of a fog spray. The application shall be in accordance with the manufacturer's recommendation and be compatible with the membrane waterproofing.

2. Final Curing: After completion of finishing and as soon as any bleed water has dissipated and the concrete reaches sufficient strength to avoid marring, the Final curing period shall begin and the entire concrete surface shall be covered with water-retaining materials such as cotton mats, multiple layers of burlap, or other materials approved by the Engineer. Materials used shall be kept saturated by means of an acceptable sprinkler or wetting system.

The Contractor may cover the wet water-retaining material with a suitable polyethylene film to minimize evaporation during the curing period. The use of the polyethylene film does not relieve the Contractor from maintaining saturation of the curing materials.

3. Temperature Monitoring: The internal temperature of the concrete shall be monitored with a calibrated continuous recording thermometer for a minimum of 7 days. The air temperature at the concrete surface or the air temperature between the concrete surface and its protective covering shall be monitored with a minimum of 1 recording thermometer.

The number and placement of the thermometers will be determined by the Engineer. A minimum of 2 thermometers per concrete placement shall be provided by the Contractor.

The following types of thermometers shall be used to monitor curing temperatures:

- i) Continuously Recording Thermometer: The thermometer shall be capable of continuously recording temperatures within a range of -4°F to 122°F for a minimum of 24 hours.
- ii) Maximum–Minimum Recording Thermometer: For all placements, the thermometer shall be capable of recording maximum and minimum temperatures in a range of -4°F to 122°F.

**10. Finishing Concrete Surfaces:** Any minor repairs due to fins, bulges, offsets and irregular projections shall be performed immediately following the removal of forms. For areas of newly placed concrete that are honeycombed or segregated the Contractor shall provide a written corrective procedure for review by the Engineer prior to the work being performed.

Construction and expansion joints in the completed work shall be left carefully tooled and free of mortar and concrete. The joint filler shall be left exposed for its full length with clean and true edges.

The cavities produced by form ties and all other holes, broken corners or edges, and other defects shall be cleaned, saturated with water, pointed and trued with a mortar conforming to M.11.04. Cement similar in color to the exposed surface being repaired shall be added to the mortar. Mortar used in pointing shall be used within 1 hour of mixing. The concrete shall be finished as defined below if required and the cure continued as previously specified in 6.01.03-II-9, Curing Concrete.

Finishing work shall not interrupt the curing period unless permitted by the Engineer. The curing period may be extended to provide the minimum total number of days required.

Concrete surface finishes shall be classified as follows:

- (a) **Float Finish:** This finish shall be achieved by placing an excess of material in the form and removing or striking off of such excess forcing the coarse aggregate below the mortar surface. Concave surfaces in which water will be retained will not be allowed. After the concrete has been struck off, the surface shall be thoroughly worked and floated. Before this last finish has set, the surface shall be lightly stripped with a fine brush to remove the surface cement film, leaving a fine-grained, smooth, but sanded texture. Curing, as specified elsewhere, shall follow. Any surfaces that will support appurtenances such as light standards, railing, or fences shall be finished in accordance with 6.01.03-II-8, Bearing Surfaces.
- (b) **Rubbed Finish:** The initial rubbing shall only be allowed within 3 days after placement. The entire surface shall be thoroughly wet with a brush and rubbed with a No. 16 Carborundum Stone or an abrasive of equal 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 stripping with a clean brush, or it may be spread uniformly over the surface and allowed to re-set. If all or portions of the rubbed surface are unacceptable to the Engineer or a rubbed finish is not provided within 3 days after removal of forms, the Contractor will be directed to provide a grout clean down finish.
- (c) **Grout Clean-Down Finish:** As soon as all cavities have been filled as required elsewhere and the cement mortar has set sufficiently, grout clean-down shall be performed. All burrs, unevenness, laitance, including that in air holes, and any other material which will adversely affect the bond of the grout to the concrete, shall be removed by acceptable methods. This cleaning shall be done from the top or uppermost part of the surface to be finished to the bottom.

A mixture of a fine aggregate and Portland cement shall be thoroughly blended while dry. The proportions shall be such that when mixed with the proper amount of water, the color will match that of the concrete to be finished. Water shall be added to this mixture in an amount which will bring the grout to a workable thick paint-like consistency.

The surface to be treated shall be thoroughly wetted with a sufficient amount of water to prevent the absorption of water from the grout. Grout shall then be applied to the wetted surface before setting of the grout occurs. Grout which has set shall not be re-tempered and shall be disposed of by the Contractor at no cost to the State.

The grout shall be uniformly applied over the entire surface, completely filling all air bubbles and holes. Immediately after applying the grout, the surface shall be floated with a suitable float, scouring the surface vigorously. While the grout is still plastic, all excess grout shall be removed.

After the final rubbing is completed and the surface has dried, it shall be rubbed to remove loose powder and shall be left free from all unsound patches, paste, powder, and objectionable marks. Wetting, application and removal of excess grout shall be completed in 1 work shift.

All finished surfaces shall be cured for a minimum of 24 hours. Horizontal surfaces shall have a float finish and vertical exposed surfaces shall have a rubbed finish. A grout clean down finish may be substituted for a rubbed finish as noted in this section or as directed by the Engineer.

## 11. Mortar, Grout, Epoxy and Joint Seal:

- (a) **Mortar and Grout:** This work consists of the making and placing of mortar and grout. At least 48 hours prior to the planned use, a copy of the installation instructions and MSDS sheets shall be provided to the Engineer for review and concurrence of their applicability and for verification of proper hole sizes in concrete structures. Such uses include mortar for filling under masonry plates, mortar used to fill voids and repair surface defects, grout used to fill sleeves for anchor bolts, and mortar and grout for other such uses where required or approved.

Concrete areas to be in contact with the mortar or grout shall be cleaned of all loose or foreign material that would in any way prevent bond, and the concrete surfaces shall be flushed with water and allowed to dry until no free-standing water is present.

The mortar or grout shall completely fill and shall be tightly packed into recesses and holes, on surfaces, under structural members, and at other locations specified. After placing, all surfaces of mortar or grout shall be cured as previously specified in 6.01.03-II-9(a)-2, for a period of not less than 3 days.

- (b) **Epoxy:** The epoxy shall be prepared and placed in accordance with the manufacturer's directions and with the equipment prescribed by the manufacturer. Instructions furnished by the supplier for the safe storage, mixing, handling and application of the epoxy shall be followed. Contents of damaged or previously opened containers shall not be used.

- (c) **Joint Seal:** This work consists of sealing joints where shown on the plans or as otherwise directed by the Engineer.

Before placement of the sealing material, the joints shall be thoroughly cleaned of all scale, loose concrete, dirt, dust or other foreign matter. Projections of concrete into the joint space shall be removed. The joint shall be clean and dry before the sealing compound is applied.

The joint sealant shall be prepared and placed in accordance with the manufacturer's directions and with the equipment prescribed by the manufacturer. The sealing compound shall be flush with, or not more than 1/8 inch above the adjacent surface of concrete, cutting off all excess compounds after the application. The joints shall be sealed in a neat and workmanlike manner and when the work is completed, the joints shall effectively seal against infiltration of moisture and water.

The Contractor shall arrange for, and have present at the commencement of the joint-sealing operation, a technically competent manufacturer's representative knowledgeable in the methods of installation of the sealant. The Contractor shall also arrange to have the representative present at such other times as the Engineer may request.

- (d) **Closed Cell Elastomer:** The closed cell elastomer shall be of the thickness specified and installed as shown on the plans and shall be in accordance with M.03.08-6.

**12. Application of Loads:** Loads shall not be applied to concrete structures until the concrete has attained sufficient strength and, when applicable, sufficient pre-stressing and post tensioning has been completed, so that damage will not occur. The means to determine when the concrete has attained sufficient strength shall be the use of Progression cylinders as defined elsewhere in this specification, or other means approved in advance by the Engineer.

- (a) **Earth Loads:** The placement of backfill shall not begin until the concrete is cured and has reached at least 80% of its specified strength unless otherwise permitted by the Engineer.

The sequence of placing backfill around structures shall minimize overturning or sliding forces and flexural stresses in the concrete.

- (b) Construction Loads:** Light materials and equipment may be hand carried onto bridge decks only after the concrete has been in place at least 24 hours providing curing is not interfered with and the surface texture is not damaged.

Prior to the concrete achieving its specified compressive strength, any other live or dead loads imposed on existing, new, or partially completed portions of structures, shall not exceed the reduced load carrying capacity of the structure, or portion of structure. The Contractor may be required to submit calculations to the Engineer that verify these requirements are being met. The compressive strength of concrete ( $f'c$ ) to be used in computing the load-carrying capacity shall be the smaller of the actual field compressive strength at the time of loading or the specified design strength of the concrete. The means to determine the actual field compressive strength shall be approved by the Engineer.

For post-tensioned structures, no live or dead loads shall be allowed on any span until the steel for that span has been tensioned.

- (c)** Precast concrete or steel girders shall not be placed on substructure elements until the substructure concrete has attained 85% of its specified strength.

No load shall be allowed on mortar or grout that has been in place less than 72 hours.

- (d) Traffic Loads:** The concrete deck will not be opened to traffic until at least 14 days after the last placement of deck concrete and until such concrete has attained its specified strength.

**13. Dispute Resolution:** The basis of any dispute resolution is side-by-side and quality control testing by the Contractor or the Contractor's representative. The Contractor and Engineer should perform independent testing on the material to reasonably establish the true characteristics of the material at the time of delivery. Absent of Contractor QC testing, the Engineer's test results will apply to the quantity of concrete represented by the sample, not to exceed 75 c.y.

**Air Content:** Contractor QC Testing must be performed by personnel qualified by The American Concrete Institute as an ACI Concrete Field Testing Technician Grade 1 or higher and performed in accordance with AASHTO T-23. If the Contractor's test results vary from those of the Engineer, the Contractor shall immediately notify the Engineer of the difference and work cooperatively to determine the reasonable cause and recognize the valid test. Should there be agreement, the result of the valid test will be used for acceptance and adjustment purposes for that lot of material. Should there not be an agreement as to the valid test, an additional set of tests should be performed. Results of all valid tests on the same lot may be averaged and used for acceptance and adjustment purposes. Should the Contractor wish to perform additional QC testing on subsequent material, the lot sizes may be adjusted to the amount of material included in that specific delivery. Any such QC testing must be witnessed and agreed to by the Engineer.

**Compressive Strength:** Contractor QC testing for compressive strength must be performed in accordance with AASHTO T-22 by personnel approved by the Engineer. Samples used to dispute the Engineer's test results must be made simultaneously and from the same batch of concrete. Should the Contractor wish to pursue a dispute resolution with regard to compressive strength, the Contractor shall submit in writing to the Engineer all test results, control charts, or other documentation that may be useful in determining if the specific lot(s) of material met the Contract specifications. The Engineer will consider the submittal and may average specific test results on the disputed lot(s) for acceptance and adjustment purposes. Destructive testing of any

kind on the placed concrete structure will not be allowed.

### **III. Additional Requirements for Surface Repairs and Structural Repairs**

**1. Work Area Access and Shielding:** Prior to removal of existing concrete, the Contractor shall provide access to the anticipated work areas so that the inspector and the Contractor may together determine and delineate the exact limits and locations of the work.

The Contractor shall design, furnish, install and remove a shield(s) to prevent debris from entering areas adjacent or beneath the work. The Contractor shall submit working drawings to the Engineer in accordance with 1.05.02. The shield(s) shall be maintained by the Contractor and remain in place during all phases of the repair work.

**2. Concrete Removal:** The perimeter of each area to be repaired shall be saw cut as shown on the plans. All concrete within that area shall be removed to at least 1 inch beneath any visible reinforcing steel and to sound concrete. The reinforcing steel shall not be damaged or its bond in the surrounding concrete. The Contractor must use fifteen (15) pound hammers or other methods accepted by the Engineer.

In addition to removal of concrete to a depth of 1 inch below reinforcing steel, localized areas of removal may be required if embedded galvanic anodes are specified in the Contract, to allow a minimum of 2 inches of concrete cover over the anodes.

Any steel reinforcing scheduled to be left in place that is damaged during the concrete removal process shall be replaced in accordance with 6.02 to the satisfaction of the Engineer and at the expense of the Contractor.

Corroded, missing, or broken reinforcing steel shall be replaced in accordance with 6.02 and as shown on the plans or as directed by the Engineer.

The Contractor shall perform the work in a manner that prevents debris from entering roadway lanes or areas below the structure. All debris shall be removed from the Site and disposed of by the Contractor.

**3. Surface Preparation:** All newly exposed surfaces of concrete shall be sandblasted and be visibly free from oil, solvent, grease, loose particles, or any other foreign matter. Exposed reinforcing steel shall be sandblasted in accordance with SSPC-SP-6, Commercial Blast Cleaning, to remove all contaminants, rust and rust scale.

**4. Installation of Embedded Galvanic Anodes:** After sandblasting reinforcing steel, galvanic anodes shall be embedded where shown on the plans and in accordance with the Contract.

**5. Welded Wire Fabric in Vertical and Overhead Surface Repairs:** Prior to installing formwork, steel welded wire fabric meeting the requirements of M.06.01-3 shall be installed at the proper depth in those areas as shown on the plans or directed by the Engineer. The fabric shall be tied to exposed reinforcing steel or anchored to sound concrete using means approved by the Engineer.

**6. Formwork:** Forms and support systems shall be designed in accordance with 6.01.03-II-1. Forms shall be so designed so that access is from the top of the formwork. If access is not possible from the top of the formwork, the Contractor shall submit a method of concrete placement for review by the Engineer.

**7. Concrete Placement and Curing:** Bonding compounds shall not be used before or during the placement of the concrete. Exposed surfaces shall be wetted with water immediately prior to placement. There shall be no excessive water on the surface or in the formwork. Light rust on sandblasted reinforcing steel can be anticipated and is acceptable.



The temperature of the air and surface to be repaired at the time of placement and curing shall be a minimum of 45°F. Concrete shall be placed and consolidated immediately with appropriate vibratory equipment.

Forms shall be kept moist and shall be left in place for a minimum of 7 days or as shown on the plans.

**8. Form Removal and Sequence of Repair:** Form removal shall be in accordance with 6.01.03-II-1(m) unless otherwise noted on the plans. The Contractor shall follow the sequence of repairs shown on the plans.

**9. Finishing:** Immediately following curing and form stripping, the exposed faces shall be finished in accordance with Subarticle 6.01.03-II-10(c) Grout Clean-Down Finish.

**10. Sounding of Completed Repairs:** Cured and finished areas may be sounded by the Engineer to detect the presence of subsurface voids or delamination. Such areas shall be removed and replaced by the Contractor at its expense until an acceptable repair is in place as determined by the Engineer.

**11. Sealing Concrete Surfaces:** After all repairs have been accepted, penetrating sealer shall be applied in accordance with the Contract to the repaired areas as well as all contiguous areas to the repair or as directed by the Engineer.

**6.01.04—Method of Measurement:** This work will be measured for payment as follows:

**1. Concrete used for new construction:** The quantity of concrete used for new construction will be the actual volume in cubic yards of the specified class, with the exception of underwater concrete, completed and accepted within the neat lines as shown on the plans or as ordered by the Engineer. Parapets will be measured for payment by the number of linear feet of parapet, completed and accepted. The length of parapet will be measured along the centerline of the top of the parapet.

When concrete is placed against bedrock, a maximum of 6 additional inches beyond the neat lines can be measured for payment.

No deduction will be made for panels, form liners, reinforcing bars, structural steel shapes or for pile heads. There will be no deduction made for the volume occupied by culvert and drainage pipes, scuppers, weep holes, public utility structures or any other opening, unless the surface area of any such single opening is 9 s.f. or more.

In the case of culverts or drainage pipes, the computation of the surface area will be based on the nominal diameter of the pipe, disregarding the thickness of the shell.

Miscellaneous materials necessary for completion of the work such as felt, mortar, grout, epoxy and joint seal will not be measured for payment.

Incidental work such as forming for anchor bolts, utilities, keyways, and sampling and testing will not be measured for payment.

The work to produce and administer the Concrete Quality Control Plan (CQCP) will not be measured for payment.

**2. Underwater Concrete:** When underwater concrete is used, it will be measured by the volume in cubic yards within the actual horizontal limits of the cofferdam and between the elevations established by the Engineer.

**3. Concrete used for Surface or Structural Repairs:** The quantity of concrete used for surface repairs or structural repairs will be the actual volume completed and accepted. Welded wire fabric used in repair areas will not be measured for payment.

**4. Joint Filler:** This material will be measured by the area in square feet of the joint filler, of the type and thickness specified, installed and accepted.

**5. Closed Cell Elastomer:** This material will be measured by the volume in cubic inches of elastomer, of the thickness specified, installed and accepted.

**6.01.05—Basis of Payment:** Payment for this work will be made as follows:

**1. Concrete:** Progress payments may be allowed for completed major labor elements of work such as forming, placing and curing. Prior to placement, the Contractor shall submit a proposed schedule of values for review and approval by the Engineer.

Payment for any lot of concrete allowed to remain in place will be adjusted when the field and laboratory testing of the material is completed. The quantity of concrete in each lot for new construction will be a maximum of 75 c.y. Payment for each lot of concrete will be adjusted based on the results of the acceptance testing performed by the Engineer.

The pay factors listed in Table 6.01.05-1 apply for Standard and Modified Standard Mix classes with regard to entrained air content.

**Table 6.01.05-1 Entrained Air Content Pay Factors**

Specified Entrained air (%)*				Pay factor (%)
6.0 +/- 1.5%		7.5 +/- 1.5%		1.00 (100)
4.3 and 4.4	7.6 and 7.7	5.8 and 5.9	9.1 and 9.2	0.98 (98)
4.1 and 4.2	7.8 and 7.9	5.6 and 5.7	9.3 and 9.4	0.96 (96)
3.9 and 4.0	8.0 and 8.1	5.4 and 5.5	9.5 and 9.6	0.94 (94)
3.7 and 3.8	8.2 and 8.3	5.2 and 5.3	9.7 and 9.8	0.92 (92)
3.5 and 3.6	8.4 and 8.5	5.0 and 5.1	9.9 and 10.0	0.90 (90)
Concrete lots with less than 3.5% or greater than 8.5% entrained air will be rejected.		Concrete lots with less than 5.0% or greater than 10% entrained air will be rejected.		
<b>*Air content measured at time and point of placement</b>				

The pay factors listed in Table 6.01.05-2a apply for Standard and Modified Standard Mix classes with regard to compressive strength.

**Table 6.01.05-2a Compressive Strength Pay Factors**

Compressive Strength (%)	Pay factor (%)
95 or greater	1.00 (100)
90 to 94.9	0.95 (95)
85 to 89.9	0.90 (90)
*Measured at 28 days	
Concrete lots with less than 85% specified strength will be rejected.	

The pay factors listed in Table 6.01.05-2b apply for Standard and Modified Standard Mix classes with regard to surface resistivity when specified in accordance with AASHTO T 358 using 4 inch × 8-inch cylinders.

**Table 6.01.05-2b Permeability Pay Factors**

Surface Resistivity (kΩ-cm)*	Pay factor (%)
29 or greater	1 (100)
25 to 28.9	0.85 (85)
21 to 24.9	0.75 (75)
<b>*Measured at 56 days</b>	
Concrete lots with resistivity values less than 21 will be rejected.	

The payment adjustment value for entrained air, 28-day strength, and permeability if applicable, for any lot of concrete for new construction that is allowed to remain in-place is determined using the formulas listed in Table 6.01.05-3a. An Index Price of \$400.00 per c.y. will be used to calculate each adjustment, except for Parapet Concrete, for which an Index Price of \$100 per l.f. will be used. The sum of the individual adjustment values will be deducted from the cubic yard or linear foot payment for the appropriate item.

**Table 6.01.05-3a Payment Adjustment Formulas for New Construction**

Adj (air) = (1 - air pay factor) × Index Price × lot size (c.y. or l.f.)
Adj (strength) = (1 - strength pay factor) × Index Price × lot size (c.y. or l.f.)
Adj (permeability) = (1 - permeability pay factor) × Index Price × lot size (c.y. or l.f.)
Total Adjustment = Adj (air) + Adj (strength) + Adj (permeability)

The payment adjustment value for entrained air and 28-day strength for any lot of repair concrete that is allowed to remain in-place is determined using the formulas listed in Table 6.01.05-3b. An index price of \$200.00 per c.f. shall be used to calculate each adjustment. The total adjustment value will be the sum of each individual adjustment value and will be deducted from the cubic foot payment for the appropriate item.

**Table 6.01.05-3b Payment Adjustment Formulas for Repair Concrete**

Adj (air) = (1 - air pay factor) × \$200/c.f. × lot size (c.f.)
Adj (strength) = (1 - strength pay factor) × \$200/c.f. × lot size (c.f.)
Total Adj = Adj (air) + Adj (strength)

The Contractor shall request permission from the Engineer to remove and replace a lot(s) of concrete to avoid a negative payment adjustment. Any replacement material will be sampled, tested and evaluated in accordance with this specification.

No direct payment will be made for any labor, equipment or materials used during the sampling and testing of the concrete for Progression or Acceptance. The cost shall be considered as included in the general cost of the work or as stated elsewhere in the Contract. The work of transporting the concrete test specimens, after initial curing, for Acceptance testing will be performed by the Department without expense to the Contractor.

This material used for new construction will be paid for at the Contract unit price per cubic yard or linear foot less any adjustments, for the specified class, complete in place, which price shall include all materials, equipment, tools, labor and work incidental thereto, including Concrete Quality Control Plan, heating, all admixtures, joint sealer, roofing felt, and any miscellaneous materials such as metal flashing and metal used in expansion joints and bearings.

**2. Underwater Concrete:** When this class of concrete is used, it will be paid for at the Contract unit price per cubic yard for "Underwater Concrete," complete in place, which price shall include all materials, equipment, tools, labor and work incidental thereto.

**3. Concrete Used For Structural Repairs or Surface Repairs:** The material used for structural repairs or surface repairs will be paid for at the Contract unit price per cubic foot less any adjustments, complete in place, which price shall include saw cutting, removing concrete, sandblasting, cleaning, forming, placing, curing, stripping, and finishing new surfaces, and all materials, equipment, tools, labor and clean-up incidental thereto.

**4. Joint Filler:** Expansion joint filler will be paid for at the Contract unit price per square foot for "Joint Filler for Bridges" of the type and thickness specified, complete in place, which price shall include all materials, equipment, tools, labor and work incidental thereto.

**5. Closed Cell Elastomer:** Closed cell elastomer will be paid for at the Contract unit price per cubic inch for "Closed Cell Elastomer" of the thickness specified, complete in place, which price shall include all materials, equipment, tools, labor and work incidental thereto.

Embedded galvanic anodes, deformed steel bars, and penetrating sealer, will be paid for separately.

Pay Item	Pay Unit
Footing Concrete	c.y.
Footing Concrete (Mass)	c.y.
Abutment and Wall Concrete	c.y.
Abutment and Wall Concrete (Mass)	c.y.
Column and Cap Concrete	c.y.
Column and Cap Concrete (Mass)	c.y.
Bridge Deck Concrete	c.y.
Bridge Deck Concrete (SIP Forms)	c.y.
Parapet Concrete	l.f.
Bridge Sidewalk Concrete	c.y.
Approach Slab Concrete	c.y.
Barrier Wall Concrete	c.y.
Underwater Concrete	c.y.
Surface Repair Concrete	c.f.
Structural Repair Concrete	c.f.
Class PCCXXYZ Concrete	c.y.
(Thickness and Type) Joint Filler for Bridges	s.f.
(Thickness) Closed Cell Elastomer	c.i.

## **SECTION 6.03 - STRUCTURAL STEEL**

Section 6.03 is amended as follows:

### **6.03.03—Construction Methods: Revise Subarticle 4(f) “High Strength Bolted Connections” as follows:**

*Replace the first paragraph and Table A: "Minimum Bolt Tension in kips" with the following:*

" The assembly of structural connections using high-strength bolts shall be installed so as to develop the minimum required bolt tension specified in Table A. The Manufacturer’s certified test report; including the rotational capacity test results must accompany the fastener assemblies. Fastener Assemblies delivered without the certified reports will be rejected.

**Table A: Minimum Bolt Tension in kips\***

<b><u>Bolt Diameter (Inches)</u></b>	<b><u>ASTM F3125 Grade A325</u></b>	<b><u>ASTM F3125 Grade A490</u></b>
5/8	19	24
3/4	28	35
7/8	39	49
1	51	64
1 1/8	64	80
1 1/4	81	102
1 3/8	97	121
1 1/2	118	148

\*Equal to 70% of specified minimum tensile strength of bolts (as specified in ASTM Specifications for tests of full-size F3125 Grade A 325 and F3125 Grade A 490 bolts with UNC threads, loaded in axial tension) rounded to the nearest kip.

*Revise the last sentence of the sixteenth paragraph, "Rotational-Capacity Tests" as follows:*

" When performed in the field, the procedure shall meet the requirements of ASTM F3125 Annex A2."

*In Table C, insert the word "Grade" in the third row before every occurrence of "A325" and "A490."*

## **SECTION 6.86 - DRAINAGE PIPES, DRAINAGE PIPE ENDS**

### **6.86.01—Description**

### **6.86.02—Materials**

### **6.86.03—Construction Methods**

### **6.86.04—Method of Measurement**

### **6.86.05—Basis of Payment**

**6.86.01—Description:** This work shall consist of furnishing, preparing and installing drainage pipes of the size and type specified, bedding material, joint sealant, rubber gaskets, clamps, collars, grout, grout collars, drainage trench excavation, backfilling or satisfactory disposal of all materials, the removal of which is necessary for the proper completion of the work, connecting proposed drainage systems to existing systems, plugging or abandoning existing pipes and removal of existing pipe within trench limits, as shown on the plans or as directed by the Engineer.

This Section shall also include removal of drainage pipes outside of drainage trench excavation limits, as defined in 2.86.03-1.

**6.86.02—Materials:** The materials for this work shall meet the following requirements: Drainage Pipe, Drainage Pipe Ends, Sealers, Gaskets and connection hardware shall meet the requirements of M.08.01.

Bedding Material shall meet the requirements of M.08.03-1.

Granular Fill, if necessary, shall meet the requirements of M.02.01.

Brick Masonry shall meet the requirements of M.11.03 and Mortar shall meet the requirements of M.11.04.

Concrete used for Concrete Pipe Connections shall be Class “F” Concrete meeting the requirements of M.03.

### **6.86.03—Construction Methods:**

(1) **Drainage Trench Excavation:** Drainage trench excavation and backfilling shall be performed in accordance with 2.86.03 and the requirements of the plans.

Where drainage pipe is to be laid below the surface, a drainage trench shall be excavated to the required depth, the bottom of which shall be graded to the elevation of the bottom of the bedding material.

Where drainage pipe is to be laid in a fill area, the embankment shall be placed and compacted to a minimum elevation 12 inches above the top of the proposed pipe, whereupon the drainage trench excavation shall be performed and the pipe installed.

(2) **Rock in Drainage Trench Excavation:** When rock, as defined in 2.86.01-2, is encountered, work shall be performed in accordance with 2.86.03 and the requirements of the plans.

(3) **Drainage Pipe Installation:** New or re-laid drainage pipes shall be installed on 4 inches of bedding material (12 inches if over rock in ledge formation), the details as shown on the plans, or as directed by the Engineer. Prior to placement of the drainage pipe, in accordance with the plans, bedding material shall be pre-shaped to 10% of the total height

of the pipe in order to keep the pipe in the center of the trench. Following placement of the drainage pipe, bedding material backfill shall be placed in accordance with the following table:

<b>Internal Pipe Diameter</b>	<b>Required Bedding Material Backfill</b>
< 48 inches*	25% of total height of the pipe
≥ 48 inches*	12 inches above the top of the pipe
*Includes pipe arch of equivalent internal horizontal span See Standard Drawing	

The placement of the drainage pipe shall start at the downstream end and progress upstream or as shown on the plans, or as directed by the Engineer. All drainage pipes shall be carefully laid in the center of the drainage trench, true to the lines and grades given. Bell ends shall face upgrade and all joints shall be tight.

Joints in concrete pipe shall be sealed with cold-applied bituminous sealer, preformed plastic gaskets or flexible, watertight, rubber-type gaskets. Portland cement mortar shall not be used for sealing pipe joints except with permission of the Engineer.

When cold-applied bituminous sealer is used, the bell and spigot ends shall be wiped clean and dry before applying the bituminous sealer to the pipe ends. Before the drainage pipes are placed in contact with each other, the spigot or tongue end shall be completely covered with bituminous sealer; then the pipe shall be laid to line and grade so the inside surface of all abutting pipes are flush. Additional bituminous sealer shall be applied to the joint after the connection has been made to ensure a water tight connection.

Where the end of an existing drainage pipe is not compatible with the end of a proposed concrete pipe, the Contractor shall align the inner diameters of the pipes being connected, butt the pipe ends together, and construct a cast-in-place concrete pipe connection, as shown in the plans. Incompatible bell/spigot or tongue/groove ends shall be cut off as required to ensure the interior drainage pipe walls are aligned to provide a smooth transition between the pipes.

Metal pipe and pipe arches shall be carefully joined and firmly clamped together by approved connecting bands, which shall be properly bolted in place before any backfill is placed.

Newly installed drainage pipe which is not in true alignment, or which shows any settlement or distortion, shall be reinstalled in accordance with 1.05.03.

When drainage pipe outside of proposed drainage trench limits is to be removed, it shall be removed to the limits shown on the plans and all remaining pipes shall be plugged with cement masonry.

Where shown on the plans or directed by the Engineer, the Contractor shall plug abandoned existing pipes with cement masonry.

**(4) Drainage Pipe End Installation:** Reinforced concrete drainage pipe ends shall be placed on a prepared bed of the existing ground and accurately aligned as shown on the plans. The joints shall be sealed as specified in 6.86.03-3 and backfill shall be placed around both sides of the unit simultaneously to the elevation shown on the plans.

Metal drainage pipe ends shall be placed on a prepared bed of the existing ground and accurately aligned as shown on the plans. After the attachment of the drainage pipe end, backfill shall be placed around both sides of the unit up to the elevation shown on the plans, exercising caution to avoid displacement or deformation of the unit.

**6.86.04—Method of Measurement:** This work will be measured as follows:

**Drainage Trench Excavation**, in accordance with 2.86.04, will not be measured for payment.

**Rock in Drainage Trench Excavation** will be measured in accordance with 2.86.04.

**Bedding Material** will not be measured for payment.

**New and Re-laid Pipes and Pipe Arches** will be measured for payment by the actual number of linear feet of pipe or pipe arch of the various sizes and types, completed and accepted and measured in place along the invert. Coupling bands and fittings for pipes and pipe arches will not be measured for payment.

**Reinforced Concrete Drainage Pipe Ends and Metal Drainage Pipe Ends** will be measured for payment as separate units.

**Corrugated Metal Pipe Elbows** (of the Size and Type specified) will be measured for payment by the actual number of linear feet of pipe elbows completed and accepted, based on 6 linear feet per elbow, as shown on the plans. Coupling bands for elbows will not be measured for payment.

**Concrete Pipe Connection** will be measured for payment by the number of each concrete pipe connection constructed at locations where proposed concrete pipes tie into an existing pipe with an incompatible end, completed and accepted by the Engineer.

**Removal of drainage pipe** outside of drainage trench excavation limits, as defined in 2.86.03, will be measured for payment by the actual number of linear feet of drainage pipe removed.

There will be no measurement for plugging existing pipes with cement masonry.

**6.86.05—Basis of Payment:**

**Drainage Trench Excavation** for the installation of drainage pipes will not be paid separately but shall be included in the Contract unit price for the respective drainage pipe or pipe end item(s), in accordance with the provisions of 2.86.05.

**Rock in Drainage Trench Excavation** will be paid for in accordance with the provisions of 2.86.05.

**Bedding Material** necessary for the installation of drainage items described herein will be included in the Contract unit price for the respective drainage pipe or pipe end item(s). Bedding material required to fill voids when rock in drainage trench is encountered will not be measured for payment but shall be included in the Contract unit price for "Rock in Drainage Trench Excavation," in accordance with 2.86.05.

**New Pipes and Pipe Arches** will be paid for at the Contract unit price per linear foot for "(Size and Type) Pipe (Thickness) – 0' to 10' Deep," "(Size and Type) Pipe (Thickness) – 0' to 20' Deep," "(Size) Pipe Arch (Thickness) – 0' to 10' Deep" or "(Size) Pipe Arch (Thickness) – 0' to 20' Deep" complete in place, including materials, drainage trench excavation, bedding material, equipment, tools, and labor incidental thereto.



**Relaid Pipes and Pipe Arches** will be paid for at the Contract unit price per linear foot for "Relaid Pipe (Size and Type) – 0' to 10' Deep," "Re-laid Pipe (Size and Type) – 0' to 20' Deep," "Relaid Pipe Arch (Size and Type) – 0' to 10' Deep," or "Relaid Pipe Arch (Size and Type) – 0' to 20' Deep," complete in place, including all materials, drainage trench excavation, bedding material, equipment, tools, and labor incidental thereto.

**Reinforced Concrete Drainage Pipe Ends and Metal Drainage Pipe Ends** will be paid for at the Contract unit price for each drainage pipe end of the Size and Type specified, complete in place, including all excavation, materials, attachment systems, equipment, tools and labor incidental thereto.

**Corrugated Metal Pipe Elbows** will be paid for at the Contract unit price per linear foot for "(Size and Type) Corrugated Metal Pipe Elbow" including all materials, drainage trench excavation, bedding material, equipment, tools, and labor incidental thereto.

**Concrete Pipe Connection** will be paid for at the Contract unit price each for "Concrete Pipe Connection" complete in place, including all materials, equipment, tools and labor incidental thereto.

**Removal of drainage pipes** of all types and sizes, outside of drainage trench excavation limits, as defined in 2.86.03-1, will be paid for at the Contract unit price per linear foot for "Remove Existing Pipe – 0' to 10' Deep," or "Remove Existing Pipe – 0' to 20' Deep," which price shall include excavation, temporary trench protection, backfill, and all equipment, tools and labor incidental thereto.

There will be no direct payment for the plugging of existing drainage pipes, but the cost thereof shall be included in the respective drainage Contract item(s).

Pay Item	Pay Unit
(Size and Type) Pipe (Thickness) – 0' to 10' Deep	l.f.
(Size and Type) Pipe (Thickness) – 0' to 20' Deep	l.f.
(Size and Type) Pipe Arch (Thickness) – 0' to 10' Deep	l.f.
(Size and Type) Pipe Arch (Thickness) – 0' to 20' Deep	l.f.
Relaid (Size and Type) Pipe– 0' to 10' Deep	l.f.
Relaid (Size and Type) Pipe– 0' to 20' Deep	l.f.
(Size and Type) Relaid Pipe Arch – 0' to 10' Deep	l.f.
(Size and Type) Relaid Pipe Arch – 0' to 20' Deep	l.f.
(Size) Reinforced Concrete Drainage Pipe End	ea.
(Size) Metal Drainage Pipe End	ea.
(Size and Type) Corrugated Metal Pipe Elbow	l.f.
Concrete Pipe Connection	ea.
Remove Existing Pipe – 0' to 10' Deep	l.f.
Remove Existing Pipe – 0' to 20' Deep	l.f.

## **SECTION 10.00 - GENERAL CLAUSES FOR HIGHWAY ILLUMINATION AND TRAFFIC SIGNAL PROJECTS**

### **Article 10.00.03 – Plans:**

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

The Contractor shall digitally mark, in red, any changes on the plan(s) using a pdf program.

The Contractor shall submit the digital pdf file(s) to the Engineer and to [DOT.TrafficElectrical@ct.gov](mailto:DOT.TrafficElectrical@ct.gov), for Traffic Signals, prior to requesting the Functional Inspection.

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

In the first paragraph, last sentence, in item no. 1, replace “Four (4)” with “Digital PDF Files and Five (5)” [paper prints of schematics and wiring diagrams...].

**Article 10.00.10 Section 3.** Functional Inspection, first paragraph after the 2<sup>nd</sup> sentence: Add the following:

The Contractor shall have a bucket truck with crew on site during the Functional Inspection to make any necessary aerial signal adjustments as directed by the Engineer.

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

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

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

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

## **SECTION M.03 - PORTLAND CEMENT CONCRETE**

*Replace Section M.03 in its entirety with the following:*

### **M.03.01—Component Materials**

### **M.03.02—Mix Design Requirements**

### **M.03.03—Producer Equipment and Production Requirements**

### **M.03.04—Curing Materials**

### **M.03.05—Non Shrink, Non Staining Grout**

### **M.03.06—Expansive Cement for Anchoring**

### **M.03.07—Chemical Anchors**

### **M.03.08—Joint Materials**

### **M.03.09—Protective Compound/Sealers**

### **M.03.10—Formwork**

### **M.03.01—Component Materials**

**1. Coarse Aggregate:** Coarse aggregate shall meet the requirements of M.01.

**2. Fine Aggregate:** Fine aggregate shall meet the requirements of M.01.

#### **3. Cement:**

**(a) Portland:** Types I, II, and III Portland cement shall meet the requirements of AASHTO M 85. Type I and Type III Portland cement shall be used only when required or expressly permitted by the Project specification or the Engineer. The use of Type I or III will require that these mixtures be submitted as Non-standard Mix Designs. All cement shall be provided by a mill participating in the Departments' Cement Certification program. The requirements of the Certification Program are detailed in the Departments' Quality Assurance Program for Materials.

**(b) Pre-Blended Cements:** Binary or Ternary cements consisting of Portland Cement and supplemental cementitious materials may be used provided that all the requirements of M.03.01- 3(a) and -3(c) are met.

**(c) Replacement Materials:** Unless already approved as a Standard Mix Design, any Contractor proposed Mix Designs with partial replacement of Portland Cement (PC) with fly ash or ground granulated blast furnace slag (GGBFS), shall be submitted in writing to the Engineer for approval prior to the start of work, on a project-by-project basis. The type of material, source, and the percentage of the PC replaced shall be clearly indicated. Upon request, a Certified Test Report for the cement replacement material shall be provided to the Engineer for use during the Mix Design review.

**1. Fly Ash:** Fly ash to be used as a partial replacement for Portland cement shall meet the requirements of AASHTO M 295, either Class C or Class F, including the uniformity requirements of Table 2A. Loss on Ignition for either class of fly ash shall not exceed 4.0%. Fly ash may be used to replace up to a maximum of 20% of the required Portland cement for mixes without permeability requirements. For mixes with permeability requirements, the maximum of 20% may be exceeded. The fly ash shall be substituted on a weight basis, with a minimum of 1 lb. of fly ash for 1 lb. of Portland cement. Different classes of fly ash or the same class from different sources shall not be permitted on any single project without the written approval of the Engineer.

2. **Ground Granulated Blast Furnace Slag (GGBFS):** GGBFS used as a partial replacement for Portland cement shall meet the requirements of AASHTO M 302/ASTM C989, Grade 100 or 120. As determined by the Engineer, GGBFS may be used to replace a maximum of 30% of the required Portland cement for mixes without permeability requirements. For mixes with permeability requirements, the maximum of 30% may be exceeded. The Engineer may restrict or prohibit the use of GGBFS if ambient temperatures anticipated during the placement and initial curing of the concrete are low. The GGBFS shall be substituted on a weight basis, with a minimum of 1 lb. of slag for 1 lb. of Portland cement. Different sources of GGBFS shall not be permitted on any single project without the written approval of the Engineer.

**4. Water:** All water used in the mixing of concrete shall be odorless and clear in appearance. Surface water may be used if not taken from shallow or muddy sources; classified as Class C or Class D on the Department of Energy and Environmental Protection (DEEP) Water Quality Classification mapping; and accommodations have been made to prevent contaminants from entering the supply to the satisfaction of the Engineer. The Engineer may request that water from any surface or ground source be tested in accordance with AASHTO T26 and AASHTO D512 if the appearance or scent of the water is suspect. To be acceptable, the pH of the water must not be less than 6.0 or greater than 8.0 and Chloride Ion Concentration of the water must not exceed 250ppm. Potable water taken directly from a municipal or regional water supply may be used for mixing concrete without testing. Heating or cooling of water may be required to meet mix temperature requirements at time of placement.

**5. Admixtures:** All admixtures shall perform their function without injurious effects upon the concrete. If requested by the TDC, the Contractor shall present a certified statement from a recognized laboratory attesting to this requirement. A "recognized" laboratory is any cement and concrete laboratory approved and inspected regularly by the Cement and Concrete Reference Laboratory (CCRL). The statement shall contain results of compression tests of cylinder specimens made with concrete utilizing the admixture(s) in proportions equal to those proposed by the Contractor. The results of at least 5 standard 6 inch x 12 inch cylinders of each mix design shall be listed with the results of at least 5 like-sized cylinders not utilizing the admixture(s). Specimens must be made and cured in the laboratory in accordance with AASHTO T 126 and will be tested in accordance with AASHTO T 22.

**(a) Air-Entraining Admixtures:** In the event that air entrained concrete is required, an admixture meeting the requirements of AASHTO M 154 may be used. Tests for 7 and 28-day compressive and flexural strengths and resistance to freezing and thawing are required whereas tests for bleeding, bond strength and volume change will not be required.

**(b) Other Chemical Admixtures:** In the event that concrete properties are specified that require the use of additional admixtures, or the Contractor proposes the use of additional admixtures to facilitate placement, the admixtures shall meet the requirements of AASHTO M194M/M, including the 1 year performance data.

**M.03.02—Mix Design Requirements**

**1. Standard ConnDOT Mix Designs:** Standard Mix Designs shall be designed in accordance with applicable sections of ACI 211 and ACI 318. The mixtures shall consist of Portland cement, fine aggregate, coarse aggregate, admixtures, and water proportioned in accordance with Table M.03.02-1. The mixtures shall also be designed to obtain the plastic properties of Portland cement concrete as specified in Table 6.01.03-2.

**Table M.03.02-1 Standard Portland Cement Concrete Mixes**

Class <sup>1</sup>	Max. Water/Cement <sup>2</sup> ratio	Min. Cement <sup>2</sup> Content - lb./c.y.	Air Content %	Electrical Resistivity (Permeability) kΩ-cm AASHTO T 358
PCC0223Z	0.69	455	6 +/- 1.5	NA
PCC0334Z	0.48	615		NA
PCC0336Z	0.50	564		NA
PCC0354Z	0.49	615		NA
PCC0446Z	0.44	658		NA
PCC04462	0.42			29 minimum
PCC0556Z	0.40			NA
PCC05562	0.40			29 minimum
PCCXXX81 <sup>3</sup>	0.46		15 maximum	
PCCXXX82	0.40	7.5 +/- 1.5	29 minimum	

<sup>1</sup> PCCXYZ where:

PCC = Portland Cement Concrete

XXX = 28-day minimum compressive strength (psi/100)

Y = Nominal Maximum Aggregate Size (U.S. Sieve No. Designation)

Z = Exposure Factor (See Table M.03.02-1a)

<sup>2</sup> Portland Cement may be partially replaced within a Standard Mix Design by other approved cementitious material meeting the requirements of M.03.01-3(c) if permitted by the Engineer.

<sup>3</sup> When this class is paid for in a surface or structural repair concrete item, the plastic properties necessary for confined placement to ensure appropriate workability for consolidation within the forms shall be noted on the delivery ticket by the concrete supplier.

**Table M.03.02-1a Exposure Factor per Application**

Exposure		Application
0	Benign	Elements not exposed to weather (buried, enclosed)
1	Moderate	Elements not in contact with salt water or deicing chemicals
2	Severe	Elements in contact with salt water, deicing chemicals, flowing/standing water

Mix designs shall indicate the dosage of admixtures anticipated to provide plastic properties required in the Project specification. Plastic properties of standard mix classes of concrete in the plastic state are listed in Table 6.01.03-2.

Standard Mix Designs are required to be designed and submitted by the concrete producers, and are approved by the Department on a standing basis. Submittal or re-approval of these Standard Mix Designs on an annual basis is not required. Previously approved producer-designed Standard Mixes that have a record of satisfactory performance may be utilized on Department projects unless there is a change in the gravimetric properties or the sources of any materials. Revisions to the Standard Mix Designs, which include changes in component sources, can be submitted at any time to the TDC, but must be approved prior to use on Department projects.

**2. Non-Standard CTDOT Mix Designs:** Any proposed Mix Designs that do not comply with Table M.03.02-1 are required to be submitted 15 days prior to use on a project-by-project basis and be approved by the TDC prior to use. The use of an approved admixture with an otherwise approved Standard Mix Design is not considered non-standard.

All Non-standard Mix Designs used for load-bearing structures shall contain a minimum of 658 lb./c.y. of cementitious materials.

Concrete used in applications such as flowable fill or controlled low-strength material may be designed with less than 658 lb./c.y. of cementitious materials.

### **M.03.03—Producer Equipment and Production Requirements**

**1. General Requirements:** The source of the concrete must be approved by the Engineer prior to use on Department projects. Specifically the location and capacity of the central mix or dry batch plant, and complement of truck mixers/haulers, shall be adequate for continuous placement of concrete on a typical Department project. Approval may be revoked at any time in accordance with 1.06.01.

- (a) **Inspection:** The production facility supplying hydraulic cement concrete shall have a current Certification of Ready Mixed Concrete Production Facilities from the National Ready Mixed Concrete Association (NRMCA), or equivalent certification approved by the Engineer.
- (b) In addition to the requirements of approved third party certification, the facility shall produce batch tickets that meet the requirements of 6.01.03-3(a).
- (c) **Quality Control:** The Contractor is responsible for all aspects of Quality Control (QC). As determined by the Engineer, should material delivered to a project not meet specification, the Contractor may be required to submit to the Engineer a corrective procedure for approval within 3 calendar days. The procedure shall address any minor adjustments or corrections made to the equipment or procedures at the facility.
- (d) **Suspension:** As determined by the Engineer, repeated or frequent delivery of deficient material to a Department project may be grounds for suspension of that source of material. A detailed QC plan that describes all QC policies and procedures for that facility may be

required to formally address quality issues. This plan must be approved by the Engineer and fully implemented, prior to reinstatement of that facility.

**2. Hand Mixed Concrete:** Hand mixing shall be permitted only with the permission of the Engineer. Hand mixed batches shall not exceed 1/2 c.y. in volume. Hand mixing will not be permitted for concrete to be placed under water.

#### **M.03.04—Curing Materials**

**1. Water:** Any water source deemed acceptable by the Engineer for mixing concrete may be used to provide water for curing purposes. Surface water may be used if classified as Class C or Class D on the Department of Energy and Environmental Protection (DEEP) Water Quality Classification mapping and accommodations have been made to prevent contaminants from entering the supply to the satisfaction of the Engineer. In general, water shall not be taken from shallow or muddy sources. In cases where sources of supply are relatively shallow, the intake pipe shall be enclosed to exclude silt, mud, grass, etc.; and the water in the enclosure shall be maintained at a depth of not less than 2 feet under the intake pipe.

**2. Mats:** Mats for curing concrete shall be capable of maintaining moisture uniformly on the surface of the concrete. The mats shall not contain any materials such as dyes, sugar, etc., that may be injurious to the concrete.

The length or width of the mats shall be sufficient to cover all concrete surfaces being cured. Should more than one mat be required, sufficient overlap shall be provided by the Contractor as determined by the Engineer.

**3. Liquid Membrane-Forming Compound:** Liquid membrane-forming compound shall meet the requirements of AASHTO M 148 Type 2, Class B, or shall be a water-soluble linseed oil-based compound meeting the requirements of AASHTO M 148, Type 2.

**4. White Polyethylene Sheeting (Film):** White polyethylene sheeting (film) shall meet the requirements of AASHTO M 171.

#### **M.03.05—Non Shrink, Non Staining Grout**

**1. Bagged (pre-mixed):** Bagged (pre-mixed) formulations of non-shrink grout shall meet the requirements of ASTM C1107. The grout shall be mixed with potable water for use. The grout shall be mixed to a flowable consistency as determined by ASTM C230. All bagged material shall be clearly marked with the manufacturer's name, date of production, batch number, and written instructions for proper mixing, placement and curing of the product.

**2. Bulk:** The Contractor may formulate and design a grout mix for use on the Project in lieu of using a pre-bagged product. The Contractor shall obtain prior written approval of the Engineer for any such proposed Mix Design. Any such Mix Design shall include the proportions of hydraulic cement, potable water, fine aggregates, expansive agent, and any other necessary additive or admixture. This material shall meet all of the same chemical and physical requirements as shall the pre-bagged grout, in accordance with ASTM C1107.

#### **M.03.06—Expansive Cement for Anchoring**

The premixed anchoring cement shall be non-metallic, concrete gray in color and prepackaged. The mix shall consist of hydraulic cement, fine aggregate, expansive admixtures and water meeting the following requirements:

**1.** The anchoring cement shall have a minimum 24 hour compressive strength of 2,600 psi when tested in accordance with ASTM C109.

2. The water content of the anchoring cement shall be as recommended by the manufacturer. Water shall meet the requirements of M.03.01-4.

The Contractor shall provide a Certified Test Report and Materials Certificate for the premixed anchoring cement in accordance with 1.06.07. The Contractor shall also provide, when requested by the Engineer, samples of the premixed anchoring cement for testing and approval.

### **M.03.07—Chemical Anchors**

Chemical anchor material must be listed on the Departments' Qualified Products List and approved by the Engineer for the specified use.

The chemical anchor material shall be epoxy or polyester polymer resin. It shall not contain any metals or other products that promote corrosion of steel. The Contractor shall supply the Engineer with a Certified Test Report and Materials Certificate for the chemical anchor material in accordance with 1.06.07. When requested by the Engineer, the Contractor shall also provide samples of the chemical anchor material.

### **M.03.08—Joint Materials**

**1. Transverse Joints for Concrete Pavement:** Transverse joints shall consist of corrosion resistant load transfer devices, poured joint seal and in addition, in the case of expansion joints, expansion joint filler all meeting the following requirements:

- (a) The corrosion resistant load transfer device shall be coated steel or sleeved steel or be made of corrosion resistant material. The dimensions of any devices used shall be as shown on the plans, exclusive of any coating or sleeving. Core material of coated or sleeved metallic devices shall be steel meeting the requirements of AASHTO M 255M/M 255 Grade 520, or steel having equal or better properties and approved by the Engineer. Nonmetallic devices shall meet the various strength requirements applicable to metallic devices as well as all other requirements stated herein.
- (b) All coated load transfer devices shall meet the requirements of AASHTO M 254. Uncoated or sleeved load transfer devices shall meet the applicable physical requirements of AASHTO M 254. The use of field applied bond breakers will not be permitted.
- (c) The basis of acceptance for corrosion resistant load transfer devices shall be the submission by the Contractor of a minimum of 2 samples accompanied by Certified Test Reports meeting the requirements of 1.06.07 demonstrating that the load transfer device meets the requirements of AASHTO M 254 for the type of device supplied. The Engineer reserves the right to reject any load transfer device deemed unsatisfactory for use.

**2. Joint Filler for Concrete Curbing:** Expansion joint filler shall be either preformed expansion joint filler or wood joint filler as indicated on the plans and shall meet the following requirements:

- (a) Preformed expansion joint filler shall be the bituminous cellular type and shall meet the requirements of AASHTO M 213.
- (b) Boards for wood joint filler shall have 2 planed sides and shall be redwood, cypress or white pine. Redwood and cypress boards shall be of sound heartwood. White pine boards shall be of sound sapwood. Occasional small, sound knots and medium surface checks will be permitted provided the board is free of any defects that will impair its usefulness for the purpose intended. The joint filler may be composed of more than one length of board in the length of the joint, but no board of a length less than 6 feet shall be used; and the



separate boards shall be held securely to form a straight joint. Boards composed of pieces that are jointed and glued shall be considered as one board.

- (c) Dimensions shall be as specified or shown on the plans; and tolerances of plus 1/16 inch thickness, plus 1/8 inch depth and plus 1/4 inch length will be permitted.
- (d) All wood joint filler boards shall be given a preservative treatment by brushing with creosote oil meeting the requirements of AASHTO M 133. After treatment, the boards shall be stacked in piles, each layer separated from the next by spacers at least 1/4 inch thick; and the boards shall not be used until 24 hours after treatment. Prior to concreting, all exposed surfaces of the wood filler shall be given a light brush coating of form oil.
- (e) Testing of board expansion joint filler shall be in accordance with pertinent sections of AASHTO T 42.

**3. Longitudinal Joint Devices:** The metal used in the fabrication of longitudinal joint devices shall meet ASTM requirements for each type of metal used. The dimensions shall be as shown on the plans.

**4. Expansion Joint Fillers for Bridges and Bridge Bearings:**

- (a) Preformed expansion joint filler for bridges shall meet the requirements of AASHTO M 153, Type I or Type II.
- (b) Pre-molded expansion joint filler for bridge bearings shall meet the requirements of AASHTO M 33.

**5. Joint Sealants:**

- (a) **Joint Sealer for Pavement:** The joint sealer for pavement shall be a rubber compound of the hot-poured type and shall meet the requirements of AASHTO M 324 Type II unless otherwise noted on the plans or in the special provisions.
- (b) **Joint Sealer for Structures:** Structure joint sealers shall be one of the following type sealants:
  1. Where "Joint Seal" is specified on the plans, it shall meet the requirements of the Federal Specifications SS-S-200-E (Self-leveling type), TT-S-0227E (COM-NBS) Type II-Class A (Non-sag type), or 1 component polyurethane-base elastomeric sealants conforming to FS TT-S-00230C Type II-Class A or an approved equal.

A Certified Test Report will be required in accordance with 1.06.07, certifying that the sealant meets the requirements set forth in the Federal Specification. Should the consignee noted on a Certified Test Report be other than the Prime Contractor, a Materials Certificate shall be required to identify the shipment.

2. Where "Silicone Joint Sealant" is specified on the plans, it shall be one of the following or an approved equal:
  - i. Sealant, manufactured by the Dow Corning Corporation, Midland, Michigan 48686-0994
  - ii. Dow Corning 888 Silicone Joint Sealant or
  - iii. Dow Corning 888-SL Self-Leveling Silicone Joint 48686-0994

**6. Closed Cell Elastomer:** The closed cell elastomer shall meet the requirements of ASTM D1056, Grade RE-41 B2. The elastomer shall have a pressure-sensitive adhesive backing on one side.

The Contractor shall deliver the closed cell elastomer to the job site a minimum of 30 days prior to installation. Prior to the delivery of the closed cell elastomer, the Contractor shall notify the Engineer of the date of shipment and the expected date of delivery. Upon delivery of the closed cell elastomer to the job site, the Contractor shall immediately notify the Engineer.

Each separate length, roll or container shall be clearly tagged or marked with the manufacturer's name, trademark and lot number. A lot is defined as that amount of closed cell elastomer manufactured at 1 time from 1 batch of elastomer. A batch is defined as that amount of elastomer prepared and compounded at 1 time. The Contractor shall furnish a Certified Test Report in accordance with 1.06.07, confirming that the closed cell elastomer meets the requirements set forth in these specifications. Should the co-signee noted on a Certified Test Report be other than the Prime Contractor, a Materials Certificate shall be required to identify shipment.

The Contractor shall furnish a 1 foot length of closed cell elastomer in each lot for purposes of inspection and testing by the Engineer. The Engineer will cut a 1 foot sample from each lot and inspect the sample for conformance to size, and perform physical tests on the sample as deemed necessary.

The Engineer shall reject any lot or portion of a lot that does not meet the requirements stated herein. A rejected lot or portion of a lot may be resubmitted provided the Contractor has removed or corrected, in a manner acceptable to the Engineer, all non-conforming material.

#### **M.03.09—Protective Compound/Sealers**

The brand and type of material must be listed on the Department's Qualified Products List and approved by the Engineer for the specified use.

#### **M.03.10—Formwork**

**1. Stay-in-place Forms:** Material for stay-in-place metal forms shall be made of zinc-coated (galvanized) steel sheet meeting ASTM Specification A653 (Structural Steel (SS) Grade 33 through 80). The minimum thickness shall be 20 gauge. Coating weight shall meet the requirements of ASTM A924, Class G235, and shall otherwise meet all requirements relevant to steel stay-in-place metal forms and the placing of concrete as specified herein and as noted in the Contract.

Form supports shall either be fabricated and meet the same material requirements as the forms, or be fabricated from structural steel meeting the requirements of ASTM A36 and shall be hot-dip galvanized in accordance with ASTM A123.

Lightweight filler material for forms shall be as recommended by the form manufacturer.

**2. Temporary Forms and Falsework:** Forms and Falsework shall be of wood, steel or other material approved by the Engineer. This approval does not relieve the Contractor from employing adequately sized materials of sufficient rigidity to prevent objectionable distortion of the formed concrete surfaces caused by pressure of the plastic concrete and other loads incidental to the construction operations.

## **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 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.04.03-5.

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 M.01.

**2. Fine Aggregate:** All fine aggregate shall meet the requirements listed in 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 was found acceptable for the material shipped and that the binder is free of contamination from any residual material, along with 2 copies of the bill of lading.
- iv. The blending or combining of PG binders in 1 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 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(M) 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 R 77. Only suppliers that have an approved "Quality Control Plan for Emulsified Asphalt" formatted in accordance with AASHTO R 77 and that 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 meet 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 meet 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 1/2 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 approval from 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 M.04.01-1 through M.04.01-3 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-lb. sample of the RAP to be incorporated into the recycled mixture.
  - 2. A 25-lb. 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 conforms 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 Material Certificate to the Engineer stating that the CRCG complies with all the applicable requirements in this Section.

**8. Joint Seal Material:** Joint seal material must meet the requirements of ASTM D6690 - Type 2. The Contractor shall submit a Material Certificate in accordance with 1.06.07 certifying that the joint seal material meets the requirements of this Section.

**9. Recycled Asphalt Shingles (RAS):** 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 Material Certificate to the Engineer stating that the RAS complies with all the applicable requirements in this Section.

**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 storage 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 1 silo at a time. Simultaneous discharge of multiple silos for the same Project is not permitted.

Type of silo cylinder	Maximum storage time for all classes (hr)	
	<u>HMA</u>	<u>WMA/PMA</u>
Open Surge	4	Mfg Recommendations*
Unheated - Non-insulated	8	Mfg Recommendations*
Unheated - Insulated	18	Mfg Recommendations*
Heated - No inert gas	TBD by the Engineer	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 3 years after the completion of the Project.

For batch Plants, the Plant ticket shall be produced for each bath and maintained by the vendor for a period of 3 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 truck and batch plant printout 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 AASTO 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) Testing Laboratory:** The Contractor shall maintain a laboratory to test bituminous concrete mixtures during production. The laboratory shall have a minimum of 300 s.f., 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 a high speed 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 the applicable 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 materials 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, and 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, 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.

The Contractor shall test the mixture for compliance with the submitted JMF and Table M.04.02-1. The maximum theoretical density (Gmm) will be determined by AASHTO T 209. If the mixture does not meet the requirements, the JMF shall be adjusted within the ranges shown in Table M.04.02-1 until an acceptable mixture is produced.

An accepted JMF from the previous operating season may be acceptable to the Engineer provided that there are no changes in the sources of supply for the coarse aggregate, fine aggregate, recycled material (if applicable) and the Plant operation had been consistently producing acceptable mixture.

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**

Mix	Curb Mix	Production Tolerances from JMF Target
<b>Grade of PG Binder content %</b>	<b>PG 64S-22 6.5 - 9.0</b>	<b>0.4</b>
<b>Sieve Size</b>		
No. 200	3.0 - 8.0 (b)	2.0
No. 50	10 - 30	4
No. 30	20 - 40	5
No. 8	40 - 70	6
No. 4	65 - 87	7
1/4 inch		
3/8 inch	95 - 100	8
1/2 inch	100	8
3/4 inch		8
1 inch		
2 inch		
<b>Additionally, the fraction of material retained between any 2 consecutive sieves shall not be less than 4%.</b>		
<b>Mixture Temperature</b>		
<b>Binder</b>	325°F maximum	
<b>Aggregate</b>	280-350°F	
<b>Mixtures</b>	265-325°F	
<b>Mixture Properties</b>		
<b>Air Voids (VA) %</b>	0 – 4.0 (a)	
<b>Notes:</b> (a) Compaction Parameter 50 gyrations ( $N_{des}$ ) (b) The percent passing the No. 200 sieve shall not exceed the percentage of bituminous asphalt binder.		

**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 to M.04.02-5. Each JMF and component samples must be submitted no less than 7 days prior to production and must be approved by the Engineer prior to use. All 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 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. A minimum of 45000 grams of laboratory or plant blended mixture and the

corresponding complete Form MAT-412s shall be submitted to the Division of Material Testing (DMT) for design TSR testing verification. The mixture submitted shall be representative of the corresponding mix design as determined by the Engineer.

- 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 (2) representative samples of RAP shall be obtained. Each sample shall be split, and 1 split sample shall be tested for binder content in accordance with AASHTO T 164 and the other in accordance with 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 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.
  - Superpave Mixtures with RAS shall meet AASHTO PP 78 design considerations.
- iii. Superpave Mixtures with CRCG: CRCG may be used solely in HMA S1 mixtures. One percent (1%) 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 in the JMF submittal:
  - i. Gradation, consensus properties and specific gravities of the aggregate, RAP or RAS.
  - ii. Average asphalt content of the RAP or RAS by AASHTO T 164.
  - iii. Source of RAP or RAS and percentage to be used.
  - iv. Warm mix Technology, manufacturer's recommended additive rate and tolerances, and manufacturer recommended mixing and compaction temperatures.
  - v. TSR test report and anti-strip manufacturer and recommended dosage rate if applicable.
  - vi. Mixing and compaction temperature ranges for the mix with and without the warm-mix technology incorporated.
  - vii. 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 (1) quart cans of PG binder, with corresponding Safety Data Sheet (SDS)
- 1 - 50 lbs. bag of RAP
- 2 - 50 lbs. bags 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 in Tables M.04.02-2, M.04.02-3 and M.04.02-4. A new JMF must be submitted to the Engineer for approval whenever a new component source is proposed.

Only 1 mix with 1 JMF will be approved for production at a time. Switching between approved JMF mixes with different component percentages or sources of supply is prohibited.

**TABLE M.04.02-2: Superpave Master Range for Bituminous Concrete Mixture Design Criteria**

	<b>S0.25</b>		<b>S0.375</b>		<b>S0.5</b>		<b>S1</b>	
Sieve	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	-	-
No. 4	72	90	-	72	-	-	-	-
No. 8	32	67	32	67	28	58	19	45
No. 16	-	-	-	-	-	-	-	-
No. 30	-	-	-	-	-	-	-	-
No. 50	-	-	-	-	-	-	-	-
No. 100	-	-	-	-	-	-	-	-
No. 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 / effective binder	0.6 - 1.2		0.6 - 1.2		0.6 - 1.2		0.6 - 1.2	
TSR	≥ 80%		≥ 80%		≥ 80%		≥ 80%	
T-283 Stripping	Minimal as determined by the Engineer							

(c) Mix Status: Each facility will have each type of bituminous concrete mixture rated based on the results of the previous year of production. Mix status will be provided to each bituminous concrete Producer 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 results with compliant VMA and the percentage of acceptance results with compliant air voids.

The final rating assigned will be the lower of the rating obtained with Criteria A or Criteria 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. it is a new JMF not previously submitted; or
7. the average of 10 consecutive acceptance results for VFA, Density to  $N_{ini}$  or dust to effective binder ratio does not meet the criteria in tables M.04.02-2 and M.04.02-4.

Bituminous concrete mixtures rated 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 specification requirements in Tables M.04.02-2 through M.04.02-4 are met and the binder content (Pb) meets the requirements in Table M.04.03-2 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

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 “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.04.02-3:  
Superpave Consensus Properties Requirements for Combined Aggregate**

Traffic Level	Design ESALs (80kN) Millions	Coarse Aggregate Angularity <sup>(1)</sup>	Fine Aggregate Angularity AASHTO T 304, Method A Minimum %	Flat and Elongated Particles <sup>(2)</sup> ASTM D4791, Maximum %	Sand Equivalent AASHTO T 176, Minimum %
		ASTM D5821, 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

Notes:  
<sup>(1)</sup> 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.  
<sup>(2)</sup> Criteria presented as maximum Percent by mass of flat and elongated particles of materials retained on the No. 4 sieve, determined at 5:1 ratio.

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

Traffic Level	Design ESALs (million)	Number of Gyration by Superpave Gyratory Compactor			Percent Density of Gmm from HMA/WMA Specimen			Voids Filled with Asphalt (VFA) Based on Nominal Mix Size - Inch			
		N <sub>ini</sub>	N <sub>des</sub>	N <sub>max</sub>	N <sub>ini</sub>	N <sub>des</sub>	N <sub>max</sub>	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	7	75	115	≤90.0	96.0	≤98.0	65-77	65-76	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	5.80
S0.25	2	5.70
S0.25	3	5.70
S0.375	1	5.70
S0.375	2	5.60
S0.375	3	5.60
S0.5	1	5.10
S0.5	2	5.00
S0.5	3	5.00
S1	1	4.60
S1	2	4.50
S1	3	4.50

**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 No. 4 sieve
- percent passing No. 200 sieve
- binder content
- air voids
- Gmm
- Gse
- 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 and 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:**

### **(a) General:**

For those mixes with a total estimated project tonnage over 500 tons, a NETTCP HMA Paving Inspector certified Contractor representative shall obtain a field sample of the material placed at the project site in accordance with AASHTO T 168 using the procedure indicated in Section 5.2.3 or an alternate procedure approved by the Engineer. Sampling from the truck at the Plant in accordance with AASHTO T 168 using the procedure indicated in Section 5.2.2 will be allowed for those mixes with a total estimated project tonnage equal to or less than 500 tons. Regardless of sampling location, the sample shall be quartered by the Contractor in accordance with AASHTO R 47 and placed in an approved container. The container shall be sealed with a security tape provided by the Department and labelled to include the project number, date of paving, mix type, lot and subplot numbers and daily tonnage. The minimum weight of each quartered sample shall be 14000 grams. The Contractor shall transport one of the containers to the Departments Central Laboratory in Rocky Hill, retain one of the sealed containers for potential use in dispute resolution and test the remaining samples for acceptance in accordance with past practice.

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 QC and acceptance 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.

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

Should the Department be unable to validate the Contractor's acceptance test result(s) for a lot of material, the Engineer will use results from verification testing and re-calculate the pay adjustment for that lot. The Contractor may request to initiate the dispute resolution process in writing within 24 hours of receiving the adjustment and must include supporting documentation or test results to justify the request.

**(b) Curb Mix Acceptance Sampling and Testing Procedures:** Curb Mixes shall be tested by the Contractor at a frequency of 1 test per every 250 tons of cumulative production, regardless of the day of production.

When these mix designs are specified, the following acceptance procedures and AASHTO test methods shall be used:



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

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

**Notes:** <sup>(1)</sup> One (1) set equals 2 each of 6-inch molds. Molds to be compacted to 50 gyrations.  
<sup>(2)</sup> Once per year or when requested by the Engineer.

- i. Determination of Off-Test Status:
    1. 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 for that mixture. 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.
    2. When multiple silos are located at 1 site, mixture supplied to 1 project is considered as coming from 1 source for the purpose of applying the “off test” status.
    3. The Engineer may cease supply from the Plant when test results from 3 consecutive samples are not within the JMF tolerances or the test results from 2 consecutive samples not within the control points indicated in Table M.04.02-1 regardless of production date.
  - ii. JMF Revisions
    1. 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.
    2. 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.
- (c) Superpave Mix Acceptance:
- i. 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; or
- a lot spanning 30 calendar days.

The acceptance sample(s) location(s) shall be selected using stratified - random sampling in accordance with ASTM D3665 based on:

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

One (1) acceptance sample shall be obtained and tested per sub lot with quantities over 125 tons. The Engineer may direct that additional acceptance samples be obtained. For non-PWL lots, one (1) 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 125	0, Unless requested by the Engineer
126 to 500	1
501 to 1,000	2
1,001 to 1,500	3
1,500 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 <sub>des</sub>
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 2 tests)
9	AASHTO T 329	Moisture content of bituminous concrete

- Notes:** <sup>(1)</sup> One (1) set equals 2 each of 6-inch molds. Molds to be compacted to N<sub>max</sub> for PPTs and to N<sub>des</sub> for production testing. The first sub lot of the year shall be compacted to N<sub>max</sub>.
- <sup>(2)</sup> Average value of 1 set of 6-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 5 consecutive tests regardless of the production date (moving average), the Contractor shall immediately investigate, determine an assignable cause, and correct the issue. When 2 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 5 acceptance results.

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. A minimum of 45000 grams of plant blended mixture and the corresponding complete Form MAT-412s shall be submitted to the DMT for production TSR testing verification. The mixture submitted shall be representative of the corresponding mix design as determined by the Engineer. Additionally, the TSR test report and tested 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.

- i. Determination of Off-Test Status:
  - 1. Superpave mixes shall be considered “*off test*” when any control point sieve, binder content, VA, VMA, and 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.

2. Any time the bituminous concrete mixture is considered off-test:
  - A. 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 1 site, mixture supplied to 1 project is considered as coming from 1 source for the purpose of applying the “*off test*” determination.
  - B. 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 with 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.

ii. Cessation of Supply for Superpave Mixtures in Non-PWL Lots:

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

1. four (4) consecutive tests in any combination of VA, VMA or Gmm, regardless of date of production, or
2. two (2) consecutive tests in the control point sieves in 1 production shift.

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

iii. 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 or 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 or bin percentage deviates by more than 5% 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**

	<b>S0.25</b>		<b>S0.375</b>		<b>S0.5</b>		<b>S1</b>		Tolerances
Sieve	Control Points		Control Points		Control Points		Control Points		From JMF Targets <sup>(2)</sup>
inches	Min (%)	Max (%)	Min (%)	Max (%)	Min (%)	Max (%)	Min (%)	Max (%)	+/- Tolerance
1.5	-	-	-	-	-	-	100	-	
1.0	-	-	-	-	-	-	90	100	
3/4	-	-	-	-	100	-	-	90	
1/2	100	-	100	-	90	100	-	-	
3/8	97	100	90	100	-	90	-	-	
No. 4	72	90	-	72	-	-	-	-	
No. 8	32	67	32	67	28	58	19	45	
No. 16	-	-	-	-	-	-	-	-	
No. 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>(3)</sup>
VMA (%)	16.5		16.0		15.0		13.0		1.0 <sup>(4)</sup>
VA (%)	4.0		4.0		4.0		4.0		1.0 <sup>(5)</sup>
Gmm	JMF value		JMF value		JMF value		JMF value		0.030
Mix Temp. – HMA <sup>(6)</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>		
Mix Temp. – PMA <sup>(6)</sup>	285-335°F <sup>(1)</sup>		285-335°F <sup>(1)</sup>		285-335°F <sup>(1)</sup>		285-335°F <sup>(1)</sup>		
Prod. TSR	N/A		N/A		≥80%		N/A		
T-283 Stripping	N/A		N/A		Minimal TBD by the Engineer		N/A		

**Notes:** <sup>(1)</sup> 300°F minimum after October 15.

<sup>(2)</sup> JMF tolerances shall be defined as the limits for production compliance.

<sup>(3)</sup> 0.4 for PWL lots

<sup>(4)</sup> 1.3 for all PWL lots except S/P 0.25 mixes. 1.1 for S/P 0.25 Non-PWL lots. 1.4 for S/P 0.25 PWL lots

<sup>(5)</sup> 1.2 for PWL lots

<sup>(6)</sup> Also applies to placement

**Table M.04.03-5:  
Modifications to Standard AASHTO and ASTM Test Specifications and Procedures**

<b>AASHTO Standard Method of Test</b>	
<b>Reference</b>	<b>Modification</b>
<b>T 30</b>	Section 7.2 through 7.4 Samples are not routinely washed for production testing
<b>T 209</b>	Section 7.2 The average of 2 bowls is used proportionally in order to satisfy minimum mass requirements. 8.3 Omit Pycnometer method.
<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 manufacturer's 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 shall be certified or Interim Qualified by NETTCP as a PG Asphalt Binder Lab Technician.</p> <p>All laboratories testing binders for the Department are required to be accredited by the 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 or limitations required.</p> <p>All AASHTO M 320 references shall be replaced with AASHTO M 332.</p> <p>Once a month, 1 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 2 BBR tests at 2 different temperatures in accordance with AASHTO R 29.</p>

## **SECTION M.06 - METALS**

Section M.06 is amended as follows:

### **M.06.01—Reinforcing Steel:**

*Delete the entire last paragraph in Subarticle 1 "Bar Reinforcement" that reads: "Prior to the incorporation... ..and type of bar reinforcement."*

### **M.06.02—Structural Steel:**

*Revise Subarticle 2 "Anchor Bolts" as follows:*

"(a) Anchor bolt assemblies shall meet the requirements of ASTM F1554, and the grade shall be as specified on the plans. All components of the bolt assembly shall be galvanized in accordance with ASTM F2329."

*Replace Subarticle 3 "High Strength Bolts" with the following:*

" **3. High-Strength Bolts:** High-strength bolts, including suitable nuts and hardened washers, shall meet the following requirements:

- (a) High-strength bolts shall meet the requirements of ASTM F3125 Grade A325 or ASTM F3125 Grade A490 as shown on the plans. High-strength bolts used with coated steel shall be mechanically galvanized, unless otherwise specified. High-strength bolts used with uncoated weathering grades of steel shall be Type 3.

Nuts for ASTM F3125 Grade A325 bolts shall meet the requirements of ASTM A563, Grades DH, DH3, C, C3 and D. Where galvanized high-strength bolts are used, the nuts shall be galvanized, heat-treated Grade DH. Where Type 3 high-strength bolts are used, the nuts shall be Grade C3 or DH3.

Nuts for ASTM F3125 Grade A490 bolts shall meet the requirements of ASTM A563, Grade DH. Where Type 3 high-strength bolts are used, the nuts shall be Grade DH3.

All galvanized nuts shall be lubricated with a lubricant containing a visible dye of any color that contrasts with the color of the galvanizing. Black bolts must be oily to the touch when delivered and installed.

Circular flat and square or rectangular beveled, hardened steel washers shall meet the requirements of ASTM F436. Unless otherwise specified, galvanized washers shall be furnished when galvanized high-strength bolts are specified, and washers with atmospheric corrosion resistance and weathering characteristics shall be furnished when Type 3 high-strength bolts are specified.

Compressible-washer-type direct tension indicator washers, used in conjunction with high-strength bolts, shall meet the requirements of ASTM F959. Where galvanized high-strength bolts are used, the washers shall be galvanized in accordance with ASTM B695,

Class 55. Where Type 3 high-strength bolts are used, the washers shall be galvanized in accordance with ASTM B695, Class 55 and coated with epoxy.

- (b) Identifying Marks:** ASTM F3125 Grade A325 for bolts and the specifications referenced therein for nuts require that bolts and nuts manufactured to the specification be identified by specific markings on the top of the bolt head and on one face of the nut. Markings may be raised or depressed at the manufacturer's option and shall be visible after coating if coating is required. Head markings must identify the grade by the symbol "A325," the manufacturer and the type, if Type 3. Nut markings must identify the grade, the manufacturer and if Type 3, the type. Markings on direct tension indicators must identify the manufacturer and Type "A325." Other washer markings must identify the manufacturer and if Type 3, the type.

ASTM F3125 Grade A490 for bolts and the specifications referenced therein for nuts require that bolts and nuts manufactured to the specifications be identified by specific markings on the top of the bolt head and on one face of the nut. Markings may be raised or depressed at the manufacturer's option and shall be visible after coating if coating is required. Head markings must identify the grade by the symbol "A490," the manufacturer and the type, if Type 3. Nut markings must identify the grade, the manufacturer and if Type 3, the type. Markings on direct tension indicators must identify the manufacturer and Type "A490." Other washer markings must identify the manufacturer and if Type 3, the type.

ASTM F3125 Grade A325 and ASTM F3125 Grade A490 bolt lengths up to 4 times the diameter which are fully threaded but which are not required to be fully threaded by the relevant ASME standard shall be marked with a "T" immediately after the grade designation, for example "A325T." Bolts with any other non-standard dimensions, including thread length, shall be marked with an "S" immediately after the grade designation, for example "A325S." All other markings, if used, such as a private label distributor's mark shall also be separate and distinct.

- (c) Dimensions:** Bolt and nut dimensions shall meet the requirements for Heavy Hexagon Structural Bolts and for Heavy Semi-Finished Hexagon Nuts given in ASME Standard B18.2.6.
- (d) Galvanized Bolts:** Galvanized bolts shall meet the requirements of ASTM F3125 Grade A325, Type 1. The bolts shall be hot-dip galvanized in accordance with ASTM F2329, to a thickness of 50  $\mu\text{m}$  or mechanically galvanized in accordance with ASTM B695, Class 55. Bolts, nuts, and washers of any assembly shall be galvanized by the same process. The nuts shall be overtapped to the minimum amount required for the fastener assembly, and shall be lubricated with a lubricant containing a visible dye so a visual check can be made for the lubricant at the time of field installation. Galvanized bolts shall be tension tested after galvanizing. ASTM F3125 Grade A490 bolts shall be uncoated or shall be coated in accordance with either ASTM F1136 Grade 3 or ASTM F2833 Grade 1.
- (e) Test Requirements:** The maximum hardness of ASTM F3125 Grade A325 bolts shall be 34 HRC. The maximum hardness of ASTM F3125 Grade A490 bolts shall be 38 HRC. Plain, ungalvanized nuts shall have a minimum hardness of 89 HRB.

Proof load tests, in accordance with the requirements of ASTM F606 Method 1, shall be required for the bolts. Wedge tests of full-size bolts are required in accordance with Section 10.1 of ASTM F3125. Galvanized bolts shall be wedge tested after galvanizing.



Proof load tests of ASTM A563 are required for nuts. Proof load tests for nuts used with galvanized bolts shall be performed after galvanizing, overtapping and lubricating.

Rotational-capacity tests are required and shall be performed on all plain or galvanized (after galvanizing) bolt, nut and washer assemblies by the manufacturer or distributor prior to shipping and by the Contractor at the Site.

The thickness of galvanizing on bolts, nuts and washers shall be measured. On bolts, it shall be measured on the wrench flats or on top of the bolt head, and on nuts it shall be measured on the wrench flats.

- (f) **Certified Test Reports and Materials Certificates:** The Contractor shall submit notarized copies of Certified Test Reports and Materials Certificates in accordance with Article 1.06.07 for fastener assemblies. In addition the Certified Test Reports and Materials Certificates shall include the following:
1. Mill test reports shall indicate the place where the material was melted and manufactured.
  2. Test reports for proof load tests, wedge tests, and rotational-capacity tests shall indicate where the tests were performed, date of tests, location of where the components were manufactured and lot numbers.
  3. The test report for galvanized components shall indicate the thickness of the galvanizing.
- (g) **Material Samples:** Prior to incorporation into the work, the Contractor shall submit samples of the bolt assemblies to the Engineer for testing in accordance with the latest edition of the "[Materials Testing Manual](#) (Chapter 8, Minimum Schedule for Acceptance Testing)." Samples shall be submitted for each diameter, length, material designation, grade, coating and manufacturer of bolt assembly."

### **M.06.03—Galvanizing:**

*Replace the entire subarticle with the following:*

" **M.06.03—Galvanizing:** Unless otherwise specified on the plans or in the special provisions, the zinc coating on all iron and steel materials, other than wire, shall meet the requirements of ASTM A123, A153 or F2329, whichever shall apply.

When mechanical galvanizing is used it shall meet the requirements of ASTM B695 Class 55."

## **ITEM #0020801A – ASBESTOS ABATEMENT**

### **Description:**

Work under this item shall include the abatement of asbestos containing materials (ACM) and associated work by persons who are knowledgeable, qualified, trained and licensed in the removal, treatment, handling, and disposal of ACM and the subsequent cleaning of the affected environment. ACM shall include material composed of any type of asbestos in amounts greater than one percent (1%) by weight. The Contractor performing this work shall possess a valid Asbestos Abatement Contractor license issued by the Connecticut Department of Public Health (CTDPH).

These Specifications govern all work activities that disturb asbestos containing materials. All activities shall be performed in accordance with, but not limited to, the current revision of the OSHA General Industry Standard for Asbestos (29 CFR 1926.1001), the OSHA Asbestos in Construction Regulations (29 CFR 1926.1101), the USEPA Asbestos National Emission Standards for Hazardous Air Pollutants (NESHAP) Regulations (40 CFR Part 61 Subpart M), the CTDPH Standards for Asbestos Abatement, Licensure and Training (19a-332a-1 through 16, 20-440-1 through 9 & 20-441), and the CTDEEP Special Waste Disposal Regulations (22a-209-8(i)).

The asbestos abatement work shall include the removal and disposal of all ACM as identified on the Contract Plans and Specifications prior to the planned renovation/demolition project. This Item 0020801A – Asbestos Abatement was designed by Mr. Stephen Arienti, a State of Connecticut licensed Asbestos Project Designer (#000284).

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.

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

Fire retardant polyethylene sheet shall be in roll size to minimize the frequency of joints, with factory label indicating four (4) or six (6) mil thickness.

Six (6) mil polyethylene disposable bags shall have pre-printed OSHA/EPA/DOT labels and shall be transparent.

Tape (or equivalent) 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.

Surfactant is a chemical wetting agent added to water to improve penetration and shall consist of fifty (50) percent polyoxyethylene ether and fifty (50) percent polyoxyethylene ester, or equivalent. The surfactant shall be mixed with water to provide a concentration one (1) ounce surfactant to five (5) gallons of water, or as directed by the manufacturer.

Spray equipment must be capable of mixing necessary chemical agents with water, generating sufficient pressure and volume; and equipped with adequate hose length to access all necessary work areas.

Drills, saws, sanders, grinders, wire brushes and needle-gun type removal equipment shall be equipped with a High Efficiency Particulate Air (HEPA) filtered vacuum dust collection system.

Containers for storage, transportation and disposal of asbestos containing waste material shall be impermeable and both air and watertight.

Labels and warning signs shall conform to OSHA 29 CFR 1926.1101, USEPA 40 CFR Part 61.152, and USDOT 49 CFR Part 172 as appropriate.

Encapsulant, a material used to chemically entrap asbestos fibers to prevent these fibers from becoming airborne, shall be of the type which has been approved by the Engineer. Use shall be in accordance with manufacturer's printed technical data. The encapsulant shall be clear and must be compatible with new materials being installed, if any.

Any planking, bracing, shoring, barricades and/or temporary sheet piling, necessary to appropriately perform work activities shall conform to all applicable federal, state and local regulations.

Air filtration devices and vacuum units shall be equipped with HEPA filters.

## **Construction Methods:**

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

- (a) The scope of work for this project includes the removal of exterior non-friable ACM, which is not defined as "Asbestos Abatement" under the CTDPH Asbestos Abatement Standards (19a-332a-1) nor as Regulated asbestos containing materials (RACM) under the EPA Asbestos NESHAP. Therefore, the Contractor is **not required to submit an Asbestos Abatement Notification to CTDPH or EPA, prior to the commencement of work, so long as work practices will not render more than 25 square feet (SF) (CTDPH) or 160 SF (EPA) of the exterior non-friable ACM into a friable state.**
- (b) Fifteen (15) working days prior to the commencement of asbestos abatement work, the Contractor shall submit to the Engineer for review and acceptance and/or acknowledgment of the following:
  - 1. Permits and licenses for the removal of asbestos-containing or contaminated materials, including a CTDPH valid asbestos removal contractor's license.

2. Documentation dated within the previous twelve (12) months, certifying that all employees have received USEPA Model Accreditation Plan approved asbestos worker/supervisor training in the proper handling of materials that contain asbestos; understand the health implications and risks involved, including the illnesses possible from exposure to airborne asbestos fibers; understands the use and limits of respiratory equipment to be used; and understands the results of monitoring of airborne quantities of asbestos as related to health and respiratory equipment as indicated in 29 CFR 1926.1101 on an initial and annual basis, and copies of all employees CTDPH asbestos worker and/or supervisor licenses.
  3. 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 1926.1101;
    - b. respirator fit testing within the previous twelve (12) months as detailed in 29 CFR 1910.134 (for all employees who must also don a tight-fitting face piece respirator).
  4. Copies of the EPA/State-approved certificates for the proposed asbestos landfill.
- (c) No abatement shall commence until a copy of 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 to, and receipt of, all required paperwork by the Engineer.

**(2) Asbestos Abatement Provisions:**

**(a) General Requirements**

The Abatement Contractor/Subcontractor shall possess a valid State of Connecticut Asbestos Contractor License. Should any portion of the work be subcontracted, the subcontractor must also possess a valid State of Connecticut Asbestos Contractor License. The Asbestos Abatement Site Supervisor employed by the Contractor shall be in control on the job site at all times during asbestos abatement work. All employees of the Contractor who shall perform work (i.e. Asbestos Abatement Site Supervisor, Asbestos Abatement Worker) shall be properly certified/licensed by the State of Connecticut to perform such duties.

All labor, materials, tools, equipment, services, testing, insurance (with specific coverage for work on asbestos), and incidentals which are necessary or required to perform the work in accordance with applicable governmental regulations, industry standards and codes, and these Specifications shall be provided by the Contractor. The Contractor shall be prepared to work all shifts and weekends throughout the course of this project.

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

The Contractor shall, when necessary, provide temporary power and adequate lighting and ensure safe installation of electrical equipment, including ground fault protection and power cables, in compliance with applicable electrical codes and OSHA requirements. The Contractor is responsible for proper connection and installation of electrical wiring.

If sufficient electrical service is unavailable, the Contractor may need to supply electrical power to the site by fuel operated generator(s). Electrical power supply shall be sufficient for all equipment required for this project in operation throughout the duration of the project.

Water service may not be available at the site. Contractor shall supply sufficient water for each shift to operate the decontamination shower units as well as to maintain the work areas adequately wet.

Ladders and/or scaffolds shall be in compliance with OSHA requirements, and of adequate length, strength and sufficient quantity to support the scope of work. Use of ladders/scaffolds shall be in conformance with OSHA 29 CFR 1926 Subpart L and X requirements.

Work performed at heights exceeding six feet (6') shall be performed in accordance with the OSHA Fall Protection Standard 29 CFR 1926 Subpart M including the use of fall arrest systems as applicable.

Data provided regarding asbestos sampling conducted throughout the structure(s) is for informational purposes only. Under no circumstances shall this information be the sole means used by the Contractor for determining the presence, location and/or quantity of all asbestos containing materials. The Contractor shall verify all field conditions affecting performance of the work as described in these Specifications in accordance with OSHA, USEPA, USDOT, DEEP standards. Compliance with the applicable requirements is solely the responsibility of the Contractor.

The Engineer will provide a Project Monitor to oversee the activities of the Contractor. No asbestos work shall be performed until the Project Monitor is on-site. Pre-abatement, during abatement and post-abatement air sampling will be conducted as deemed necessary by the Project Monitor. Waste stream testing will be performed, as necessary, by the Project Monitor prior to waste disposal.

(b) Set-Up

Pre-clean the work areas using HEPA filtered equipment (vacuum) and/or wet methods as appropriate, collecting and properly containing all loose debris as asbestos-containing/asbestos contaminated waste. Vacuum units, of suitable size and capabilities for the project, shall have HEPA filters capable of trapping and retaining at least 99.97 percent of all monodispersed particles of three micrometers in diameter or larger. Do not use methods that raise dust, such as dry sweeping or vacuuming with equipment not equipped with HEPA filters.

The Contractor shall establish a remote Worker Decontamination Enclosure System consisting of Equipment Room, Shower Room and Clean Room in series, as detailed below. Access to the Regulated Area shall only be through this enclosure.

Access between rooms in the Worker Decontamination Enclosure System shall be through airlocks. Other effective designs are permissible. The Clean Room, Shower Room and Equipment Room located within the Worker Decontamination Enclosure, shall be contiguously connected with taped airtight edges.

The Clean Room shall be adequately sized to accommodate workers and shall be equipped with a suitable number of hooks, lockers, shelves, etc., for workers to store personal articles and clothing. Changing areas of the Clean Room shall be suitably screened from areas occupied by the public.

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 through the use of electric hot water heaters supplied by the Contractor. No worker or other person shall leave a Regulated Area without showering. Shower water shall be collected and filtered using best available technology and disposed of in an approved sanitary drain. Shower stalls and plumbing shall include sufficient hose length and drain system or an acceptable alternate.

The Contractor shall ensure that no personnel or equipment be permitted to leave the Regulated Area until proper decontamination procedures (including HEPA vacuuming, wet wiping and showering) to remove all asbestos debris have occurred.

Post warning signs meeting the specifications of OSHA 29 CFR 1910.1001 and 29 CFR 1926.1101 at each Regulated Area. In addition, signs shall be posted at all approaches to Regulated Areas so that an employee may read the sign and take the necessary protective steps before entering the area. Additional signs may require posting following construction of workplace enclosure barriers.

### **Alternate set up requirements for exterior non-friable asbestos abatement procedures**

In lieu of the establishment of a negative pressure enclosure (NPE) system as described by CTDPH Sections 19a-332a-5(c), 5(d), 5(e), and 5(h), non-friable ACM will be removed from exterior work areas within an outdoor Regulated Area(s). The regulated work area will be established by the use of appropriately labeled barrier tape and postings in compliance with CTDPH 19a-332a-5(a) as well as OSHA 29 CFR 1926.1101. A remote personnel decontamination unit as specified in Section 19a-332a-6 will be required. This method shall only be utilized provided exposure assessment air sampling data collected during the removal of the exterior non-friable materials indicates that the exposure levels during removal of such materials do not exceed 0.1 asbestos f/cc. Should exposure assessment air sampling data exceed this level, and engineering efforts to reduce the airborne fiber levels not be successful in reducing the levels to less than 0.1 f/cc, removal shall occur within these areas under full containment conditions.

#### (c) Personnel Protection

The Contractor shall utilize all appropriate engineering controls and safety and protective equipment while performing the work in accordance with OSHA, USEPA, USDOT, CTDEEP and CTDPH regulations.

The Contractor shall provide and require all workers to wear protective clothing in the Regulated Areas where asbestos fiber concentrations may reasonably be expected to exceed the OSHA established Permissible Exposure Limits (PEL) or where asbestos contamination exists. Protective clothing shall include impervious coveralls with elastic wrists and ankles, head covering, gloves and foot coverings.

Respiratory protection shall be provided and shall meet the requirements of OSHA as required in 29 CFR 1910.134, and 29 CFR 1926.1101 as well as the requirements of the CTDPH regulations. A formal respiratory protection program must be implemented in accordance with 29 CFR 1926.1101 and 29 CFR 1910.134. The Contractor shall provide respirators from among those approved as being acceptable for protection by the National Institute for Occupational Safety and Health (NIOSH) under the provisions of 30 CFR Part II.

All other necessary personnel protective equipment (i.e. hardhat, work boots, safety glasses, hearing protection, etc.) required to perform the asbestos abatement work activities shall conform to all applicable federal, state and local regulations.

All other qualified and authorized persons entering into a Regulated Area (i.e. Project Monitor, Regulatory Agency Representative) shall adhere to the requirements of personnel protection as stated in this section.

(d) Asbestos Abatement Procedures

The Asbestos Abatement Site Supervisor, as the OSHA Competent Person shall be at the site at all times.

The Contractor shall not begin abatement work until authorized by the Project Monitor, following a pre-abatement visual inspection.

All workers and authorized persons shall enter and leave the Regulated Area through the Worker Decontamination Enclosure System, leaving contaminated protective clothing in the Equipment Room for reuse or disposal of as asbestos contaminated waste. No one shall eat, drink, smoke, chew gum or tobacco, or apply cosmetics while in a Regulated Area.

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. 03903, Mosher Street over Amtrak RR, Groton, CT**

**Includes the removal of:**

- **Grey Brittle Caulking on Metal Water Pipe/Conduit (C2)**

**A regulated area(s) shall be established at the perimeter of the work area(s), and access shall be controlled by the Contractor. A remote personnel decontamination unit shall be utilized. Removal shall be undertaken in accordance with OSHA Class II and USEPA Asbestos NESHAP requirements.**

During removal, the Contractor shall spray asbestos materials with amended water using airless spray equipment capable of providing a "mist" application to reduce the release of airborne fibers. Spray equipment shall be capable of mixing wetting agent with water and capable of generating sufficient pressure and volume. Hose length shall be sufficient to reach all of the Regulated Area. Do not "flood" the area with hose type water supply equipment with the potential to create water releases and/or run-off from the regulated area.

The Contractor shall continue to spray the asbestos materials with amended water, as necessary, throughout removal activities to ensure the asbestos materials remain adequately wet. The asbestos materials shall not be allowed to dry out.

In order to minimize airborne asbestos concentrations inside the Regulated Area, the Contractor shall remove the adequately wetted asbestos in manageable sections. In addition, asbestos materials removed from any elevated level shall be carefully lowered to the floor.

The Contractor shall promptly place the adequately wet asbestos material in disposal containers (six (6) mil polyethylene bags/fiber drum/poly-lined dumpsters, etc.) as it is removed. Large components removed intact may be wrapped in two (2) layers of six (6) mil polyethylene sheeting secured with tape. As the disposal containers are filled, the Contractor shall promptly seal the containers, apply caution labels and clean the containers before transportation from the regulated area. Bags shall be securely sealed to prevent accidental opening and leakage by taping in gooseneck fashion. Small components and asbestos-containing waste with sharp-edged components (e.g. nails, screws, metal lath, tin sheeting) which could tear polyethylene bags and sheeting shall be placed in clean drums and sealed with locking ring tops. All waste containers shall be leak-tight, (typically consisting of two layers of 6 mil poly (or bags)), and shall be properly labeled and placarded with OSHA Danger labels, DOT shipping labels, markings and placards and USEPA NESHAP generators labels. Containers shall be decontaminated by wet cleaning and HEPA vacuuming prior to exiting the regulated area.

If at any time during asbestos removal, the Project Monitor should suspect contamination of areas outside the Regulated Area, the Contractor shall immediately stop all abatement work and take steps to decontaminate these areas and eliminate causes of such contamination. Unprotected individuals shall be prohibited from entering contaminated areas until air sampling and/or visual inspections determine decontamination.

After completion of abatement work, all surfaces from which asbestos has been removed shall be wet brushed, using a nylon brush, wet wiped and sponged or cleaned by an equivalent method to remove all visible material (wire brushes are not permitted). During this work the surfaces being cleaned shall be kept wet. Cleaning shall also include the use of HEPA filtered vacuum equipment.



The Contractor shall also remove and containerize all visible accumulations of asbestos-containing and/or asbestos-contaminated debris which may have splattered or collected on the polyethylene engineering controls/barriers.

The Contractor shall remove contamination from the exteriors of the scaffolding, ladders, extension cords, hoses and other equipment inside the Regulated Area. Cleaning may be accomplished by brushing, HEPA vacuuming and/or wet cleaning. The Contractor shall wet wipe the Regulated Area using cotton rags or lint free paper towels. Rags and towels shall be disposed of after each use. Workers should avoid the use of dirty rags to insure proper cleaning of surfaces. Waste water shall be filtered using best available technology into leak-proof containers prior to being transported to a sanitary sewer for discharge.

Once the Regulated Area surfaces have dried, the Project Monitor shall perform a thorough post abatement visual inspection utilizing protocols from the ASTM Standard E1368-90 *Standard Practice for Visual Inspection of Asbestos Abatement Projects*. All surfaces within the Regulated Area, including but not limited to ledges, beams, and hidden locations shall be inspected for visible residue. Evidence of asbestos contamination identified during this inspection will necessitate further cleaning as heretofore specified. The area shall be re-cleaned at the Contractor's expense, until the standard of cleaning is achieved.

Once the area has received a satisfactory post-abatement visual inspection, any equipment, tools or materials not required for completion of the work, shall be removed by the Contractor from the Regulated Area.

(e) Air Monitoring Requirements

1. The Contractor shall:
  - a. 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.
  - b. Conduct personnel exposure assessment air sampling, as necessary, to assure that workers are using appropriate respiratory protection in accordance with OSHA Standard 1926.1101. 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.
2. The Project Monitor, acting as the representative of the Engineer during abatement activities, will:
  - a. Collect air samples in accordance with the current revision of the NIOSH 7400 Method of Air Sampling for Airborne Asbestos Fibers while overseeing the activities of the Abatement Contractor. Frequency and duration of the air sampling during abatement will be representative of the actual conditions at the abatement site. The size and configuration of the asbestos project will be a factor in the number of samples required to monitor the abatement activities and shall be determined by the Project

Monitor. The following schedule of samples may be collected by the Project Monitor:

1. Pre-Abatement (Optional)
  - a. Background areas
  - b. Area(s) adjacent to Work Area(s)
  - c. Work Area(s)
2. During Abatement (Optional)
  - a. Within Regulated Area(s)
  - b. Area(s) adjacent to Regulated Areas(s)  
(exterior to critical barriers)
  - c. At the Decontamination Enclosure System

<b>Abatement Activity</b>	<b>Pre-Abatement</b>	<b>During Abatement</b>	<b>Post-Abatement</b>
Exterior Friable/Non-Friable	---	PCM	---

If air samples collected outside of the Regulated Area during abatement activities indicate airborne fiber concentrations greater than original background levels, or greater than 0.1 f/cc, as determined by Phase Contrast Microscopy, whichever is larger, an examination of the Regulated Area perimeter shall be conducted and the integrity of barriers shall be restored. Cleanup of surfaces outside the Regulated Area using HEPA vacuum equipment or wet cleaning techniques shall be done prior to resuming abatement activities.

(f) Post Abatement Work Area Deregulation

The Contractor shall remove all remaining polyethylene, including critical barriers, drop-cloths, and Decontamination Enclosure Systems. HEPA vacuum and/or wet wipe any visible residue which is uncovered during this process. All waste generated during this disassembly process shall be discarded as ACM waste.

A final visual inspection of the work area shall be conducted by the Competent Person and the Project Monitor to ensure that all visible accumulations of suspect materials have been removed and that no equipment or materials associated with the abatement project remain.

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 Engineer.

(g) Waste Disposal

Unless otherwise specified, all removed materials and debris resulting from execution of this project shall become the responsibility of the Contractor and removed from the premises. Materials not scheduled for reuse shall be removed from the site and disposed of in accordance with all applicable Federal, State and Local requirements.

Waste removal dumpsters and cargo areas of transport vehicles shall be lined with a layer of six (6) mil polyethylene sheeting to prevent contamination from leaking or spilled containers. Floor sheeting shall be installed first, and shall be extended up sidewalls 12-inches. Wall sheeting shall overlap floor sheeting 24-inches and shall be taped into place.

OSHA “Danger” signs must be attached to vehicles used to transport asbestos-containing waste prior to loading ACM waste. The signs must be posted so that they are plainly visible.

Ensure all waste containers (bags, drums, etc.) are properly packed, sealed and labeled with USEPA NESHAP generator labels, OSHA danger labels and DOT shipping labels. For each shipment of ACM waste, the Contractor shall complete an EPA-approved asbestos waste shipment record.

Authorized representatives signing waste shipment records on behalf of the generator must have USDOT Shipper Certification training in accordance with HMR 49 CFR Parts 171-180.

Transport vehicles hauling ACM waste shall have appropriate USDOT placards visible on all four (4) sides of the vehicle.

The Contractor shall dispose of asbestos-containing and/or asbestos contaminated material at an EPA authorized site and must be in compliance with the requirements of the Special Waste Provisions of the Office of Solid Waste Management, Department of Energy & Environmental Protection, State of Connecticut, or other designated agency having jurisdiction over solid waste disposal.

Any asbestos-containing and/or asbestos-contaminated waste materials which also contain other hazardous contaminants shall be disposed of in accordance with the EPA’s Resource Conservation and Recovery Act (RCRA), CTDEEP and ConnDOT requirements. Materials may be required to be stored on-site and tested by the Project Monitor to determine proper waste disposal requirements.

(h) Project Closeout Data:

1. Provide the Engineer, within 30 days of completion of asbestos abatement, a compliance package; which shall include, but not be limited to, the following:
  - a. Asbestos Abatement Site Supervisor job log;
  - b. OSHA personnel air sampling data;
  - c. Completed waste shipment records.

The Contractor shall submit the original completed waste shipment records to the Engineer.

**Method of Measurement:**

No measurement will be made for the work in this Section. The completed work shall be paid as a lump sum.

**Basis of Payment:**

The lump sum bid price for this item shall include the specialty services of the Asbestos Removal Contractor including: labor, materials, equipment, insurance, permits, notifications, submittals, personal air sampling, personal protection equipment, temporary enclosures, utility costs, incidentals, fees and labor incidental to the removal, transport and disposal of ACM, including close out documentation.

Final payment for asbestos abatement will not be made until all the project closeout data submittals have been completed (including waste shipment record(s) signed by an authorized disposal facility representative) and provided to the Engineer. Once the completed package has been received in its entirety, the Engineer will make the final payment to the Contractor.

<u>Pay Item</u>	<u>Pay Unit</u>
Asbestos Abatement	Lump Sum

## **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 RCOSA 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 construction and demolition (C&D) lead debris bulky 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 ug/m<sup>3</sup>, 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 Contractors 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. 03903, Mosher Street over Amtrak RR, Groton, CT**

- **Lead paint was identified on the metal road barriers, metal pipe/conduit along south side sidewalk, structural steel/metal bridge components and the wooden sidewalk fence of Bridge No. 03903.**

<b>Girders, Bearings, Cross Beams, Beam Ends, etc.</b>	<b>Metal</b>	<b>Black</b>	<b>0.5-8.2 mg/cm<sup>2</sup></b>
<b>Metal Road Barriers</b>	<b>Metal</b>	<b>Grey</b>	<b>1.6 mg/cm<sup>2</sup></b>
<b>Metal Pipe/Conduit along side walk</b>	<b>Metal</b>	<b>Grey</b>	<b>14 mg/L</b>
<b>Wooden side walk fencing</b>	<b>Wood</b>	<b>Green</b>	<b>1.0-1.9 mg/cm<sup>2</sup></b>

- **TCLP waste stream sampling/analysis of the metal road barriers, metal pipe/conduit along south side sidewalk and structural steel/metal bridge components, characterized the paint waste as RCRA Hazardous waste.**

<b>Paint debris (structural steel/metal bridge components)</b>	<b>1300 mg/L</b>
<b>Paint debris (metal road barriers)</b>	<b>240 mg/L</b>
<b>Paint debris (metal pipe/conduit)</b>	<b>14 mg/L</b>

- **TCLP waste stream sampling/analysis of the green painted wood side walk fencing, characterized the waste as Non-Hazardous C&D bulky waste.**

<b>Paint debris (wood fencing)</b>	<b>2.6 mg/L</b>
------------------------------------	-----------------

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

- a. **Remove the paint to be impacted prior to impacting the metal in accordance with OSHA Lead in Construction Standard 29CFR 1926.62, or**
- b. **Impact the metal 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.**

**On Bridge No. 03903, the Engineer has characterized the paint waste streams associated with the metal road barriers, metal pipe/conduit along south side sidewalk and structural steel/metal bridge components as RCRA Hazardous waste. If the paint is removed from the metal surfaces, the paint shall be handled and disposed of in accordance with USEPA/CTDEEP Hazardous Waste Regulations as described under this Item 0020903A.**

**On Bridge No. 03903, the Engineer has also characterized the waste stream associated with the green painted wood side walk fencing as Non-Hazardous C&D bulky waste. If the wood painted fencing is required to be removed it shall be handled and disposed of as nonhazardous, non-RCRA bulky waste 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:

Non-metallic building debris waste materials tested and found to be non-hazardous Construction and Demolition (C&D) bulky waste shall be disposed of properly at a CTDEEP approved Solid Waste landfill as described under this Item 0020903A.



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	ACV Enviro(CycleChem)(General Chem Co) 217 South First Street, Elizabeth, NJ 07206 Phone: (908) 355-5800; Fax (908) 355-0562
Triumverate (EnviroSafe Corp Northeast) (Jones Environmental Services (NE), Inc.) 263 Howard Street, Lowell, MA 01852 Phone: (978) 453-7772; Fax: (978) 453-7775	US Ecology Environmental Quality Detroit, Inc. 1923 Frederick Street, Detroit, MI 48211 Phone: (800) 495 -6059; Fax: (313) 923-3375
Stericycle (Republic Environmental Systems) 2869 Sandstone Drive, Hatfield, PA 19440 Phone: (215) 822-8995; Fax: (215) 997-1293	Clean Harbors – Spring Grove Facility 4879 Spring Grove Ave, Cincinnati OH 45322 Phone: (513) 681-6242; Fax: (513) 681-0869
Envirite of PA (US Ecology) 730 Vogelsong Road, York, PA 17404 Phone: (717) 846-1900; Fax: (717) 854-6757	Stablex, Canada, Inc. 760 Industrial Bl, Blainville Quebec J7C3V4 Phone: (451) 430-9230; Fax: (451) 430-4642

<p>Environmental Quality Company: Wayne Disposal Facility 49350 North I-94 Service Drive Belleville, MI 48111 Phone: (800) 592-5489; Fax: (800) 592-5329</p>	<p>Stericycle (Northland Environmental, Inc.) (PSC Environmental Systems) 275 Allens Avenue, Providence, RI 02905 Phone: (401) 781-6340; Fax: (401) 781-9710</p>
--	--

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, while materials characterized as non-hazardous shall be disposed of as non-hazardous CTDEEP Solid Waste.

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 coordinate 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 polices, 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 non-hazardous lead construction and demolition (C&D) waste disposal or recycling and 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 and/or non-hazardous, non-RCRA 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 #0101000A - ENVIRONMENTAL HEALTH AND SAFETY**

### **Description:**

Under this Item, the Contractor shall establish protocols and provide procedures to protect the health and safety of its employees and subcontractors as related to the proposed construction activities performed within the Project Area of Environmental Concern (AOEC). Work under this Item consists of the development and implementation of a written site-specific Health and Safety Plan (HASP) that addresses the relative risk of exposure to documented hazards present within Project limits. The HASP shall establish health and safety protocols that address the relative risk of exposure to regulated substances in accordance with 29 CFR 1910.120 and 29 CFR 1926.65. Such protocols shall only address those concerns directly related to site conditions.

**Note:** The Engineer will prepare a site-specific health and safety plan which is compatible with the Contractor's plan and will be responsible for the health and safety of all Project Inspectors, Department employees and consulting engineers.

### **Materials:**

The Contractor must provide chemical protective clothing (CPC) and personal protective equipment (PPE) as stipulated in the Contractor's HASP during the performance of work in areas identified as potentially posing a risk to worker health and safety for workers employed by the Contractor and all subcontractors.

### **Construction Methods:**

**1-Existing Information:** The Contractor shall utilize all available information and existing records and data pertaining to chemical and physical hazards associated with any of the regulated substances identified in the environmental site investigations to develop the HASP. A list of documents containing this data is found in "Notice to Contractor – Environmental Investigations".

**2-General:** The requirements set forth herein pertain to the provision of workers' health and safety as it relates to proposed Project activities when performed in the presence of hazardous or regulated materials or otherwise environmentally sensitive conditions. THE PROVISION OF WORKER HEALTH AND SAFETY PROTOCOLS WHICH ADDRESS POTENTIAL AND/OR ACTUAL RISK OF EXPOSURE TO SITE SPECIFIC HAZARDS POSED TO CONTRACTOR EMPLOYEES IS SOLELY THE RESPONSIBILITY OF THE CONTRACTOR.

The Contractor shall be responsible for the development, implementation and oversight of the HASP throughout the performance of work within the Project, as identified in the Contract Documents, and in other areas identified by the Engineer, where site conditions may pose a risk

to worker health and safety and/or the environment. **No physical aspects of the work within the Project shall begin until the HASP is reviewed by the Engineer and is determined to meet the requirements of the specifications. However, the Contract time, in accordance with Article 1.03.08, will begin on the date stipulated in the Notice to Proceed.**

**3-Regulatory Requirements:** All construction related activities performed by the Contractor within the limits of the Project, or in other areas where site conditions may pose a risk to worker health and safety and/or the environment, shall be performed in conformance with 29 CFR 1926, Safety and Health Regulations for Construction and 29 CFR 1910, Safety and Health Regulations for General Industry. Conformance to 29 CFR 1910.120, Hazardous Waste Site Operations and Emergency Response (HAZWOPER) may also be required, where appropriate.

**4-Submittals:** Three copies of the HASP shall be submitted to the Engineer within four (4) weeks after the Award of Contract or four (4) weeks prior to the start of any work in the AOEC, but not before the Award of the Contract. The HASP shall include copies of the Contractor-designated Health and Safety Officer's (HSO) training certificates as well as a demonstration of the required experience, as indicated in Section 5-HASP Provisions (b) (iii) of this Item.

The HASP shall be developed by a qualified person designated by the Contractor. This qualified person shall be a Certified Industrial Hygienist (CIH), Certified Hazardous Material Manager (CHMM), or a Certified Safety Professional (CSP). The qualified person shall have review and approval authority over the HASP and be identified as the Health and Safety Manager (HSM). The HASP shall bear the signature of said HSM indicating that the HASP meets the minimum requirements of 29 CFR 1910.120 and 29 CFR 1926.65.

The Engineer will review the HASP within four (4) weeks of submittal and provide written comments as to deficiencies in and/or exceptions to the plan, if any, to assure consistency with the specifications, applicable standards, policies and practices, and appropriateness given potential or known site conditions. Items identified in the HASP which do not conform to the specifications will be brought to the attention of the Contractor, and the Contractor shall revise the HASP to correct the deficiencies and resubmit it to the Engineer for determination of compliance with this Item. The Contractor shall not be allowed to commence work activities in the Project, or commence work in other areas where site conditions exist which may pose a risk to worker health and safety and/or the environment, until the HASP has been reviewed and accepted by the Engineer. No claim for delay in the progress of work will be considered for the Contractor's failure to submit a HASP that conforms to the requirements of the Contract.

### **5-HASP Provisions:**

(a) General Requirements: The Contractor shall prepare a HASP covering all Project site work regulated by 29 CFR 1910.120(b)/ 1926.65(b) to be performed by the Contractor and all subcontractors under this Contract. The HASP shall establish in detail, the protocols necessary for the recognition, evaluation, and control of all hazards associated with each task performed under this Contract. The HASP shall address site-specific safety and health hazards of each phase of site operation and include the requirements and procedures for employee protection. The level of detail provided in the HASP shall

be tailored to the type of work, complexity of operations to be performed, and hazards anticipated. Details about some activities may not be available when the initial HASP is prepared and submitted. Therefore, the HASP shall address, in as much detail as possible, all anticipated tasks, their related hazards and anticipated control measures.

The HASP shall interface with the Contractor's Safety and Health Program. Any portions of the Safety and Health Program that are referenced in the HASP shall be included as appendices to the HASP. All topics regulated by the 29 CFR 1910.120(b)(4) and those listed below shall be addressed in the HASP. Where the use of a specific topic is not applicable to the Project, the HASP shall include a statement to justify its omission or reduced level of detail and establish that adequate consideration was given the topic.

(b) Elements:

(i) Site Description and Contamination Characterization: The Contractor shall provide a site description and contaminant characterization in the HASP that meets the requirements of 29 CFR 1910.120/1926.65.

(ii) Safety and Health Risk Analysis/Activity Hazard Analysis: The HASP shall address the safety and health hazards on this site for every operation to be performed. The Contractor shall review existing records and data to identify potential chemical and physical hazards associated with the site and shall evaluate their impact on field operations. Sources, concentrations (if known), potential exposure pathways, and other factors as noted in CFR 1910.120/126.65, paragraph (c)(7) employed to assess risk shall be described. The Contractor shall develop and justify action levels for implementation of engineering controls and PPE upgrades and downgrades for controlling worker exposure to the identified hazards. If there is no permissible exposure limit (PEL) or published exposure level for an identified hazard, available information from other published studies may be used as guidance. Any modification of an established PEL must be fully documented.

The HASP shall include a comprehensive section that discusses the tasks and objectives of the site operations and logistics and resources required to complete each task. The hazards associated with each task shall be identified. Hazard prevention techniques, procedures, and/or equipment shall be identified to mitigate each of the hazards identified.

(iii) Staff Organization, Qualifications and Responsibilities: The HASP shall include a list of personnel expected to be engaged in site activities and certify that said personnel have completed the educational requirements stipulated in 29 CFR 1910.120 and 29 CFR 1926.65, are currently monitored under a medical surveillance program in compliance with those regulations, and that they are fit for work under "level C" conditions.

The Contractor shall assign responsibilities for safety activities and procedures. An outline or flow chart of the safety chain of command shall be provided in the HASP.



Qualifications, including education, experience, certifications, and training in safety and health for all personnel engaged in safety and health functions shall be documented in the HASP. Specific duties of each on-site team member should be identified. Typical team members include but are not limited to Team Leader, Scientific Advisor, Site Safety Officer, Public Information Officer, Security Officer, Record Keeper, Financial Officer, Field Team Leader, and Field Team members.

The HASP shall also include the name and qualifications of the individual proposed to serve as Health and Safety Officer (HSO). The HSO shall have full authority to carry out and ensure compliance with the HASP. The Contractor shall provide a competent HSO on-site who is capable of identifying existing and potential 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 or control them. The qualifications of the HSO shall include completion of OSHA 40-hour HAZWOPER training (including current 8-hour refresher training); 8-hour HAZWOPER supervisory training; a minimum of one (1) year of working experience with the regulated compounds that have been documented to exist within Project limits; a working knowledge of Federal and State safety regulations; specialized training or documented experience (one (1) year minimum) in personal and respiratory protective equipment program implementation; the proper use of air monitoring instruments, air sampling methods, and procedures; and certification training in first aid and CPR by a recognized, approved organization such as the American Red Cross.

The primary duties of the HSO shall be those associated with worker health and safety. The Contractor's HSO responsibilities shall be detailed in the written HASP and shall include, but not be limited to the following:

- (A) Directing and implementing the HASP.
- (B) Ensuring that all Project personnel have been adequately trained in the recognition and avoidance of unsafe conditions and the regulations applicable to the work environment to control or eliminate any hazards or other exposure to illness or injury (29 CFR 1926.21). All personnel shall be adequately trained in procedures outlined in the Contractor's written HASP.
- (C) Authorizing Stop Work Orders, which shall be executed upon the determination of an imminent health and safety concern.
- (D) Contacting the Contractor's HSM and the Engineer immediately upon the issuance of a Stop Work order when the HSO has made the determination of an imminent health and safety concern.
- (E) Authorizing work to resume, upon approval from the Contractor's HSM.
- (F) Directing activities, as defined in the Contractor's written HASP, during

emergency situations; and

(G) Providing personal monitoring where applicable and as identified in the HASP.

(iv) Employee Training Assignments: The Contractor shall develop a training program to inform employees, supplier's representatives, and official visitors of the special hazards and procedures (including PPE, its uses and inspections) to control these hazards during field operations. Official visitors include but are not limited to Federal Agency Representatives, State Agency Representatives, Municipal Agency Representatives, Contractors, subcontractors, etc. This program shall be consistent with the requirements of 29 CFR 1910.120 and 29 CFR 1926.65.

(v) Personal Protective Equipment: The plan shall include the requirements and procedures for employee protection and should include a detailed section on respiratory protection. The Contractor shall describe in detail and provide appropriate PPE to insure that workers are not exposed to levels greater than the action level for identified hazards for each operation stated for each work zone. The level of protection shall be specific for each operation and shall be in compliance with all requirements of 29 CFR 1910 and 29 CFR 1926. The Contractor shall provide, maintain, and properly dispose of all PPE.

(vi) Medical Surveillance Program: All on-site Contractor personnel engaged in 29 CFR 1910.120/1926.65 operations shall have medical examinations meeting the requirements of 29 CFR 1910.120(f) prior to commencement of work.

The HASP shall include certification of medical evaluation and clearance by the physician for each employee engaged in 29 CFR 1910.120/1926.65 operations at the site.

(vii) Exposure Monitoring/Air Sampling Program: The Contractor shall submit an Air Monitoring Plan as part of the HASP which is consistent with 29 CFR 1910.120, paragraphs (b)(4)(ii)(E), (c)(6), and (h). The Contractor shall identify specific air sampling equipment, locations, and frequencies in the air-monitoring plan. Air and exposure monitoring requirements shall be specified in the Contractor's HASP. The Contractor's CIH shall specify exposure monitoring/air sampling requirements after a careful review of the contaminants of concern and planned site activities.

(viii) Site Layout and Control: The HASP shall include a map, work zone delineation (support, contamination, reduction, and exclusion), on/off-site communications, site access controls, and security (physical and procedural).

(ix) Communications: Written procedures for routine and emergency communications procedures shall be included in the Contractor's HASP.

(x) Personal Hygiene, Personal Decontamination and Equipment Decontamination: Decontamination facilities and procedures for PPE, sampling equipment, and heavy equipment shall be discussed in detail in the HASP.

(xi) Emergency Equipment and First Aid Requirements: The Contractor shall provide appropriate emergency first aid kits and equipment suitable to treat exposure to the hazards identified, including chemical agents. The Contractor will provide personnel that have certified first aid/CPR training on-site at all times during site operations.

(xii) Emergency Response Plan and Spill Containment Program: The Contractor shall establish procedures in order to take emergency action in the event of immediate hazards (i.e., a chemical agent leak or spill, fire or personal injury). Personnel and facilities supplying support in emergency procedures will be identified. The emergency equipment to be present on-site and the Emergency Response Plan (ERP) procedures, as required 29 CFR 1910.120, paragraph (1)(1)(ii) shall be specified in the ERP. The ERP shall be included as part of the HASP. This ERP shall include written directions to the closest hospital as well as a map showing the route to the hospital.

(xiii) Logs, Reports and Record Keeping: The Contractor shall maintain safety inspections, logs, and reports, accident/incident reports, medical certifications, training logs, monitoring results, etc. All exposure and medical monitoring records are to be maintained according to 29 CFR 1910 and 29 CFR 1926. The format of these logs and reports shall be developed by the Contractor to include training logs, daily logs, weekly reports, safety meetings, medical surveillance records, and a phase-out report. These logs, records, and reports shall be maintained by the Contractor and be made available to the Engineer.

The Contractor shall immediately notify the Engineer of any accident/incident. Within two working days of any reportable accident, the Contractor shall complete and submit to the Engineer an accident report.

(xiv) Confined space entry procedures: Confined space entry procedures, both permit required and non-permit required, shall be discussed in detail.

(xv) Pre-entry briefings: The HASP shall provide for pre-entry briefings to be held prior to initiating any site activity and at such other times as necessary to ensure that employees are apprised of the HASP and that this plan is being followed.

(xvi) Inspections/audits: The HSM or HSO shall conduct inspections or audits to determine the effectiveness of the HASP. The Contractor shall correct any deficiencies in the effectiveness of the HASP.

**6-HASP Implementation:** The Contractor shall implement and maintain the HASP throughout the performance of work. In areas identified as having a potential risk to worker health and safety, and in any other areas deemed appropriate by the HSO, the Contractor shall be prepared

to immediately implement the appropriate health and safety measures, including but not limited to the use of PPE, and engineering and administrative controls.

If the Engineer observes deficiencies in the Contractor's operations with respect to the HASP, they shall be assembled in a written field directive and given to the Contractor. The Contractor shall immediately correct the deficiencies and respond, in writing, as to how each was corrected. Failure to bring the work area(s) and implementation procedures into compliance will result in a Stop Work Order and a written directive to discuss an appropriate resolution(s) to the matter. When the Contractor demonstrates compliance, the Engineer shall remove the Stop Work Order. If a Stop Work Order has been issued for cause, no delay claims on the part of the Contractor will be honored.

Disposable CPC/PPE, i.e. disposable coveralls, gloves, etc., which come in direct contact with hazardous or potentially hazardous material shall be placed into 55-gallon USDOT 17-H drums and disposed of in accordance with Federal, State, and local regulations. The drums shall be temporarily staged and secured until the material is appropriately disposed.

**7-HASP Revisions:** The HASP shall be maintained on-site by the Contractor and shall be kept current with construction activities and site conditions under this Contract. The HASP shall be recognized as a flexible document which shall be subject to revisions and amendments, as required, in response to actual site conditions, changes in work methods and/or alterations in the relative risk present. All changes and modifications shall be signed by the Contractor's HSM and shall require the review and acceptance by the Engineer prior to the implementation of such changes.

Should any unforeseen hazard become evident during the performance of the work, the HSO shall bring such hazard to the attention of the Contractor and the Engineer as soon as possible. In the interim, the Contractor shall take action, including Stop Work Orders and/or upgrading PPE as necessary to re-establish and maintain safe working conditions and to safeguard on-site personnel, visitors, the public, and the environment. The HASP shall then be revised/amended to reflect the changed condition.

**Method of Measurement:**

1-Within thirty (30) calendar days of the award of the Contract, the Contractor shall submit to the Engineer for acceptance a breakdown of the lump sum bid price for this Item detailing:

- (a) The development costs associated with preparing the HASP in accordance with these Specifications.
- (b) The cost per month for the duration of the Project to implement the HASP and provide the services of the HSM and the HSO.

2-If the lump sum bid price breakdown is unacceptable to the Engineer; substantiation showing that the submitted costs are reasonable shall be required.

3-Upon acceptance of the payment schedule by the Engineer, payments for work performed will be made as follows:

- (a) The lump sum development cost will be certified for payment.
- (b) The Contractor shall demonstrate to the Engineer monthly that the HASP has been kept current and is being implemented, and the monthly cost will be certified for payment.
- (c) Any month where the HASP is found not to be current or is not being implemented, the monthly payment for the Environmental Health and Safety Item shall be deferred to the next monthly payment estimate. If the HASP is not current or being implemented for more than thirty (30) calendar days, there will be no monthly payment.
- (d) Failure of the Contractor to implement the HASP in accordance with this Specification shall result in the withholding of all Contract payments.

**Basis of Payment:**

This work will be paid for at the Contract lump sum price for “Environmental Health and Safety” which shall include all materials, tools, equipment, and labor incidental to the completion of this Item for the duration of the Project to maintain, revise, monitor, and implement the HASP. Such costs include providing the services of the HSM and HSO, Contractor employee training, CPC, PPE, disposal of PPE and CPC, medical surveillance, decontamination facilities, engineering controls, monitoring, and all other HASP protocols and procedures established to protect the Health and Safety for all on-site workers.

Pay Item	Pay Unit
Environmental Health and Safety	L.S.

## **ITEM #0101143A – HANDLING AND DISPOSAL OF REGULATED ITEMS**

### **Description:**

Work under this item shall include the management (handling and disposal) of regulated items and all associated work by persons who are employed by a CTDEEP permitted Spill Contractor and trained/certified in accordance with OSHA Hazard Communication regulations. Regulated items include hazardous and other materials and wastes, the disposal of which is restricted by Federal and/or State laws and regulations, and which may be a component of equipment or other items located on-site. Regulated items include those listed herein, or additional similar items identified on site by the Engineer. Work under this item does not include asbestos containing materials, lead paint, contaminated or hazardous soils.

Activities shall be performed in accordance with, but not limited to, the current revision of the USEPA & CTDEEP Hazardous Waste Regulations (40 CFR 260-282, 22a-209 and 22a-449(c)), USEPA PCB Regulations (40 CFR 761), USEPA Protection of Stratospheric Ozone (40 CFR 82), OSHA Hazard Communication (29 CFR 1910.1200), OSHA Hazardous Waste & Emergency Response Regulations (29 CFR 1910.120), USDOT Hazardous Materials Regulation (49 CFR 171-180), OSHA, RCRA, CERCLA, CAA, TSCA, and all other laws and regulations.

The work activities include the removal, handling, packing, labeling, transport, manifesting, and recycling or disposal of various regulated items at the Project site prior to beginning planned renovation/demolition activities.

The Contractor is solely responsible for verifying actual locations and quantities of the items with hazardous/regulated material/waste constituents and for their proper handling and disposal. The recycling or proper disposal, as appropriate, of all regulated items shall be completed prior to the initiation of any demolition or renovation activities.

### **Materials:**

All materials shall be suitable for the management of regulated items and shall meet all applicable federal, state and local regulations. Such materials include, but are not limited to, proper containers, packing materials, labels, signs, shipping papers, personnel protective equipment (PPE) and spill kits.

### **Construction Methods:**

#### **(1) Allowable Disposal/Recycling Facilities**

**Disposal facilities for RCRA-hazardous, TSCA-hazardous, Connecticut Regulated, and Universal wastes shall be chosen from among those listed below. No other facility shall be used for these types of wastes without the written approval of the Engineer.**

Rev. Date 06/20/19

Advanced Disposal Services  
Greentree Landfill 635  
Toby Road  
Kersey, PA 15846  
Phone: (814) 265-1744 Fax: (814) 265-8745  
MSW, C&D, asbestos, PCB remediation waste <50  
ppm, petroleum contaminated soils, nonhazardous solid  
wastes

Advanced Disposal  
(managed by Interstate Waste Services)  
7095 Glades Pike  
Summerset, PA 15501  
Phone: (814) 444-0112 Fax: (814) 444-0127  
MSW, C&D debris, residual waste, sewer sludge,  
incinerator ash, asbestos

Allied Waste Niagara Falls Landfill, LLC 5600  
Niagara Falls Blvd.  
Niagara, NY 14304  
Phone: (716) 285-3344 Fax: (716) 285-3398  
Non-hazardous waste, industrial solid waste, municipal  
sewage treatment sludge, contaminated soil & debris,  
asbestos waste, C&D debris, industrial process sludge

American Lamp Recycling, LLC  
26 Industrial Way  
Wappingers Falls, NY 12590  
Phone: (845) 896-0058 Fax: (845) 896-1520  
Mercury containing device, universal waste

Tradebe (Bridgeport United Recycling, Inc.)  
50 Cross Street  
Bridgeport, CT 06610  
Phone: (203) 334-1666 Fax: (203) 334-1439  
RCRA & CRW waste oil, fuel, wastewater

Clean Earth of Carteret

24 Middlesex Ave.,  
Carteret, NJ 07008  
Phone: (732) 541-8909 Fax: (732) 541-8505  
Concrete, brick, block, street sweepings, stone, rock,  
asphalt and petroleum contaminated soil

Clean Earth of Philadelphia, Inc.  
3201 South 61 St.,  
Philadelphia, PA 19153  
Phone: (215) 724-5520 Fax: (215) 724-2939  
Petroleum contaminated soil

Clean Earth of North Jersey, Inc. (aka CENJ)  
115 Jacobus Ave,  
South Kearny, NJ 07105  
Phone: (973) 344-4004 Fax: (973) 344-8652  
RCRA liquid and solid, asbestos

Clean Earth of Southeast Pennsylvania, Inc.  
7 Steel Road,  
Morrisville, PA 19067  
Phone: (215) 428-1700 Fax: (215) 428-1704  
Petroleum contaminated soil

Clean Harbors Environmental Services, Inc.  
2247 South Hwy. 71,  
Kimball, NE 69145  
Phone: (308) 235-1012 Fax: (308) 235-4307  
RCRA liquid, solid & sludge

Clean Harbors Environmental Services, Inc.  
Cleveland Facility  
2900 Rockefeller Ave.,  
Cleveland, OH 44115  
Phone: (216) 429-2401 Fax: (216) 883-1918 RCRA  
liquid: aqueous organic & inorganic wastewater

Clean Harbors Environmental Services, Inc.  
Spring Grove Facility  
4879 Spring Grove Ave.,  
Cincinnati, OH 45232  
Phone: (513) 681-6242 Fax: (513) 681-0869

RCRA liquid, solid & sludge: aqueous organic & inorganic wastewater, PCB wastewater treatment

Phone: (717) 729-2060 Fax: (717) 423-6822  
Municipal solid waste, non-hazardous waste

Clean Harbors of Baltimore, Inc.  
1910 Russell St,  
Baltimore, MD 21230  
Phone: (410) 244-8200 Fax: (410) 752-2647 RCRA  
liquid: aqueous organic & inorganic wastewater

ACV Enviro (aka Cycle Chem & General  
Chemical Corp.)  
217 South First Street,  
Elizabeth, NJ 07206  
Phone: (908) 355-5800 Fax: (908) 355-0562  
RCRA, TSCA liquid and solid

Clean Harbors of Braintree, Inc.  
1 Hill Avenue,  
Braintree, MA 02184  
Phone: (781) 380-7134 Fax: (781) 380-7193  
RCRA & TSCA liquid & solid

Envirite of PA (US Ecology)  
730 Vogelsong Road,  
York, PA 17404  
Phone: (717) 846-1900 Fax: (717) 854-6757  
RCRA hazardous wastes

Clean Harbors of Connecticut, Inc.  
51 Broderick Road,  
Bristol, CT 06010  
Phone: (860) 583-8917 Fax: (860) 583-1740  
RCRA & CRW liquid

Environmental Quality Company:  
Wayne Disposal Facility  
(aka EQ Michigan Disposal Waste Treatment  
Plant and Wayne Disposal Inc. Site #2) 49350  
North I-94 Service Drive  
Belleville, MI 48111  
Phone: (734) 697-2200 Fax: (734) 699-3499  
RCRA & TSCA liquid and solid

Clean Harbors of Woburn  
(Murphy's Waste Oil Services, Inc.)  
252 Salem Street,  
Woburn, MA 01801  
Phone: (781) 935-9066 Fax: (781) 935-8615  
RCRA liquid: oil, oil/water mixtures; CRW oil filters,  
oily soil & debris, F001/F002 contaminated oils,  
antifreeze

US Ecology (Environmental Quality Detroit Inc.)  
1923 Frederick Street,  
Detroit MI 48211  
Phone: (734) 329-8017 Fax: (313) 923-3375  
RCRA & CRW liquid wastewater  
Environmental Soil Management of New York,  
LLC (ESMI of New York)  
304 Towpath Road,  
Fort Edward, NY 12828  
Phone: (518) 747-5500 Fax: (518) 747-1181  
Petroleum contaminated soil

Clinton Landfill  
242 Church Street  
Clinton, MA 01510  
Phone: (978) 365-4110 Fax: (978) 365-4106  
Comm-97 soils and other materials subject to a BUD  
and additional review by MADEP (\*2-week lead time  
for review by MADEP)

Environmental Soil Management of NH 67  
International Dr.  
Loudon, NH 03307  
Phone: (603) 783-0228 Fax: (603) 783-0104  
Petroleum contaminated soil

Colonie Landfill (Waste Connections, Inc.)  
1319 Loudon Rd,  
Cohoes, New York 12047  
Phone: (518) 783-2827 Fax: (518) 786-7331  
Non-haz. wastes, special wastes, contaminated soil

Cumberland County Landfill  
(aka Community Refuse Services  
Managed by Interstate Waste Services)  
135 Vaughn Road,  
Shippensburg, PA 17257

Triumvirate (Formerly EnviroSafe Corporation  
Northeast & Jones Environmental Services)  
263 Howard Street,  
Lowell, MA 01852  
Phone: (978) 453-7772 Fax: (978) 453-7775



RCRA & TSCA liquid and solid

Hazelton Creek Properties, LLC\*  
(Hazelton Mine Reclamation Project)  
280 South Church St.,  
Hazelton, PA 18201

Phone: (570) 574-1010 Fax: (570) 457-3395  
Fresh, brackish or marine dredge material, coal ash,  
cement kiln dust, lime kiln dust, co-gen ash, regulated  
fill

\*Please note that if this facility is to be used, each bin  
letter will require an additional 10 day (or more)  
waiting period on top of the 15 day lab period  
designated in the specs to allow for PADEP review.

Heritage Hazardous Waste Landfill (Heritage  
Environmental Services, LLC)  
4370 W County Rd 1275 N  
Roachdale, IN 46172  
Phone:( 765) 435-2704 Fax: (315) 687-3898  
Hazardous Wastes, Asbestos

Manchester Landfill  
311 Olcutt St.,  
Manchester, CT 06040  
Phone: (860) 647-3248 Fax: (860) 647-3238  
Municipal solid waste, non-hazardous waste,  
contaminated soil

Northeast Lamp Recycling, Inc.  
250 Main Street,  
East Windsor, CT 06088  
Phone: (860) 292-1992 Fax: (860) 292-1114  
CRW solid waste, mercury containing devices &  
universal waste  
Stericycle (Northland Environmental, LLC)  
(aka PSC Environmental Systems)  
275 Allens Ave.,  
Providence RI 02905  
Phone: (401) 781-6340 Fax: (401) 781-9710  
RCRA liquid and solid

Ontario County Landfill  
(Managed by Casella Waste)  
3555 Post Farm Road,  
Stanley, NY 14561  
Phone: (585) 526-4420 Fax: (585) 526-5459  
Municipal solid waste, non-hazardous waste solid,  
special wastes including asbestos, ash from  
boilers/incinerators, contaminated soil, demo debris

Paradise Heating Oil, Inc.  
Quimby Street,  
Ossining, NY 10562  
Phone: (631) 926-2576 Fax: (718) 294-2226  
CRW waste oil liquid

Phoenix Soil, LLC  
58 North Washington Street  
Plainville, CT 06062  
Phone: (860) 747-8888 Fax: (203) 757-4933  
Contaminated Soil

Red Technologies Soil  
232 Airline Avenue Portland,  
CT 06980  
Phone: (860) 342-1022 Fax: (860) 342-1042  
Temporary Storage & Transfer of contaminated soil

Republic Services Conestoga Landfill  
420 Quarry Road  
Morgantown, PA 19543  
Phone: (610) 286-6844 Fax: (610) 286-7048  
MSW, C&D debris, residual waste, contaminated soil,  
asbestos \*Please note that if this facility is to be used,  
each bin letter will require an additional 10 day (or

more) waiting period on top of the 15 day lab period  
designated in the specs to allow for PADEP review.

Stericycle (Formerly Republic Environmental  
Systems (aka Philip Services Corporation (PSC)  
Republic)  
2869 Sandstone Dr.,  
Hatfield PA 19440  
Phone: (215) 822-8995 Fax: (215) 997-1293  
RCRA & TSCA industrial solid & sludge, aqueous  
waste, contaminated soil, PCB waste, oil & petroleum  
waste, organic waste Soil  
Safe, Inc.  
378 Route 130, Logan Township,  
Bridgeport NJ 08085  
Phone: (410) 872-3990 x1120  
Fax: (410) 872-9082  
Soil contaminated with petroleum or metals, some  
industrial waste solids

The Southbridge Recycling & Disposal Park 165  
Barefoot Rd.  
Southbridge, MA 01550  
Phone: (508) 765-9723, (603) 235-3597  
Fax: (508) 765-6812  
MSW, non-hazardous C & D waste, contaminated soil  
for cover

Stablex Canada, Inc.  
760 Industrial Blvd.  
Blainville Quebec J7C 3V4  
Phone: (450) 430-9230 Fax: (450) 430-4642  
RCRA liquid and solid, industrial wastes

Ted Ondrick Company, LLC  
58 Industrial Road,  
Chicopee, MA 01020  
Phone: (413) 592-2566 Fax: (413) 592-7451  
Petroleum contaminated soil

Tradebe Treatment & Recycling 136  
Gracey Ave.  
Meriden, CT 06451  
Phone: (203) 238-8114 Fax: (203) 238-6772  
RCRA, CRW wastewater, oil, hazardous waste fuels,  
hazardous and non-hazardous waste water

Tunnel Hill Reclamation

2500 Township Road, 205 Route 2  
New Lexington, OH 43764  
Phone: (914) 713-0203 Fax: (914) 713-0672  
Municipal solid waste, non-hazardous waste,  
contaminated soils

Solid: MSW, non-hazardous waste, C&D,  
contaminated soil for use as cover material under  
MADEP COMM-97 policy

Waste Management  
RCI Fitchburg  
Landfill  
Fitchburg Princeton Road,  
Westminister, MA 01473  
Phone: (978) 355-6821 Fax: (978) 355-6317

Turnkey Landfill (Waste Management of NH)  
TLR III Refuse Disposal Facility  
90 Rochester Neck Road, PO Box 7065  
Rochester, NH 03839  
Phone: (603) 330-2197 Fax: (603) 330-2130  
Solid: MSW, C&D, PCB remediation waste  
(<50ppm),  
virgin petroleum contaminated soil, CRW solid waste

The category of material accepted by each facility listed above is for informational purposes only. The Contractor shall verify facility acceptance of each type of regulated item.

**(2) Submittals**

Thirty (30) days prior to commencement of work involving the management of regulated items, the Contractor shall submit to the Engineer for approval, the following documentation:

1. Hazard communication training for all employees performing this work.
2. Biohazardous Waste Compliance Plan as outlined in Section 3(c)
3. Names of the treatment facilities, recycling facilities and/or disposal facilities the Contractor intends to use to receive each type of regulated item.
4. Hazardous Material Transporter USDOT Certificate of Registration for each waste transporter.
5. Hazardous Material Transporter Permit for the State of Connecticut, the destination state(s), and all other applicable states for each waste transporter.

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

**(3) Regulated Item Management Provisions**

**(a) General Requirements**

The Contractor’s OSHA Competent Person shall be in control on the job site at all times during hazardous material management work activities. This person must be capable of identifying existing hazards, possess the authority to implement corrective measures to reduce/eliminate the hazards, comply with applicable Federal, State and Local regulations that mandate work practices, and be capable of performing the work of this contract. All employees who perform regulated material management related work shall be properly trained and qualified to perform such duties.

All labor, materials, tools, equipment, services, testing, insurance, and incidentals which are necessary or required to perform the work in accordance with applicable governmental regulations, industry standards and codes, and these specifications, shall be provided by the Contractor.

Ladders and/or scaffolds shall be in compliance with OSHA requirements, and of adequate length, strength and sufficient quantity to support the scope of work. Use of ladders/scaffolds shall be in conformance with OSHA 29 CFR 1926 Subpart L and X requirements.

Work performed at heights exceeding six feet (6') shall be performed in accordance with the OSHA Fall Protection Standard 29 CFR 1926 Subpart M including the use of fall arrest systems as applicable.

Inventory data from investigative surveys throughout the buildings are included herein and are presented for informational purposes only. Under no circumstances shall this information be the sole means used by the Contractor for determining the quantities or extent of the regulated items to be managed. The Contractor shall be responsible for verification of all field conditions affecting performance of the work. The Contractor shall submit to the Engineer for concurrence any additional items not listed herein that it believes to be regulated items included under this item. However, compliance with applicable requirements is solely the responsibility of the Contractor.

The Engineer will provide a Project Monitor to monitor the activities of the Contractor and inspect the work required. Environmental sampling shall be conducted as deemed necessary by the Engineer. Spill areas shall be cleaned by the Contractor until accepted by the Engineer. The Engineer may sample the spill area to demonstrate Contractor compliance with an acceptable standard.

(b) Personnel Protection

Prior to commencing work, the Contractor shall provide hazard communication training to all employees as necessary in accordance with OSHA 29 CFR 1926.59 and 29 CFR 1910.1200 and instruct all workers in all aspects of personnel protection, work procedures, emergency procedures and use of equipment including procedures unique to this project. Worker health and safety protocols that address potential and/or actual risk of exposure to site specific hazards are solely the responsibility of the Contractor.

The Contractor shall provide respiratory protection that meets the requirements of OSHA as required in 29 CFR 1910.134 and 29 CFR 1926.1000. A formal respiratory protection program, including appropriate medical surveillance, must be implemented in accordance with OSHA standards. The Contractor shall, as necessary, conduct exposure assessment air sampling, analysis and reporting to ensure the workers are afforded appropriate respiratory protection.

The Contractor shall provide and require all workers to wear appropriate personnel protective equipment, including protective clothing and respiratory protection, as required, within regulated work areas which exceed OSHA Personnel Exposure Limits (PELs) or when handling hazardous materials.

(c) Regulated Item Management Work Procedures

The Contractor shall not begin work until the Project Monitor is on-site.

Prior to beginning work on-site, the Contractor shall prepare waste characterization profile forms for each type of waste stream to be generated and forward such forms to the Engineer for review, approval and signature. Upon approval, the Contractor shall forward such forms to the appropriate disposal facilities for acceptance.

The Contractor shall utilize all appropriate engineering controls and safety and protective equipment while performing the work in accordance with OSHA, USEPA, USDOT, CTDEEP and Connecticut Department of Public Health DPH regulations.

The Contractor shall employ work practices so as to minimize the disturbance of the constituents in the regulated items, and prevent breakage and spills. In the event of a spill, the Contractor shall cordon off the area and notify the Engineer. The Contractor is responsible to have spills and the effected areas decontaminated to the acceptance of the Engineer by personnel trained in hazardous waste operator emergency response.

The Contractor shall carefully and properly remove, handle, pack, label and manifest all of the regulated items in waste containers specified and suitable to contain the waste in accordance with all federal and state regulations.

Prior to transportation and recycling and/or disposal, all proper USEPA, OSHA, CTDEEP and USDOT labels and placards shall be affixed to the waste containers and hazardous materials shipping papers such as waste manifests/bills of lading shall be completed.

**Bridge No. 03903, Mosher Street over Amtrak RR, Groton, CT**

**Prior to rehabilitation work, properly remove, handle, pack, label, transport, manifest and recycle or dispose of the regulated items from those listed below:**

**The following hazardous/ regulated materials, wastes and items have been identified at Bridge No. 03903 and will be impacted by the bridge replacement work.**

**Homeless activity was observed in areas around Bridge No. 03903, including, but not limited to human waste, sharps, bedding/clothing, etc. with the potential for contamination with human fluids presenting a potential exposure to blood borne pathogens and a need for management/disposal as biohazardous waste.**

- **Biohazardous/Blood Borne Pathogen (BBP) Waste – human fecal waste, sharps, bedding, clothing with potential for contamination with human fluids.**

**The Contractor shall submit a Biohazardous Waste Compliance Work Plan to CTDOT outlining the exact procedures that will be used to perform the work and protect the employees performing the biohazardous waste work. No biohazardous work shall be started**

**by the Contractor until the Engineer has been notified and the Work Plan has been approved by the Engineer.**

**Regular construction/demolition (C&D) or trash from site shall not be mixed in with the potential biohaz materials (sharps/needles, feces, etc.)**

**No soil removal will be considered for payment under this Item without the approval of the Engineer.**

**Upon discovery of any previously unidentified regulated items during renovation activities, the Contractor shall immediately notify the Engineer and work shall cease in that area until the Engineer can determine the extent of any impact and proper handling procedures are implemented.**

Efforts shall be made to recycle the constituents of the regulated items rather than dispose of them in accordance with the waste minimization efforts required under RCRA.

RCRA hazardous waste shall not be stored on the job site in excess of 90 calendar days from the accumulation start date.

Connecticut Regulated Waste shall not be transported to a RCRA or TSCA permitted facility for disposal, unless otherwise allowed by the Engineer in writing.

All non-RCRA hazardous waste materials, regulated waste materials and recyclable waste items shall be manifested separately from RCRA and TSCA hazardous waste, and documented properly on non-hazardous waste manifests, waste shipment records, bills of lading or other appropriate shipping papers for transportation to the recycling and/or disposal facility.

The Contractor shall prepare each lab pack list and shipping document (manifests, waste shipment records, bills of lading, etc.) with all of the required information completed (including types of waste, proper shipping name, categories, packing numbers, amounts of waste, etc.) in accordance with applicable federal and state regulations. The document will be signed by an authorized agent representing ConnDOT as the Generator for each load that is packed to leave the site.

The Contractor shall forward the appropriate original copies of shipping papers to the Engineer the same day the regulated items leave the project site.

All vehicles departing the site transporting hazardous materials shall display proper USDOT placards, as appropriate for the type of waste being transported.

(d) Project Closeout Documents:

Within thirty (30) days after completion of the on-site project work, the Contractor shall submit to the Engineer copies of the following completed documents:

1. Hazardous Waste Manifests

2. Waste Shipment Records/Bills of Lading
3. Recycling Receipts

**Documents 1. through 3. must include the signature of an authorized disposal facility representative acknowledging receipt of hazardous materials.**

**Method of Measurement:**

The work of “Handling and Disposal of Regulated Items” shall be provided for in accordance with Article 1.04.05 – Extra Work.

**Basis of Payment:**

The work of “Handling and Disposal of Regulated Items” shall be paid for in accordance with Article 1.04.05 – Extra Work, which price shall include the management, removal, handling, packing, labeling, transport, manifesting, recycling or disposal of the regulated constituents in the specific equipment/items scheduled for impact at the project site, and all equipment, materials, tools and labor incidental to the work.

Final payment will not be made until completed copies of all Manifest(s), Waste Shipment Records, Bills of Lading and/or Recycling Receipts have been provided to the Engineer. Once completed and facility-signed copies have been received in their entirety, the Engineer will make the final payment.

<u>Pay Item</u>	<u>Pay Unit</u>
Handling and Disposal of Regulated Items	Estimate

END OF SECTION

## **ITEM #0202315A - DISPOSAL OF CONTROLLED MATERIALS**

### **Description:**

Work under this item shall consist of the direct loading, transportation, and final off-site disposal/ recycling/treatment of Controlled Materials (excluding dewatering fluids) that have been generated from various excavations within the Project limits and determined to be contaminated with regulated substances at non-hazardous levels. This contamination is documented in the report listed in the “Notice to Contractor – Environmental Investigations”.

The results contained in the environmental investigation reports listed in the “Notice to Contractor – Environmental Investigations” show levels of various contaminants that the Contractor may encounter during construction. Actual levels found during construction may vary and such variations will not be considered a change in condition provided the material can still be disposed as non-hazardous at one or more of the disposal facilities listed herein. The Controlled Materials have been properly characterized by the Engineer and shall be excavated, loaded, transported directly to, and treated/recycled/disposed of at a permitted treatment/recycle/disposal facility listed herein.

The Contractor must use one or more of the following Department-approved treatment/recycle/disposal facilities for the disposal of non-hazardous materials:

Clean Earth of Carteret 24 Middlesex Avenue Carteret, NJ 07008 (732) 541-8909; Cheryl Coffee	Clean Earth of Philadelphia 3201 S. 61 Street Philadelphia, PA 19153 (215) 724-5520; Mike Kelly
Clean Earth of New Jersey 115 Jacobus Avenue South Kearny, NJ 07105 (732) 541-8909; Cheryl Coffee	Clinton Landfill 242 Church Street Clinton, MA 01510 (978) 365-4110; Chris McGown
Colonie Landfill 1319 Loudon Road Cohoes, NY 12047 (518) 951-0794; Eric Morales (518) 783-2827	Cumberland County Landfill 135 Vaughn Road Shippensburg, PA 17257 (717) 729-2060; Don Demkoviz
Dudley Reclamation Project 123 Oxford Avenue Dudley, MA 01571 (978) 663-2623; Jarret Everton	ESMI of New York, LLC 304 Towpath Road Fort Edward, NY 12828 (518) 747-5500; Peter Hansen



ESMI of New Hampshire, LLC 67 International Drive Louden, NH 03307 (603) 783-0228; Stephen Raper	Hazelton Creek Properties, LLC * 280 South Church Street Hazelton, PA 18201 (570) 207-2000; Allen Swantek (570) 574-1010
Manchester Landfill 311 Olcott Street Manchester, CT 06040 (860) 647-3248; Brooks Parker	Ontario County Landfill 3555 Post Farm Road Stanley, New York 14561 (603) 235-3597; Scott Sampson
Clean Earth of Connecticut 58 North Washington Street Plainville, CT 06062 (860) 747-8888; Sue Brenner	Red Technologies LLC 232 Airline Avenue Portland, CT 06980 (860) 342-1022; Christopher Windangle
Republic Services Conestoga Landfill 420 Quarry Road Morgantown, PA 19543 (717) 246-4640; James Kuhn	Soil Safe, Inc. 378 Route 130 Logan Township Bridgeport, NJ 08085 (410) 872-3990 ext. 1123; Mike Kozak
Southbridge Recycling and Disposal Park 165 Barefoot Road Southbridge, MA 01550 (508) 765-9723; Scott Sampson	Ted Ondrick Company, LLC 58 Industrial Road Chicopee, MA 01020 (413) 592-2566; Alan Desrosiers
Waste Management: RCI Fitchburg Landfill Fitchburg Princeton Road Westminster, MA 01473 (978) 355 6821; Frank Sepiol	

\* Note: PADEP requires an additional 10 days (or more) to review analytical data and approve material for disposal prior to facility acceptance of material. This is in addition to all other restrictions and wait periods defined below.

The above list contains treatment/recycle/disposal facilities which can accept the waste stream generated by the Project in quantities that may be limited by their permits and their operations restrictions. It is the responsibility of the Contractor to verify that a facility will be available and capable of handling the volume as well as the chemical and physical characteristics of material generated by the Project. As such, the Contractor must factor in the potential for multiple approvals.

## **Construction Methods:**

### A. General

When Controlled Materials are encountered during the course of the work, health and safety provisions shall conform to the appropriate sections of the Contract. Provisions may include implementation of engineering controls, air and personal monitoring, the use of chemical protective clothing (CPC), personal protective equipment (PPE), implementation of engineering controls, air and personal monitoring, and decontamination procedures.

Controlled Materials requiring disposal off-site shall be loaded directly into vehicles for immediate transport to the Contractor selected treatment/recycling/disposal facility(s). Controlled Materials may be stockpiled within the Project limits, as directed by the Engineer.

### B. Material Disposal

The Engineer shall sample the in-place Controlled Materials prior to the start of any excavation work for waste characterization purposes. The Contractor shall notify the Engineer 30 days in advance of any scheduled excavation work to allow time for the collection and analysis of the waste characterization samples. The Contractor shall designate to the Engineer which facility it intends to use, as well as the facility acceptance criteria and sampling frequency, prior to samples being taken. The Engineer will provide the Contractor with the in-situ waste characterization sampling results.

The Contractor shall obtain and complete all paperwork necessary to arrange for material disposal (such as disposal facility waste profile sheets). It is solely the Contractor's responsibility to coordinate the disposal of Controlled Materials with its selected treatment/recycling/disposal facility(s). Upon receipt of the final approval from the facility, the Contractor shall arrange for the excavation, loading, transport and treatment/recycling/disposal of the materials in accordance with all Federal and State regulations.

**The Contractor shall not begin excavation within the Project until the selected disposal facility has indicated final approval of the Controlled Material for disposal. No claim will be considered based on the failure of the Contractor's selected 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.**

Any material processing (including but not limited to the removal of woody debris, scrap metal, pressure-treated and untreated wood timber, large stone, concrete, polyethylene sheeting or similar material) required by the Contractor's selected facility will be completed by the Contractor prior to the material leaving the site. It is solely the Contractor's responsibility to meet any such requirements of its facility. Any materials removed shall be disposed of or recycled in a manner acceptable to the Engineer at no additional cost.

All manifests or bills of lading utilized to accompany the transportation of the material shall be prepared by the Contractor a minimum of 24 hours in advanced and signed by an authorized Department representative, as Generator, for each truck load of material that leaves the site. The Contractor shall forward the appropriate original copies of all manifests or bills of lading to the Engineer the same day the material leaves the Project.

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

#### C. Dust Control

The Contractor shall implement a fugitive dust suppression program in accordance with the Contract to prevent the off-site migration of particulate matter and/or dust resulting from excavation, loading, and operations associated with Controlled Materials. It shall be the Contractor's responsibility to supervise fugitive dust control measures and to monitor airborne particulate matter. The Contractor shall:

1. Employ reasonable fugitive dust suppression techniques.
2. Visually observe the amounts of particulate and/or fugitive dust generated during the handling of Controlled Materials. If the apparent amount of fugitive dust and/or particulate matter is not acceptable to the Engineer, the Engineer may direct the Contractor to implement corrective measures at his discretion, including, but not limited to, the following:
  - (a) apply water to pavement surfaces
  - (b) apply water to equipment and excavation faces; and
  - (c) apply water during excavation, loading, and dumping.

#### D. Material Transportation

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

- Transported Controlled Materials are to be covered sufficiently to preclude the loss of material during transport prior to leaving the site and are to remain covered until the arrival at the selected treatment/recycling/disposal facility.
- 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.

- No materials shall leave the site unless a treatment/recycling/disposal facility has agreed to accept the type and quantity of waste.

#### E. Equipment Decontamination

All equipment shall be provided to the work site free of gross contamination. The Engineer may prohibit from the site any equipment that in his opinion has not been thoroughly decontaminated prior to arrival. Any decontamination of the Contractor's equipment prior to arrival at the site shall be at the expense of the Contractor. The Contractor is prohibited from decontaminating equipment on the Project that has not been thoroughly decontaminated prior to arrival.

The Contractor shall furnish labor, materials, tools and equipment for decontamination of all equipment and supplies that are used to handle Controlled Materials. Decontamination shall be conducted at an area designated by the Engineer and shall be required prior to equipment and supplies leaving the Project, between stages of the work, and between work in different AOECs.

The Contractor shall use dry decontamination procedures. Residuals from dry decontamination activities shall be collected and managed as Controlled Materials. If the results from dry methods are unsatisfactory to the Engineer, the Contractor shall modify decontamination procedures as required.

The Contractor shall be responsible for the collection and treatment/recycling/disposal of any liquid wastes that may be generated by its decontamination activities in accordance with applicable regulations.

#### **Method of Measurement:**

The work of "DISPOSAL OF CONTROLLED MATERIALS" will be measured for payment as the actual net weight in tons of material delivered to the treatment/recycling/disposal facility. Such determinations shall be made by measuring each hauling vehicle on the certified permanent scales at the treatment/recycling/disposal facility. Total weight will be the summation of weight bills issued by the facility specific to this Project. Excess excavations made by the Contractor beyond the payment limits specified in Specification Sections 2.02, 2.03, 2.05, 2.06, or the Contract Special Provisions (as appropriate) will not be measured for payment and the Contractor assumes responsibility for all costs associated with the appropriate handling, management and disposal of this material.

The disposal of excavated materials, originally anticipated to be Controlled Materials, but determined by characterization sampling not to contain concentrations of regulated chemicals (non-polluted or "clean" materials) will not be measured for payment under this item but will be considered as surplus excavated materials and will be paid in accordance with Article 1.04.05.

Equipment decontamination, the collection of residuals, and the collection and disposal of liquids generated during equipment decontamination activities will not be measured separately for payment.

Any material processing required by the Contractor-selected disposal facility, including the proper disposal of all removed materials other than creosote treated wood, will not be measured for payment.

**Basis of Payment:**

This work will be paid for at the Contract unit price, which shall include the direct loading and transportation of Controlled Materials from the Project to the treatment/recycling/disposal facility; the fees paid to the facility for treatment/recycling/disposal; the preparation of all related paperwork; and all equipment, materials, tools, and labor incidental to this work. **This unit price will be applicable to all of the listed disposal facilities and will not change for the duration of the Project.**

This price shall also include equipment decontamination; the collection and handling of residuals generated during decontamination and the collection; and disposal of liquids generated during equipment decontamination activities.

Payment for dust control activities shall be made under the appropriate Contract items.

Pay Item	Pay Unit
Disposal of Controlled Materials	Ton

**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 #0514271A – PRECAST CONCRETE/STEEL COMPOSITE SUPERSTRUCTURE**

**Description:** Work under this item shall be in accordance with the applicable provisions of Sections 5.08, 6.01, 6.02 and 6.03, and the provisions contained herein.

This Item shall include the fabrication, delivery, temporary bracing, initial positioning, and final positioning (installation) of the Prefabricated Bridge Units (PBUs), including all necessary materials, labor and equipment to complete the work, as shown on the plans. The PBUs are comprised of metallized steel beams made composite with a reinforced concrete deck.

This item also includes appurtenances that are incidental to the PBU or projecting from the PBU such as diaphragms, bearing bolster and sole plates, projecting reinforcing steel, and inserts for attachments.

Due to the accelerated nature of this project, the PBUs, backwalls, and stem block units shall be manufactured, preassembled for verification, match marked for field assembly, and approved prior to the initiation of the full roadway closure at the site.

This item excludes the following: steel coating, steel shims, steel load plates vulcanized to elastomeric bearings, elastomeric bearings, pre-cast concrete backwall, deck concrete closure pours, field cast concrete (sidewalks, parapets), railings, and utility supports.

**Materials:** The materials for Prefabricated Bridge Units shall conform to the following requirements:

**1. Bridge Deck Concrete:** Concrete shall be low permeability concrete that meets the requirements of Article M.03.01, for “Bridge Deck Concrete”, Class PCC04462, and shall have a minimum 28-day compressive strength of 4,400 psi. The use of calcium chloride or an admixture containing calcium chloride will not be permitted.

**2. Structural Steel:** Structural steel materials shall conform to the requirements of Section M.06. All structural steel in the superstructure shall conform to the requirements of AASHTO M270, Grade 50T2. This includes the steel girders, connection plates, bearing stiffeners, diaphragms, bolsters, sole plates, and drip bars.

**3. Shear Connectors:** Shear Connectors shall conform to Article M.06.02-4.

**4. High Strength Bolts:** High Strength Bolts shall conform to Article M.06.02-3.

**5. Reinforcing Steel:** Reinforcing steel shall be galvanized and conform to the requirements of Article M.06.01.

**Construction Methods:**

**1. Submittals:**

**(a) Concrete Material:** Submit mix designs “Bridge Deck Concrete”.

**(b) Shop Drawings and Working Drawings:** Prior to any fabrication, the Contractor shall prepare and submit shop and working drawings in accordance with Article 1.05.02. Multiple shop drawings may be required for the PBUs since the fabrication can take place in two separate facilities. The Contractor shall coordinate the preparation of the separate shop drawings to ensure that there are no conflicting details. Acceptance of the shop drawings will be required prior to the ordering of the materials and the fabrication of the prefabricated bridge units.

In addition to the standard detailing of shop drawings and minimum requirements for working drawing submittals as specified in Article 6.03.03-2d, the Contractor shall include the following information:

- a. The stamp of the registered Professional Engineer licensed in the State of Connecticut who has reviewed and certified the shop drawings.
- b. All lifting inserts, hardware, or devices and locations for Engineer’s approval. All lifting devices shall be designed by the Contractor.
- c. Locations and details of the lifting devices, including supporting calculations, type, and amount of any additional reinforcing required for lifting. All lifting devices shall be designed based on the no cracking criteria in Chapter 8 of the PCI Design Handbook (Seventh Edition).
- d. Details and methods for accommodating the dimensional requirement of each PBU accounting for profile grade and cross slope.
- e. Methods for controlling the accumulation of dimensional tolerances through the use of working points or working lines. The width of each individual unit along with the width of the closure pour shall be determined such that, when pieces are laid together, the prefabricated bridge units shall satisfy the required bridge out-to-out width and cross slopes shown on the plans.
- f. Field verified elevations of existing abutment elements interfacing with PBU’s. Provide developed elevations from bridge seat through bolsters and top of PBU elements.
- g. The minimum required compressive strength of the concrete deck prior to handling the prefabricated bridge units.

**(c) Shop Schedule:** Refer to Article 6.03.03-2b of Form 817.

**(d) Welding Procedures:** Refer to Article 6.03.03-2c of Form 817.

**(e) Assembly Plan:** The Assembly Plan is a document prepared by the Contractor and a qualified Professional Engineer with specific knowledge of the Contractor's equipment and "means and methods" for constructing the elements required to complete the work on the project. The development of this Assembly Plan is closely linked to the schedule of operations and the interim material strengths necessary for the work to progress. The Contractor shall coordinate the development of the Assembly Plans with the development of the Shop Drawings to ensure consistent detailing. For example, if additional lifting hooks, grout ports, leveling devices, etc. are required, they should be added to the shop drawings prior to approval.

The development of the Assembly Plan and Shop Drawings for the PBUs shall not be measured separately for payment and should be considered incidental to this Item.

The Assembly Plan shall be considered a Working Drawing. The development and approval of the Assembly Plan shall be according to Article 1.05.02. Approval of the Assembly Plan is required prior to the initiation of the full roadway closure.

Under no circumstances shall the fabrication of the prefabricated bridge units commence prior to the approval of the Shop Drawings and the Assembly Plan unless written permission is given by the Engineer. The Department shall reject any components fabricated before receiving written approval or components that deviate from the approved drawings. Any expenses incidental to the revision of materials furnished, in accordance with the Shop Drawings and order lists, to make them comply with the plans and specifications, including costs incurred due to faulty detailing or fabrication, shall be borne by the Contractor.

At a minimum, the Assembly Plan shall include the following information:

- a. Details and/or cut sheets of all equipment that will be employed for the assembly of the prefabricated bridge units.
- b. Details of all equipment to be used to lift the PBUs including cranes, excavators, lifting slings, sling hooks, and jacks. Crane locations, operation radii, and lifting calculations shall also be included. The factors of safety for the lifting of PBUs shall be achieved by using 150% of the weight of the PBU being lifted. The Contractor is responsible for determining the center of gravity for all PBUs. Special care shall be used for PBUs that are not symmetrical. These elements may require special lifting hardware to allow for installation to the grades shown on the plans.
- c. The Assembly plan shall include the evaluation of construction stress for the two PBUs that are loaded prior to closure pour. These PBUs may be only be loaded by approved transport vehicles for the delivery for the adjacent PBUs. Include loaded

transport vehicle axle loads and spacing. PBU delivery construction loads, subject to review by Engineer of Record, shall satisfy the following:

- Unfactored Wheel Load shall not exceed 20,000 lbs
  - Axle Spacing shall not be less than 4'-6"
  - Unfactored Live Load Moment shall not exceed 1,000 kip-ft
- d. The Assembly plan shall include a detailed transportation plan.
  - e. The Assembly plan shall address the potential for tension in the PBU deck during shipping and handling. Allowable tension stresses in the concrete shall be according Chapter 8 of the PCI Design Handbook (seventh edition). Calculations shall be prepared for the lifting and handling in accordance with the no discernible cracking criteria. Lifting hook locations and hardware shall be coordinated with the Fabricator(s).
  - f. A statement of compliance with all requirements of applicable railroad and environmental permits.
  - g. A statement of compliance with the construction timeframes specified in the "Maintenance and Protection of Traffic" and "Prosecution and Progress" specifications.
  - h. A work area plan, depicting all affected utilities, drainage, and protective measures that will be employed throughout the construction activities.
  - i. PDF drawings developed as full-size sheets depicting the assembly procedures for the PBUs.
  - j. A detailed schedule with the timeline for all operations. In development of the schedule the Contractor shall account for setting and cure times for concrete closure pours.
  - k. Methods of adjusting and securing the elements after placement.
  - l. Procedures for controlling erection tolerances for both the horizontal and vertical direction.
  - m. Methods of forming and curing closure pours in accordance with Special Provisions for Item Nos. 0601054A "Ultra High Performance Concrete" and 0601107A "High Early Strength Concrete". The Contractor shall include description of curing materials if casting is anticipated during times when wet weather can be anticipated.

- n. The Assembly Plan shall be bound into one complete document and shall be prepared and stamped by a registered Professional Engineer licensed in the State of Connecticut.

## **2. Fabrication Plants:**

Fabrication of structural steel for PBUs shall be performed in accordance with Section 6.03 of Form 817.

On-site fabrication of the concrete deck shall conform to the requirements of Article 6.01.03 of Form 817.

At a minimum, the following requirements shall be met for off-site fabrication of the PBUs:

- a. The reinforced concrete deck on top of the girder pairs shall be constructed by a concrete fabricator with an established Quality Control Management plan that is accepted by the Department. The fabricator shall follow the quality control procedures that have been submitted to and approved by the Department.
- b. The PBUs shall be constructed to tolerances shown on the plans. Where tolerances are not shown, follow tolerance limits in the PCI MNL 116-99, "Manual for Quality Control for Plants and Production of Structural Precast Concrete Products, 4<sup>th</sup> Edition". Elements that are found to be out of tolerance may be subject to rejection. Rejection of the elements may be waived by the Engineer if the Contractor can demonstrate that the out of tolerance element can be installed without significant modifications to the bridge. For example, an over width element may be acceptable if the adjacent element is under width.
- c. The fabricator and Contractor shall prevent cracking or damage of the PBUs during handling, storage, transportation, and final installation in permanent position.
- d. If damage occurs, replace defects and breakage of the PBUs in accordance with the following:
  - i. Members that sustain damage or surface defects during fabrication, handling, storage, hauling, or erection are subject to review or rejection.
  - ii. Approval must be obtained before performing repairs.
  - iii. Repair work must re-establish the elements' structural integrity, durability, and aesthetics to the satisfaction of the Engineer.
  - iv. Determine the cause when damage occurs and take corrective action.
  - v. Failure to take corrective action, leading to similar repetitive damage, can be cause for rejection of the damaged element.
  - vi. Cracks that extend to the nearest reinforcement plane and fine surface cracks that do not extend to the nearest reinforcement plane but are numerous or extensive are subject to review and rejection.

**3. Quality Control:** At a minimum, the following requirements shall be met:

- a. The Contractor is required to provide field survey to determine that the PBUs are placed within the horizontal and vertical tolerances herein or as stated on the plans.
- b. The Contractor is responsible for interim testing of concrete strength required to proceed with various stages of construction, including, but not limited to: shop assembly/dryfit, lifting, and transportation to project site. For materials used throughout the construction that have a proven strength gain at predetermined time interval, the compressive testing requirements may be waived by the Engineer. All testing furnished by the Contractor shall be performed by an AASHTO accredited laboratory. All Quality Control test results shall be submitted to the Division of Materials Testing section for approval. Additional testing by the Contractor shall be performed at no additional cost and will not be measured for payment. Final acceptance testing of concrete shall be in accordance with Article 6.01.03. Closure pour testing requirements shall be in accordance with each item's respective Special Provision.
- c. The plant shall document all test results. The quality control file shall contain at least the following information:
  - i. Element identification
  - ii. Date and time of casting
  - iii. Concrete cylinder test results
  - iv. Quantity of used concrete and the batch printout
  - i. Form-stripping date and repairs if applicable
  - ii. Location/number of blockouts and lifting inserts
  - iii. Temperature and moisture of curing period
  - iv. Document lifting device details, requirements, and inserts

**4. PBU Marking:** Permanently mark each prefabricated bridge unit with the date of casting and supplier identification. Stamp markings in fresh concrete.

**5. PBU Handling and Storage:** Materials for this work shall be stored off the ground before, during, and after fabrication. The PBUs shall be kept free from dirt, grease and other contaminants and shall be reasonably protected from corrosion. Care shall be taken during storage, transporting, hoisting and handling of all precast sections to prevent damage. Sections damaged by improper storing, transporting or handling shall be repaired or replaced by the Contractor, as directed by the Engineer and at no cost to the State. All storage and handling operations shall be as directed by the Engineer.

**6. Dry Fit prior to Shipment:** The Contractor has two options to ensure the proper fit up of the PBUs when placed on the bridge substructure.

Option 1: Fabricate PBUs individually using geometric controls to maintain vertical and horizontal tolerances at closure pours. A dry fit of adjacent elements prior to shipment is required to ensure that they can be properly joined in the field.

Option 2: Fabricate the total number of PBUs, required to make up the full bridge width, together on temporary supports in the same orientation as they will end up in their final location supported by the bridge substructure. A separate dry fit of the PBUs is not required prior to shipping the PBUs.

All connections shall be dry fit in the fabrication yard prior to installation of the elements at the bridge site. Include fit up with other precast elements including concrete stem blocks and backwall units. Match mark all components for field reassembly.

**7. Field Installation:** The Contractor field personnel shall have knowledge of and follow the approved Assembly Plan. If changes are warranted due to varying site conditions, resubmit the plan for review and approval.

Working points, working lines, and benchmark elevations shall be established prior to placement of all elements. The Contractor is responsible for field survey as necessary to complete the work. The District reserves the right to perform additional independent survey. This survey does not relieve the Contractor from performing survey for the construction. If discrepancies are found, the Contractor may be required to verify previous survey data.

The PBUs shall be placed in the sequence and according to the methods outlined in the Assembly Plan. The height of each element shall be adjusted to acceptable tolerances by means of leveling devices or shims. The Contractor shall ensure that the PBU is in the proper horizontal and vertical location prior to releasing from the crane and setting the next unit. Bottom of PBU steel beam elevation must be measured within the Amtrak envelope and meet or exceed the minimum clearance requirements shown on the Contract Plans. Vertical tolerance between PBU's needs to be checked at the top surface of the PBU. Diaphragms may be used to control geometry; however, if the required setting tolerance cannot be met, the Contractor may be required to adjust or fabricate new diaphragms.

## **8. Erection Tolerances:**

### a) Plan Alignment: Location and Clearances

Note: the accumulation of maximum or minimum tolerances when multiple elements are joined may result in final overall dimensions that do not conform to the final dimensions shown on the contract plans. The Contractor must specifically design the element dimensions and tolerances to prevent this.

The Contractor shall adhere to the following tolerances for the final condition of the PBU after placement:

- v. Do not exceed 1/4 inch maximum deviation at each end of the span from overall longitudinal alignment after setting.
- vi. Do not exceed 1/4 inch maximum deviation from overall transverse location (i.e. longitudinal position) at each line of bearings.



- vii. Maximum deviation from alignment in both primary plan directions at each end of the span being set shall not exceed 1/4 inch or that required for the accommodation of manufactured expansion joint components or bearings, whichever is the less.
- viii. In the absence of other constraints, keep individual elements or surfaces within 1/4 inch of location with respect to similar matching surfaces.

b) Bridge Bearings: Elevation and Location

The Contractor shall keep the elevation of individual bridge bearings within plus or minus 1/8 inch of required elevations. The plan location of bridge bearings shall be within a tolerance of 1/8 inch and the alignment within plus or minus 1/16 inch across the bearing.

If tolerances are not met, submit for approval of Engineer, means to adjust elevations or to correct for or accommodate errors or unintended deviations from required tolerances. Submit proposals and seek approval of the Engineer for the use of shims, injection of high strength grout or other methods to accommodate differences from required tolerance. Do likewise, for the accommodation of anchor bolts or similar restraining devices.

- c) Reinforcing Steel: The development length of reinforcing steel within the region of the closure pours must be maintained. Field cutting of reinforcing steel that protrudes from PBU elements to accommodate dimensional variations or the installation of field-placed reinforcing bars is strictly prohibited.

**Method of Measurement:** This work will be measured for payment per square foot of precast deck. The length and width of the structure shall be to the limits defined on the contract plans. Payment for work and materials described above or as noted on the plans as being incidental to the construction of the PBU shall be included in the unit price of the PBU.

Coating of the PBU structural steel shall be paid for under the item “Metallizing Structural Steel (Site No. 1)”.

Concrete for transverse deck end closure pour shall be paid for under the item “High Early Strength Concrete”.

Ultra High Performance Concrete for longitudinal bridge deck closure pours shall be paid for under the item “Ultra High Performance Concrete”.

**Basis of Payment:** This work will be paid for at the contract unit price per square foot for “Precast Concrete/Steel Composite Superstructure”, complete and accepted. Price shall include all tools, material, equipment, labor and work incidental to the construction.

Payment for work and materials described above or as noted on the plans as being incidental to the construction of the PBU shall be included in the unit price of the PBU.

Pay Item	Pay Unit
Precast Concrete/Steel Composite Superstructure	SF

## **ITEM #0520041A - PREFORMED JOINT SEAL**

**Description:** Work under this item consists of furnishing and installing a preformed joint seal as shown on the plans. Work also includes a pre-installation survey to measure the pavement depth at all locations where the joint meets the curb.

**Materials:** One of the following Preformed Joint Seals specified on the plans shall be supplied:

V-Shaped Silicone Seals:

1. Silicoflex:  
RJ Watson, Inc.  
11035 Walden Ave  
Alden, New York 14004  
Tel: (716) 901-7020  
Website: <http://www.rjwatson.com>
2. V-Seal:  
D.S. Brown Company  
300 East Cherry Street  
North Baltimore, Ohio 45872  
Tel: (419) 257-3561  
Website: <http://www.dsbrown.com>

Foam-Supported Silicone Seals:

3. Bridge Expansion Joint System (B.E.J.S.):  
EMSEAL Joint Systems Ltd.  
25 Bridle Lane,  
Westborough, MA 01581  
Tel: (508) 836-0280  
Website: <http://www.emseal.com>
4. Wabo FS Bridge Seal  
Watson Bowman Acme Corp.  
95 Pineview Drive  
Amherst, NY 14228  
Tel: (716) 691-9239  
Website: <https://wbacorp.com/products/bridge-highway/joint-seals/wabofsbridge/>

When foam-supported silicone joint seals are the only type allowed on the plans (such as at bridge joints that extend through sidewalks), the CTDOT will consider products from other foam-supported silicone joint manufacturers, if the products have been installed by another State Department of Transportation, are functioning successfully in a similar climate to Connecticut's for at least one year, and are deemed by

the CTDOT to be suitable for use in the specific application for which the Contractor is requesting. To be considered, the Contractor shall submit documentation indicating the product name, manufacturer, the contact information for a Department of Transportation official who can confirm the successful installation and continued success of the product, the date of installation and the nature of the installation, including thermal movement range and skew of the installed joint.

A Materials Certificate for all components of the selected preformed joint seal shall be submitted by the Contractor in accordance with the requirements of Article 1.06.07

**Construction Methods:** All work at each joint location shall be accomplished in accordance with “Maintenance and Protection of Traffic” and “Prosecution and Progress.”

Submittals:

Prior to ordering preformed joint seals, and prior to forming block-outs for the preformed joint seals in the headers, the Contractor shall submit the following to the Engineer:

- The Manufacturer and product information of the selected joint system;
- Material safety data sheets (MSDS) and technical product information;
- Name and credentials of a qualified technical representative supplied by the manufacturer and acceptable to the Engineer. This person shall be available to provide assistance at the beginning of the work and be available to provide training and guidance throughout the project.
- A detailed, step-by-step installation procedure, including surface preparation, splicing of the preformed joint seal, and a list of the specific equipment to be used for the installation.

Installation: The technical representative of the accepted joint system shall be notified of the scheduled installation a minimum of 2 weeks in advance and be present to provide direction and assistance for the first joint installation and succeeding joint installations until the Contractor becomes proficient in the work and to the satisfaction of the Engineer.

The minimum ambient temperature for installing any of the qualified, preformed joint seals is 40°F and rising. When the manufacturer’s requirement for minimum installation temperature is greater than 40°F, the manufacturer’s requirement will govern.

All concrete surfaces to which sealing glands will be bonded shall be prepared in accordance with International Concrete Repair Institute (ICRI) concrete surface profile standards. The minimum acceptable surface profile is CSP2 (grinding), but CSP3 (light abrasive blast) is preferred. Any discontinuities or sharp projections into the plane of the joint shall be ground smooth prior to blasting. Whenever abrasive blast cleaning is performed, the Contractor shall take adequate measures to ensure that the abrasive blast cleaning will not cause damage to adjacent traffic or other facilities. Traffic will not be allowed to pass over the joint after blasting has occurred.

Following blasting, the joint surfaces shall be wiped down or blown clean as recommended by the manufacturer.

The joint surfaces shall be completely dry before installing any of the components of the selected joint seal. The selected joint seal shall not be installed immediately after precipitation or if precipitation is forecast. Joint preparation and installation of the selected preformed joint seal must be done during the same day.

The selected joint sealing system shall be installed continuously with no field splices in the preformed seal in the roadway section, unless field splices are allowed by the manufacturer of the selected preformed joint seal. In no case shall field splices of the preformed joint seal be allowed in a wheel path or within the roadway shoulder. When splices cannot be avoided due to traffic constraints, the splice shall be at a painted lane line.

After the joint seal has been installed, water shall not be able to penetrate the joint. Any joint seal that does not effectively seal against water shall be removed and replaced at the Contractor's expense.

**Method of Measurement:** This work will be measured for payment by the number of linear feet of preformed joint sealing system installed and accepted. The measurement will be made along the centerline of the joint at the top surface of header, curb, sidewalk and parapet.

**Basis of Payment:** This work will be paid for at the Contract unit price per linear foot for "Preformed Joint Seal," complete in place, including all materials, equipment, tools, and labor's incidental thereto.

The Contract unit price shall include the cost of assistance from a technical representative of the selected joint system.

Pay Item	Pay Unit
Preformed Joint Seal	l.f.

## **ITEM #0521014A – STEEL-LAMINATED ELASTOMERIC BEARINGS**

**Description:** Work under this item shall consist of furnishing and installing steel-laminated elastomeric bearings as shown on the plans, as directed by the Engineer and in accordance with these specifications.

### **Materials:**

1. Elastomer: The elastomer shall be Grade 3 Virgin Neoprene (polychloroprene) with Shore “A” Durometer hardness as shown on the plans and conforming to the requirements of the AASHTO Standard Specifications for Highway Bridges, Division II - Construction. Elastomer shall have shear modulus as indicated on the Contract Plans when measured using the apparatus and procedure described in Annex A of ASTM D4014.
2. Steel Laminae: The internal steel laminae, used for reinforcement, shall be mild rolled steel conforming to ASTM A570, Grade 36 or 40, ASTM A611, Grade C or D, or an approved equal. Laminae shall be sandblasted and cleaned of all surface coatings, rust and mill scale before bonding and shall be free of sharp edges and burrs. Steel laminae shall develop minimum peel strength of 473 lb/ft when tested in accordance with ASTM D429 Method B.
3. External Load Plates (if indicated on the plans): Steel load plates shall conform to Section 6.03 “Structural Steel” and Section M.06 “Metals”. The external load plates shall conform to AASHTO M270, Grade 50. Bonding surface of the external load plates shall be abrasive blast cleaned prior to being hot bonded to the bearing during vulcanization. Adhesive bonding of the load plate surface to the elastomer is not allowed.

Load plates shall be galvanized in accordance with ASTM A123.

4. Fabrication and Fabrication Tolerances: The fabrication and fabrication tolerances of elastomeric bearings shall conform to the requirements of the AASHTO LRFD Bridge Construction Specifications (4<sup>th</sup> Edition).

If guide pins or other devices are used to control the side cover over the steel laminae, any exposed portions of the steel laminae shall be sealed by vulcanized patching.

5. Testing: The materials for the elastomeric bearing and the finished bearings themselves shall be subjected to testing. The testing shall conform to the requirements of the AASHTO LRFD Bridge Construction Specifications (4<sup>th</sup> Edition).

.

Test bearings, in addition to the bearings shown on the plans, shall be furnished for each type (size and thickness) of bearing for destructive testing. The test bearings shall be

furnished without external load plates.

6. **Marking:** Each steel-laminated elastomeric bearing shall have marked on it, with indelible ink, the following: the manufacturer's identification code or symbol, and the month and year of manufacture, the orientation, order number, lot number, bearing identification number, and elastomer type and grade (Neoprene, Grade 3). The markings should be placed on a side of the bearing that is visible after installation.
7. **Certification:** The Contractor shall furnish a Certified Test Report, confirming that the elastomeric bearings satisfy the requirements of these specifications, in conformance with the requirements set forth in Article 1.06.07.
8. **Adhesive:** The adhesive, for bonding the shims, shall be a long lasting, high strength, cold applied, air cured, water and heat resistant material specifically formulated for bonding neoprene and shall meet the following requirements:

Property	Requirement	ASTM Test Procedure
Adhesion	30 lbf/in	D429, Method B
Hardness	50 ± 5 Shore A points	D2240
Tensile Strength, min	1800 psi	D412
Elongation before breaking, min.	750 %	D412

### Construction Methods:

**Shop Drawings:** Before fabricating any materials, the Contractor shall submit shop drawings to the Engineer, for review and approval, in accordance with sub-article 1.05.02-3. These drawings shall include, but not be limited to, the following information: manufacturer's name, complete details of the bearings, material designations, nominal hardness of the elastomer, the quantity of bearings required, including test bearings, and the location of the bearing identification.

In lieu of the low temperature crystallization test for each lot of bearings and shear modulus test for each batch of material, the manufacturer may provide certificates from tests performed on identical formulations within the preceding year.

**Fabrication:** The bearing shall be cast as a unit in a mold and shall be bonded and vulcanized under heat and pressure. The mold finish shall conform to standard shop practice.

Fabrication tolerances shall conform to AASHTO LRFD Bridge Construction Specifications (4<sup>th</sup> Edition). Flash tolerance, finish and appearance shall meet the requirements of the latest edition of the Rubber Handbook, published by the Rubber Manufacturer's Association, Inc., RMA F3 and T.063.



Every bearing shall be visually inspected for compliance with dimensional tolerance and for overall quality of manufacture. Buffing, cutting, or other attempt to alter the size of the bearings, for the purpose of meeting the tolerances stated herein will not be permitted. Adhesive bonding of the elastomeric bearings to steel and concrete surfaces is not permitted.

Each elastomeric bearing pad shall have embossed on it the following: the word "CTDOT", project number, manufacturer's identification code or symbol, and the month and year of manufacture. The bearing shall also have stenciled on it, with indelible ink, the lot number, bridge number, and the bearing number. The marking shall be placed on a side of the bearing that is visible after installation.

For structures requiring less than fifty pads, one test pad shall be furnished. For structures requiring more than fifty pads, one test pad shall be furnished for each additional fifty pads or part thereof. If there are two or more types of pads in one structure, and only one test pad is required, the pad will be furnished for the type of which there are the greater numbers. All test pads shall be furnished without charge.

The same firm shall manufacture all the elastomeric bearing pads to be installed on this structure.

The manufacturer shall furnish facilities for the test and inspection for the completed bearing in its plant or at the independent test facility and the inspectors shall be allowed free access to the manufacturer's plant and test facility.

Short-Duration Compression Test: Each bearing shall be tested as follows for a Short-Duration Compression Test:

1. The Bearing shall be loaded in compression to 1.5 times the design load shown on the plans. The load shall be held constant for 5 minutes, removed and reapplied for another 5 minutes.
2. The bearing shall be carefully examined while under the second loading.
3. If the bulging pattern indicates lamina parallelism of layer thickness outside of specified tolerance, or poor lamina bond, the bearing shall be rejected. If there are three or more separate surface cracks greater than  $\frac{1}{16}$ " wide and  $\frac{1}{16}$ " deep, the bearing shall be rejected.

A Certified Test Report in accordance with Section 1.06.07 of the Standard Specifications shall be required for the specified test on the elastomer and for the specified short duration tests.

Installation: Bearing areas of the masonry upon which the elastomeric bearing pads are to be placed shall be cleaned of all debris. Bearing areas shall be carefully finished, by grinding if necessary, to a smooth, even, level surface of the required elevation, and shall show no variations from a true plane greater than  $\frac{1}{16}$  inch over the entire area upon which the elastomeric bearing pads are to rest.

There shall be full contact and uniform bearing between the elastomeric bearing pad and the concrete seat after application of full dead load. Also, after application of full dead load, there shall be uniform deflection of the elastomeric bearing pad.

The elastomeric bearings shall be installed as shown on the plans. The elastomeric bearings shall be installed when the ambient air temperature is between forty (40) and eighty-five (85) degrees Fahrenheit and has been within this range for at least 2 hours.

Welding, with the elastomeric bearings in place, will not be permitted unless there is more than 1½" of steel between the weld and the elastomer. In no case shall the elastomer be exposed to temperatures greater than 400 deg. F. Welding shall conform to the requirements of Subarticle 6.03.03.

Assembly with high strength bolts shall conform to the requirements of Subarticle 6.03.03.

**Method of Measurement:**

This work will be measured by the number of each elastomeric bearing assemblies installed as shown on the plans, conforming to the details and specifications and as accepted by the Engineer. No allowance shall be made for test bearings.

**Basis of Payment:**

This work will be paid for at the contract unit price for each "Steel-Laminated Elastomeric Bearings", complete in place and accepted, which price shall include all vulcanized external load plates, test bearings and all materials, testing, equipment, tools and labor incidental thereto.

<u>Pay Item</u>	<u>Pay Unit</u>
Steel-Laminated Elastomeric Bearings	EA

## **ITEM #0522178A - CONSTRUCT CONCRETE KEEPER BLOCKS**

### **Description:**

This item shall consist of constructing a concrete keeper block including the furnishing and placing of reinforcing steel, embedded steel keeper plates, welded studs and concrete. This work shall be done as indicated on the plans, in accordance with these specifications, and as directed by the Engineer.

This item excludes the work to install drilled and grouted dowels paid for under Item Nos. 0602910A Drilling Holes and Grouting Dowels and 0602030 Deformed Steel Bars – Galvanized.

### **Materials:**

The materials shall conform to the following requirements:

1. Steel keeper plates shall meet the requirements of Section M.06.02 and conform to ASTM A709, Grade 36. Steel for welded studs shall conform to the requirements of Subarticle M.06.02-4.
2. Concrete for keeper block shall conform to the requirements of Section 6.01 and M.03. Concrete shall meet the requirements of Class PCC03340 Concrete.
3. Reinforcement shall be galvanized and conform to ASTM A615, Grade 60.
4. The steel keeper plates shall be galvanized after fabrication and welding of the studs in accordance with ASTM A123.

A Materials Certificate shall be required for the chemical anchor material and the steel keeper plates in accordance with Article 1.06.07, certifying the conformance of these materials to the requirements stated herein.

All materials shall be approved by the Engineer before use.

### **Construction Methods:**

Before fabricating any materials, the Contractor shall submit shop drawings to the Engineer for review in accordance with Article 1.05.02-3. These drawings shall include but not be limited to the following: Location and sizes of all reinforcing steel including splice lengths, steel plates and studs, material lists and material designations.

The installation of the keeper blocks shall be done after the Prefabricated Bridge Units and the precast stem block have been installed. The keeper block may be installed before or after backwall attachment.

Holes shall be drilled into the concrete at the locations shown on the plans. Drilling and grouting is to be paid for under "Drilling Holes and Grouting Dowels".

The surface on which the concrete keeper is to be poured shall be intentionally roughened to a depth of 1/4".

Fabrication and placement of reinforcing steel shall conform to the requirements of Article 6.02.03.

The installation of welded studs shall be in accordance with the requirements of Article 5.08.03.

Mixing, placing, curing, and finishing of the concrete shall be in accordance with Article 6.01.03.

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.

At no time during the Contractor's work will interruption in traffic carried by the structure be permitted solely as a result of constructing the keeper block.

**Method of Measurement:**

This work will be measured for payment by the number of concrete keeper blocks, as described above, completed and accepted by the Engineer.

**Basis of Payment:**

This work will be paid for at the contract unit price each for "Construct Concrete Keeper Blocks", complete in place, which price shall include concrete, furnishing and placing reinforcing steel, steel keeper plates and welded studs, and all materials, equipment, tools and labor incidental thereto. This work excludes drilling and grouting dowels into the existing bridge seat.

Pay Item:	Unit:
Construct Concrete Keeper Blocks	Ea.

## **ITEM #0601054A – ULTRA HIGH PERFORMANCE CONCRETE**

**Description:** Work under this item shall consist of all materials, tools, equipment and labor necessary for the performance of all work to transport, mix, form, place, cure, grind and test Ultra-High Performance Concrete (UHPC) where required per plans.

**Materials:** The materials for this work shall be as follows:

**Ultra High Performance Concrete (UHPC):** The UHPC shall be mixed on Site from pre-packaged components, pre-proportioned by the UHPC Supplier.

**Components:** The following materials shall be as recommended by the UHPC Supplier:

- (a) Fine Aggregate
- (b) Cementitious Material and any replacement materials, such as silica fume
- (c) Steel Fibers (must be in accordance with Article 1.06.01)
- (d) Liquid Admixtures (such as super plasticizers or accelerators)

**Water:** Water for mixing shall meet the requirements of M.03.01-4 and the temperature at mixing shall be per UHPC Supplier recommendations for use in the UHPC mix.

**Mix Design:** The Contractor shall submit a mix design that meets the following criteria:

<b>Table 1: UHPC Material Properties (after 28 days or as noted)</b>		
<b>Description</b>	<b>Test Method</b>	<b>Acceptance Criteria</b>
Compressive Strength	ASTM C39 (as modified by ASTM C1856)	$\geq 14$ ksi at 4 days $\geq 20$ ksi at 28 days
Shrinkage	ASTM C157 (initial reading after set)	$\leq 800$ micro-strain
Chloride Ion Penetrability	ASTM C1202	$\leq 250$ coulombs
Freeze-Thaw Resistance	ASTM C666 Procedure A (300 cycles)	Relative Dynamic Modulus of Elasticity, RDM > 95%
Flow	ASTM C1437 (as modified by ASTM C1856)	7 to 10 inches

**Packaging:** The fine aggregate and cementitious material must be premixed and proportioned in bags or supersacks, in accordance with the approved mix design, and shall be identified by batch or lot number.

### **Construction Methods:**

#### **1. Contractor Submittals:**

- (a) Mix Design, including proportions of each component, water-to-cementitious materials ratio, mixing time, set time, compressive strength properties of the mix at ages of 2, 4, 7, 14, and 28 days, and Certified Test Reports addressing the material properties in Table 1, shall be submitted to the Engineer for approval at least 90 days in advance of the first UHPC placement.
- (b) UHPC Supplier and Technical Representatives: The Contractor shall obtain the

services of a Supplier experienced in designing, mixing, placing, curing and testing of UHPC. Technical representatives shall be certified or recognized by the UHPC Supplier in the mixing, and placing of UHPC in similar installations. The Supplier and Technical Representatives submittal shall be submitted to the Engineer for approval at least 90 days in advance of the first UHPC placement and shall include the following:

- i. Name and location of Supplier.
  - ii. Name of UHPC product and a list of bridge projects it was utilized on. For each bridge listed, provide a location, description, date of completion of work, the project owner's name, and the name, title and current contact information of a project owner representative.
  - iii. Identification of the potential Technical Representatives (minimum three ).
  - iv. UHPC Supplier certification demonstrating that the Technical Representatives are qualified to oversee the UHPC operations.
  - v. Work experience of the Technical Representatives: For each Technical Representative, submit a list of projects they attended that included UHPC mixing and placing operations. For each project, provide a location, description, date of completion of work, the project owner's name, and contact information of a project owner representative.
- (c) Construction Work Plan: The Contractor shall submit a Construction Work Plan to the Engineer for review and comment at least 90 days in advance of the first UHPC placement, which shall include the following elements:
- i. Formwork
    1. Proposed formwork materials
    2. Procedure for installing, sealing and maintaining watertight formwork
    3. Procedure and schedule for installing top forms, chimneys and head pails
    4. Planned bulkhead locations
    5. Removal of formwork including tools and access to underside of deck
  - ii. Surface preparation
    1. Procedure to confirm precast concrete surfaces to be in contact with the UHPC are roughened and have exposed aggregate finish with average amplitude of 1/4 inch (at the precast plant or upon delivery to the Site)
    2. Procedures, including source of water, for ensuring saturated surface dry (SSD) connection interfaces prior to UHPC placement
  - iii. Mixing
    1. Storage plan for UHPC components
    2. Mixers and mixing setup including the type and number of mixers, mixing location, water source, and contingency plan if a mixer malfunctions
    3. Description of equipment for weighing UHPC components
    4. Procedure for controlling UHPC mix temperatures including methods of storing ice
    5. Sample batch identification sheet to be used during UHPC production
  - iv. Placement
    1. Placement sequence and schedule including all planned bulkheads
    2. Equipment for transportation and placement of UHPC
    3. Contingency plan if placement operations are interrupted by weather, equipment malfunctions or other issues
  - v. Protection and Curing
    1. Procedure to protect joints from live loads during curing

- 2. Cold weather protection plan, if required
- vi. Grinding
  - 1. Proposed equipment
  - 2. Method of collecting and disposing of debris
- vii. Trial placement plan, outlining procedures to be followed and a dimensioned drawing showing the proposed UHPC placement of a representative joint
- (d) Contractor Quality Control:
  - i. Quality Control Plan, including equipment list, testing setup, sampling methods, frequency and types of tests at least 90 days in advance of the first placement of UHPC.
  - ii. The proposed format for test reporting (or an example test report) shall be provided for the Engineer's review and comment at least 90 days in advance of the first placement of UHPC.
  - iii. The name and location of the Contractor's proposed AASHTO accredited testing laboratory shall be provided to the Engineer at least 90 days in advance of the first placement of UHPC.
  - iv. Reports of test results shall be provided to the Engineer within 7 days of each test.

- 2. Pre-Placement Meeting:** The Contractor shall arrange a pre-placement meeting to be held on Site after the approval of all submittals, and at least 7 days in advance of the trial placement. The meeting shall be attended by the UHPC Supplier's Technical Representatives, the Contractor's staff, any subcontractors involved in the work operation, and representatives from the Department. The objective of the meeting will be to review the Project plans, Contractor's Construction Work Plan and to review the procedures for mixing, placing, curing and testing of the UHPC, as well as the specifics of the trial placement.
- 3. Trial Placement:** The Contractor shall construct a cast-in-place joint trial placement at the Site (or a location approved by the Engineer), based on Pre-Placement meeting discussions, and as recommended by the UHPC Supplier.

The joint trial placement shall be a representation of the proposed joint and replicate the form pressure created by the plastic UHPC. Following placement and minimum 14 day cure of the UHPC, the Contractor shall cut the hardened trial placement transversely at two locations to allow for visual inspection of the joint interface and material bond. The Contractor shall make the completed joint trial placement cut sections available for review and approval by the Engineer a minimum of 28 days prior to placement of the UHPC.

The Contractor shall perform flow tests during joint trial placement casting to determine the duration that the plastic UHPC will remain workable. The flow tests shall be in accordance with ASTM C1437 (using modifications described in ASTM C1856) and the mix temperature shall be maintained between 50°F and 85°F as determined using ASTM C1064.

The Contractor shall perform the following workability procedure during the casting of joint trial placement:

- (a) Take initial samples prior to the start of the discharge of plastic UHPC and perform the flow tests. Record the time of sampling and initial flow value.

- (b) Measure the UHPC and ambient temperatures.
- (c) Continue sampling at 10-minute intervals and determine the flow of each sample, until flow measure is below 4 inches.
- (d) Plot the flow versus time for the duration of the test. From the plot of flow-time curve, determine the flow time at 8 inches, which is considered the mixture cutoff time.

The Contractor shall perform a Time of Setting test of UHPC during joint trial placement in accordance with ASTM C191 (as modified by ASTM C1856).

The Contractor shall cast five sets of 3 cylinders, in accordance with ASTM C1856, during joint trial placement for determination of compressive strength and test them in accordance with ASTM C39 (as modified by ASTM C1856) at 2, 4, 14, and 28 days.

4. **Safety:** The Contractor shall make UHPC material safety data sheets (MSDS) available and shall provide a safety briefing to all on-site personnel prior to UHPC placement. Proper personal protective equipment shall be used (including but not limited to goggles, dust masks, and respirators) as recommended by the UHPC supplier and as required by the MSDS based on proximity to specific operations.
5. **Storage:** The Contractor shall assure the proper storage of dry premixed components, steel fibers and admixtures as recommended by the Supplier and the following:
  - (a) All dry premixed components shall be stored on raised pallets, with vapor barrier between the pallets and the ground surface to prevent moisture ingress, and shall be covered thoroughly.
  - (b) Steel fibers shall be stored with the same protection as the dry premixed components and rusted fibers shall not be used in mixing.
  - (c) Liquid admixtures shall be stored in sealed containers above freezing temperatures and shall be protected from direct sunlight.
6. **Formwork:** Formwork shall be non-absorbing, watertight and of sufficient rigidity and strength to safely support all loads imposed. The Contractor shall form the UHPC locations to be overfilled according to the Plans.

Top forms, chimneys, and head pails shall be used, according to UHPC Supplier recommendations, to achieve the desired profile and confirm that the joint is completely full. Formwork removal shall not begin until the compressive strength has reached 12 ksi.

7. **Surface Preparation:** The Contractor shall confirm that precast concrete surfaces to be in contact with the UHPC are roughened and have exposed aggregate with an average amplitude of 1/4 inch. The Contractor shall pre-wet the precast concrete surfaces for at least 4 hours prior to placement of UHPC to confirm that a saturated surface dry (SSD) condition has been reached. During the pre-wetting operation, the Contractor shall check the formwork for leaks and shall seal any formwork that is not watertight. Just prior to placement of the UHPC, the Contractor shall air blast the joints to remove dirt, debris and standing water.
8. **Technical Representatives:** The Contractor shall arrange for two approved Supplier's Technical Representatives to be on Site for the duration of the UHPC mixing and placement operations. One representative shall remain with the mixing operations and the other representative shall remain with the placement operations. Mixing or placement shall not



begin until the Supplier's representatives are on-Site and have checked in with the Engineer.

9. **Mixing:** In accordance with the approved Mix Design, the UHPC components shall be pre-weighed using a calibrated scale prior to the commencement of mixing. The Contractor shall provide a minimum of three portable mixing units for mixing of the UHPC. Mixing equipment that is not provided by the Supplier must be reviewed by the Supplier for adequacy. The Contractor shall keep the temperature of the UHPC below 85°F during mixing. Ice may be added to the mix as recommended by the Supplier's representative. Should the ambient temperature fall below 50°F, the batching water shall be heated to maintain the mix temperature between 50 and 85°F.
  
10. **Placement:** In accordance with the approved placement sequence, start at the low end of the joint to allow fluid mix to fill in up-hill. Confirm that the joint is overfilled according to the plans. Add top forms as flow progresses. If the formwork exhibits evidence of leakage at any location, the Contractor shall take remedial measures necessary to stop further leakage. The UHPC shall not be internally vibrated but where 2 successive batches meet, agitate the point of intersection with a rod. Cold weather placement procedures are required when the ambient temperature falls below 50°F.
  
11. **Curing:** Curing and cold weather protection shall be per Supplier recommendations and the following: Cover the UHPC and keep formwork in place until the Contractor's testing confirms that it has achieved a minimum compressive strength of 12 ksi. Prevent construction or traffic live loads from traveling over the UHPC until the Contractor's testing confirms that it has achieved a minimum compressive strength of 14 ksi.
  
12. **Grinding:** Immediately after removal of formwork, the UHPC overfill shall be removed using grinding equipment to level the joint material with the precast concrete surface. The grinding equipment shall be equipped with an on-board wet vacuum attachment capable of removing the debris and residue from the grinding process. The Contractor shall be responsible for proper disposal of the debris.
  
13. **Contractor QC requirements:**
  - (a) Batch identification: For each batch of UHPC, record the date and time, amounts of water and ice, and admixtures used.
  - (b) Flow tests: The Contractor shall conduct one flow test per batch of UHPC in accordance with ASTM C1437 (as modified by ASTM C1856) to verify workability and time of setting. The flow shall be 7 to 10 inches.
  - (c) Mix temperature checks: The Contractor shall conduct one temperature check per batch of UHPC in accordance with ASTM C1064. The temperature of the mix at discharge shall be between 50 and 85°F.
  - (d) Compressive strength cylinder specimens: A minimum of 12 cylinders, 3 inches x 6 inches shall be cast for each day's production. One set (3 cylinders) shall be cast at the beginning and one set at the end of the day's production. Two intermediate sets of cylinders shall be cast from the middle portion of the day's production.

All sets shall be cured initially in the field and shipped to the Contractor's AASHTO accredited testing lab for final curing, preparation of test specimens in accordance with ASTM C1856, and testing.

All cylinders shall be cured using the same method of curing used in the field. The temperature during curing shall be controlled to represent field conditions. The compressive strength of three cylinders shall be tested at 2, 4, 14, and 28 days after casting. The compressive strength shall be measured using ASTM C39 (as modified by ASTM C1856). The minimum compressive strength shall be 14 ksi at 4 days and 20 ksi at 28 days. Failure to meet the minimum at any point requires immediate notification to the Engineer and a written corrective action plan to be submitted to the Engineer for approval.

- (e) Pull out tests: The Contractor shall cast 6 cylinders 12 inches diameter and 7 1/2 inches deep. Each cylinder shall have one 32-inch-long reinforcing bar cast in the center of the circular face. The axis of the bar shall be perpendicular to the formed surface. Three (3) of the castings shall have #6 bars embedded 5 inches deep, and three (3) of the castings shall have #4 bars embedded 3 inches deep. These cylinders shall be kept wet for four (4) days then delivered to the Contractor’s AASHTO accredited testing lab for testing using a continuous rate of loading until failure in accordance with the tensile test requirements of ASTM E488. The test shall be performed as soon as practical after the corresponding compressive strength samples reach 14 ksi. The samples pass if the bars yield without the UHPC failing and without the bars pulling out of the UHPC. Failure to meet these requirements requires immediate notification to the Engineer and a written corrective action plan to be submitted to the Engineer for approval.
- (f) As-built records: The Contractor shall track and show the placement locations of UHPC production by day. A PDF copy of the records shall be submitted to the Engineer on a weekly basis.

Results of all the laboratory tests, conducted by the Contractor’s AASHTO accredited testing lab, shall be submitted to the Engineer for review. Testing frequency shall be as needed to maintain control of the operation.

**Method of Measurement:** The volume of UHPC will be calculated in cubic yards based on the nominal dimensions shown on the plans except the UHPC material used to overfill above top of deck elevation will not be measured for payment. No volume adjustments will be made for precast tolerances, or for embedded components such as reinforcing steel or shear studs.

**Basis of Payment:** This work will be paid for at the Contract unit price per cubic yard for “Ultra High Performance Concrete,” complete and accepted in place, which price shall include all materials, equipment, tools and labor incidental thereto.

Preparation of the mix design, trial mixes and Work Plan; transporting and mixing UHPC; formwork, testing, placing, curing and grinding, as well as the services of the Supplier’s Technical Representatives shall be included in the Contract unit price.

Pay Item	Pay Unit
Ultra High Performance Concrete	c.y.

## **ITEM #0601091A - SIMULATED STONE MASONRY**

**Description:** This item shall consist of furnishing and installing textured and colored formed concrete surfaces using simulated stone molds (form liners) and a color stained system designed to duplicate closely the appearance of natural stone as described herein of the type and size called for on the plans, including accessories and hardware and in accordance with these specifications. The architectural form liner simulated stone masonry shall be monolithically formed with the reinforced concrete wall.

### **Materials:**

1. Quality Of Work: The process of form lining, texturing and color staining of the hardened concrete shall be performed in strict accordance with the manufacturer's written recommendations and as approved by the Engineer.
2. The design and pattern of form lined concrete surfaces shall follow the layout shown on the contract plans and the manufacturer's standard drawing. Final coloration of the cast stone concrete surfaces shall closely simulate the appearance of real stone.
3. Quality Assurance:
  - a. Manufacturer of Simulated Stone Molds and Custom Coloring Systems shall have five years experience making custom simulated stone molds and color stains to create formed concrete surfaces to match natural stone shapes, surface textures and colors.
  - b. Contractor/Subcontractor (installer) shall have five years experience pouring vertically formed architectural concrete. The installer shall be trained in the manufacturer's special techniques in order to achieve realistic surfaces.
  - c. Color Stain System Application shall be performed by the manufacturer or manufacturer's authorized representative. The stain shall be applied by an applicator that has experience with similar projects.
  - d. A Pre-installation Meeting shall be scheduled with the manufacturer's representative, installer, designer, and Department inspection personnel to assure understanding of simulated stone masonry use, color staining application, and to coordinate the work.
4. Protection: The Contractor is solely responsible for construction methods, means, techniques, and for construction site safety precautions. The Contractor shall conduct all construction operations in conformance with all applicable local, state and federal safety laws, rules, regulations and codes. All Material Safety Data Sheets (MSDS) shall be available for inspection.

5. Manufacturer: Subject to compliance with the design and specification requirements, the Contractor shall provide simulated stone masonry color staining system as manufactured by Custom Rock International, Inc., St. Paul, Minnesota, or approved equivalent.
6. Materials:
  - a. Simulated Stone Molds (form liners) shall be made of reusable elastomeric form liners, made of high-strength urethane and cuttable form liners, made of lower grade urethane, easily attachable to forms. Formliners shall leave crisp, sharp definition of the architectural surface. Recurring textural configurations exhibited by repeating, recognizable shadow patterns shall be prevented by proper casting of formliner patterns. Form liners shall not compress more than 1/4 inch when concrete is poured at a rate of 10 vertical feet per hour. Form liners shall be removable without causing deterioration of surface or underlying concrete. No substitutions will be permitted.
  - b. The form liner shall conform to the Pattern No. 12003 “New England Drystack” manufactured by Custom Rock International, St. Paul, Minnesota, or an approved equivalent pattern as shown on the plans with a maximum relief of 1½”, and including texture and color staining system.
  - c. The form liner shall be designed to permit 180 degree rotation and interconnection with itself or another pattern liner of differing horizontal dimension. Maximum relief of pattern and the average relief shall be as shown on the contract plans. The simulated stone pattern shall vary in a random manner in the coursing parameters to prevent noticeable multiple duplicate pattern repetition and avoid stacked joints.
  - d. In addition to orthogonal surfaces, the form liner shall be capable of forming curved and/or battered surfaces, if shown on the plans, while maintaining the dimensioned coursing and plumb vertical joints without distortion.
7. Release Agent: The release agent shall be compatible with simulated stone masonry and color staining system to be applied to surface, as recommended by the manufacturer.
8. Form Ties: Form ties shall be designed to separate at least one inch back from finished surface, leaving only a neat hole that can be plugged with compatible patching material.
9. Color Stain: The color stain shall be a penetrating stain mix as provided by the manufacturer, shall achieve color variations present in the natural stone being simulated for the project, as approved by the Engineer and in accordance Items 1 and 2 above. The stain shall create a surface finish that is breathable (allowing water vapor transmission), and that resists deterioration from water, acid, alkali, fungi, sunlight or weathering. The stain mix shall be a water borne, low V.O.C. material, less than 180 grams/liter, and shall meet requirements for weathering resistance of 2000 hours accelerated exposure measured by weather-o-meter in accordance with ASTM G23 with 3-bulb. Scrub test 1000 revolutions. Abrasive resistance (Tabor-CF-10) 500 cycles. Adhesion ASTM D3359 1.OOMM cross cuts on glass pass 3 or

higher on a scale of 1 to 5. The Contractor shall supply information pertaining to chemical resistance in accordance with ASTM D1308.

**Construction Methods:**

1. Shop Drawings and Submittals: Before fabricating any materials, the contractor shall submit shop drawings, product data sheets and samples to the Engineer for approval in accordance with Article 1.05.02 for the materials listed in Item 3 below. These drawings and submittals shall include, but not be limited to, the following information: manufacturer's name, listing of product compliance with referenced specification standards, complete details of the assemblies, material designations, nominal hardness of appropriate materials, design loads, quantities and locations. The Engineer's drawings shall not be reproduced, traced or used for shop drawings or erection purposes.
2. Field Measurements: Prior to ordering or fabricating any materials, the contractor shall take complete and accurate field measurements.
3. Submittals:
  - a. Catalog cuts, manufacturer's literature, and technical data for the materials specified herein, including but not limited to simulated stone mold pattern, form liner, release agent, concrete patching material and color charts for staining for hardened concrete.
  - b. Photographs: Color photographs of three (3) similar past projects of the manufacturer. Include project names, locations and a telephone number of the previous projects Owner's representatives.
  - c. Samples: Form ties, sample and description, showing method of separation when forms are removed.
  - d. Plan, elevation and details to show overall pattern, joint locations, form tie locations, and end, edge and other special conditions.
4. Scheduling: Schedule color stain applications with earthwork and back filling of any wall areas making sure that all simulated stone texture is colored to the minimum distance below grade. Delay adjacent plantings until color application is completed. Coordinate the work to prevent interference with other trades.
5. Test Panels: At least 30 days prior to construction of the first textured and colored concrete surfaces, the Contractor shall prepare a test panel with a full-scale field mock-up of the formed concrete surface (4' x 4') showing the proposed color, pattern, joint treatment and layout as shown on the plans or in the Manufacturer's catalog. If the resulting appearance is not acceptable to the Engineer, adjustments shall be made to the color, pattern, finished texture and/or joint treatment and another test panel shall be prepared for inspection. The accepted mock-up shall provide the standard for the work.

6. Installation:

a. Contractor's responsibilities:

1. Install liners.
2. Apply manufacturer release agent.
3. Install concrete as specified elsewhere in the Specifications.
4. Remove form liner.
5. Patching, grinding and bush hammering of form liner seams as required.
6. Provide scaffolding and heat as required, and clean water for power washing of the hardened concrete prior to the staining process.
7. Power washing and patching of form liners.
8. Return of form liners to manufacturer.

b. Manufacturer's responsibilities:

1. Ship and supply form liners and release agent.
2. Technical information.
3. Power wash wall.
4. Apply the color staining process

7. Liner to Form Attachment System: Securely attach form liners to forms with wood or sheet metal screws; threaded inserts added to the back of the form liner for bolts to fasten the form liner through the forms, or; bolted through the face of the form liner with flat head bolts inserted in a pattern joint and through the form liner and forming system. Construction adhesives may be used, but not on reusable forms. Place adjacent form liners with less than 1/4 inch separation between form liners.
8. Release of Form Liners From Hardened Concrete: Only manufacturer recommended form release agents (Lark V or Orna Con) shall be utilized and shall be applied to the form liners before the concrete is poured. Release agents shall be applied in strict accordance with release agent manufacturer recommendations. Hand-charged sprayers will only be allowed if a thin uniform coating of release agent is obtained on the form liner.
9. Remove the form liner from the wall within 24 hours of pouring the concrete. The form liners may be detached from the forms and then removed from the concrete, or they may remain attached to the forms and the entire forming system removed from the concrete. Remove the form liners from the top, down. Curing of concrete may be accomplished with form liners and forms placed back against the wall after the initial detachment. Other means of curing can also be used including curing blankets and/or plastic. Curing compounds shall not be used.
10. Care and Cleaning of Form Liner: Form liners shall be cleaned the same day they are removed from the wall with a power wash and mild detergent. Synthetic brushes with stiff bristles may be used on stubborn areas. Mild acid washes may also be used. Solvents shall not be used. If

necessary, patching of holes shall be performed with 100% clear silicone caulk. Form liners shall be stored inside or under a protective, non-transparent cover, in a vertical, upside-down position.

11. Wall Patching and Finishing: After form liners are removed from the hardened concrete, the textured uncolored surface shall be prepared for color staining. All holes larger than 3/4" in greatest principal dimension shall be filled with concrete patching material such as Tamm's Speed-Crete or equal mixed with latex or acrylic bonder, as approved by the manufacturer and Engineer. All honeycombed areas shall be filled and textured to match surrounding areas. Seam lines and other unnatural protrusions shall be ground down to match adjacent areas with a hand-held power grinder using discs made for concrete. Grinding of seams shall be performed immediately after removal of the form liners. Perform final bush hammering to blend defects and ground areas into the final rock texture. In particular, the process of wall patching and finishing shall be subject to approval of the manufacturer and Engineer.
12. Color Staining (by manufacturer): The hardened concrete shall be a minimum of 30 days old before color staining is applied. Power wash the wall to free it from laitance, dirt, oil and other objectionable materials. After the wall has dried, the color staining process is applied using colors approved by the Engineer. Color staining shall be applied in such a way that the stones shall have individual colorations from adjacent stones. Water-based stains shall be used in air temperatures between 50 degrees F and 100 degrees F. Solvent-based stains shall be used in air temperatures of 50 degrees F and below, but in no case when the temperature of the hardened concrete is 40 degrees and falling. During color staining operations the Contractor shall protect property, pedestrians, vehicular and other traffic in the vicinity of the wall against damage or disfigurement from errant stain materials. Comply with all environmental regulations regarding surface cleaning, stain application, ground and watercourse protection and disposal protection of waste materials. Refer to Section 1.10 of the Standard Specifications (Form 817). Refer to Notice To Contractor-Architectural and Industrial Maintenance Coatings for additional specifications.
13. Simulated Stone Molds Preparation: Clean and make free of buildup prior to each pour. Inspect for blemishes and tears. Repair if needed following manufacturer's recommendations.

**Method of Measurement:**

This work shall be measured for payment by the actual number of square yards of the face area of accepted architectural form liner, poured in place simulated stone masonry, completed within the neat lines as shown on the plans, or as ordered by the Engineer.

**Basis of Payment:** This Work will be paid for at the contract unit price per square yard for "Simulated Stone Masonry", complete in place, which price shall include all equipment, formwork molds, test panels, and all other tools and labor incidental thereto.

This work shall also include the cost of furnishing and application of the color stain system to the simulated stone masonry surface.

Pay Item	Pay Unit
Simulated Stone Masonry	s.y.



## **ITEM #0601107A – HIGH EARLY STRENGTH CONCRETE**

**Description:** Work under this item shall consist of furnishing and placing concrete for the deck end closure pour, backwall reconstructed areas, or where shown on the plans, including all necessary materials and equipment to complete the work. Work under this item shall conform to the pertinent requirements of Section 6.01 and M.03, supplemented and amended as follows:

**Materials:** The materials shall conform to the following requirements:

1. High Early Strength Concrete – The high early strength concrete shall conform to one of the following:
  - A. The Contractor shall design and submit to the Engineer for approval a high early strength concrete mix. This mix shall be air-entrained, and shall be composed of Portland cement, fine and coarse aggregates, approved admixtures and additives, and water. The mix shall contain entrained air of 6.0% +/- 1.5%, and shall attain a 12-hour compressive strength of 3,000 psi and a 28-day minimum compressive strength of 5,000 psi.
  - B. In lieu of the above high early strength concrete mix, the Contractor may propose the use of a proprietary type mix that will meet the same physical requirements as those stated above. A mix design shall be submitted for this material, stating the percentage of each component to be utilized.
2. Regardless of the type of high early strength concrete proposed by the Contractor, substantive data that demonstrates the ability of the material to meet the specification requirements shall be submitted with the proposed mix design at least 30 days prior to its use.

**Construction Methods:** The construction methods for this work shall conform to the requirements of Section 6.01 supplemented and amended as follows:

**Working Drawings:** At least thirty (30) days before the erection of falsework and forms, the Contractor shall submit working drawings of falsework and forms to the Engineer for approval in accordance with Article 1.05.02(2). These working drawings are required on the following conditions:

Working drawings shall be submitted only when falsework is required to support the forms of the superstructure. These working drawings shall include but not be limited to the following information:

1. Complete details and erection plans of falsework and forms.
2. The computed falsework foundation pressures.

3. The computed settlements and deflections of falsework and forms.
4. Required camber of the forms to correct falsework settlement and form deflections.
5. Sequence of concrete placement.

Any work done or material ordered prior to approval of these drawings shall be at the Contractor's risk. Approval of the working drawings shall not serve to relieve the Contractor of any of his responsibility for the successful completion of the project.

At least thirty (30) day before the erection of falsework and forms, the Contractor shall submit information in accordance with Article 1.05.02 for review by the Engineer. This information shall include details of equipment to be used in placing and finishing of the concrete, including the number and type of personnel who will be engaged in placing the concrete. The personnel shall consist exclusively of persons with skill and experience appropriate to their working assignments.

The Contractor shall notify the Engineer and obtain written permission for placing of concrete at least 24 hours in advance of this placing of concrete.

Concrete shall not be placed until the Engineer has inspected the forms, form ties, the placing of the reinforcing steel, metal conduits and anchorages, and has given his approval thereof.

When falsework is required to support the forms, the Contractor shall make proper allowances for the deflection and settlement of forms and form supports and for the deflection and camber of substructure due to all operations, including post-tensioning.

If sequential placing of concrete is required, the concrete shall be placed in the sequence shown on contract plans.

Construction joint shall be made only where shown on the plans. Approval will not be given to place concrete in more than one operation where construction joints are not shown on the plans.

The concrete shall be vibrated. Both internal and external vibration shall be used when ordered by the Engineer. The vibrating shall be done with care in such a manner as to avoid displacement of reinforcing steel or other components. Concrete shall be carefully placed in the forms and vibrated sufficiently to produce a surface free from imperfections such as honeycomb, segregation, cracking, or checking.

Any deficiency, such as honeycomb or segregation, may be cause for rejection.

The forms and form supports under the deck slab shall be left in place until the concrete attains a minimum compressive strength of 3,000 psi.

Mixing, Placing, and Finishing: Mixing and placing concrete shall be done in accordance with the applicable portions of Article 6.01.03. Mixing and placing shall not be executed unless the ambient temperature is above 40 °F and rising.

Testing: The Contractor shall form, cure and test all concrete test cylinders under supervision of a representative of the Department. The dimensions, type of cylinder mold, number of cylinders, and method of curing shall be as directed by the Engineer.

The Contractor shall provide a portable compressive testing machine, on Site, for the purpose of testing all compressive strength cylinders. All testing shall be in accordance with the requirements of ASTM C39. NOTE: This compressive testing machine must be calibrated in accordance with the provisions of Section 5, ASTM C39.

**Method of Measurement:** This work will be measured for payment by the actual volume in cubic yards of concrete, complete and accepted.

**Basis of Payment:**

The work completed under this Item will be paid for at the contract unit price per cubic yard for “High Early Strength Concrete,” which price shall include surface preparation and all equipment, tools, labor and work incidental thereto.

Pay Item	Pay Unit
High Early Strength Concrete	C.Y.

## **ITEM #0601275A – PRECAST SUBSTRUCTURE ELEMENTS**

**Description:** Work under this item shall include the fabrication, delivery, temporary bracing and installation of precast concrete stem blocks, including all necessary materials and equipment to complete the work, as shown on the plans.

This item shall include the reinforcing steel, lifting and seating inserts, non-shrink grout, and all other necessary materials and equipment to complete the work.

This item shall exclude the cost of drilling and grouting dowels required to connect precast stem block to the existing abutment bridge seat. This work is paid for under Item No. 0602910A “Drilling Holes and Grouting Dowels” and Item No. 0602030 “Deformed Steel Bars - Galvanized”.

Semi-integral abutment precast backwall elements are included under the Item No. 0601277A “Precast Concrete Bridge Components”. Backwalls are considered a superstructure element and are not a part of this item.

Fabrication of precast elements specified under this Item and Item No. 0601277A “Precast Concrete Bridge Components” shall be completed by one manufacturer. Closed cell foam material between stem block and backwall shall be included for payment under Item No. 0601277A “Precast Concrete Bridge Components”.

Due to the accelerated nature of this project, the PBUs, backwalls, and stem block units shall be manufactured, preassembled (dry-fit) for verification, match marked for field assembly, and approved prior to the initiation of the full roadway closure at the site. The cost to dry-fit the precast substructure elements shall be incidental to the Item “Precast Concrete/Steel Composite Superstructure”.

**Materials:** The materials for precast stem block shall conform to the following requirements:

**1. Concrete:** Concrete shall meet the requirements of Article M.03.01, for “Bridge Deck Concrete” and shall have a minimum 28-day compressive strength of 4,400 psi. All cement shall meet the requirements of ASTM C 10 Type I. Air content shall be between 5% and 7%. The use of calcium chloride or an admixture containing calcium chloride will not be permitted.

**2. Reinforcing Steel:** Reinforcing steel shall be galvanized and conform to the requirements of Article M.06.01.

**3. Grout:** Non-shrink grout shall conform to the requirements of Section M.03.05.

**5. Lifting hooks and Inserts:** If used, lifting hooks and inserts shall be of a design satisfactory to the Engineer for the purpose intended and shall be galvanized in accordance with ASTM A153 or ASTM B695 Grade 50.

**7. Miscellaneous Materials:** Materials for leveling devices or non-metallic shims for setting the precast units to proper grade during installation shall comply with the applicable sections of Form 817, for the specific materials used.

**Construction Methods:** A Department Certified Precast Concrete Plant or a pre-qualified on-site pre-caster shall be used for the precast substructure units.

- 1. Shop Drawings:** The Contractor shall submit shop drawings in accordance with the requirements of Article 1.05.02. Approval of the shop drawings will be required prior to the ordering of the materials and the fabrication of the substructure units. The width of each precast substructure unit shall be determined by the Contractor. Suggested precast substructure unit section widths are shown on the Contract Plans.

The Contractor shall submit Shop Drawings including the following, at a minimum, to the Division of Materials Testing, the Designer of Record and the Project Engineer, for review a minimum of 60 days prior to fabrication, etc.:

- a. The stamp of the registered Professional Engineer licensed in the State of Connecticut who has reviewed and certified the shop drawings.
  - b. All lifting inserts, hardware, or devices and locations for Engineer's approval.
  - c. Locations and details of the lifting devices, including supporting calculations, type, and amount of any additional reinforcing required for lifting. All lifting devices shall be designed based on the no cracking criteria in Chapter 8 of the PCI Design Handbook (Seventh Edition).
  - d. Dimensions from working points or working lines to prevent the cumulation of dimensional tolerances. The width of each individual stem block unit along with the width of the shear key closure pour shall be determined such that, when pieces are laid together, the stem block sections shall satisfy the required stem block total width and cross slopes shown on the plans.
  - e. The minimum compressive strength attained prior to handling the stem block.
  - f. Details of leveling devices or vertical adjusting hardware.
  - g. Reinforcement details in accordance with Subarticle 6.02.03-1 of Form 817.
- 2. Assembly Plan:** The Assembly Plan is a document prepared by the Contractor and a qualified Engineer with specific knowledge of the Contractor's equipment and "means and methods" for constructing the precast elements required to complete the work on the project. The development of the Assembly Plan is closely linked to the schedule of operations and the interim material strengths necessary for the work to progress. The Contractor needs to be involved with any required modifications to the shop drawings so that he can incorporate these into the development of the Assembly Plan.

The Assembly Plan will be reviewed by both the Engineer of Record and the District Construction personnel similar to a Working Drawing. The approved Assembly Plan will serve as the governing specification with respect to progressing with construction prior to components achieving the final required material strengths as stated in this Contract. Approval of the Assembly Plan will be required prior to the start of the closure of the roadway.

Under no circumstances shall the fabrication of the precast concrete substructure units commence prior to the approval of the Shop Drawings and the Assembly Plan unless written permission is given by the Engineer. The Department will reject any components fabricated before receiving written approval or components that deviate from the approved drawings.

Any expenses incidental to the revision of materials furnished, in accordance with the Shop Drawings and order lists, to make them comply with the plans and specifications, including costs incurred due to faulty detailing or fabrication, shall be borne by the Contractor.

At a minimum, the Assembly Plan shall include the following information:

- a. Details and/or cut sheets of all equipment that will be employed for the assembly of the substructure units.
- b. Details of all equipment to be used to lift substructure units including cranes, excavators, lifting slings, sling hooks, and jacks. Crane locations, operating radii, and lifting calculations. The factors of safety for the lifting of stem block shall be achieved by using 125% of the weight of the stem block being lifted in the calculations.
- c. A procedure for handling and erection including bracing requirements based on Chapter 8 of the PCI Design Handbook (Seventh Edition). Calculations shall be prepared for the lifting and handling in accordance with the no discernible cracking criteria and shall be submitted as part of the Assembly Plan. Lifting hook locations and hardware shall be coordinated with the Fabricator.
- d. A statement of compliance with all requirements of applicable environmental permits.
- e. A work area plan, depicting all affected utilities, drainage, and protective measures that will be employed throughout the construction activities.
- f. PDF documents prepared on full size 22"x34" sheets depicting the assembly procedures for the precast substructure units.
- g. A detailed schedule with an hourly timeline for all operations. In development of the schedule the Contractor shall account for setting and cure time for concrete closure pours.
- h. Methods of providing temporary support of the substructure units. Include methods of adjusting and securing the stem block after placement.
- i. Procedures for controlling erection tolerances for both the horizontal and vertical direction.

- j. Methods of pouring shear keys.
  - k. The Assembly Plan shall be bound into one PDF document and shall be prepared and stamped by a registered Professional Engineer licensed in the State of Connecticut.
- 3. Forms:** Forms shall be mortar tight and strong enough to prevent misalignment of stem block edges. They shall be constructed to allow their removal without damage to the concrete. A positive means of supporting reinforcing cages in place during forming shall be required.

The forms shall not be removed until the concrete is strong enough to avoid possible injury from such removal. A minimum compressive strength of 500 psi shall be obtained prior to stripping the form. Forms shall not be removed without approval being granted by the Engineer. All forming materials used for casting cylindrical openings for lifting holes shall be removed. Do not place concrete in the forms until the Engineer has inspected the forms and approved all the materials in the stem blocks.

- 4. Placing Concrete:** Provide to the Engineer a tentative casting schedule at least two weeks in advance to make inspection and testing arrangements. Concrete shall not be deposited in the forms until the Engineer has inspected the placing of the reinforcing steel, and other cast-in-place components, and has given his approval thereof.

The mix shall be proportioned and mixed in a batch mixer to produce homogeneous concrete. At no time will truck-mixed or transit-mixed concrete be allowed. The concrete temperature shall be 60deg F to 90deg F at the time of placement.

Concrete shall not be deposited into the forms when the ambient temperature is below 40deg F or above 100deg F, unless adequate heating or cooling procedures have been previously approved by the Engineer. Production during the winter season, from November 15 to March 15 inclusive, will be permitted only on beds located in a completely enclosed structure of suitable size and dimension that provides a controlled atmosphere for the protection of the casting operation and the product. Outside concreting operations will not be permitted during rainfall unless the operation is completely under cover.

Void forms shall be held in place against uplift or lateral displacement during the pouring and vibrating of the concrete by substantial wire ties or other satisfactory means as approved by the Engineer. The concrete shall be vibrated internally, or externally, or both, as ordered by the Engineer. The vibrating shall be done with care in such a manner as to avoid displacement of reinforcing steel, voids, forms, or other components. There shall be no interruption in the pouring of any of the sections. Concrete shall be carefully placed in the forms and vibrated sufficiently to produce a surface free from imperfections such as honeycombing, segregation, cracking, or checking. Any deficiencies noted in the sections may be cause for rejection.

5. **Finishing:** Finish the precast stem blocks in accordance with Subarticle 6.01.03. Trowel-finish the top surface of all precast substructure units. Intentionally roughen grouted concrete surfaces. Formed surfaces shall not be finished in any specific manner except as noted below. All fins, runs, or mortar shall be removed from surfaces which will remain exposed. Form marks on exposed surfaces shall be smoothed by grinding.
6. **Test Cylinders:** During the casting of the sections, the Contractor shall make test cylinders under the supervision of a representative of the State. Tests shall be performed by an AASHTO accredited laboratory and the Contractor shall arrange for testing. A minimum of 4 cylinders shall be taken during each production run or as ordered by the Engineer. The dimensions and type of cylinder mold shall be as specified by the Engineer. Cylinders shall be cured under the requirements of ASTM C31 and shall be used to determine the 28 day compressive strength requirements ( $f'c$ ). Failure of any of the 28 day tests cylinders to meet 90% of the minimum compressive strength requirement may be cause for rejection. The Engineer also reserves the right to request and test core specimens from the sections to determine their adequacy.
7. **Curing:** The precast stem blocks shall be continuously wet cured for 7-days, commencing immediately after final finishing with all exposed surfaces covered. The precast stem blocks shall have minimum cure of 14 days prior to delivery to site. Test data such as slump, air content, or unit weight for fresh concrete and compressive strengths for the hardened concrete after 7, 14, and 28 days, shall be submitted to the Engineer.
8. **Patching:** The Engineer shall evaluate the acceptability and the cause of the defects and the service condition of the precast stem block section. No repairs shall be done by the Contractor unless permission has been granted by the Engineer. The Contractor shall submit to the Engineer for review, the proposed methods and materials to be used in the repair operation. All repairs shall be sound and properly finished and cured before the precast elements are delivered to the job site. The Contractor shall bear the costs of all repair work.
9. **Installation:** The installation of the precast substructure units shall proceed as required by the approved Assembly Plan and in accordance with the special provisions "Prosecution and Progress" and "Maintenance and Protection of Traffic". The stem block sections shall be placed in a manner to best accommodate and facilitate the accelerated construction sequence. The stem block sections shall be set level as indicated on the plans. The following is the general procedure for installing the stem block:
  - a. Review the approved Assembly Plan. If changes are warranted due to varying site conditions, resubmit the plan for review and approval.
  - b. Establish working points, working lines, and benchmark elevations prior to placement of all elements.



- c. Drill and grout bars for stem block attachment, to be paid for separately under the Items “Drilling and Grouting Dowels” and “Deformed Steel Bars (Galvanized)”. Use template to match holes cast into stem blocks.
- d. Lift stem block segments using lifting devices as shown on the shop drawings.
- e. Set stem blocks in the proper horizontal location in the sequence and according to the methods outlined in the Assembly Plan.
- f. Check for proper alignment and grade within specified tolerances. Survey the top elevation of the stem block. Adjust vertical leveling devices prior to full release of the stem block from the crane. This will reduce the amount of torque required to turn the bolts in the leveling devices. Check for proper grade within specified tolerances.
- g. Place non-shrink grout below stem block per the Assembly Plan.
- h. All fixtures or holes cast into the sections for lifting, anchoring, or seating shall be neatly filled with non-shrink grout. The finished surface shall be flush and smooth with the adjacent concrete.

**10. Quality Control:** At a minimum, the following requirements shall be met:

- a. All precast substructure units shall be fabricated by a PCI certified fabricator that is approved by the Department with a minimum certification of “B1”.
- b. Cracking or damage of precast substructure units shall be prevented during handling and storage.
- c. Defects and breakage of precast elements shall be repaired or the stem block replaced, as follows:
  - i. Members that sustain damage or surface defects during fabrication, handling, storage, hauling, or erection are subject to review or rejection.
  - ii. Approval shall be obtained before performing repairs.
  - iii. Repair work must re-establish the elements’ structural integrity, durability, and aesthetics to the satisfaction of the Engineer.
  - iv. The cause shall be determined when damage occurs and corrective action shall be taken.
  - v. Failure to take corrective action, leading to similar repetitive damage, can be cause for rejection of the damaged element.
  - vi. Cracks that extend to the nearest reinforcement plane and fine surface cracks that do not extend to the nearest reinforcement plane but are numerous or extensive are subject to review and rejection.
  - vii. Full depth cracking and breakage greater than one foot are cause for rejection.
- d. Precast elements shall be constructed to tolerances shown below, within this section. Where tolerances are not shown, follow tolerance limits in the PCI MNL116-99, “Manual for Quality Control for Plants and Production of Structural Precast Concrete Products, 4th Edition”.

- i. Do not exceed 1/4 inch maximum deviation at each end of the span from overall longitudinal alignment after setting.
  - ii. Do not exceed 1/4 inch maximum deviation from overall transverse location at each construction joint.
  - iii. Maximum deviation from alignment in both primary plan directions at shall not exceed 1/4 inch or that required for the accommodation of the construction joint width shown on plans, whichever is the less.
  - iv. In the absence of other constraints, keep individual elements or surfaces within 1/4 inch of location with respect to similar matching surfaces.
- e. The plant shall document all test results. The quality control file shall contain at least the following information:
- i. Element identification.
  - ii. Date and time of cast.
  - iii. Concrete cylinder test results.
  - iv. Quantity of concrete used and the batch printout.
  - v. Form-stripping date and repairs if applicable.
  - vi. Location/number of blockouts and lifting inserts.
  - vii. Temperature and moisture of curing period.
  - viii. Document lifting device details, requirements, and inserts.
- f. The Contractor shall perform strength testing of materials prior to proceeding to the next stage of construction. The strength achieved at the time of testing shall meet the value in the approved Assembly Plan. The Contractor shall not rely solely on cylinder breaks by Department personnel as the schedules for testing by the Department will not be changed. The Contractor shall provide this testing at its own expense and shall take the required number of cylinders in the event that the material does not gain strength as anticipated.

**11. Marking:** Permanently mark each precast substructure unit with the date of casting and supplier identification. Stamp markings in fresh concrete.

**12. Special Considerations:** Preassemble (dry-fit) adjacent elements in the shop, including precast stem blocks, Precast Bridge Units (PBUs), and precast backwalls.

**13. Handling and Storage:** Care shall be taken during storage, transporting, hoisting and handling of all precast sections to prevent damage. Sections damaged by improper storing, transporting or handling shall be repaired or replaced by the Contractor, as directed by the Engineer and at no cost to the State. All storage and handling operations shall be as directed by the Engineer.

The precast sections shall not be removed from their casting beds until the concrete has attained the minimum compressive strength determined by the Contractor and approved by the Engineer. Precast sections shall not be shipped to the job site until the 28 day

strength (f'c) has been attained. Provide to the Engineer a delivery schedule at least two weeks in advance of the shipment of precast slabs to the job site.

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

**Basis of Payment:** This work will be paid for at the lump sum price for "Precast Substructure Elements", complete and accepted in place, which price shall include all materials, equipment, tools, labor and work incidental to the fabrication, testing, transport and installation. There shall be no separate payment for: forms, leveling devices, shims, or any other component or material used for the work, as they are to be included in the contract unit price. Grouted Dowels shall be compensated under "Drilling Holes and Grouting Dowels" and "Deformed Steel Bars - Galvanized".

Pay Item	Pay Unit
Precast Substructure Elements	L.S.

## **ITEM #0601277A – PRECAST CONCRETE BRIDGE COMPONENTS**

**Description:** Work under this item shall include the fabrication, delivery, temporary bracing and connection of precast concrete backwalls to the Prefabricated Bridge Units (PBU), including all necessary materials and equipment to complete the work, as shown on the plans.

This item shall include the reinforcing steel, embedded steel plates, connectors & fasteners, lifting and seating inserts, non-shrink grout, and all other necessary materials and equipment to complete the work.

Joint filler material between precast stem block, backwall and existing backwall or wingwall shall be included for payment under this item.

Fabrication of precast elements specified under this Item and Item No. 0601275A “Precast Substructure Elements” shall be completed by one manufacturer.

Due to the accelerated nature of this project, the PBUs, backwalls, and stem block units shall be manufactured, preassembled (dry-fit) for verification, match marked for field assembly, and approved prior to the initiation of the full roadway closure at the site. The cost to dry-fit the precast substructure elements shall be incidental to the Item “Precast Concrete/Steel Composite Superstructure”.

**Materials:** The materials for precast backwall shall conform to the following requirements:

- 1. Concrete:** Concrete shall meet the requirements of Article M.03.01, for “Bridge Deck Concrete” and shall have a minimum 28-day compressive strength of 4,400 psi. All cement shall meet the requirements of ASTM C 10 Type I. Air content shall be between 5% and 7%. The use of calcium chloride or an admixture containing calcium chloride will not be permitted.
- 2. Reinforcing Steel:** Reinforcing steel shall be galvanized and conform to the requirements of Article M.06.01.
- 3. Structural Steel:** Structural steel materials for embedded plates shall conform to the requirements of Section M.06. All structural steel in the superstructure shall conform to the requirements of AASHTO M270, Grade 50T2.
- 4. Shear Connectors:** Shear Connectors shall conform to Article M.06.02-4. Non-shrink grout shall conform to the requirements of Section M.03.05.
- 5. Lifting hooks and Inserts:** If used, lifting hooks and inserts shall be of a design satisfactory to the Engineer for the purpose intended and shall be galvanized in accordance with ASTM A153 or ASTM B695 Grade 50.

**6. High Strength Bolts:** High Strength Bolts, attached to embedded plates, shall conform to Article M.06.02-3.

**7. Joint Filler:** Expansion joint fillers for bridges shall conform to the requirements of Section M.03.08.

**8. Grout:** Non-shrink grout shall conform to the requirements of Section M.03.05.

**9. Miscellaneous Materials:** Materials for leveling devices or non-metallic shims for setting the precast units to proper grade during installation shall comply with the applicable sections of Form 817, for the specific materials used.

**Construction Methods:** A Department Certified Precast Concrete Plant or a pre-qualified on-site pre-caster shall be used for the precast components.

- 1. Shop Drawings:** The Contractor shall submit shop drawings in accordance with the requirements of Article 1.05.02. Approval of the shop drawings will be required prior to the ordering of the materials and the fabrication of the backwalls. The width (transverse direction perpendicular to roadway baseline) of each backwall unit shall be as shown on the plans or as approved by the Engineer of Record. The Contractor may submit alternative segment widths for acceptance.

The Contractor shall submit Shop Drawings including the following, at a minimum, to the Division of Materials Testing, the Designer of Record and the Project Engineer, for review a minimum of 60 days prior to fabrication, etc.:

- a. The stamp of the registered Professional Engineer licensed in the State of Connecticut who has reviewed and certified the shop drawings.
  - b. All lifting inserts, hardware, or devices and locations for Engineer's approval.
  - c. Locations and details of the lifting devices, including supporting calculations, type, and amount of any additional reinforcing required for lifting. All lifting devices shall be designed based on the no cracking criteria in Chapter 8 of the PCI Design Handbook (seventh edition).
  - d. Dimensions from working points or working lines to prevent the cumulation of dimensional tolerances. The width of each individual backwall along with the width of the shear keys shall be determined such that, when pieces are laid together, the backwall sections shall satisfy the required backwall total width and cross slopes shown on the plans.
  - e. The minimum compressive strength attained prior to handling the backwall.
  - f. Details of leveling devices or vertical adjusting hardware.
  - g. Reinforcement details in accordance with Subarticle 6.02.03-1 of Form 817.
- 2. Assembly Plan:** The Assembly Plan is a document prepared by the Contractor and a qualified Engineer with specific knowledge of the Contractor's equipment and "means and methods" for constructing the precast elements required to complete the work on the

project. The development of the Assembly Plan is closely linked to the schedule of operations and the interim material strengths necessary for the work to progress. The Contractor needs to be involved with any required modifications to the shop drawings so that he can incorporate these into the development of the Assembly Plan.

The Assembly Plan will be reviewed by both the Engineer of Record and the District Construction personnel similar to a Working Drawing. The approved Assembly Plan will serve as the governing specification with respect to progressing with construction prior to components achieving the final required material strengths as stated in this Contract. Approval of the Assembly Plan will be required prior to the start of the closure of the roadway.

Under no circumstances shall the fabrication of the precast concrete bridge components commence prior to the approval of the Shop Drawings and the Assembly Plan unless written permission is given by the Engineer. The Department will reject any components fabricated before receiving written approval or components that deviate from the approved drawings.

Any expenses incidental to the revision of materials furnished, in accordance with the Shop Drawings and order lists, to make them comply with the plans and specifications, including costs incurred due to faulty detailing or fabrication, shall be borne by the Contractor.

At a minimum, the Assembly Plan shall include the following information:

- a. Details and/or cut sheets of all equipment that will be employed for the assembly of the backwall units.
- b. Details of all equipment to be used to lift backwall units including cranes, excavators, lifting slings, sling hooks, and jacks. Crane locations, operating radii, and lifting calculations. The factors of safety for the lifting of backwalls will be achieved by using 125% of the weight of the backwall being lifted in the calculations.
- c. A procedure for handling and erection including bracing requirements based on Chapter 8 of the PCI Design Handbook (seventh edition). Calculations shall be prepared for the lifting and handling in accordance with the no discernible cracking criteria and shall be submitted as part of the Assembly Plan. Lifting hook locations and hardware should be coordinated with the Fabricator.
- d. A statement of compliance with all requirements of applicable environmental permits.
- e. A work area plan, depicting all affected utilities, drainage, and protective measures that will be employed throughout the construction activities.
- f. PDF Documents prepared on full size 22"x34" sheets depicting the assembly procedures for the precast backwall units.
- g. A detailed schedule with a timeline for all operations. In development of the schedule the Contractor shall account for setting and cure time for concrete closure pours.
- h. Methods of providing temporary support of the backwall units. Include methods of adjusting and securing the backwall after placement.

- i. Procedures for controlling erection tolerances for both the horizontal and vertical direction.
  - j. Methods of pouring shear keys.
  - k. The Assembly Plan shall be bound into one complete document and shall be prepared and stamped by a registered Professional Engineer licensed in the State of Connecticut.
- 3. Forms:** Forms shall be mortar tight and strong enough to prevent misalignment of backwall edges. They shall be constructed to allow their removal without damage to the concrete. A positive means of supporting reinforcing cages in place during forming shall be required.

The forms shall not be removed until the concrete is strong enough to avoid possible injury from such removal. A minimum compressive strength of 500 psi shall be obtained prior to stripping the form. Forms shall not be removed without approval being granted by the Engineer. All forming materials used for casting cylindrical openings for lifting holes shall be removed. Do not place concrete in the forms until the Engineer has inspected the forms and approved all the materials in the backwalls.

- 4. Placing Concrete:** Provide to the Engineer a tentative casting schedule at least two weeks in advance to make inspection and testing arrangements. Concrete shall not be deposited in the forms until the Engineer has inspected the placing of the reinforcing steel, and other cast-in-place components, and has given his approval thereof.

The mix shall be proportioned and mixed in a batch mixer to produce homogeneous concrete. At no time will truck-mixed or transit-mixed concrete be allowed. The concrete temperature shall be 60deg F to 90deg F at the time of placement.

Concrete shall not be deposited into the forms when the ambient temperature is below 40deg F or above 100deg F, unless adequate heating or cooling procedures have been previously approved by the Engineer. Production during the winter season, from November 15 to March 15 inclusive, will be permitted only on beds located in a completely enclosed structure of suitable size and dimension that provides a controlled atmosphere for the protection of the casting operation and the product. Outside concreting operations will not be permitted during rainfall unless the operation is completely under cover.

Void forms shall be held in place against uplift or lateral displacement during the pouring and vibrating of the concrete by substantial wire ties or other satisfactory means as approved by the Engineer. The concrete shall be vibrated internally, or externally, or both, as ordered by the Engineer. The vibrating shall be done with care in such a manner as to avoid displacement of reinforcing steel, voids, forms, or other components. There shall be no interruption in the pouring of any of the sections. Concrete shall be carefully placed in the forms and vibrated sufficiently to produce a surface free from imperfections

such as honeycombing, segregation, cracking, or checking. Any deficiencies noted in the sections may be cause for rejection.

5. **Finishing:** Finish the precast backwalls in accordance with Subarticle 6.01.03. Formed surfaces shall not be finished in any specific manner except as noted below. Provide an exposed aggregate finish on the top surface of all precast backwall units. All fins, runs, or mortar shall be removed from surfaces which will remain exposed. Form marks on exposed surfaces shall be smoothed by grinding.
6. **Test Cylinders:** During the casting of the sections, the Contractor shall make test cylinders under the supervision of a representative of the State. Tests shall be performed by an AASHTO accredited laboratory and the Contractor shall arrange for testing. A minimum of 4 cylinders shall be taken during each production run or as ordered by the Engineer. The dimensions and type of cylinder mold shall be as specified by the Engineer. Cylinders shall be cured under the requirements of ASTM C31 and shall be used to determine the 28 day compressive strength requirements ( $f'c$ ). Failure of any of the 28 day tests cylinders to meet 90% of the minimum compressive strength requirement may be cause for rejection. The Engineer also reserves the right to request and test core specimens from the sections to determine their adequacy.
7. **Curing:** The precast backwalls shall be continuously wet cured for 7-days, commencing immediately after final finishing with all exposed surfaces covered. The precast backwalls shall be cured for a minimum of 14 days prior to placement. Test data such as slump, air content, or unit weight for fresh concrete and compressive strengths for the hardened concrete after 7, 14, and 28 days, shall be submitted to the Engineer.
8. **Patching:** The Engineer shall evaluate the acceptability and the cause of the defects and the service condition of the precast backwall section. No repairs shall be done by the Contractor unless permission has been granted by the Engineer. The Contractor shall submit to the Engineer for review, the proposed methods and materials to be used in the repair operation. All repairs shall be sound and properly finished and cured before the precast elements are delivered to the job site. The Contractor shall bear the costs of all repair work.
9. **Installation:** The installation of the precast backwall units shall proceed as required by the approved Assembly Plan and in accordance with the special provisions "Precast Concrete/Steel Composite Superstructure", "Prosecution and Progress" and "Maintenance and Protection of Traffic". The backwall sections shall be placed in a manner to best accommodate and facilitate the accelerated construction sequence. The backwall sections shall be set to the grade indicated on the plans. The following is the general procedure for installing the backwalls:
  - a. Review the approved Assembly Plan. If changes are warranted due to varying site conditions, resubmit the plan for review and approval.



- b. Establish working points, working lines, and benchmark elevations prior to placement of all elements.
- c. Lift backwall segments using lifting devices as shown on the shop drawings.
- d. Set backwalls into their proper transverse location as shown on the approved Assembly Plan. Align anchor bolts with holes in PBU end plates. Do not tighten anchor bolt nuts until final elevation has been verified.
- e. Check for proper alignment and grade within specified tolerances. Survey the top elevation of the backwall. Adjust vertical leveling devices prior to full release of the backwall from the crane. Check for proper grade within specified tolerances.
- f. Fully torque anchor bolt nuts to secure backwall in place and release crane.
- g. Set adjacent backwall section using same procedure until all segments are in place.
- h. Fill vertical shear keys with non-shrink grout.
- i. After all segments are in place and grouted, deck end closure pour using “High Early Strength Concrete” may be completed.

**10. Quality Control:** At a minimum, the following requirements shall be met:

- a. All precast backwall units shall be fabricated by a PCI certified fabricator that is approved by the Department with a minimum certification of “B1”.
- b. Cracking or damage of precast backwall units be prevented during handling and storage.
- c. Defects and breakage of precast elements shall be repaired or the backwall replaced, as follows:
  - i. Members that sustain damage or surface defects during fabrication, handling, storage, hauling, or erection are subject to review or rejection.
  - ii. Approval shall be obtained before performing repairs.
  - iii. Repair work must re-establish the elements’ structural integrity, durability, and aesthetics to the satisfaction of the Engineer.
  - iv. The cause shall be determined when damage occurs and corrective action shall be taken.
  - v. Failure to take corrective action, leading to similar repetitive damage, can be cause for rejection of the damaged element.
  - vi. Cracks that extend to the nearest reinforcement plane and fine surface cracks that do not extend to the nearest reinforcement plane but are numerous or extensive are subject to review and rejection.
  - vii. Full depth cracking and breakage greater than one foot are cause for rejection.
- d. Precast elements shall be constructed to tolerances shown below, within this section. Where tolerances are not shown, follow tolerance limits in the PCI MNL116-99, “Manual for Quality Control for Plants and Production of Structural Precast Concrete Products, 4th Edition”.

- i. Do not exceed 1/4 inch maximum deviation at each end of the span from overall longitudinal alignment after setting.
  - ii. Do not exceed 1/4 inch maximum deviation from overall transverse location at each construction joint.
  - iii. Maximum deviation from alignment in both primary plan directions at shall not exceed 1/4 inch or that required for the accommodation of the construction joint width shown on plans, whichever is less.
  - iv. In the absence of other constraints, keep individual elements or surfaces within 1/4 inch of location with respect to similar matching surfaces.
- e. The plant shall document all test results. The quality control file shall contain at least the following information:
  - i. Element identification.
  - ii. Date and time of cast.
  - iii. Concrete cylinder test results.
  - iv. Quantity of concrete used and the batch printout.
  - v. Form-stripping date and repairs if applicable.
  - vi. Location/number of blockouts and lifting inserts.
  - vii. Temperature and moisture of curing period.
  - viii. Document lifting device details, requirements, and inserts.
- f. The Contractor shall perform strength testing of materials prior to proceeding to the next stage of construction. The strength achieved at the time of testing shall meet the value in the approved Assembly Plan. The Contractor should not rely solely on cylinder breaks by Department personnel as the schedules for testing by the Department will not be changed. The Contractor shall provide this testing at his/her own expense and shall take the required number of cylinders or cubes in the event that the material does not gain strength as anticipated.

**11. Marking:** Permanently mark each precast backwall unit with the date of casting and supplier identification. Stamp markings in fresh concrete.

**12. Special Considerations:** Dry fit adjacent elements in the shop, including Precast Bridge Units (PBUs), and precast stem blocks.

**13. Handling and Storage:** Care shall be taken during storage, transporting, hoisting and handling of all precast sections to prevent damage. Sections damaged by improper storing, transporting or handling shall be repaired or replaced by the Contractor, as directed by the Engineer and at no cost to the State. All storage and handling operations shall be as directed by the Engineer.

The precast sections shall not be removed from their casting beds until the concrete has attained the minimum compressive strength determined by the Contractor and approved by the Engineer. Precast sections shall not be shipped to the job site until the 28 day

strength (f'c) has been attained. Provide to the Engineer a delivery schedule at least two weeks in advance of the shipment of precast slabs to the job site.

**Method of Measurement:** This work, being paid for 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 “Precast Concrete Bridge Component”, complete and in place, which price shall include all materials, equipment, tools, labor and work incidental to the fabrication, testing, transport and installation. There shall be no separate payment for: forms, leveling devices, shims, or any other component or material used for the work, as they are to be included in the contract unit price.

Pay Item	Pay Unit
Precast Concrete Bridge Components	L.S.

## **ITEM #0601954A – EPOXY INJECTION CRACK REPAIR**

**Description:** This Item shall consist of surveying the existing areas, locating all cracks to be repaired under this item, and rebonding the cracked concrete structures with two a component modified epoxy resin system injected into the cracked structure under low pressure using continuous positive displacement metering and mixing equipment as directed in accordance with these specifications.

Work under this item shall also include providing of a safe access to the structure for the delineation of the repair locations and review of the performed repair work. The Contractor shall not perform any repair work without prior approval of the engineer for location, limits and types of repairs.

**Materials:** The modified epoxy resin shall be a pre-qualified epoxy resin (see Appendix A). A Materials Certificate and a Certified Test Report in accordance with Article 1.06.07 shall accompany each batch or lot of the material delivered to the job site, to verify the epoxy resin's conformance with the manufacturer's supplied infrared spectroscopy test results.

A batch of each component will be defined as that quantity of material that has been subjected to the same unit chemical or physical mixing process intended to make the final product substantially uniform.

Each component shall be packaged in steel containers no larger than 5 gallons in volume. The containers shall have lug type crimp lids this ring seals, shall be new, not less than 0.024-inch nominal thickness, and shall be well sealed to prevent leakage. If a lining is used in the container, it shall be of such character as to resist any action by the components. Each container shall be clearly labeled with the designation (component A or B), manufacturer's name and date or manufacturer, batch number and the following warning:

**CAUTION:** This material will cause severe dermatitis if it is allowed to come in contact with the skin or eyes. Use gloves and protective creams on the hands. Should this material contact the skin, wash thoroughly with soap and water. Do not attempt to remove this material from the skin with solvents. If any material gets in the eyes, flush for 10 minutes with water and secure immediate medical attention.

Any material, which shows evidence of crystallization or a permanent increase in viscosity or settling of pigments that cannot be readily dispersed with a paddle, shall not be used.

**Construction Methods:** A survey shall be undertaken by the Contractor on the area designated to be repaired, under the direction and to the satisfaction of the Engineer, to determine the exact limits and location of the area to be repaired under this item.

At the time of mixing, components A and B and the substrate temperature shall be between 50° and 85° Fahrenheit, unless the material has been pre-qualified at a temperature less than 75°

Fahrenheit, in which case this lesser temperature shall govern the use of the material. Any heating of the adhesive components shall be done by application of indirect heat. Immediately prior to filling the tanks of the mixing equipment, each component shall be thoroughly stirred with a paddle. Separate paddles shall be used to stir each component.

Cracks less than 1/8 inch in width shall not be repaired under this item unless directed by the Engineer, but shall be sealed by the application of "Protective Compound for Bridges".

Prior to sealing, the crack shall be cleaned free of dust, silt and any other material, which would impair bond. Cleaning shall be done with oil free compressed air jets or preferably by vacuum cleaning with an industrial vacuum cleaner (such as Black and Decker No. 95 Vackar or equivalent).

Injection ports shall be inserted in the cracks at intervals not less than the thickness of the concrete being injected. At the end of a crack or at a point where the thickness of the crack becomes less than 0.125 inches, at the first port shall be half the distance from this point. The Contractor may use either surface injection ports or insertable injection ports as recommended by the manufacturer of the epoxy.

Drilling of the injection ports shall be done with a hollow drill bit to which vacuum is applied with an industrial vacuum cleaner (such as Black and Decker No. 95 Vackar or equivalent). The drill shall not contact any steel reinforcing or pre-stressing strands or ducts. A pachometer shall be used to locate the embedded steel.

Spacing of the ports shall be such that the injected adhesive will substantially fill the crack without excessive waste. If necessary to meet this requirement, the spacing of the ports shall be revised as approved by the Engineer as the injection process progresses.

The surface of the crack between ports shall be sealed with tape or other temporary surface sealant, which is capable of retaining the epoxy adhesive in the crack during pressure injection, and shall remain in places until the epoxy has hardened. Sealant tape and/or temporary surface sealant shall also be removed and any spillage of epoxy shall also be removed.

Epoxy adhesive shall be pumped into the cracks through the injection ports. The pump, hose, injection gun and appurtenances shall properly proportion and mix the epoxy and shall be capable of injecting the epoxy at a sufficient rate and pressure to completely fill all designated cracks. A suitable gasket shall be used on the head of the injection gun to prevent the adhesive from running down the face of the concrete. Pumping pressure shall be kept as low as practicable.

The temperature of the concrete shall not be less than 50° Fahrenheit at the time epoxy is injected, unless the epoxy has been pre-qualified at a lower temperature as hereinbefore provided, in which case the lower temperature shall govern.

For a crack with uniform thickness, the epoxy adhesive shall be forced into the first port at one end of the crack until adhesive runs in substantial quantity from the next adjacent port. The first port shall then be sealed and injection started at the next port. Injections shall then continue from port to port in this manner until the crack is fully injected.

Cracks with non-uniform thickness shall have the epoxy adhesive forced into the port at the widest separation in the crack until adhesive runs in substantial quantity from the two adjacent ports. The first port shall then be sealed and injection started at the adjacent port corresponding to the shortest length of the crack. Injection shall then continue from port to port in this manner until the short side of the crack is fully injected. Then, beginning with the port that is filled with epoxy adhesive but not sealed, injection shall continue from port to port until the crack is fully injected.

For slanting or vertical cracks, pumping shall start at the lower end of the crack. Where approximately vertical and horizontal cracks intersect, the vertical crack below the intersection shall be injected first. The ports shall be sealed by removing the fitting, filling the void with epoxy and covering with tape or surface sealant.

Before starting injection work and at 2-hour intervals during injection work when requested by the Engineer, a 3-fluid ounce sample of mixed epoxy shall be taken from the injection gun. Should these samples show any evidence of improper proportioning or mixing, injection work shall be suspended until the equipment or procedures are corrected.

Samples obtained above shall be used directly, without further stirring, to make test pieces for the Slant Shear Strength on Dry Concrete. One test piece shall be made at the beginning, middle and end of daily operations. The samples shall be allowed to cure for 7 days in the "Concrete Cylinder Curing Box". On the 7<sup>th</sup> day the samples shall be removed to the laboratory and tested in accordance with the requirements for Slant Shear Strength (see Appendix A, attached).

Each sample shall be numbered consecutively and dated (with a waterproof marker) and it shall be noted which sample represents which part of the structure.

**Technical Advisor:** The Contractor shall obtain the services of a Technical Advisor who is employed by the manufacturer of the epoxy resin. The Technical Advisor shall assist the Engineer and the Contractor in the correct use of the injection resin. The Advisor shall be a qualified representative approved by the Engineer, and shall be at the site of the work when the work begins in connection with the epoxy injection and at such other times as the Engineer may request until completion of this item.

**Method of Measurement:** This work will be measured for payment by the number of linear feet, which have been designated by the Engineer to be injected and which were subsequently filled with epoxy, shall be measured.

Where cracks are designated for injection on opposite sides of a concrete member and the epoxy adhesive injected on one side penetrates through the members to completely fill the crack on the

opposite side, payment will be made for the cracks in both sides as though injection had been performed on both sides, except that no payments will be made for such cracks on the opposite side that were not designated by the Engineer for injection. No payment will be made for such cracks on the opposite side that are also smaller than 1/8”.

Where a crack designated for injection extends around the corner of a concrete member, the length of crack on both faces will be measured for payment.

Providing of a safe access for delineation and inspection of the performed repairs will not be measured for payment.

**Basis of Payment:** This work will be paid for at the contract unit price per linear foot for “Epoxy Injection Crack Repair”, complete in place, which price shall include all preparation, materials, inspection access for delineation and inspection of performed repairs, services of qualified technical advisor, and all equipment, tools, labor and cleanup incidental thereto.

<u>Pay Item</u>	<u>Pay Unit</u>
Epoxy Injection Crack Repair	LF

## APPENDIX A

### Prequalification Procedure

The Prequalification Procedure shall consist of the following test procedure on the mixed epoxy resin at a temperature of 77°F, unless the contractor desires to use the material at a lower temperature than 50°F, in which case the lower temperature shall be used to condition the material and test pieces.

**TEST:                    VISCOSITY**

Requirements:        900 centipoise max. @20°F(±2°)  
4,000 centipoise max. @any test temperature

Test Method:         ASTM D 2393

**TEST:                    GEL TIME (POT LIFE)**

Requirement:        4 to 60 minutes

Test Method:

A. Apparatus

1. Unwaxed paper cups, 8oz., 2 ¼ inches at base (Dixie Cup No. 4338 or equivalent).
2. Wooden tongue depressor with ends cut square (Puritan No. 705 or equivalent).
3. Stainless steel spatula with blade 6" x 1" and with end cut square.
4. Stopwatch, 1 second or smaller divisions.
5. Balance, 0.1 gram divisions.

B. Test Procedure

1. Condition both A and B components to required temperature (±2°F).
2. Measure proper volumes of well-mixed components A and B into an 8-oz. unwaxed cup to yield total mass of 60 (±2 grams).
3. Start stopwatch immediate and mix components for 60 seconds, stirring with a wooden tongue depressor taking care to scrape the sides and bottom of the cup periodically.
4. Place the sample at the required temperature (±2°F) on a wooden bench top, which is free of excessive drafts.
5. Probe the mixture once with the tongue depressor every 30 seconds starting 4 minutes from the time of mixing.
6. The time at which a soft stringy mass forms in the cup is the gel time.



**TEST: SLANT SHEAR STRENGTH ON WET CONCRETE**

**Requirements:** 1700 psi min. after 7 days of cure in air at the required temperature ( $\pm 2^{\circ}\text{F}$ )

**TEST: SLANT SHEAR STRENGTH ON DRY CONCRETE**

**Requirements:** 4500 psi min. after 7 days of cure in air at the required temperature ( $\pm 2^{\circ}\text{F}$ )

**TEST: SLANT SHEAR STRENGTH**

A. Materials

1. Ottawa sand, ASTM C109
2. Portland cement, Type II
3. Water

B. Apparatus

1. Suitable mold to make diagonal concrete mortar blocks with a square base with 2-inch sides having one diagonal face 2" x 4" starting about  $\frac{3}{4}$ -inch above the base. The diagonal faces of two such blocks are bonded together producing a block of dimensions 2" x 2" x 5".
2. Block made from the following composition:
  - Ottawa sand, ASTM C109 30.1 lbs.
  - Portland cement, Type II 12.1 lbs.
  - Water 4.8 lbs.

Cure blocks 28 days in a fog room. Dry lightly sandblast diagonal faces.

3. Suitable test press

C. Test Procedure

Condition the components for 4 hours at the required temperature ( $\pm 2^{\circ}\text{F}$ ). Without entrapping air, stir the separate components for 30 seconds and place the proper volumes of each component on a plate and mix with a spatula for 60 + 5 seconds. Apply a coat approximately 0.010-inch thick to each diagonal surface. Place four 1/8-inch square pieces of shim stock 0.012-inch thick on one block to control final film thickness. Before pressing the coated surface together, leave the blocks so that the coated surfaces are horizontal until the epoxy reacts slightly to prevent excessive flow. Press diagonal surfaces of each block together by hand and remove excess epoxy adhesive.

Align the blocks so that the ends and sides are square and form a block 2" x 2" x 5". Use blocks of wood or metal against each 2" x 2" end, to keep diagonal faces from slipping until epoxy hardens.

After the required cure time, apply a suitable capping compound to each of the 2”x 2” bases, and test by applying a compression load with a Universal Test Machine or other suitable testing apparatus at the rate of 5000 lbs./min, until failure.

Report results in pounds per square inch

$$\frac{\text{Load in Pounds}}{4}$$

For wet shear strength, soak another set of blocks in water for 24 hours at the required temperature ( $\pm 2^{\circ}\text{F}$ ). Remove and wipe off excess water. Prepare, cure, and test sample according to above test procedure.

**TEST:                      TENSILE STRENGTH**

Requirements:            4500 psi Min.

**TEST:                      ELONGATION**

Requirements:            15% Max.

Test Method:            TENSILE STRENGTH AND ELONGATION

A. Apparatus

1. Leveling table about 12” x 8” with removable rim ¼ -inch by ½ -inch wide.
2. Mylar or similar plastic sheeting 0.004-inches thick.
3. Air circulation oven capable of maintain 158°F( $\pm 3^{\circ}\text{F}$ ).
4. Cutting die, Figure I
5. Thickness gauge, 1/8-inch
6. Release agent, non-silicone type

B. Procedure

1. Place Mylar sheet on leveling table.
2. Coat inside edge and bottom of rim with release agent and secure to table with screws.
3. Level the table.
4. Mix sufficient volume of well-mixed component A and well-mixed component B in the proper volumes so as to be able to form a layer 1/8-inch deep when placed inside the ring on the leveling table.
5. Introduce as few bubbles as possible during mixing.
6. Flush surface of epoxy with a heat gun or Bunsen burner to remove air bubbles on surface. Repeat if necessary.
7. Allow specimen to cure for 18 hours at the required temperature ( $\pm 2^{\circ}\text{F}$ ).

8. Remove specimen from table and strip off Mylar sheet. Cure specimen for 5 hours at 158°F ( $\pm 3^\circ\text{F}$ ).
9. Allow specimen to cool to the required temperature and cut specimens using cutting die shown in Figure I.
10. Proceed as specified in ASTM D 638, using 0.2-inches/minute test rate and 1-inch gauge length

**TEST:                    INFRARED SPECTROSCOPY**

**Requirements:**        Infrared Spectroscopy Tests shall be obtained of Components A and B

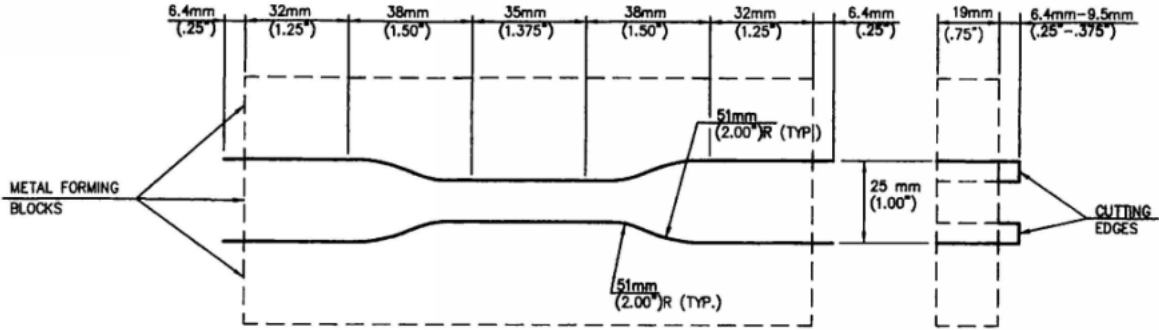
**Test Method:**        RECORDING SPECTROPHOTOMETE

A. Apparatus

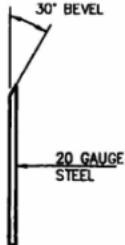
1. Perkin-Elmer Model 137-B Infracord Spectrophotometer, automatic recording system from 2.5 microns to 15 microns with two-speed recorder. Comparable results can be obtained with similar resolution.
2. Disk holder for a one-inch diameter disk.
3. Two sodium chloride crystal disks one-inch diameter.
4. Sorvall SS-3 Automatic Superspeed Centrifuge, or comparable centrifuge, which is able to separate the liquid and solid phases of the epoxy components without previous dilution with solvents.

B. Procedure

1. Place about 15 grams of component A into a stainless steel centrifuge table.
2. Counterbalance with component B in a second centrifuge tube.
3. Centrifuge the two components at 1700 rpm until there is a supernatant liquid layer present in each tube. This takes 20 to 30 minutes.
4. Place a drop of component A liquid layer on a sodium chloride disk.
5. Place another sodium chloride disk over the drop, rotate, and press down until the liquid has flowed into a uniform layer of proper thickness between the two sodium chloride disks.
6. Place the disks in the holder and run an absorption curve with the infrared spectrophotometer.
7. More or less liquid may be used between the disks so as to produce a maximum absorption of 0.7 to 1.0 for the strongest absorption point on the curve.
8. Clean the disks with toluene and dry.
9. Repeat steps 4 through 8 with the liquid layer from component B.
10. Record each curve in order that they may be used for comparison purposes with lots of material delivered to the job site.



**NOTE**  
CUTTING EDGES ARE OF 20 GAUGE SPRING STEEL AND ARE HELD BETWEEN THREE METAL BLOCKS MACHINED TO CONFORM TO THE ABOVE DIMENSIONS.



**FIGURE 1**  
**CUTTING DIE FOR TENSILE TEST**  
N.T.S.

## **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 Contractor and approved by the Department.

**Materials:** The bonding material shall be a compound specially formulated to anchor steel bars in holes drilled into concrete for the purpose of resisting tension pull-out. The bonding material shall be selected from the Connecticut Department of Transportation Qualified Product List.

The grout shall be a non-shrink grout conforming to Article M.03.05

The chemical anchoring material shall conform to Article M.03.07.

A Materials Certificate and Certificate of Compliance shall be required for the adhesive bonding material in accordance with Article 1.06.07, certifying the conformance of this material to the requirements stated herein.

**Construction Methods:** Before fabricating any materials, the Contractor shall submit manufacturer's specifications and installation requirements for the chemical anchoring material to the Department for review in accordance with Article 1.05.02. The Contractor shall submit the following to the Department for approval: type of drill, diameter of bit, method of cleaning holes and method of placement of the adhesive bonding material. Specifications and recommendations for the aforementioned may be obtained from the manufacturer of the adhesive bonding material.

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 rebar being anchored.

The weight of the drill shall not exceed 20 pounds. The reinforcing dowels shall be able to develop a pull-out resistance of 90 percent of their nominal yield strength when bonded at the embedment depths provided. The Contractor shall provide the minimum cover for the dowels as shown on the plans. If the existing reinforcing steel is encountered during drilling, the holes may be relocated only if approved by the Department. Drilling methods shall not cause spalling, cracking, or other damage to the concrete. Those areas damaged by the Contractor shall be repaired in a manner suitable to the Department and at no expense to the State. The Contractor shall take necessary precautions to prevent any materials from falling onto the tracks below. For the adhesive bonding materials, a Certified Test Report and a Materials Certificate will be required in accordance with Article 1.06.07, confirming the conformance of the adhesive bonding material to the requirements set forth these specifications.

Prior to placing the chemical anchoring material in the holes, the holes shall be cleaned of all dirt, moisture, dust and other foreign material. The reinforcing bars and the chemical anchoring material or grout shall be installed in the holes in accordance with the chemical anchoring

material or grout manufacturer's recommendations. When grouting, each hole shall be blown clean with an air jet and then flushed with a jet of clean water. In the water-flushing operation, the pressure hose shall be extended to the bottom of the hole several times and withdrawn gradually each time. After flushing, the vertical holes shall be left full of clean water for a period of 6 hours. Immediately prior to grouting all water shall be removed and the free water shall be removed with an air jet.

**Method of Measurement:** This work will be measured for payment by each dowel or anchor rod grouted into drill holes, completed and accepted.

**Basis of Payment:** This work will be paid for at the contract unit price per each for "Drilling Holes and Grouting Dowels", which price shall include drilling and preparing holes, and applying adhesive bonding material in the hole. It shall also include all materials, except dowels, and all equipment, tools and labor incidental thereto.

Note: Furnishing dowels will be paid for under the appropriate reinforcing steel item "Deformed Steel Bars - Galvanized".

Pay Item	Pay Unit
Drilling Holes and Grouting Dowels	EA

## **ITEM #0603474A – METALLIZING STRUCTURAL STEEL (SITE NO. 1)**

**Description:** Work under this item shall consist of the surface preparation, shop application of a thermal spray (metallizing) coating, shop application of urethane sealer, and field painting and touch-up painting operations of new structural steel to be furnished, fabricated and installed under item “Precast Concrete/Steel Composite Superstructure”, as shown on the plans, or as directed by the Engineer.

Work under this item shall also consist of galvanizing structural steel bolted attachments, including diaphragms, furnished, fabricated and installed under the item “Precast Concrete/Steel Composite Superstructure”, as shown on the plans, or as directed by the Engineer.

**Materials:** Only one metallizing supplier and one sealer/top coat manufacturer may be used for the Project including material supplied for field painting and touch-up painting operations.

### Abrasives:

Abrasives shall conform to the following:

1. SSPC AB 1 for mineral slag abrasives
2. SSPC AB 2 for recycled ferrous metal abrasives
3. SSPC AB 3 for new steel abrasives

**Thermal Spray Coating (TSC) Materials:** The thermal spray coating (TSC) wire feedstock material used for metallizing must be 85%/15% (Zn/Al alloy) and meet the Chemical Composition requirements stated in Table 2 of AWS C2.25/2.25M, classification W-ZnAl-2. The Contractor shall provide a Certified Test Report (CTR) in accordance with 1.06.07 for the feedstock from the feedstock supplier.

**Urethane Sealer:** The Contractor shall select a semi-gloss urethane coating, of the color shown on the plans, from the list below:

- AkzoNobel: *International Interthane 870UHS*
- Carboline: *Carbothane 133 LV*
- Sherwin Williams: *Hi-Solids Polyurethane 250*

The urethane coating shall be packaged and sealed, in the original container with labeling bearing the manufacturer’s name, type of material, brand name, shelf life, batch number, and instructions for mixing and thinning. The top coat shall meet the color and gloss retention performance criteria of SSPC Paint 36, Level 3, for accelerated weathering. The Contractor shall provide a Materials Certificate in accordance with 1.06.07.

**Primer Coat:** The top of the top flange of bridge girders shall be coated with an inorganic zinc-rich primer only, which shall be chosen from the [NEPCOAT Qualified Products List](#).

**Caulking Materials:** Caulking shall be as recommended by the coating manufacturer.

Galvanizing: Shall meet the requirements of M.06.03.

**Construction Methods:** The Contractor shall implement procedures that comply with this specification. If a state or local regulation is more restrictive than the requirements of this specification, the more restrictive requirements shall prevail. The Contractor must comply with all local OSHA and EPA standards and regulations, even if the regulation or standard is not specifically referenced herein.

The complete coating system shall be shop-applied except for surfaces that are not suitable for shop application by virtue of erection considerations or incomplete connections. Such surfaces shall be coated only after all members are erected, bolts are fully tensioned, and temporary deck formwork is removed. The tops of bridge girder top flanges shall be primer coated only and shall not be metallized or sealed.

Metallizing Contractor Worker Qualifications: The Metallizing Contractor shall be certified by the SSPC Painting Contractor Certification Program QP-6, entitled "Thermal Spray (Metallizing) Contractor Certification Program" in the *enclosed shop* category or be certified in the American Institute of Steel Construction (AISC) Sophisticated Paint Endorsement (SPE) category – *enclosed shop* P1 or *covered shop* P2. A list of approved contractors can be found on the AISC website at [www.AISC.org](http://www.AISC.org).

The Metallizing Contractor shall be fully certified, including endorsements, for the duration of the time they are doing the surface preparation and coating application. The certification(s) 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.

Each person applying a metallized coating shall be qualified according to ANSI/AWS C2.18-93R.

The Metallizing Contractor shall have a certified NACE Coatings Inspector Program (CIP) Level 3 inspector, or approved equal, on staff for the duration of the project and actively engaged in the metallizing activities before during and after the coating application.

The Metallizing Contractor 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 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.

**Submittals:** The Contractor shall submit the following to the Division of Materials Testing, the Designer of Record and the Project Engineer, for review a minimum of thirty (30) days prior to metallizing.

A. Metallizing Quality Control (QC) Plan, including:

1. Written procedures for the preparation of surfaces and the application of the metallizing and the urethane sealer in the shop and procedures for the repair and touch up of any damage that occurs to the newly applied metallizing or coatings. Shop and field repair procedures must be clearly identified.
2. Checkpoints for surface preparation, metallizing application, adhesion testing of metallizing application and coating thickness measurements.
3. Identification of the metallizing and coating materials to be applied, including manufacturer's name, product names, and product numbers.
4. Product Data Sheets, VOC levels for liquid coatings, MSD sheets, and written application instructions including mixing requirements, specified thinners, and thinner amounts for liquid coatings.
5. Identification of the type and brand name of the abrasive proposed for use.
6. Metallizing Manufacturer's Slip Critical Class B Certificate of Compliance.
7. Copies of qualification records along with continuity logs for all thermal spray operators.
8. Copies of NACE CIP Level 3 certifications, or approved equal, for all staff required to possess same. Copies of CAS (SSPC ACS/NACE No. 13) certifications, for all staff required to possess same.
9. Identification of the thermal spray equipment.
10. A work schedule that includes timelines for surface preparation, metallizing and top coating.

**Notification:** Contact the Division of Materials Testing at [DOT.Steel@ct.gov](mailto:DOT.Steel@ct.gov) a minimum of two (2) weeks prior to the start of work.

**Surface Preparation:**

- A. Weld Spatter, Sharp Edges, and Holes: All slag, flux deposits, and weld spatter and steel irregularities such as fins, tears and slivers shall be removed from the surfaces to be metallized. Any resulting burrs from such removal shall be ground smooth, including burrs around holes. All corners and edges shall be rounded to a 0.0625 inch radius or chamfered to a 0.0625 inch chamfer.
- B. Cleaning of Steel: All visible contaminants shall be removed from surfaces in accordance with SSPC-SP 1 using only solvents or detergents.
- C. Compressed Air Cleanliness: The cleanliness of the compressed air shall be confirmed in accordance with ASTM D4285 at least once per shift for each compressor system.
- D. Surface Requirements: The required surface preparation shall meet SSPC SP 5. Surface preparation shall not be performed under damp environmental conditions or when the surface temperature of the steel is less than 5°F above the dewpoint temperature as determined by a surface thermometer and an electric or sling psychrometer.

- E. Abrasives/Profile:
1. The Contractor shall use abrasives that are free of oil, soluble salts and other similar substances that could contaminate the surface.
  2. A uniform sharp angular profile with a minimum profile of 3.0 to 4.0 mils shall be provided in accordance with ASTM D4417, Method B or C.
- F. Acceptance Prior to Metallizing: The cleaned surface shall be accepted by the Engineer before application of metallizing. Failure of the Contractor to prepare and clean the surfaces to be metallized in accordance with these specifications shall be cause for rejection by the Engineer. All surfaces that are rejected shall be re-cleaned to the satisfaction of the Engineer at no additional cost to the State.
- G. Pre-Production Test Section and Bend Tests:
1. The Contractor shall blast clean and metallize at least 9 square feet of steel surface prior to initiating the full-scale metallizing operation using the same metallizing equipment, set up, materials, and calibration and operating procedures in the test section(s) that shall be used for the production operations.
  2. Spray parameters shall be validated by passing a bend test as follows:
    - a. Five (5) steel coupons  $2 \times 8 \times 0.05$  inches shall be fabricated of the same steel grade proposed as the member being coated.
    - b. The coupons shall receive the same surface preparation, and metallizing as the actual member.
    - c. The coupons may be fastened to larger pieces of stock during the blast cleaning and metallizing operations.
    - d. Bend coupons 180 degrees around a 0.5 inch diameter mandrel.
    - e. The bend test passes if there is no cracking or only minor cracking visually observed on the bend radius.
    - f. The bend test fails if the coating cracks and lifts from the substrate.
  3. Additional coupons may be required by the Engineer to establish the suitability of the surface preparation and the thermal spray coating. Full-scale metallizing shall not commence until the Engineer has inspected and approved the Test Section and coupons.

Metallizing Application:

- A. Quality of Surface Preparation: The Contractor shall verify that the surface meets the specified SSPC-SP 5 surface requirements immediately prior to application of the metallized coating.
- B. Surface Cleanliness: Subsequent coats shall not be applied until overspray, spent abrasive, dirt, dust, and other contaminants have been removed in accordance with SSPC-SP 1.
- C. Ambient Conditions: Metallizing shall be applied when the relative humidity is less than 80%. Metallizing shall not be applied under damp environmental conditions or when the surface temperature of the steel is less than 5°F above the dewpoint temperature as determined by a surface thermometer and an electric or sling psychrometer.
- D. Metallizing: The coating shall be applied by thermal spray employing multiple passes to achieve a uniform thickness of 0.008 to 0.012 inches (8-12 mils) unless otherwise specified. No single pass shall deposit more than 0.004 inches.
- E. Metallizing Adhesion: Adhesion strength of the metallizing shall be 700 psi minimum as measured with approved equipment per ASTM D4541, Annex A4. Measurements shall be

taken every 500 square feet. If adhesion is less than 700 psi but greater than 560 psi, four (4) additional adhesion tests shall be made. If any of the additional adhesion tests are less than 700 psi, the coating shall be removed and re-applied. Any single adhesion test result less than 560 psi, will be justification for the Engineer to have the Contractor remove the entire coating. All corrective action will be at the Contractors expense.

- F. Quality Control of Metallizing Operation: The Metallizing Contractor shall verify proper spray equipment set up, calibration, and operating procedures by performing a bend test at the beginning of each work shift that metallizing is to be applied in accordance with requirements described in the Pre-Production Test Section. In addition to the bend test, a cut test shall be performed at the end of each shift to confirm that metallizing is being properly applied. The cut test consists of a single cut 1.5 inches long through the thermal spray coating to the substrate without severely cutting the substrate. A cut shall be made with a hammer and sharp chisel. The chisel cut shall be made at a shallow angle. The bond of the metallizing is considered unsatisfactory if any part of the metallizing lifts from the substrate along the cut.
- G. Bolted Connections and Other Areas:
1. The Contractor shall state in writing to the Engineer a list of areas they believe are inaccessible prior to the start of work. The Engineer will have the final determination as to the accessibility of those areas.
  2. Bolted connections shall be processed in a manner that achieves the required Slip Critical Classification detailed on the approved steel shop drawings.
  3. Thickness in bolted, Class B, connection areas shall not exceed those listed on the Metallizing Manufacturer's Class B Slip Critical Certificate of Compliance. Under no circumstance shall any thickness reading exceed 16 mils.
  4. All connection points shall be appropriately masked off either before or after metalizing and prior to the application of seal coat.
  5. After members have been erected in the field, all previously masked areas that remain exposed shall receive a brush applied coat of the same urethane sealer used in the shop. Prior to the application of the urethane coating these areas shall be thoroughly cleaned and lightly sanded by hand.
  6. Areas such as bolt holes, backs of snipes and other similar areas where the standard application of a metallized coating cannot be performed shall be cleaned and free of dirt and any loose overspray and shall receive a brush applied coating system approved by the Designer.
  7. The top of the top flange shall NOT be metallized but shall be coated with an inorganic zinc-rich primer from the [NEPCOAT Qualified Products List](#). No sealer shall be applied over the zinc-rich primer.
  8. Metalized coating applied to surfaces not required to be coated may remain if found to be tightly adhered, as determined by the Engineer.

Urethane Sealer Application:

- A. The sealer shall be applied in two coating operations, a single mist coat and a full top coat.
1. The Metallizing Contractor shall apply the sealer/paint in accordance with the manufacturer recommendations unless otherwise specified.
  2. The mist coat shall be applied no more than 8 hours after application of the metallizing, and in no cases shall the mist coat be applied over visible oxidation of the metallizing.

3. If necessary, the mist coat shall be thinned up to the manufacturer's written maximum amount using the recommended thinner in order to penetrate the metallizing layer. The top coat sealer shall be applied without thinning.
  4. When conventional spray equipment is used, the Contractor shall verify that the compressed air supply is clean and dry as determined by the blotter test.
  5. The topcoat shall be applied to achieve a 4 to 6 mils dry film thickness and shall be applied after the previous coat has been allowed to dry as required by the recoat time in the manufacturer's written instructions, but in no case shall a coat remain exposed for longer than ten (10) calendar days prior to overcoating.
- B. Coverage and Continuity: All surfaces shall be completely coated and free of voids, runs, sags or other defects. Special attention shall be given to hard-to-reach or inaccessible areas and irregular surfaces. Some configurations may require spraying from multiple directions to assure complete coverage.
- C. Urethane Sealer Adhesion to Metallized Surfaces:
1. The Metallizing Contractor shall apply the urethane sealer in such a manner to assure adherence to the underlying surface. Any lifting of an underlying coat, or poor adhesion between coats or to the substrate, will require removal of the coating in the affected area to adjacent sound, adherent, coating, and reapplication of the material.
  2. Urethane Sealer adhesion shall be verified using adhesion tests in accordance with ASTM D4541 as directed by the Engineer.
  3. Wet Film Thickness: The Contractor shall verify and document the thickness of each liquid coat at the time of application using wet film thickness gages in accordance with ASTM D4414.
  4. Dry Film Thickness: The dry film thicknesses of the completed coating shall be:

Metallizing	8 to 12 mils
Urethane Sealer	<u>4 to 6 mils</u>
TOTAL SYSTEM	12 to 18 mils

The Contractor shall measure the thickness of each coat using nondestructive magnetic dry film thickness gages. The procedure shall comply with SSPC-PA2 for the calibration and use of the gages, and the frequency of thickness measurements. Spot readings both 20% above and 20% below the thicknesses shown above are permitted, provided the average thicknesses are within the specified tolerances.

Field Required Sealing Operations: Any areas requiring seal coat after erection shall be done in accordance with the previously submitted and approved field painting procedures and shall be in accordance with the manufacturer's recommendations.

Repair of Film Discontinuities and Damage to Coating System after Erection: A repair procedure shall be submitted for concurrence by the Engineer prior to the start of repair work.

Shipping and Storage: All materials shall be shipped and stored in a manner to prevent damage from all physical and environmental factors.

**Method of Measurement:** The work under this item, being paid on a lump sum basis, will not be measured for payment.

**Basis of Payment:** The coating of structural steel, incorporated in the completed and accepted structure, will be paid for at the Contract lump sum price for “Metallizing Structural Steel (Site No. 1).” The lump sum price shall include all materials, equipment, tools, transportation, repairs, corrective actions, inspection access, and labor incidental thereto

A schedule of values shall be submitted to the Engineer for review and comment prior to application of the metallizing coating.

Pay Item	Pay Unit
Metallizing Structural Steel (Site No. 1)	l.s.

**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

ITEM #0707009A

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 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.

Pay Item	Pay Unit
Membrane Waterproofing (Cold Liquid Elastomeric)	s.y.

**ITEM #0712021A – GRS ABUTMENT AND WINGWALL**  
**ITEM #0712023A – REINFORCED SOIL FOUNDATION (RSF)**  
**ITEM #0712024A – REINFORCED INTEGRATED APPROACH**

**DESCRIPTION:**

This work consists of furnishing materials and constructing geosynthetic reinforced soil (GRS) walls in the locations and to the dimensions and details shown on the plans, and in accordance with these Specifications.

Where called for on the plans or as ordered by the Engineer, this work shall also include furnishing and constructing a geosynthetic reinforced soil foundation (RSF).

The following are definitions of key elements in the GRS specification and details:

**Reinforced Integrated Approach:** The portion of the system that is placed under the roadway approach pavement behind the rear face of the superstructure.

**GRS Wall:** The portion of the system that makes up the reinforced soil mass of the system, including the No. 8 gradation crushed stone and the geotextile reinforcement.

**GRS Foundation:** The portion of the system that is below the reinforced soil mass of the GRS Abutment. It is used to properly seat the system on the substrate.

**MATERIALS:**

1. **Reinforced Soil Foundation (RSF) Backfill:** The material used in the Reinforced Soil Foundation (RSF) backfill shall meet the requirements of Article M.01.02, No. 8 Gradation.
2. **GRS Walls Backfill:** The material used in the Abutment Backfill shall meet the requirements of Article M.01.02 of the Standard Specifications, No. 8 Gradation.
3. **Reinforced Integrated Approach Backfill:** The material used for the Integrated Approach Backfill shall meet the requirements of Article M.05.01, Processed Aggregate Base.
4. **Geotextile:** The material shall be a biaxial, polypropylene geotextile. The Geotextile is required to have a minimum ultimate tensile strength of 4,800 lbs/ft and the reinforcement

strength at 2% strain shall be greater than 960 lbs/ft in both the cross-machine and machine directions, in accordance with ASTM 4595-11 or ASTM D 6637-11.

The geosynthetic reinforcement Manufacturer is responsible for establishing and maintaining a quality control (QC) program to ensure compliance with the requirements of these Specifications.

Conformance testing shall be performed as part of the manufacturing process and may vary for each type of product. Sampling and conformance testing shall be in accordance with ASTM D-4354, with conformance testing procedures established as noted in the specification. Geotextile product acceptance shall be based on ASTM D-4759.

The quality control certificate shall include roll number and identification, sampling procedures, and results of control test (including a description of test methods used).

## **SHOP DRAWINGS:**

**Preliminary Submissions:** Prior to the start of fabrication or construction, the Contractor shall submit to the Engineer a construction package, which shall include, but not be limited to the following:

- a. PDF documents prepared on full size 22" x 34".
- b. Full plan view of each GRS wall drawn to scale. The plan view must illustrate the reinforcement lengths the Contractor plans on using for each lift height in accordance with the minimum lengths provided. Beginning and ending stations/offsets of each GRS wall, all utilities, signs, fence posts, etc. located within the footprint of the reinforcement layers.
- c. Full elevation view of the GRS wall face drawn to scale. Elevation views shall indicate the elevation at the top and bottom of the GRS walls including the top of the cast-in-place copings, horizontal and vertical control joints, and the location of finished grade.
- d. Typical cross sections drawn to scale including all appurtenances. Detailed cross sections shall be provided at significant reinforcement transitions.
- e. Material designations for all materials to be used, including temporary formwork.
- f. Detailed construction methods including a quality control plan, which shall cover the following:
  - i. Methods of delivery and placement of backfill materials including the proposed equipment. Accommodation of limited vertical and horizontal clearances and their impact on the equipment shall be addressed.

- ii. Methods and materials to temporarily support and form the wrapped face walls.
  - iii. Methods to control horizontal line and 0 degree batter of the front face of the wall including methods to adjust the line and batter as the wall layers are set.
  - iv. Methods for making final grade adjustments at the top of the wall.
  - v. Methods of accommodating stage construction joints. This may require the use of temporary wall sections that are left in place in the backfill material.
- g. Details of sloping top of GRS walls where required.
  - h. Details of corner treatments where required.
  - i. Details of Temporary Earth Retaining Systems where required.
  - j. Details of wall treatment where the wall abuts other structures.

The preliminary submission shall be treated as a shop drawing in accordance with Section 1.05 amended as follows:

- a. Four (4) sets of each submission shall be supplied to the Department along with an electronic pdf copy.
- b. The Contractor shall allow 21 days for the review of each submission. If subsequent submissions are required as a result of the review process, 21 days shall be allowed for review of each submission. No extensions in contract time will be allowed for the review of these submissions.

**Final Submissions:**

- a. Once a construction package has been reviewed and accepted by the Department, the Contractor shall submit the final plans electronically in pdf form. The final submission shall also include two (2) sets of full size (22" x 34") plans and four (4) sets of half size (11" x 17") plans.
- b. The final submission shall be made within 14 days of acceptance by the Department. No work shall be performed on the GRS walls until the final submission has been received and accepted.
- c. Acceptance of the final design shall not relieve the Contractor of his responsibility under the contract for the successful completion of the work.

**CONSTRUCTION METHODS:**

1. **Pre-Installation Field Meeting:** A pre-installation field meeting will be scheduled by the Engineer and held prior to the start of any GRS wall construction. The Engineer, Contractor and all Subcontractors involved in the construction of the GRS wall. Attendance is mandatory. The pre-installation field meeting will be conducted to clarify the construction requirements for the work, to coordinate the construction schedule and activities, to identify contractual relationships, and to delineate responsibilities amongst the Engineer, the Contractor and the various Subcontractors. The meeting will be held, after approval of the shop drawings, on a date to be determined by the Engineer.
2. **Excavation:** Excavation shall be accomplished and maintained in accordance with Article 2.03. Any backfilling of the excavation outside the limits of the GRS Wall and RSF shall be in accordance with Section 2.02.
3. **GRS Foundation:** The GRS Foundation shall consist of either: in-situ soil, Granular Fill, a Reinforced Soil Foundation (RSF), a concrete leveling pad or another foundation system as called for on the plans.

GRS Foundations placed on in-situ soil shall be prepared in conformance with Section 2.03.

GRS Foundations placed on Granular Fill shall be prepared in conformance with Section 2.13.

GRS Foundations placed on a RSF shall meet the requirements of the plans and this specification. The base shall be level-graded plus 1 foot on all sides or to the limits shown on the plans. The RSF shall be constructed with backfill placed from the face of wall to the back, in order to roll folds or wrinkles to the free end of the reinforcement layer. It shall be compacted in nominal 6-inch lifts, and it shall be graded, leveled and compacted before encapsulating the RSF. A minimum of 4 passes of the compaction equipment will be required per lift. The Engineer will visually inspect the RSF to confirm proper placement and compaction. The RSF shall be encapsulated in the geotextile reinforcement and placed perpendicular to the abutment face to protect it from possible erosion. The geotextile shall be large enough to fully enclose the RSF on the face and wingwall sides. The wrapped corners of the RSF shall be tight and without exposed soil within the RSF to complete the encapsulation. Further, 'Section 7.4 RSF' of the "Design and Construction Guidelines for Geosynthetic Reinforced Soil Abutments and Integrated Bridge Systems", FHWA-HRT-17-080, June 2018, may be referenced for construction methods of the RSF only.

GRS Foundations placed on a concrete leveling pad shall be prepared in conformance with Section 3.03.

4. **GRS Abutment and Wingwalls:** The GRS Abutment and Wingwalls shall be constructed using compacted lifts with lift heights equal to the vertical spacing of reinforcement, as shown on the plans, **or a nominal 6 inches**, whichever is less. Compaction shall be performed using vibratory roller compaction equipment or other similar methods. A minimum of 4 passes will be required per lift. Within 3 feet of the front of the wall face, hand operated equipment such as lightweight mechanical tampers, plates or rollers shall be used to avoid damage or displacement of facing elements. The Engineer will visually inspect the lifts to confirm proper placement and compaction. All compaction equipment shall be selected to perform the appropriate compaction effort.

Geotextile reinforcement shall be installed in accordance with the manufacturer's recommendations and these Specifications and to the extent on the plans or as directed by the Engineer. The Geotextile shall be placed so that the strongest direction is perpendicular to the abutment facing and coverage shall be 100% of the embedment area unless otherwise shown on the plans. Adjacent sections of the Geotextile shall not be overlapped, except when exposed in the wrap-around facing system.

The Geotextile shall be laid so that it is taut and free of wrinkles prior to backfilling. Any seams in the geosynthetic shall be staggered with each successive layer of the GRS wall. All seams between adjacent sheets of geosynthetic located in the area beneath the footprint of the bridge seat shall be perpendicular to the abutment wall face.

No equipment shall be placed on the geotextile until at least 6-inches of material is placed on it and tracked equipment shall use caution while turning on the backfill to avoid damaging the Geotextile.

5. **Superstructure Placement:** A crane used for placement of the superstructure can be positioned on the GRS abutment provided the outrigger pads are positioned within the capacity of the GRS mass. The outrigger pads shall be sized for a maximum pressure of 4,000 psf near the GRS wall face with greater loads able to be supported with increasing distance from the abutment face. The lower section of the GRS Wall shall define the "front face" of the wall and no crane loads should be applied to the temporary section of the integrated approach zone. See the plan sheets for GRS wall layout details.



6. **Reinforced Integrated Approach:** After placement of the superstructure, the Reinforced Integrated Approach shall be constructed. The Reinforced Integrated Approach shall consist of reinforced Processed Aggregate Base placed and compacted per Section 3.04, with the exception of the lift dimensions.

The wrapped Geotextile reinforcement spacing shall be 12 inches, with intermediate Geotextile reinforcement layers spaced at 6 inches. The Processed Aggregate Base shall be placed and compacted in 6-inch lifts. The top wrap fold shall increase in length with each successive wrapped layer until the fill is 4 inches below the bridge grade. The top layer of Geotextile reinforcement shall be kept at least 4 inches below the pavement structure.

7. **Site Drainage:** The GRS-IBS construction area shall be protected from surface runoff during the Project. The Site shall be graded at the end of the work shift in anticipation of precipitation to avoid saturation of soil. An alternative to grading by placing diversion trenches around the perimeter to divert water would be acceptable. Any loose soil placed to construct GRS shall be graded and compacted before stoppage of work for the day. Onsite stockpiles of fill material containing fines shall be protected from excess precipitation.
8. **Miscellaneous:** Where fencing, wood post or metal beam rail is called for within the limits of the reinforced soil mass, the posts shall be installed mechanically using a metal driving cap to puncture the layers of geotextile cleanly prior to post installation. Pre-formed concrete fence post foundations may be installed as the GRS is constructed. Wood posts shall not be driven through the geotextile to avoid negative effects to the reinforced soil mass. No holes shall be drilled through the geotextile at any stage of construction.

Where plantings are called for, they shall be installed outside the limits of the GRS soil mass to avoid root growth through the reinforced soil mass.

#### **METHOD OF MEASUREMENT:**

1. **GRS Abutment and Wingwall:** The GRS wall structures, including geotextile fabric, will be measured for payment by the cubic yards of No.8 Crushed Stone measured in place after compaction within the payment lines as shown on the plans or as specified by the Engineer. The Geotextile reinforcement is considered to be part of the GRS wall structures and will not be measured for payment.
2. **Reinforced Soil Foundation (RSF):** The Reinforced Soil Foundation including geotextile fabric will be measured for payment by the cubic yards of No. 8 crushed stone measured in

place after compaction within the payment lines as shown on the plans or as specified by the Engineer. The Geotextile reinforcement is considered to be part of the Reinforced Soil Foundation and will not be measured for payment.

3. **Reinforced Integrated Approach:** The Reinforced Integrated Approach including geotextile fabric will be measured for payment by the cubic yards of Processed Aggregate Base measured in place after compaction within the payment lines as shown on the plans or as specified by the Engineer. The Geotextile reinforcement is considered to be part of the Reinforced Integrated Approach and will not be measured for payment.

**BASIS OF PAYMENT:**

1. **GRS Abutment and Wingwall:** “GRS Abutment and Wingwall” will be paid at the Contract unit price per cubic yard. Such payment shall include the cost of furnishing and installing No. 8 Crushed Stone, and Geotextile used within the backfill behind the GRS wall face. Such payment also includes all labor, materials and equipment necessary to complete the work in an acceptable fashion.
2. **Reinforced Soil Foundation (RSF):** “Reinforced Soil Foundation (RSF)” will be paid at the Contract unit price per cubic yard. Such payment shall include the cost of furnishing and installing No. 8 Crushed Stone, Geotextile within the RSF, and all labor, materials and equipment necessary to complete the work in acceptable fashion.
3. **Reinforced Integrated Approach:** “Reinforced Integrated Approach” will be paid at the Contract unit price per cubic yard. Such payment shall include the cost of furnishing and installing Processed Aggregate, Geotextile within the reinforced integrated approach, and all labor, materials and equipment necessary to complete the work in an acceptable fashion.

<u>Pay Items</u>	<u>Pay Units</u>
GRS Abutment and Wingwall	C.Y.
Reinforced Soil Foundation (RSF)	C.Y.
Reinforced Integrated Approach	C.Y.

## **ITEM #0728051A – STABILIZED STONE SLOPE PROTECTION**

**Description:** This item shall consist of coarse aggregate to be placed to a uniform depth and granular base to be placed to a uniform depth on that portion of the embankment at the location specified on the plans, or as directed by the Engineer.

**Materials:** The material for this work shall meet the requirements of Article M.01.02 for 2 in (No. 3) coarse aggregate.

Granular Base: This material shall meet the requirements of M.02.03 and Grading “C” of M.02.06.

**Construction Methods:** The surface on which the granular base is to be placed shall be shaped to an even surface and to the desired grade. The granular base shall be placed to the thickness shown on the plans and after thorough compaction shall be dressed smooth and to the required grade. The area on which the crushed stone is to be placed shall be shaped to a reasonably true surface prior to placing the crushed stone. The stone shall be spread by any suitable means which will not crush the stone and shall be shaped to a smooth uniform finished grade.

**Method of Measurement:** Stabilized Stone Slope Protection will be measured in place after compaction within the payment lines shown on the plans or specified by the Engineer.

**Basis of Payment:** This work will be paid for at the Contract unit price per S.Y. for “Stabilized Stone Slope Protection,” complete in place, which price shall include all materials, tools, equipment and labor incidental thereto, also necessary excavation and grading below the surface of the roadway embankment excavation and placing the granular base. There will be no direct payment for furnishing, placing and compacting granular base.

Pay Item	Pay Unit
Stabilized Stone Slope Protection	s.y.

## **ITEM #0819002A - PENETRATING SEALER PROTECTIVE COMPOUND**

**Description:** Work under this item shall consist of cleaning concrete surfaces of dirt, dust and debris, and furnishing and applying a clear, penetrating sealer where shown on the plans, to provide a hydrophobic barrier against the intrusion of moisture. This work also includes furnishing, installing and removing platforms, scaffolding, ladders and other means of access as well as shields, as required, to protect adjacent areas from overspray. Penetrating sealer shall not be applied to concrete surfaces that have been previously treated with coatings or curing compounds that would hinder penetration of the sealer into the concrete.

**Materials:** The penetrating sealer shall be a single component, 100% silane or silane siloxane from the list of materials below. The material shall be selected in anticipation of the expected ambient and surface temperature at the time of installation.

The following products may be used when ambient and surface temperatures are 40°F and above:

SIL-ACT ATS-100 (Silane)  
Advanced Chemical Technologies, Inc.  
9608 North Robinson Ave.  
Oklahoma City, OK 73114  
405-843-2585  
[www.advchemtech.com](http://www.advchemtech.com)

Armor SX 5000 EXT-100 or SX 5000 WB (Silane Siloxane)  
Foundation Armor, LLC.  
472 Amherst St. STE 14  
Nashua, NH 03063  
866-306-0246  
[www.foundationarmor.com](http://www.foundationarmor.com)

Aquinil Plus 100 (Silane)  
ChemMasters  
300 Edwards Street  
Madison, OH 44057  
440-428-2105, 800-486-7866  
[www.chemmasters.net/Aquanil100.php](http://www.chemmasters.net/Aquanil100.php)

The following product may be used when ambient and surface temperatures are 20°F and above:

Certi-Vex Penseal 244 100% (Silane)  
Vexcon Chemicals  
7240 State Road  
Philadelphia, PA 19135  
888-839-2661  
[www.Vexcon.com](http://www.Vexcon.com)

**Construction Methods:**

Submittals: The Contractor shall submit to the Engineer Safety Data Sheets (SDS) and product literature for the selected product. The literature shall include written instructions how to apply the product to vertical and horizontal surfaces, and where required, overhead surfaces.

The Contractor shall submit to the Engineer, in accordance with Article 1.05.02, written procedures for cleaning the concrete surfaces. The submittal shall include proposed equipment and materials and shall address how adjacent traffic and other areas shall be protected from dust, debris and overspray during the cleaning and application processes. Where the sealer is to be applied to parapets before pavement is placed, the submittal shall address protecting the deck and curb to which membrane waterproofing will be applied. Should the membrane already be present, the submittal shall address protecting the membrane. It shall also indicate how vegetation shall be protected from overspray. The submittal shall address the conditions under which work may proceed, including wind speed, temperature and precipitation. It shall also include procedures to be followed to protect the work should unfavorable weather conditions occur before the product has been absorbed.

The Contractor shall inspect the surfaces to be sealed to identify surface cleaning needs before submitting the procedures. The Contractor shall identify conditions that need repair or surfaces that may require special attention or cleaning procedures. Such observations shall be addressed in the written procedures.

Surface Preparation: Concrete surfaces to which penetrating sealer will be applied shall be dry, clean and free of grease, oil and other surface contaminants. New concrete and newly placed repair concrete shall be allowed to cure for at least 28 days before applying sealer. After rain or water cleaning, allow existing concrete surfaces to dry for at least 8 hours before applying sealer. Dry surfaces may be cleaned by sweeping with brushes or brooms, and blowing clean with oil-free, compressed air. The Contractor shall take care not to damage the concrete surface finish during cleaning operations. Care shall be taken so that cleaning methods do not damage joint sealant or other components of the structure.

Application: Application of the sealer can only begin after the Engineer evaluates the concrete surfaces for cleanliness and moisture, and determines that conditions are appropriate for application.

The sealer shall saturate the concrete surface with a rate of application of 200 square feet per gallon of sealer. The dispersion shall run six to eight inches down a vertical surface from the spray pattern. The maximum run-down is 12 inches. The Contractor shall monitor and record the number of square feet per gallon of sealer used to verify that the required application rate is being met. Additional sealer may be needed if surfaces are porous, rough or textured.

The Engineer will inspect the concrete surface during application and after the sealer has had adequate time to penetrate. As a test, water sprayed from a bottle on the sealed surface shall bead up and not be absorbed. Should water be absorbed into the concrete at a test area, additional areas shall be tested to determine which areas should receive additional application of sealer. The

Contractor shall apply additional sealer to the identified areas until absorption of water is prevented.

**Method of Measurement:** This work will be measured for payment by the actual number of square yards of concrete, coated completely and accepted, within the designated limits. The area will be measured once, regardless of the number of applications required.

**Basis of Payment:** This work will be paid for at the Contract unit price per square yard for “Penetrating Sealer Protective Compound,” complete, which price shall include all equipment tools, labor and materials, incidental thereto, including the preparation of the concrete surfaces and proper disposal of debris.

Pay Item	Pay Unit
Penetrating Sealer Protective Compound	s.y.

**ITEM #0822005A – TEMPORARY PRECAST CONCRETE BARRIER CURB (STRUCTURE)**

**ITEM #0822006A – RELOCATED TEMPORARY PRECAST CONCRETE BARRIER CURB (STRUCTURE)**

**Description:** Work under this item shall consist of furnishing, installing, relocating, and removing temporary concrete barrier for use on structures, as shown on the plans, to separate traffic from opposing traffic or work areas. This work shall also include furnishing and installing anchor bolts and the later removal of anchor bolts.

If called for on the plans, the temporary concrete barrier shall also be relocated as necessary to accommodate stage construction conditions.

**Materials:**

1. The barrier shall be precast concrete conforming to Article 8.21.02-1.
2. Manufacturer identification and casting date shall be permanently marked on each barrier unit by means of a non-corrosive metal or plastic tag in the location shown on the plan. When used barrier is furnished, the Contractor shall provide documentation stating from where the material came, what project it will be used on, the casting dates, and certification that the barrier conforms to all State requirements.
3. Reinforcing steel shall conform to the requirements of ASTM A615M, Grade 420.
4. Lifting hooks, keys, bolts, devices and attachments shall be of the size indicated on the plans or of a design satisfactory for the purpose intended as approved by the Engineer.
5. Anchor bolts shall conform to ASTM F1554, Grade 36 (248 MPa). Heavy hex nuts shall conform to AASHTO M291. The plate washers shall conform to AASHTO M270M, Grade 345. The anchor bolts, nuts, and plate washers shall be hot-dip galvanized in accordance with AASHTO M232M and M111M as applicable.

Anchor bolts shall be stainless steel and shall conform to ASTM A193M, Grade B6. Heavy hex nuts shall conform to ASTM A194M, Grade 6. The plate washers shall conform to ASTM A167.

6. Loop bars shall be bent from smooth bar steel conforming to AISI 1018 (Hot-rolled). Ends shall be hot-dip galvanized in accordance with AASHTO M111.
7. Threaded connection rods shall be steel conforming to AASHTO M 314 (ASTM F1554) Grade 55 except that threads and nominal diameters shall conform to ANSI B1.13M for Class 6g threads. The rod shall be threaded for a minimum of 4" (100mm) at each end. Plain

steel washers shall be manufactured in accordance with ANSI B18.22M. Heavy hex nuts shall conform to AASHTO M 291M for Class 10S and shall conform to the geometry defined in ANSI B18.2.4.6M. The threaded connection rods, washers, and nuts shall be hot-dip galvanized after fabrication in accordance with the requirements of Class C of AASHTO M232.

8. The chemical anchor material shall be a resin compound specially formulated to secure bolts in concrete against tension pullout. The Contractor shall select the chemical anchor material in accordance with Article M.03.07.
9. Non-shrink grout shall conform to Article M.03.05.
10. Barrier shall be accepted on the basis of the manufacturer's certification, as defined in Article M.08.02-4.
11. Sealant for patching holes in bituminous overlays shall be a cold-applied bituminous sealer conforming to M.08.01-15.
12. Anchor Bolts/Threaded Connection Rods-Certified Test Reports: The Contractor shall submit a Certified Test Report and a Materials Certificate in conformance with Article 1.06.07 and a sample of all anchor bolts, threaded connection rods, nuts, and washers for testing prior to their installation. The Contractor shall not install any anchor bolts or threaded connection rods prior to receipt of the approved test results and approval by the Engineer.
13. Delineators shall conform to Article 8.22.02.

**Construction Methods:**

1. Fabrication: The barrier shall be precast concrete in conformance with the pertinent requirements of Article 8.21.03 and the plans, except that penetrating sealer protective compound is not required.
2. Installation: The barrier shall be placed as shown on the plans or as directed by the Engineer.

The barriers shall be anchored to the concrete deck or approach slab in accordance with the plans and the following:

- a.) Prefabricated Bridge Units: Threaded inserts with matching anchor bolts shall be used for securing the barrier to precast deck units. The threaded inserts shall be cast into the deck units during fabrication as necessary to accommodate stage construction.
3. Connection of Barrier Units: The barrier shall be joined together with threaded connection rods, washers, and heavy hex nuts in accordance with the plans.



4. Cutting of Anchor Bolts: Where ordered by the Engineer, protruding anchor bolts shall be cut off flush with the surface of the concrete deck. The bolts shall then be ground down ½” (13mm) below the surface of the deck and the space filled in with non-shrink grout. The surface of the concrete deck shall be considered to start just below the bituminous or latex modified concrete wearing course. At the Contractor’s option, the anchor bolts may be pre-coated with a material, recommended by the manufacturer of the chemical anchoring material, which will allow for complete removal of the anchor bolts.
5. Patching with Non-Shrink Grout: After removal of the barrier, threaded inserts and holes in newly constructed concrete decks or approach slabs shall be blown clean with an air jet and filled in with non-shrink grout. The non-shrink grout shall be mixed and placed in strict accordance with the manufacturer's directions. The non-shrink grout shall be finished flush with the deck surface. Allow grout to cure a minimum of 24 hours before placing sealant in any remaining hole in the bituminous wearing surface.
6. Delineators: Delineators shall be installed on top of the barrier in accordance with Article 8.22.03-3 and the plans.
7. General: The barrier shall be kept in good condition at all times by the Contractor during all stages of construction. Any damaged material shall be replaced by the Contractor at his expense.  
  
When the barrier is no longer required, it shall be removed from the work site and become the property of the Contractor.
8. Relocation of Barrier: If called for on the plans, the Contractor shall relocate the barrier and its appurtenances to locations within the project limits as shown on the plans or as ordered by the Engineer.

**Method of Measurement:**

Temporary structure barrier will be measured for payment along the centerline at the top of the barrier and will be the actual number of feet of temporary structure barrier furnished, installed, and accepted.

Relocated temporary structure barrier will be measured for payment in linear feet along the centerline at the top of the barrier each time the barrier has been satisfactorily relocated and anchored as indicated on the plans, including to and from the storage area. Storage of the temporary structure barrier will not be measured for payment.

**Basis of Payment:**

This work will be paid for at the contract unit price per linear foot for "Temporary Precast Concrete Barrier Curb (Structure)", complete in place, which price shall include all furnishing, transportation, storage, materials, including concrete, reinforcing steel, connection rods, initial installation, and final removal, and which price shall also include hardware and materials, equipment, tools, and labor incidental thereto. The cost of furnishing, installing and removing of anchor bolts, as well as patching of any holes shall also be included for payment under this item. Each temporary structure barrier will be paid for once regardless of the number of times it is used on the project. Any temporary barrier units that become lost, damaged or defaced shall be replaced by the Contractor at no cost to the State.

The relocation of the temporary structure barrier will be paid for at the contract unit price per linear foot for "Relocated Temporary Precast Concrete Barrier Curb (Structure)", which price shall include removing, transporting and re-anchoring the barrier units, and all other materials, equipment, tools, and labor incidental thereto. The cost of furnishing, installing and removing of anchor bolts, as well as patching of any holes shall also be included for payment under this item.

Delineators will be paid for in accordance with Article 12.05.05.

Pay Item	Pay Unit
Temporary Precast Concrete Barrier Curb (Structure)	l.f.
Relocated Temporary Precast Concrete Barrier Curb (Structure)	l.f.

## **ITEM #0904949A -METAL BRIDGE RAIL (SOLID PANEL) (8' HIGH)**

### **Description:**

Work under this item shall consist of fabricating and installing metal bridge railings, consisting of extruded aluminum channels connected to aluminum posts, as shown on the plans, as directed by the Engineer and in accordance with this specification.

The Metal Bridge Rail system shall extend up to a point at least 6'-6" above the riding surface at the curb line.

### **Materials:**

Materials for this work shall conform to the following requirements:

#### 1. Metal Bridge Rail:

Railing posts, post connection devices, splice bars and rails shall be extruded aluminum and conform to the requirements of ASTM B221, aluminum alloy 6061-T6.

Base plates for railing posts shall be made of aluminum plate and conform to the requirements of ASTM B209, aluminum alloy 6061-T6.

Bolts, nuts and washers shall be of aluminum alloy 2024-T4, 6061-T6, 6062-T9 and/or 7075-T6.

Stainless steel fasteners in contact with aluminum shall conform to the requirements of ASTM F593, Group 1 (AISI Type 304). Socket head cap screws shall be stainless steel and conform to the requirements of ASTM F837, Group 1 (ANSI Type 304). Washers shall be stainless steel and conform to the requirements of ASTM A167, Types 302 through 305.

#### 2. Preset Anchorage:

The preset anchorage shall be fabricated as detailed on the contract plans. Preset anchorages configured differently from those detailed on the plans may be used provided they utilize the same materials described below and are approved by the Engineer prior to fabrication.

The wire struts shall be cold-drawn and conform to ASTM A510, Grade 1030 with minimum tensile strength of 100 ksi. These wire struts shall be securely welded to the ferrules with the welds capable of developing the tensile strength of the struts and the ferrules. Steel welding shall be in accordance with the American Welding Society "Structural Welding Code-Steel", AWS D1.1-2015.

The ferrules, either open end or closed end, shall conform to ASTM A108, Grade 12L14. A plastic cap shall be provided for sealing the bottom of each open end ferrule before placing concrete. Closed end ferrules shall provide a minimum full thread length of 2". Removable plastic washers of the same diameter as the ferrules and approximately 3/32" in thickness shall be provided for the top of each ferrule and shall be left in place until the temporary supporting bolts are removed. Removable plastic caps shall be provided for sealing the top of each ferrule until the erection of railing posts.

After fabrication, the preset anchorage shall be hot-dip galvanized in accordance with ASTM A153. The bolts shall be "free running" in the ferrules after galvanization.

Bolts for the preset anchorage shall be stainless steel heavy hex head and shall conform to the requirements of ASTM F593, Group 1 (AISI Type 304). The manufacturer's symbol and the grade shall be clearly marked on the bolt heads. Nuts shall be stainless steel and conform to the requirements of ASTM F594, Group 1. Washers shall be stainless steel and conform to the requirements of ASTM A167, Types 302 through 305.

### 3. 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" 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.

### 4. Submittals:

The Contractor shall furnish a Materials Certificate in conformance with the requirements of Article 1.06.07 for the following materials: Railing posts, post connection devices, splice bars, rails, base plates, preset anchorages, bolts, washers and molded pads.

A sample preset anchorage, and samples of all sizes of bolts and washers used with the metal bridge rail, shall be submitted to the Engineer for approval prior to incorporation into the project.

All submittals and shop drawings for the metal rail system will be reviewed by Amtrak and the Engineer.

### **Construction Methods:**

Before fabricating any materials, the Contractor shall submit shop drawings to the Engineer for approval in accordance with Article 1.05.02. These drawings shall include but not be limited to the following information: A layout plan showing all railing support bracket spacings, expansion joint locations relative to parapet joints, elevation view detailing the vertical profiles and material designations.

Aluminum welding shall be in accordance with the American Welding Society "Structural Welding Code-Aluminum", AWS D1.2.

The preset anchorages shall be fabricated for installation of vertical posts. The anchorages shall be firmly and accurately held in position prior to and during the placing of concrete.

The railings shall be accurately fabricated and installed as shown on the plans. Lengths of channel rails shall extend between posts. Welding of two or more rails to form an element will not be allowed.

Posts shall be installed plumb and parallel to one another.

Aluminum railings shall be carefully adjusted prior to fixing in place to ensure proper matching at abutting joints and correct alignment and curvature throughout their length. After installation, all rails and posts shall be free of burrs, sharp edges and irregularities.

Installation of the Metal Bridge Rail shall also be performed in accordance with the "Grounding and Bonding" special provisions.

**Method of Measurement:**

This work will be measured for payment by the actual number of linear feet of metal bridge rail completed and accepted, measured along the rail from end to end of channel.

**Basis of Payment:**

This work will be paid for at the contract unit price per linear foot for "Metal Bridge Rail (Solid Panel) (8' High)" complete and accepted in place, which price shall include all materials, equipment, tools, labor and work incidental thereto.

Pay Item	Pay Unit
Metal Bridge Rail (Solid Panel) (8' High)	l.f.

## **ITEM #0904953A -METAL BRIDGE RAIL (SOLID PANEL) (7' HIGH) (CURVED TOP)**

### **Description:**

Work under this item shall consist of fabricating and installing metal bridge railings, consisting of extruded aluminum channels connected to aluminum posts and curved pedestrian fence top, as shown on the plans, as directed by the Engineer and in accordance with this specification.

The Metal Bridge Rail system shall extend up to a point at least 6'-6" above the top of sidewalk at the interface between the inside face of parapet and sidewalk.

### **Materials for Solid Panel Bridge Railing:**

Materials for this work shall conform to the following requirements:

#### 1. Metal Bridge Rail:

Railing posts, post connection devices, splice bars and rails shall be extruded aluminum and conform to the requirements of ASTM B221, aluminum alloy 6061-T6.

Base plates for railing posts shall be made of aluminum plate and conform to the requirements of ASTM B209, aluminum alloy 6061-T6.

Bolts, nuts and washers shall be of aluminum alloy 2024-T4, 6061-T6, 6062-T9 and/or 7075-T6.

Stainless steel fasteners in contact with aluminum shall conform to the requirements of ASTM F593, Group 1 (AISI Type 304). Socket head cap screws shall be stainless steel and conform to the requirements of ASTM F837, Group 1 (ANSI Type 304). Washers shall be stainless steel and conform to the requirements of ASTM A167, Types 302 through 305.

#### 2. Preset Anchorage:

The preset anchorage shall be fabricated as detailed on the contract plans. Preset anchorages configured differently from those detailed on the plans may be used provided they utilize the same materials described below and are approved by the Engineer prior to fabrication.

The wire struts shall be cold-drawn and conform to ASTM A510, Grade 1030 with minimum tensile strength of 100 ksi. These wire struts shall be securely welded to the ferrules with the welds capable of developing the tensile strength of the struts and the ferrules. Steel welding shall be in accordance with the American Welding Society "Structural Welding Code-Steel", AWS D1.1-2015.

The ferrules, either open end or closed end, shall conform to ASTM A108, Grade 12L14. A plastic cap shall be provided for sealing the bottom of each open end ferrule before placing concrete. Closed end ferrules shall provide a minimum full thread length of 2". Removable plastic washers of the same diameter as the ferrules and approximately 3/32" in thickness shall be provided for the top of each ferrule and shall be left in place until the temporary supporting bolts are removed. Removable plastic caps shall be provided for sealing the top of each ferrule until the erection of railing posts.

After fabrication, the preset anchorage shall be hot-dip galvanized in accordance with ASTM A153. The bolts shall be "free running" in the ferrules after galvanization.

Bolts for the preset anchorage shall be stainless steel heavy hex head and shall conform to the requirements of ASTM F593, Group 1 (AISI Type 304). The manufacturer's symbol and the grade shall be clearly marked on the bolt heads. Nuts shall be stainless steel and conform to the requirements of ASTM F594, Group 1. Washers shall be stainless steel and conform to the requirements of ASTM A167, Types 302 through 305.

### 3. 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" 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.

### 4. Submittals:

The Contractor shall furnish a Materials Certificate in conformance with the requirements of Article 1.06.07 for the following materials: Railing posts, post connection devices, splice bars, rails, base plates, preset anchorages, bolts, washers and molded pads.

A sample preset anchorage, and samples of all sizes of bolts and washers used with the metal bridge rail, shall be submitted to the Engineer for approval prior to incorporation into the project.

All submittals and shop drawings for the metal rail system will be reviewed by Amtrak and the Engineer.

### **Materials for Curved Open Fencing:**

A curved pedestrian fence shall be provided and attached to the top of solid panel bridge rail on the sidewalk side of bridge. Open chain-link fencing shown on the plans shall conform to details and specifications shown in Amtrak standard "ET-1446-D".

### **Construction Methods:**

Before fabricating any materials, the Contractor shall submit shop drawings to the Engineer for approval in accordance with Article 1.05.02. These drawings shall include but not be limited to the following information: A layout plan showing all railing support bracket spacings, expansion joint locations relative to parapet joints, elevation view detailing the vertical profiles and material designations.

Aluminum welding shall be in accordance with the American Welding Society "Structural Welding Code-Aluminum", AWS D1.2.

The preset anchorages shall be fabricated for installation of vertical posts. The anchorages shall be firmly and accurately held in position prior to and during the placing of concrete.

The railings shall be accurately fabricated and installed as shown on the plans. Lengths of channel rails shall extend between posts. Welding of two or more rails to form an element will not be allowed.

Posts shall be installed plumb and parallel to one another.

Aluminum railings shall be carefully adjusted prior to fixing in place to ensure proper matching at abutting joints and correct alignment and curvature throughout their length. After installation, all rails and posts shall be free of burrs, sharp edges and irregularities.

Installation of the Metal Bridge Rail shall also be performed in accordance with the "Grounding and Bonding" special provisions.

**Method of Measurement:**

This work will be measured for payment by the actual number of linear feet of metal bridge rail completed and accepted, measured along the rail from end to end of channel.

**Basis of Payment:**

This work will be paid for at the contract unit price per linear foot for "Metal Bridge Rail (Solid Panel) (7' High) (Curved Top)" complete and accepted in place, which price shall include all materials, equipment, tools, labor and work incidental thereto.

Pay Item	Pay Unit
Metal Bridge Rail (Solid Panel) (7' High) (Curved Top)	l.f.



**ITEM #0910600A – 8” X 6” BOX BEAM GUIDE RAILING**

**Description:** This item shall consist of the installation and fabrication of the 8” x 6” box beam rail elements in accordance with the lines, designations, dimensions, and details on the plans or as directed by the Engineer.

**Materials:** Box beam rail elements shall conform with Section M.10 of the 2016 Standard Specifications.

**Construction Methods:** Construction methods shall meet the requirements of Article 9.10.03.

Contractor shall reference CTDOT Standard Sheet HW-910\_10, for the materials and installation of the 8” x 6” Box Beam Guide Railing.

**Method of Measurement:** The length of 8” x 6” Box Beam Guide Railing measured for payment will be the number of linear feet of accepted rail of the type or designation installed, including radius rail other than curved guide rail treatment, measured along the top of the rail between centers of end posts in each continuous section.

**Basis of Payment:** This work will be paid for at the Contract unit price per linear foot for the type or designation indicated on the plans or ordered by the Engineer, complete in place. The price shall include all materials, posts of all lengths, equipment, tools, removal and disposal of surplus material, and labor incidental to the installation of the rail.

Pay Item	Pay Unit
8” x 6” Box Beam Guide Railing	l.f.

**ITEM #0910602A – 8” X 6” BOX BEAM GUIDE RAILING END ASSEMBLY**

**Description:** This item shall consist of the installation and fabrication of the 8” x 6” box beam rail end assembly in accordance with the lines, designations, dimensions, and details on the plans or as directed by the Engineer.

**Materials:** Box beam rail elements for the end assembly shall conform with Section M.10 of the 2016 Standard Specifications.

**Construction Methods:** Construction methods shall meet the requirements of Article 9.10.03.

Contractor shall reference CTDOT Standard Sheet HW-910\_10, for the materials and installation of the 8” x 6” Box Beam Guide Railing.

**Method of Measurement:** The number of end assemblies measured for payment will be the actual number of accepted end assemblies of each type or designation installed in accordance with the “Pay Limit for 8”x 6” Box Beam End Assembly” shown on the plans.

**Basis of Payment:** This work will be paid for at the Contract unit price per linear foot for the type or designation indicated on the plans or ordered by the Engineer, complete in place. The price shall include all materials, posts of all lengths, equipment, tools, removal and disposal of surplus material, and labor incidental to the installation of the rail.

Pay Item	Pay Unit
8” x 6” Box Beam Guide Railing End Assembly	ea.

**ITEM #0910610A – 8” X 6” BOX BEAM BRIDGE ATTACHMENT**

**Description:** This item shall consist of the installation and fabrication of the 8” x 6” box beam bridge attachment in accordance with the lines, designations, dimensions, and details on the plans or as directed by the Engineer.

**Materials:** Box beam rail elements for the end assembly shall conform with Section M.10 of the 2016 Standard Specifications.

**Construction Methods:** Construction methods shall meet the requirements of Article 9.10.03.

Contractor shall reference Construction Details sheets within the contract documents, for the materials and installation of the 8” x 6” Box Beam Bridge Attachment.

**Method of Measurement:** The number of bridge attachments measured for payment will be the actual number of accepted bridge attachments of each type or designation installed in accordance with the “Pay Limit for Box Beam Bridge Attachment” shown on the plans.

**Basis of Payment:** This work will be paid for at the Contract unit price per linear foot for the type or designation indicated on the plans or ordered by the Engineer, complete in place. The price shall include all materials, drilling and grouting including anchor bolts, posts of all lengths, equipment, tools, removal and disposal of surplus material, and labor incidental to the installation of the end assembly.

Pay Item	Pay Unit
8” x 6” Box Beam Bridge Attachment	ea.

## **ITEM #0913068A – TEMPORARY 6' CHAIN LINK FENCE**

**Description:** Work under this item shall consist of furnishing and installing temporary 8' high chain link fence, of the type and size as indicated on the Plans, and at the locations shown on the Plans or as ordered by the Engineer. Also included in this item is the final removal and disposal following the completion of construction. Fence gates are not required.

The temporary chain link fences shall be installed between the tracks and abutments, as shown on the Plans or as ordered by the Engineer. It shall be used to separate the Contractor's work areas from railway operations.

**Materials:** The material for the temporary chain link fence and gates, including all hardware and appurtenances, shall conform to the requirements of Article 9.13.02, except that polyvinyl chloride-coated fabric, posts and/or hardware will not be allowed.

The materials used shall be new or in good condition, if previously used. Previously used materials require the approval of the Engineer prior to installation.

Concrete footings shall be Portland cement concrete, minimum compressive strength of 3,300 psi, as defined in M.03.02. Where posts are to be grouted into rock, the grout shall meet the requirements of M.03.05.

**Construction Methods:** Temporary chain link fence and gates shall be installed in accordance with the Plans and Section 9.13.03 of the specifications.

The Contractor shall maintain the fencing in good condition during the construction phase and shall immediately repair any damaged sections. Any temporary chain link fence and/or gates damaged by the Contractor, either during normal construction operations or the resetting process, shall be replaced at the Contractor's expense and at no cost to the State.

The Contractor shall remove the temporary fencing, including concrete anchorages if used, when no longer required for the work, as directed by the Engineer. The Contractor shall backfill all holes with granular material.

The temporary chain-link fencing must always be grounded and bonded throughout the construction project, according to the plans.

**Method of Measurement:** "Temporary 6' Chain Link Fence" will be measured for payment by the number of linear feet of temporary fence installed and accepted, measured from outside to outside of terminal posts, as shown on the Plans or as ordered by the Engineer.

Temporary chain link gates, within the line of the temporary chain link fence will be considered part of the temporary chain link fence and measured for payment by the linear foot as noted above.

The resetting of the temporary protective fence for the Contractor to complete the work shown on the plans, to facilitate his needs, or the installation of additional temporary protective fence or gates for the Contractor's convenience will not be measured for payment.

**Basis of Payment:** This work will be paid for at the contract unit price per linear foot for "Temporary 6' Chain Link Fence", which price shall include excavation, backfill, fabrication, concrete, disposal of surplus material, resetting, final removal and all materials, equipment, tools, and labor incidental to installing, maintaining, resetting where required and removal.

Pay Item	Pay Unit
Temporary 6' Chain Link Fence	l.f.

**ITEM #0913835A – REMOVE AND RESET CHAIN LINK FENCE**

Work under this item shall conform to the requirements of Section 9.13, supplemented and amended as follows:

**Description:** - Add the following:

Work under this item shall also consist of removing existing chain link fence, storing it during construction and re-installing the fence after construction in the area is complete, where indicated on the plans or as ordered by the Engineer.

**Construction Methods:** - Add the following:

The fence shall be removed in a workmanlike manner, stored during construction and reset in its proposed location upon completion of the work in the affected area.

Existing post foundations shall be removed, and new foundations of similar size poured at the locations of reset posts.

If the Engineer determines that the existing fence cannot be properly removed and reset due to the existing condition of fence and the impacts of removing and resetting, the Engineer may order the Contractor to install new fence.

During the removal, resetting and/or replacement of fencing, the Contractor shall install temporary fencing, to the Engineer’s satisfaction, in order to maintain the enclosed area. The Contractor shall notify the property owners in advance of their work operations and shall coordinate with property owners to gain access, as necessary.

The chain-link fencing must be grounded and bonded after it has been reset.

**Method of Measurement:** - Add the following:

Removing and resetting chain link fence will be measured for payment by the number of linear feet of fence removed and reset, complete and accepted, measured from outside to outside of terminal posts.

**Basis of Payment:** - Add the following:

The work to remove and reset fence will be paid at the contract unit price per linear foot for “Remove and Reset Chain Link Fence” complete in place, which price shall include removal, storage, resetting the fence including placement of new concrete foundations, and all material, equipment, tools and labor incidental thereto.

Pay Item	Pay Unit
Remove and Reset Chain Link Fence	l.f.

## **ITEM #0917010A – REPAIR GUIDERAIL**

**Description:** Work under this item shall consist of the repair of newly installed guiderail. It shall be repaired in the locations originally installed and fabricated in conformity with the lines, designations, dimensions, and details shown on the plans or as ordered by the Engineer.

**Materials:** The material for guiderail shall meet the requirements as specified within the original applicable contract items.

When repairing guiderail, the Contractor shall reuse any undamaged existing guiderail elements, timber rail, wire rope, appropriate posts, delineators, lap bolts, and other hardware within the project limits as approved by the Engineer to repair the guiderail. The Contractor shall use new materials when any components of the existing railing are damaged or missing and cannot be obtained from other guiderail systems being removed or converted within the Project limits.

**Construction Methods:** The repair of guiderail shall be in accordance with contraction methods as specified within the original applicable contract items.

Guiderail, including end anchors, which has been installed in final condition and accepted by the Engineer, shall be eligible for reimbursement for repairs subject to the conditions described below. If multiple runs are to be installed in a single stage as indicated in the contract documents, determination for reimbursement shall be made when all runs within the stage are complete and accepted as previously described. On projects without designated stages, guiderail installations must be complete and serving the intended function as determined by the Engineer.

When newly installed guiderail is damaged by public traffic, the following conditions must be satisfied prior to reimbursement for payment;

1. The damage must have been caused solely by the traveling public.
2. The contractor shall provide satisfactory evidence that such damage was caused by public traffic. Such as accident reports obtained from the Connecticut Department of Public Safety, police agencies or insurance companies; statements by reliable, unbiased eyewitnesses; or identification of the vehicle involved in the accident.
3. The contractor shall attempt to collect the costs from the person or persons responsible for the damage and provide documentation of those efforts to the satisfaction of the Engineer.
4. If such evidence cannot be obtained, the Engineer may determine that the damage was not caused by the Contractor and reimbursement for payment is warranted.

This repair provision does not relieve the Contractor of the requirements of Section 1.07, any other contractual requirements for maintenance and protection of traffic and final acceptance and relief of responsibility for the project.

The contractor shall remain responsible for the safety and integrity of the guiderail system for the duration of the project. In the event the guiderail is damaged, the Contractor shall provide sufficient cones, drums and other traffic control devices to provide safe passage by the public. When ordered by the Engineer, the Contractor shall furnish replacement parts and immediately repair the guiderail, but in no case more than 24 hours after notification from the Engineer. In non-emergency situations, the guiderail shall be repaired within 72 hours. The repaired guiderail or anchorages, when completed, shall conform to these specifications for a new system. The Contractor shall be responsible for the removal and the proper disposal of all damaged material and debris.

**Method of Measurement:** Guiderail damaged solely by the traveling public will be measured for payment. Damage caused by the Contractor's equipment or operations will not be measured for payment.

The sum of money shown on the estimate and in the itemized proposal as "Estimated Cost" for repair of guiderail will be considered the price bid even though payment will be made only for actual work performed. 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 price will be used to determine the total amount bid for the contract.

**Basis of Payment:** Repair of guiderail will be paid for in accordance with Article 1.09.04 as required to restore the rail to its full working condition in conformance with these specifications for a new system. There will be no payment for maintenance and protection of traffic for work associated with this item unless, in the opinion of the Engineer, the sole purpose of the maintenance and protection of traffic is for repair of the guiderail.

<u>Pay Item</u>	<u>Pay Unit</u>
Repair Guiderail	est. (est.)



## **ITEM #0921011A – CONCRETE DRIVEWAY**

**Description:** This item shall consist of concrete driveway area constructed on a granular fill base as shown on the contract plans, or as directed by the Engineer. Concrete driveway work also includes reinforcing steel, joints, saw cuts, and resetting the existing trench drain and pipe to the proposed elevation.

### **Materials:**

1. Portland Cement: Concrete shall meet the requirements of Section M.03 for Class PCC04460 Concrete.
2. Granular Fill: This material shall meet the requirements of M.02.01.
3. Reinforcement: Shall meet the requirements of Article M.06.01.
4. Joints: Shall meet the requirements of Article M.03.08.
5. Trench Drain and Pipe: Shall meet the requirements of Article M.08.

**Construction Methods:** Construction methods shall meet the requirements of Article 9.21.03. The surface shall be finished and marked off as directed by the Engineer.

During excavation activities, the contractor shall remove the existing roof drain pipe that runs underneath the driveway to an existing metal grate within the driveway. The contractor is directed to remove the existing pipe and reset it within the new driveway, along with the existing metal grate. If not possible, the existing pipe shall be cut at the concrete driveway limit and a new pipe shall be attached to the existing at the joint and replaced in kind. The existing grate shall be reused.

### **Method of Measurement:**

1. Concrete Driveway: This work will be measured for payment by the actual number of square footage of completed and accepted concrete driveway.
2. Excavation: Excavation below the finished grade, backfilling and disposal of surplus material will not be measured for payment; but the cost shall be included in the Contract price for Concrete Driveway. Excavation above the finished grade of each ramp will be classified and paid for in accordance with Section 2.02.
3. Granular Fill: This work will not be measured for payment, but the cost shall be included in the Contract price for Concrete Driveway.
4. Reinforcement: This material will not be measured for payment, but the cost shall be included in the Contract price for Concrete Driveway.
5. Joints: This work will not be measured for payment, but the cost shall be included in the Contract price for Concrete Driveway.
6. Trench Drain and Pipe: This work will not be measured for payment, but the cost shall be included in the Contract price for Concrete Driveway.
7. Cut Concrete Pavement: This work will not be measured for payment, but the cost shall be included in the Contract price for Concrete Driveway.

**Basis of Payment:** Construction of the concrete driveway will be paid for at the Contract unit price per square foot for “Concrete Driveway” complete in place, which price shall include all

excavation as specified above, backfill, disposal of surplus material, curb removal and any monolithic or separately cast sidewalk curb when required as shown on the plans, gravel or reclaimed miscellaneous aggregate base, granular fill, reinforcement, joint materials, saw cuts, trench drain materials, equipment, tools, materials and labor incidental thereto.

Pay Item	Pay Unit
Concrete Driveway	s.f.

**ITEM #0922503A – GRAVEL DRIVEWAY**

**Description:** This item shall consist of driveway areas that shall be granular fill base constructed upon existing subgrade in accordance with the contract plans, or as directed by the Engineer.

**Materials:** Granular Fill: This material shall meet the requirements of M.02.01.

**Construction Methods:** The surface on which the granular base is to be placed shall be shaped to an even surface and to the desired grade. The granular fill shall be placed to an 8” thickness in two separate lifts that shall be compacted, dressed smooth and to the required grade. The material shall be spread by any suitable means which will not crush the stone and shall be shaped to a smooth uniform finished grade.

**Method of Measurement:** Excavation below the existing grade of the driveway will not be measured for payment, but the cost shall be included in the price bid for the driveway.

**Basis of Payment:** This work will be paid for at the Contract unit price per SY for “Gravel Driveway”, complete in place, which price shall include all materials, tools, equipment and labor incidental thereto, excavation as specified above, and granular fill.

Pay Item	Pay Unit
Gravel Driveway	s.y.

**ITEM #0952001A – SELECTIVE CLEARING AND THINNING**

Section 9.52 is amended as follows:

**Article 9.52.03 – Construction Methods is supplemented as follows:**

Existing rights of way shall be established prior to any cutting, and/or trimming work.

Where directed by the Engineer, materials to be cut, trimmed shall be those items that restrict truck access along the proposed detour route.

Tree trimming shall be conducted along the detour route on Marsh Road, Terrace Avenue.

The Engineer will inspect the identified trees and verify the limits of clearing and thinning prior to the Contractor proceeding with his cutting operation.

## **ITEM #0969054A - CONTRACTOR QUALITY CONTROL PROGRAM**

### **LEVEL 1**

**Description:** The Contractor shall establish, maintain, and implement a written Project-specific Quality Control (QC) Program tailored to the complexity and scope of the work. This Program shall detail the programmatic documentation of the Contractor's processes for delivering the level of construction quality required by the Contract.

The written QC Program shall provide a comprehensive description of the planning, monitoring and reporting program the Contractor shall implement to ensure and document the quality of the work as it progresses.

The QC Program shall address, as a minimum, the following elements: Organization; Design Control; Procurement Control; Control of Subcontractors, Fabricators and Suppliers; Inspection; Special Process Control; Non-Conformance Resolution; Records; and Reporting.

The QC Program shall identify and list critical and routine work categories, which shall be used to differentiate the level of reporting, inspection and attention throughout the process.

The QC Program shall include a method to identify and resolve any deviations from the Contract while maintaining the Project schedule. The QC Program shall include a method to prevent recurring deviations once identified and resolved.

The Contractor shall modify the QC Program as needed to meet the requirements of this specification. The QC Program shall be recognized as a dynamic document, subject to revisions and amendments, as required, in response to actual Site conditions, work methods, and to address deviations encountered and corrected throughout the Project.

The Contractor shall furnish the services of a dedicated (sole responsibility), full-time, on-Site Quality Control Manager (QCM) for the Project. The QCM shall report directly to the Contractor's upper management and shall have the authority to issue stop work orders.

When simultaneous critical work categories are required by the Contractor's schedule, additional QC personnel (independent of trade staff) shall be required to meet the requirements of this specification.

The additional Contractor Quality Control requirements described herein shall be used in conjunction with the Standard Specifications. The QC Program is neither intended to relieve the Contractor from its responsibility under the Contract, nor to replace the external inspections of the work carried out by the Engineer.

The minimum lump sum bid for this item shall be **\$150,000**. Failure of the Contractor to bid at least the minimum amount will result in the Department adjusting the Contractor's bid to the minimum bid amount for this item.

### **Construction Methods:**

#### **Submittals**

(1) **QCM:** Within thirty (30) days of Contract award, the Contractor shall submit, in writing, the name of their proposed QCM with a resume of their qualifications, submitted in accordance with the requirements listed below, for concurrence by the Engineer. The QCM shall not be changed without prior written notification to and concurrence by the Engineer.

The submittal shall outline the credentials of the proposed QCM, who shall be an individual with demonstrated construction experience. This shall include at least 7 years of experience in any combination of the following areas:

- Field inspection experience
- Construction experience relevant to the type of work and the scope of the Project
- Previous experience as a Quality Control professional

The submittal shall also list any certifications or training in quality control principles (NETTCP Quality Assurance Technologist or approved equal) of the proposed QCM and two (2) letters of recommendation from previous clients.

- (2) QC Program: Within forty-five (45) days of Contract award, the Contractor, with direct input from the QCM, shall prepare and submit to the Engineer, for review and approval, a written QC Program, including the Elements listed below, and in accordance with all requirements of this specification.

Sample forms and reports intended to be used to assure compliance with this specification shall be included in the initial submittal of the QC Program. Sample forms and reports shall include, but are not limited to:

- Sample document control tracking form
- Sample design control tracking form (for Contractor design-build items)
- Sample shop drawing/working drawing review
- Sample material receiving inspection report
- Sample inspection forms for critical work categories
- Sample special process control forms
- Sample non-conformance report
- Sample daily and monthly reports

The Contractor's QCM, Project Manager and a representative of their upper management shall sign the final QC Program submission and any revisions or amendments thereto. Any revisions or amendments made to the QC Program shall be submitted in writing to the Engineer for acceptance.

Subcontractors, fabricators and suppliers involved in critical work categories, as defined in the QC Program, shall have their own work-item specific QC Plan which shall be included as an addendum to the Contractor's QC Program, and shall comply with all conditions of this item.

- (3) Additional QC Personnel: When additional QC personnel are required due to simultaneous work operations, the Contractor shall provide resume(s) of qualifications of the proposed personnel at least thirty (30) days in advance of the work. All additional QC personnel utilized for inspecting, sampling, and testing of materials shall be certified by NETTCP (or another entity approved by the Engineer) in the appropriate designation for the work or materials being inspected, sampled, or tested. These individual(s) shall also have demonstrated construction experience of at least 5 years in any combination of the following areas:

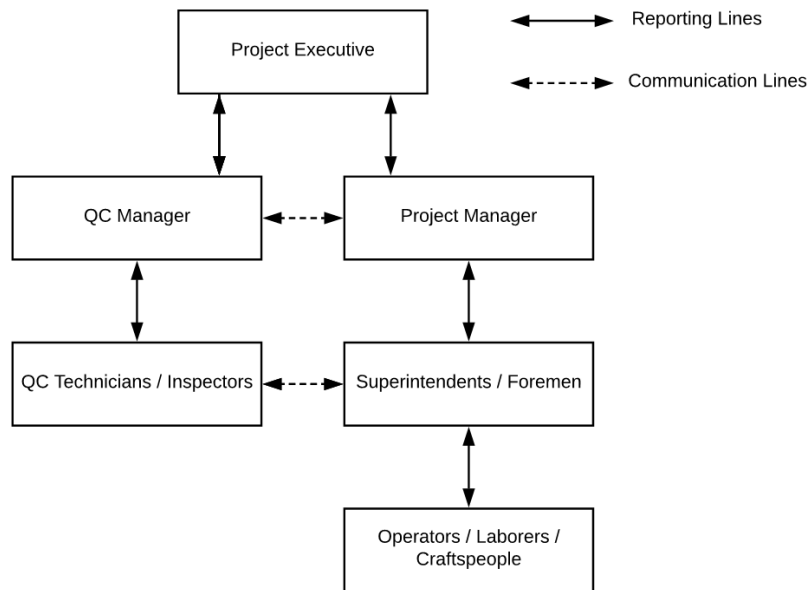
- Field inspection experience
- Construction experience relevant to the type of work and the scope of the Project
- Previous experience as a Quality Control professional

- (4) Laboratories: All laboratories performing QC testing of Project Produced Materials shall be qualified through either the AASHTO Accreditation Program (AAP) or the NETTCP Laboratory Qualification Program. The Contractor shall provide laboratory proof of qualification at least thirty (30) days in advance of the work.

(5) Reports: The Contractor shall be required to produce and submit to the Engineer daily and monthly inspection reports as described in the Reporting Element of this specification.

**Elements of the Contractor Quality Control Program:**

**1. Organization:** This Element shall describe the Contractor’s organization, including reporting relationships within and external to the Contractor’s organization. The name of the QCM shall be clearly stated and this individual shall be responsible to upper management (executive level) and have the authority to stop work. An organizational chart shall be included to graphically depict the Contractor’s organizational structure and major reporting lines and relationships. The organizational chart shall clearly show the hierarchy between the QCM, upper management and additional QC personnel; and a narrative shall follow which shall define the roles, duties and responsibilities of each person in the implementation of the QC Program and in the resolution of QC issues. This Element shall also include the resumes of all QC personnel.



**2. Design Control:** This Element shall describe how the Contractor and the QCM control any design process (i.e. working and shop drawings) for which it is responsible. This shall include the selection of design input data, checking for correctness, completeness, compatibility and format, and reviewing and approving design output documents prior to submission to the Engineer. This Element shall provide guidance as to how the QCM or other personnel shall indicate that documents have been reviewed by the Contractor prior to submission, and that Department comments have been adequately addressed prior to any required resubmissions.

**3. Procurement Control:** This Element shall describe the methods used by the Contractor and the QCM to assure that all materials and specialized equipment provided for the work are as specified. Included shall be guidelines for documenting that purchase documents have been reviewed to assure that correct details have been ordered, including specification, grade, type, color, Buy America or other aspects as required by the Contract.

This Element shall describe receiving inspection activities to be performed, and documentation required to confirm that the correct material or equipment has been delivered. A list of items requiring Materials Certificates and/or Certified Test Reports shall be developed by the Contractor and included in this Element. The Contractor shall prepare a “Material Receiving

Inspection Report” which shall include records of inspections performed and reviews of material test reports or other documentation required by the Contract. It shall also include copies of Materials Certificates and/or Certified Test Reports for all these items.

As a minimum, receiving inspections shall be performed on the following materials:

- Materials requiring a Materials Certificate or Certified Test Report
- Source-Controlled Materials (not inspected at the manufacturing plant)
- Job-Controlled Materials (other than concrete, bituminous and soils)

Following a receiving inspection, a copy of the “Material Receiving Inspection Report,” along with associated documents, shall be submitted to the Engineer.

**4. Control of Subcontractors, Fabricators and Suppliers:** Subcontractors, fabricators and suppliers involved in critical work categories, as defined in 5(a) herein, shall develop their own QC Plan to be added as an addendum to the Contractor’s QC Program, which shall comply with all conditions of this item. The Contractor shall be responsible for reporting on QC activities performed by or for subcontractors, fabricators and suppliers.

It is the Contractor’s responsibility to notify all subcontractors, fabricators, and suppliers of the requirements of the Contract. This Element shall describe the methods used by the Contractor and the QCM to assure that all the applicable requirements of the Contract are passed on to the subcontractors, fabricators and suppliers. This Element shall include the methods used by the Contractor and the QCM to monitor and control the quality of the work performed by subcontractors, fabricators and suppliers, and to obtain the required quality records.

This Element shall also describe how the Contractor will ensure that:

- The Engineer receives advance notice of:
  - The source of supply
  - The location of fabrication, including component parts
  - The schedule of fabrication, including the date of beginning of fabrication and the date the material is to be delivered to the Project
- Material fabricated specifically for the Project will be inspected and approved prior to being shipped or incorporated into the work
- Properly documented mill test reports are furnished by suppliers
- Subcontractors are approved prior to performing any work for or on the Project

**5. Inspection:** This Element shall describe how the Contractor and the QCM will assure that the specified quality of materials and workmanship will be achieved. The Contractor’s QC Program is not related to any inspection carried out by the Engineer. Inspection will include the identification and tracking of the quality characteristics (metrics) used to verify that the level of quality of materials and workmanship conforms to the requirements of the Contract.

The QC Program shall identify the reporting requirements for each item based on its work category, and these reporting requirements will be approved by the Engineer. The work categories will be identified as **critical** or **routine**.

**(a) Critical Work Categories:** For this Project, critical work categories shall include, but are not limited to the following:

- Construction Staking
- Maintenance & Protection of Traffic
- Earthwork
- Subbase and Base Material



- Hot Mix Asphalt
- Bridge Demolition
- Earth Retaining Systems
- Geotechnical (soil reinforcement)
- Reinforcing Steel
- Structural Steel
- Structural Concrete
- Electrical (grounding and bonding)
- Environmental Compliance
- Roadside Safety (guiderail, barrier, impact attenuators, etc.)
- Prefabricated Elements
- Utility Coordination
- Railroad Coordination

The QCM shall be familiar with all aspects of work related to critical work categories and no work shall be performed on these categories without the prior knowledge of the QCM. The QC Program shall define specific means and methods that shall be employed to minimize, identify, resolve and prevent recurrence of deviations from the Contract in regards to materials or workmanship for each of the critical work categories listed.

The QC Program shall identify hold points in the critical work categories beyond which work operations cannot proceed until the QCM and the Engineer have inspected the work in place and releases the hold.

When simultaneous critical work categories are required by the Contractor's schedule, additional QC personnel shall be required.

This Element shall describe the system(s) used to assure that all materials and workmanship for critical work categories are in conformance with the Contract, including but not limited to:

- visual inspection of the work, including frequency and hold points
- materials to be tested
- tests to be conducted
- frequency of testing
- locations of sampling
- checks
- intermittent or continuous inspections
- inspections of completed work
- or a combination of above methods

Quality control reporting forms shall be developed to document the work performed by the QCM and QC personnel, on each of these critical work categories. The forms shall be signed by Contractor supervisory field personnel, the QCM and QC personnel (if applicable), to document conformance of the work being performed. All work performed by the QCM and QC personnel on these critical work categories shall be documented and included in the QCM's daily and monthly reports.

**(b) Routine Work Categories:** All other work categories not covered by 6(a) will be defined as routine work categories and the general provisions of this specification shall apply.

**6. Special Process Control:** This Element shall describe the measures to be used to assure that any special processes (such as, but not limited to, welding, high-strength bolting, nondestructive examination, critical coatings, surveys, and control of critical tolerances) shall be controlled by procedures that are described in and comply with the Contractor's approved QC Program. The recording of results shall properly document that processes are in conformance with the Contract. In addition, this Element shall describe the methods used to verify, document and track any pre-qualification of the processes, personnel and equipment where required by the Contract.

**7. Non-Conformance Resolution:** This Element shall describe the protocol(s) for correcting any material or workmanship found not to be in compliance with the Contract, the reporting requirements for documenting any non-compliance, subsequent corrective measures and issue resolution.

**(a) Contractor-Issued Non-Conformance Reports:** This Element shall describe the Contractor's self-issued non-conformance reporting used to:

- document actions taken to identify non-conformance
- notify the Engineer in writing of non-conformance as soon as it is identified
- collaborate with the Engineer to establish a resolution

The non-conformance reports shall include signatures of the responsible persons for each process of the corrective action taken. Upon resolution of a non-conformance issue, the QC Program shall be revised to identify preventive measures that shall be taken to prevent similar deviations. Contractor supervisory field personnel involved in the work shall be informed of any changes implemented to avoid recurrence of deviations.

**(b) Engineer-Issued Non-Compliance Notices (NCN):** Non-compliance notices (NCNs) issued by the Engineer shall also be an indication of non-conformance and shall be addressed according to 1.05.11 and resolved to the satisfaction of the Engineer. Upon resolution, the QC Program shall be revised to identify preventive measures that shall be taken to prevent similar deviations. Contractor supervisory field personnel involved in the work shall be informed of any changes implemented to avoid recurrence of deviations.

**8. Records:** This Element shall describe how various records generated by the Contractor are originated, maintained, received, filed, protected and authenticated. Quality Control records required for submittal to the Engineer shall be described. This Element shall outline the Contractor's procedure for retaining records for a period of 3 years after acceptance of the Contract.

**9. Reporting: QC Inspection Reports:** The Contractor shall be required to produce and submit to the Engineer daily and monthly inspection reports in accordance with all requirements of this specification. The QC Program shall clearly define the information that shall be provided as part of the daily and monthly reports.

**(a) Daily Reports:** Daily reports shall include documentation of all activities, including inspection, material testing, and any work associated with the Elements of this specification, performed by the QCM and other QC personnel. The location of any forms relative to this specification shall be referenced in the daily reports.

For any week that a non-conformance report is issued, either by the Contractor or the Engineer, actions taken to resolve the non-conformance report shall be summarized and included with the submission of the daily reports. Updates on the status of the non-conformance shall continue in each submission of daily reports until the non-conformance

issue is resolved. Once resolved, the next submission of daily reports shall document that supervisory field personnel involved in the work have been informed of any changes to be implemented to avoid recurrence of deviations. Any revisions or amendments made to the QC Program, once submitted and accepted by the Engineer, shall be documented in the next submission of daily reports.

Daily reports shall be submitted (as a package) to the Engineer by 12 PM on the Tuesday following the week of the inspection reports, or as agreed to by the Engineer. Except as otherwise authorized by the Engineer, submissions after that time will be considered late.

**(b) Monthly Reports:** Monthly reports shall include a summary of the work performed, including QC activities, in the previous month and also a one (1) month “look ahead” schedule with expected QC efforts and procedures for critical and routine work categories. Monthly reports shall also include a submittal status update spreadsheet.

Monthly reports shall be submitted to the Engineer by the fifth (5th) business day each month. Except as otherwise authorized by the Engineer, monthly submissions after that time will be considered late.

**(c) Quality Assurance/Quality Control (QA/QC) Meetings:** Meetings shall be held specific to the QC Program. The Contractor shall, at minimum, be represented by the QCM and shall meet with the Engineer every other week, or more frequently at the Engineer’s request, to review reporting and all work related to this specification.

**Method of Measurement:** Within forty-five (45) calendar days of the award of the Contract, the Contractor shall submit to the Engineer for approval a schedule of values of its lump sum bid price for this item detailing the following:

1. The development costs to prepare the written QC Program. Development costs shall be ten percent (10%) of the total cost of the item.
2. The cost per-month to provide the services of the QC Program, including the QCM, QC activities, necessary QC personnel, preparing and submitting daily and monthly reports, and all other requirements of this specification. A per-month cost will be derived by taking the lump sum bid price, subtracting the development cost to prepare the written QC Program, and dividing the remainder by the number of Contract months remaining from the date of submission of the written QC Program.

**Basis of Payment:** This item will be paid for at the Contract lump sum price for “Contractor Quality Control Program Level 1” complete, which price shall include all submittals, QC Program revisions and amendments, inspections, monitoring, daily logs, reports, meetings, records, and all materials, equipment, labor and work incidental thereto.

Upon approval of the schedule of values by the Engineer, payments for work performed will be made as follows:

1. Upon acceptance of the written QC Program, the lump sum development cost from the payment schedule will be approved for payment.
2. Upon acceptable completion of the services of the QC Program for the month, the per-month cost will be approved for payment.

The Engineer reserves the right to apply the following reductions to the monthly payment portion, which cannot be recovered and will result in a reduction in the lump sum amount, should the Contractor fail to meet the requirements of this specification:

1. QC staff: A five percent (5%) reduction to the monthly payment will be applied for each day that acceptable QC services are not provided. The total reduction for any calendar month will not exceed the monthly payment for the item.
2. Reports: A five percent (5%) reduction to the monthly payment will be applied for each day that the required reports have been submitted late, up to a maximum of fifty percent (50%) of the monthly payment per report. This five percent (5%) reduction will apply to each independent report (each package of daily reports, described in 9(a) above, submitted on a weekly basis is considered one independent report). The total reduction for any calendar month will not exceed the monthly payment for the item.
3. QA/QC Meetings: A twenty-five percent (25%) reduction to the monthly payment will be applied for each bi-weekly QA/QC meeting not attended by the QCM. The total reduction for any calendar month will not exceed the monthly payment for the item.

Should the Contractor fail to continuously provide an acceptable QC Program, as required by this specification, the Engineer may withhold the entire monthly estimate until such time as all requirements are met.

Should the Contractor fail to comply with the QCM requirements of this specification, the QCM shall be replaced at the Engineer's request.

Only one monthly payment will be made for each calendar month regardless of the number of personnel required to complete the specified work.

Pay Item	Pay Unit
Contractor Quality Control Program Level 1	l.s.

**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":

**Mosher Avenue**

The Contractor shall maintain and protect one lane and shoulder in each direction on a paved travel path not less than 10 feet in width per lane, with 1 foot shoulders.

During the allowable period, the Contractor shall maintain and protect at least an alternating one-way traffic operation, on a paved travel path not less than 10 feet in width, with 1 foot shoulders.

During the allowable period, the Contractor will be allowed to close Mosher Street 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 10 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 10 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**

Unpaved travel paths will only be permitted for areas requiring full depth and full width reconstruction, in which case, the Contractor will be allowed to maintain traffic on processed

aggregate for a duration not to exceed 10 calendar days. The unpaved section shall be the full width of the road and perpendicular to the travel lanes. Opposing traffic lane dividers shall be used as a centerline.

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

The Contractor shall schedule operations so that pavement removal and roadway resurfacing shall be completed full width across a roadway (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.

The Contractor, during the course of active construction work on overhead signs and structures, shall close the lanes directly below the work area for the entire length of time overhead work is being undertaken. At no time shall an overhead sign be left partially removed or installed.

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.

### **Requirements for Winter**

The Contractor shall schedule a meeting with representatives from the Department including the offices of Maintenance and Traffic, and the Town/City 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 -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, 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, 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; 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" 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) Temporary road closures using Rolling Road Blocks (RRB) may be allowed on limited access highways for operations associated with the installation and removal of temporary lane closures. RRB may be allowed for the installation and removal of lead signs and lane tapers only and shall meet the following requirements:
  - RRB may not start prior to the time allowed in the contract Limitations of Operation for sign pattern installation. Sign pattern removal must be complete prior to the time indicated in the Limitations of Operation for restoring the lanes to traffic.
  - On limited access highways with 4 lanes or more, a RRB may not start until the Limitations of Operation Chart allows a 2 lane closure. In areas with good sight lines and full shoulders, opposite side lead signs should be installed in a separate operation.
  - Truck-Mounted Impact Attenuators (TMAs) equipped with arrow boards shall be used to slow traffic to implement the RRB. State Police Officers in marked vehicles may be used to support the implementation of the RRB. The RRB shall start by having all vehicles, including Truck-Mounted Impact Attenuators TMAs and police vehicles leave the shoulder or on-ramp and accelerate to a normal roadway speeds in each lane, then the vehicles will position themselves side by side and decelerate to the RRB speed on the highway.

- An additional Truck-Mounted Impact Attenuator TMAs equipped with a Portable Changeable Message Sign shall be utilized to advise the motorists that sign pattern installation / removal is underway. The Pre-Warning Vehicle (PWV) should be initially positioned in the right shoulder ½ mile prior to the RRB operation. If a traffic queue reaches the PWV's initial location, the contractor shall slowly reverse the PWV along the shoulder to position itself prior to the new back of queue. A Pre-Warning Vehicle, as specified elsewhere in the contract, shall be utilized to advise the motorists that sign pattern installation / removal is underway.
  - The RRB duration shall not exceed 15 minutes from start of the traffic block until all lanes are opened as designated in the Limitation of Operation chart. If the RRB duration exceeds 15 minutes on 2 successive shifts, no further RRB will be allowed until the Contractor obtains approval for a revised installation procedure from the respective construction District.
  - RRB should not be utilized to expand a lane closure pattern to an additional lane during the shift. The workers and equipment required to implement the additional lane closure should be staged from within the closed lane. Attenuator trucks (and State Police if available) should be used to protect the workers installing the taper in the additional lane.
  - Exceptions to these work procedures may be submitted to the District Office for consideration. A minimum of 2 business days should be allowed for review and approval by the District.
  - The RRB procedures (including any approved exceptions) will be reviewed and discussed by the inspection team and the Contractor in advance of the work. The implementation of the agreed upon plan will be reviewed with the State Police during the Work Zone Safety meeting held before each shift involving temporary lane closures. If the State Police determine that alternative procedures should be implemented for traffic control during the work shift, the Department and Contractor will attempt to resolve any discrepancies with the duty sergeant at the Troop. If the discrepancies are unable to be resolved prior to the start of the shift, the work will proceed as recommended by the Department Trooper. Any unresolved issues will be addressed the following day.
- 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 OR TRAILER 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 “Truck-Mounted or Trailer-Mounted Impact Attenuator”. 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. If it is used as a TMA and is in the proper location as specified, then it should be paid at the specified hourly rate for “Truck-Mounted or Trailer-Mounted Impact Attenuator”. 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 is also used as a Flashing Arrow in the same day, then the unit should be paid as a “Truck-Mounted or Trailer-Mounted Impact Attenuator” for the hours used to install and remove the pattern, typically 2 hours (1 hour to install and 1 hour to remove). If the TMA is also used as a Flashing Arrow during the same day, then the unit should be paid at the daily rate 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

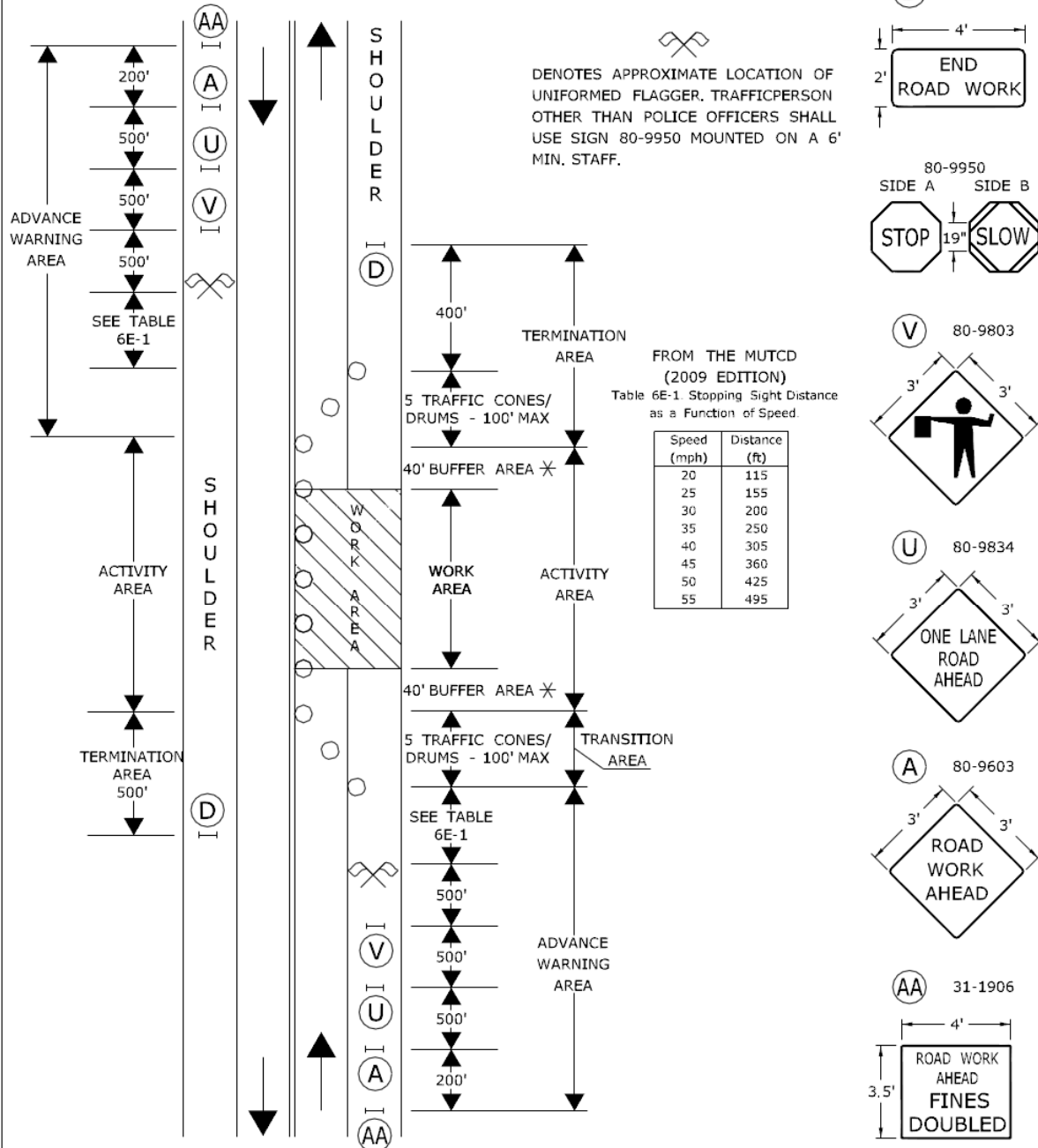
For any other message(s), approval must be received from the Office of Construction prior to their use. No more than two (2) displays shall be used within any message cycle.

**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.

# WORK IN TRAVEL LANE AND SHOULDER TWO LANE HIGHWAY ALTERNATING ONE-WAY TRAFFIC OPERATIONS

SIGN FACE  
108 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 13 - SHEET 1 OF 2**  
SEE NOTES 1, 2, 4, 6, 7, 8

CONNECTICUT DEPARTMENT OF TRANSPORTATION  
BUREAU OF ENGINEERING & CONSTRUCTION

APPROVED *Charles S. Harlow* Charles S. Harlow  
2012.06.05 15:55:23-04'00"  
PRINCIPAL ENGINEER

# 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

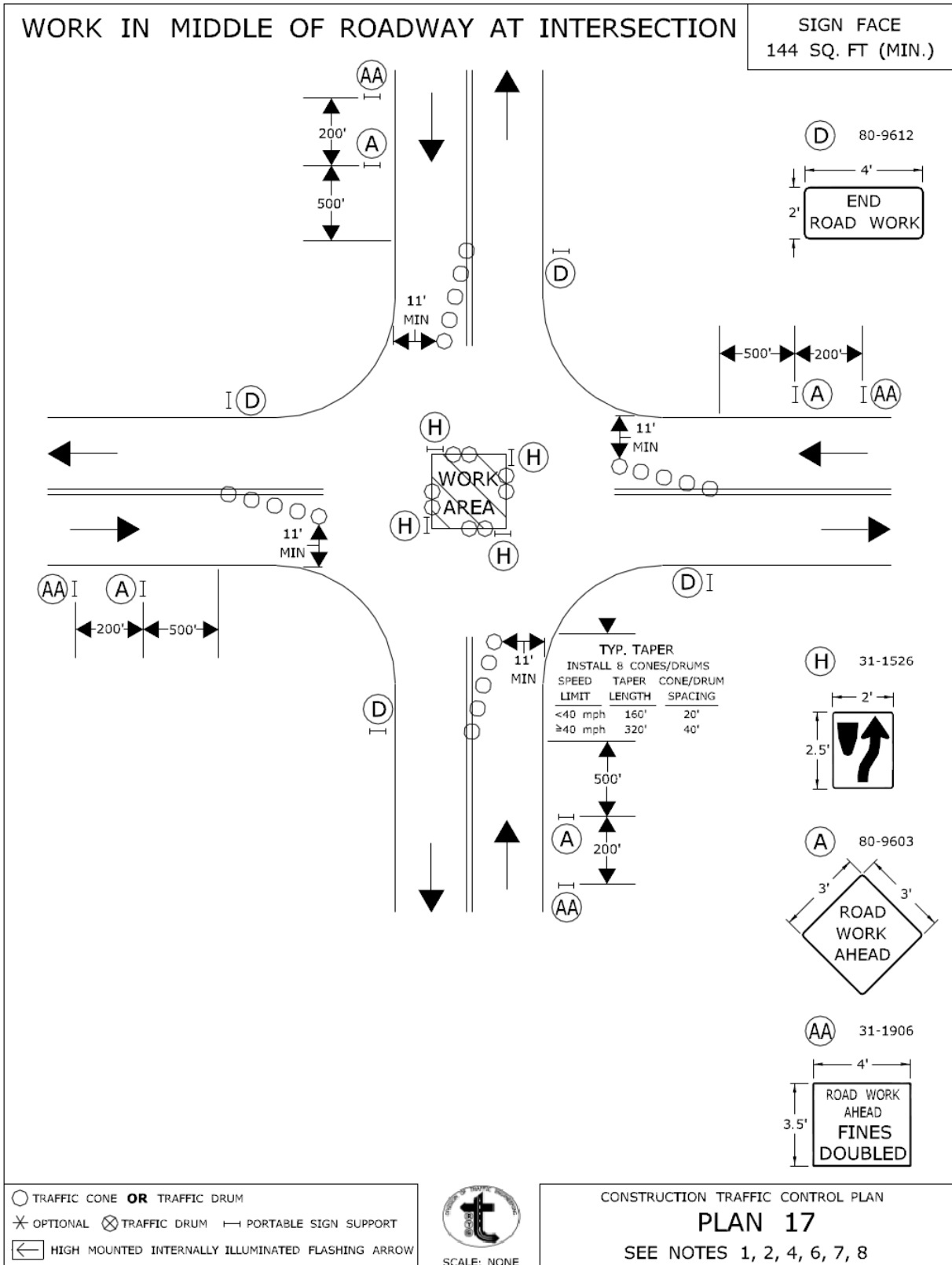


SCALE: NONE

CONSTRUCTION TRAFFIC CONTROL PLAN  
**PLAN 13 - SHEET 2 OF 2**  
SEE NOTES 1, 2, 4, 6, 7, 8

CONNECTICUT DEPARTMENT OF TRANSPORTATION  
BUREAU OF ENGINEERING & CONSTRUCTION

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



CONSTRUCTION TRAFFIC CONTROL PLAN  
**PLAN 17**  
 SEE NOTES 1, 2, 4, 6, 7, 8

CONNECTICUT DEPARTMENT OF TRANSPORTATION  
 BUREAU OF ENGINEERING & CONSTRUCTION

APPROVED *Charles S. Harlow* 2012.08.05 15:57:16-04'00"  
 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 installing and removing temporary crosswalk ramps and sidewalk shall be paid for under the item “Maintenance and Protection of Traffic”.

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.”

**ITEM #1004302A – ROADWAY LUMINAIRE-HIGH PRESSURE SODIUM (150 WATT)**

**DESCRIPTION:** Under this item the Contractor shall furnish and install a high pressure sodium roadway luminaire for temporary lighting, complete with integral ballast, lamp, photocell, and bracket arm, at the locations as shown on the plans. The luminaire shall be installed on a temporary wood pole installed as part of the temporary signalization on the project.

**MATERIALS:** The luminaire shall conform to the requirements of Article M.15.05 and shall be 150 watt high pressure sodium with external photocell and I.E.S. full-cutoff optics. The luminaire shall provide a type 3 distribution. The luminaire shall operate at 120 volts.

The bracket arm shall be fabricated from tubular steel with an upsweep design, shall accommodate a 2” slip-fitter type luminaire, shall be galvanized, and designed for wood pole attachment. The bracket length shall be 12’.

**CONSTRUCTION METHODS:** The luminare with associated bracket arm shall be installed on a temporary wood pole at the location designated on the plans and in accordance with Section 10.04.

The luminaire shall be electrically fed from a dedicated 15 amp circuit breaker located in the traffic signal control cabinet. Conductors shall be run from the single pole circuit breaker and the neutral bus bar in the cabinet, to the line side of the luminaire ballast. When necessary, the roadway luminaire and bracket arm shall be relocated to maintain proper roadway illumination as dictated by the construction stages.

The wood pole, conduit, conductors, and circuit breaker shall be paid for under the item for temporary signalization.

Upon completion of the project, the roadway luminare and bracket arm shall be removed and shall remain the property of the Contractor.

**METHOD OF MEASUREMENT:** The furnishing and installing of Roadway Luminaire – High Pressure Sodium (150 watt) will be measured for payment by the number of luminaires installed, complete and accepted.

**BASIS OF PAYMENT:** This work will be paid for at the contract unit price each for “Roadway Luminaire – High Pressure Sodium (150 Watt)” complete and accepted in place, which price shall include all materials, including luminaire, ballast, photocell, connectors, lamp, fittings, bracket arm, luminaire adjustment, connecting, and all labor, tools, equipment, incidental thereto. The cost of removing and relocating the temporary roadway luminaire and bracket arm to an alternate pole location to maintain illumination during various construction stages shall be included in the unit cost.

Date: 1/6/14

Pay Item:

Unit:

Roadway Luminaire-High Pressure Sodium (150 WATT)

Ea.



**ITEM #1015034A - GROUNDING AND BONDING**

**Description:** The work of this Section consists of furnishing and installing grounding and bonding systems for the bridges being replaced as shown on the plans and as specified herein. Work also includes the removal of the existing grounding and bonding systems on the existing bridges, as well as the furnishing, installation, and removal of temporary grounding and bonding systems during the different bridge demolition and construction stages.

Work includes providing all materials, labor, tools, equipment, supervision and all appurtenances as required for a complete grounding and bonding installation. The grounding and bonding systems shall meet the requirements of the National Electrical Code, National Electric Safety Code and the technical and safety recommendations of ANSI and IEEE.

Parts of the work will require railroad track and catenary/traction power outages which are limited to specified days and work hours that are defined elsewhere in the plans and specifications.

The Contractor shall provide new and temporary grounding and bonding for all construction stages of the project work, including but not limited to:

Temporary shielding and temporary utility support shall be bonded to each other and to the existing and new bridge bonding system as shown on the plans.

New Prefabricated Bridge Units shall be bonded to each other and to the existing and new bridge bonding system as shown on the plans. PBU's shall be bonded to each other at the end of each work shift.

The new bridge bonding system shall be bonded temporarily and permanently to the existing bridge bonding system and railroad static wires as shown on the plans.

New Metal Bridge Rail (Solid Panel) (8' High) posts shall be bonded to each other and to the new bridge bonding system as shown on the plans.

New bonding loops on each new bridge parapet shall be connected to the existing railroad static wires as show on the plans.

All required grounding and bonding shall be in place at the end of each work shift.

**Applicable Standards:** Pertinent provisions of the following listed standards (latest edition) shall apply to the work of this Section, except as they may be modified herein, and are hereby made a part of this Specification to the extent required.

<u>Organization</u>	<u>Number</u>	<u>Title</u>
NFPA	70	National Electrical Code (NEC)

IEEE	81	Recommended Guide for Measuring Ground Resistance and potential Gradients in the Earth National Electrical Safety Code (NEC)
	C2	
ASTM	B231	Concentric-lay-Stranded Aluminum Conductors Standard Specifications for Zinc (Hot-Dipped Galvanized) Coatings
	A123	
AA	I-90	Aluminum Standards and Data

**Submittals:** Test Reports: Reports of all field tests including method of measurement shall be submitted to the Engineer as required by these Specifications and referenced standards.

Certified copies of the test results on cables and other materials, supplied under this section, as per relevant standards.

The Contractor shall submit product data for all components in this Section, which shall include shop/working drawings, material/procurement specifications and other related information for each component.

The Contractor shall submit shop drawings, technical data, product data, and certificates for all materials furnished under this section including manufacturer's descriptive literature, installation recommendations, catalog data, and other information required to demonstrate compliance with the Contract Documents, including but not limited to:

- A. Conductors for Bond Wires
  - 1. Conductor for Bonding Loop
  - 2. Conductor for Bonding Wires
  - 3. Conductor for Flexible Bond Wire Jumper
- B. Connectors, Terminal Lugs, Bolts, Washers, Lock Washers, and Nuts
- C. Unistrut type channels and associated hardware
  - 1. Channel type, size, and finish
  - 2. Attachment bolts, washers, and bolts
  - 3. Channel nut with spring
  - 4. Cast-In-Place inserts
- D. Inserts
  - 1. For cast-in-place locations
  - 2. For drilled-in-place locations

The Contractor shall furnish certification from the manufacturer verifying that the wires have been designed, manufactured, inspected and tested in accordance with applicable portions of the referenced standards, these Specifications, and the plans.

Materials: All components shall conform to or be interchangeable with the Railroad's standard components.

Conductors for grounding and bonding shall be Class B, covered 4/0 AWG 1350 Aluminum 19 strand type H19.

Terminal Lugs shall be aluminum compression type with either one or two holes for bolted connections. Flexible Bond Wire Jumpers shall be Class B, covered 4/0 AWG 1350 Aluminum 19 strand type H19 as shown on the drawings.

Mounting channels shall be Unistrut P1000T channels, or an approved equal. Mounting channels shall have a hot-dipped galvanized finish.

All materials shall be protected against damage during handling and shipping. Each reel or bundle shall have a strong, weatherproof tag securely fastened showing the physical and mechanical properties as well as type designation, ASTM designation and the name and mark of the manufacturer, and the total length and weight of the cable or bundle.

**Construction Methods:** The installation of the bridge bonding system will occur in the vicinity of electrical energized facilities. De-energizing of the Railroad's electric lines will be required to perform the work.

All hardware shall be installed as shown on the plans and as recommended by the manufacturer. Bolts and nuts shall be properly tightened in accordance with the manufacturer's recommendations. All bolts shall be of sufficient length for a full thread beyond the nut, but shall not protrude beyond the nut and/or locknut more than 1/2". Bolt ends shall not be cut off.

Hardware shall be installed using tools and methods specified by the manufacturer and approved by the Engineer.

Hardware shall be inspected for cleanliness and damage. Any item that does not fit or is defective shall be rejected. Replacement shall be at the Contractor's expense.

Current-carrying connectors shall be as shown on the plans and shall be installed in accordance with the manufacturer's recommendations. Connectors for bimetallic connections shall be tin-plated.

Bolts in bolt-type connectors shall be lubricated as recommended by the manufacturer, and torqued, using a calibrated torque wrench.

Wire surfaces, which are in contact with conducting surfaces of the connector, shall be

thoroughly wire brushed and shall be coated with an inhibitor. When connectors are not factory-supplied with a corrosion inhibitor, the inhibitor shall be applied to the connector in the field.

Corrosion inhibitors shall be stable over a wide temperature range, adhere to cold metal surfaces, be water-repellent, be weather resistant, and be inert to copper, aluminum, zinc, tin, cadmium, steel, and neoprene rubber.

All conductors shall be handled in accordance with good overhead line practices and the manufacturer's recommendations.

Wire splices are not allowed without prior approval of the Engineer. No splice will be permitted within five feet of a support clamp.

Any damage to wires and conductors shall be reported, in writing, to the Engineer. Remedial action must be approved by the Engineer and will be performed as directed at the Contractor's expense.

During conductor installation, proper vertical and horizontal electrical clearances must be maintained from existing wires and structures.

Electrical resistance tests shall be made during and after installation to verify continuity of the grounding and bonding system.

**Method of Measurement:** The work under this Section will be measured on a lump sum basis which will include all materials, labor, equipment, testing, and coordination with the Railroad required for a complete and functional installation.

There shall be no separate or additional payment for the work associated with the furnishing, installation, and/or removals of temporary grounding or bonding materials.

**Basis of Payment:** This work will be paid for at the contract lump sum price for the following pay item which shall include all railroad coordination, testing, transportation, materials, equipment, tools, and labor incidental thereto.

Pay Item	Pay Unit
Grounding and Bonding	l.s.

## **ITEM #1118101A – TEMPORARY SIGNALIZATION**

### **Description:**

This item shall consist of furnishing, installing, maintaining, relocating and removing temporary traffic signal equipment and all necessary hardware as ordered and in conformance with the plans and applicable specifications.

### **Materials:**

All materials used for Temporary Signalization shall conform to the plans and pertinent articles of the Standard Specifications, the Supplemental Specifications, and the Special Provisions contained in this contract, or as approved by the Engineer. The materials can be new or used. Used material must not be damaged and its operation must be reliable. The Contractor must replace damaged or faulty material immediately. A Materials Certificate will be required.

### **Construction Methods:**

The Contractor shall review the traffic signal plan, contained in the contract plans, and, if any changes are necessary, the Contractor shall submit a revised plan to the Engineer for approval. In no case will the Contractor be allowed to revise an installation without prior knowledge and approval by the Division of Traffic Engineering.

Temporary Signalization shall begin when the Contractor installs the temporary traffic signal equipment.

The Contractor shall provide and maintain a temporary traffic signal capable of providing the approved phasing as shown on the plans or as directed by the Engineer. The Contractor shall relocate temporary signal equipment, including signal heads, vehicle detectors, etc., as many times as deemed necessary during construction to maintain and protect traffic where shown on the plans or as directed by the Engineer. The Contractor shall make modifications to the signal controller as necessary to maintain temporary signalization during each phase/stage of construction and shall make adjustments to the timing of the controller as necessary based on field conditions and as directed by the Engineer.

All equipment shall be relocated and/or removed in such a manner as to cause no hazard to pedestrians, traffic or property. When the Contractor is performing signal work, the Contractor shall maintain traffic as specified in the Special Provisions “Prosecution and Progress” and “Maintenance and Protection of Traffic.”

The Contractor shall be responsible for obtaining secondary service required for continuous operation of the temporary traffic signal during Temporary Signalization. The Contractor shall be responsible for the cost of the electricity to operate the temporary traffic signal and the intersection shall have a metered service.

The Contractor shall be responsible for maintenance of the temporary traffic signal during Temporary Signalization. The Contractor shall provide to the Engineer and the local Police Department a list of telephone numbers of personnel who will be responsible for the maintenance of the temporary traffic signal on a 24-hour basis. The Contractor shall respond to traffic signal malfunctions by having a representative at the site within three hours and the temporary traffic signal back in operation within 24 hours.

Temporary equipment supplied by the Contractor will remain the Contractor's property at the completion of the project unless otherwise noted.

Temporary Signalization shall terminate when construction is complete and the temporary signal equipment is removed from the project as approved by the Engineer.

**Method of Measurement:**

Fifty percent (50%) of the contract price for Temporary Signalization shall be paid when Temporary Signalization begins and fifty percent (50%) shall be paid when Temporary Signalization terminates.

**Basis of Payment:**

This work shall be paid at the contract Lump Sum price for "Temporary Signalization."

This item shall consist of furnishing, installing, maintaining, relocating and removing temporary traffic signal equipment and all necessary hardware, materials, labor and work incidental thereto. This item shall also include supplying the electricity to operate the temporary traffic signal. All Contractor supplied items that will remain the Contractor's property shall be included in the contract Lump Sum price for "Temporary Signalization."

Pay Item	Pay Unit
Temporary Signalization	L.S.

**ITEM #1206023A – REMOVAL AND RELOCATION OF EXISTING SIGNS**

**Description:** Work under this item shall consist of the removal, storage, 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.

**Construction Methods:** 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. Signs shall be stored in an indoor location until relocation is possible.

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.

**Method of Measurement:** 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, storage for the signs, and foundations and other materials designated for removal and disposal, and all work and equipment required.

**Basis of Payment:** 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.

Pay Item	Pay Unit
Removal and Relocation of Existing Signs	LS

**ITEM #1208931A – SIGN FACE - SHEET ALUMINUM (TYPE IX RETROREFLECTIVE SHEETING)**

*Section 12.08 is supplemented and amended as follows:*

**12.08.01—Description:**

*Add the following:*

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

**12.08.03—Construction Methods:**

*Delete the last sentence and add the following:*

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

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

**12.08.04—Method of Measurement:**

*Add the following:*

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

**12.08.05—Basis of Payment:**

*Replace the entire Article with the following:*

This work will be paid for at the Contract unit price per square foot for “Sign Face - Sheet Aluminum” of the type specified complete in place, adjusted by multiplying by the applicable Pay Factor listed in the table below. The price for this work shall include the completed sign, metal sign post(s), span-mounted sign brackets and mast arm-mounted brackets, mounting hardware, including reinforcing plates, field testing, restoration and replacement of defective base post(s), and all materials, equipment, and work incidental thereto.

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



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

<b>Number of Posts in Project =&gt;</b>	<b>51-100</b>	<b>101-250</b>	<b>251-1000</b>	<b>&gt;1000</b>
<b>Sample Size=&gt;</b>	<b>5 Posts</b>	<b>10 Posts</b>	<b>40 Posts</b>	<b>60 Posts</b>
0 Defects	1.0	1.0	1.025	1.025
1 Defect	0.9	0.95	0.975	0.983
2 Defects	Rejection	0.9	0.95	0.967
3 Defects	Rejection	Rejection	0.925	0.95
4 Defects	Rejection	Rejection	0.9	0.933
5 Defects	Rejection	Rejection	Rejection	0.917
6 Defects	Rejection	Rejection	Rejection	0.9
7 or more Defects	Rejection	Rejection	Rejection	Rejection

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

## **ITEM #1300005A – RELOCATION OF WATER MAINS**

### **Description:**

Work under this item shall consist of furnishing and installing water mains, fittings, valves, hydrant relocation, new hydrant installation, air/vacuum release assemblies and manholes, and thrust blocks as shown on the plans and in accordance with the specifications.

Work under this Item shall consist of all tools, labor, equipment, disposal of spoils, and acceptance testing necessary for installing the proposed water main (in its final configuration) as shown on the plans or as directed by the Engineer. Work under this item includes trenching, excavation, and backfilling as required.

The work to lift the water main and casing pipe and secure it in place on the structural supports shall be included under this Item. Structural supports and pipe roller saddles shall be included under Item “Structural Steel (Site No. 1)”.

Work performed under this item shall conform to the Noank Fire District – Water Department [herein as Noank Water Company] “Regulations and Specifications for Installation of Water Mains and Appurtenances in Subdivision Tracts” [herein as Regulations and Specifications] dated June of 1973, supplemented by this special provision, unless otherwise directed by the Engineer.

Work over Amtrak Right Of Way shall be in accordance with the Railroad Specifications. Coordinate all activities over Amtrak Property with Amtrak.

### **Materials:**

The Contractor shall submit to the Engineer manufacturer's specifications, data, catalogue cuts, etc., for all water distribution system materials and products incorporated into the work. The District reserves the right to inspect and approve all materials furnished by the Contractor at the manufacturer's plant. All pipe and appurtenances shall be subject to inspection by the District at the point of delivery.

Material found to be defective due to manufacture or damage in shipment shall be rejected, recorded on the bill of lading and removed from the job site. The District may perform tests as specified in the applicable AWWA standard to ensure conformance with the standard. In case of failure of the pipe or appurtenance to comply with such specifications, the replacement of the defective materials shall become the responsibility of the Contractor.

All pipe, fittings, valves, hydrants and accessories shall be loaded and unloaded by lifting with hoists or skidding in order to avoid shock or damage. Under no circumstances shall such material be dropped. Pipe handled on skidways shall not be rolled or skidded against pipe on the ground. Slings, hooks or pipe tongs shall be padded and used in such a manner as to prevent damage to

the exterior surface or internal lining of the pipe. All Materials shall be kept safe from damage. The interior of all pipes, fittings and other appurtenances shall be kept free from dirt or foreign matter at all times. Valves and hydrants shall be drained and stored in such a manner to protect them from damage by freezing. The bottom tier shall be kept off the ground on timbers, rails or concrete. Pipe in tiers shall be alternated: bell, plain end; bell, plain end. At least two rows of timbers shall be placed between tiers and chocks, affixed to each in order to prevent movement. The timbers shall be large enough to prevent contact between the pipes in adjacent tiers.

All Gaskets for mechanical and push-on joints shall be stored in a cool location protected from direct sunlight. Gaskets shall NOT come in contact with petroleum products. Gaskets shall be used on a first-in, first out basis. Mechanical-joint bolts shall be handled and stored in such a manner to ensure proper use with respect to types and sizes.

#### Ductile Iron Pipe:

Pipe used for the water main shall be ductile iron, double cement mortar lined on the inside, Zinc coated on the outside, Class 52 or 54 thickness, and in accordance with ANSI/AWWA A21.5/C151 Standards, latest revision. Cement mortar shall conform to ANSI/AWWA A21.5/C104 Standards, latest revision. All joints shall be push-on type, unless otherwise specified, using a single elongated rubber gasket and conform to ANSI/AWWA A21.11/C111 Standards, latest revision. Zinc coating shall conform to ISO 8179-1, latest revision. All pipe shall be marked with Class, Manufacturer, Weight, and Date of Manufacture.

#### Casing Pipe:

Steel casing pipe shall meet the requirements of ASTM A106, Type S, Class B, STD. The casing pipe shall be galvanized in accordance with ASTM A123.

#### Fittings:

Fittings include but are not limited to: Bends, couplings, caps, and plugs.

All fittings shall be ductile iron, double cement mortar lined on the inside, Zinc coated on the outside, and conform to ANSI/AWWA A21.10/C110 Standards, latest revision. Cement mortar shall conform to ANSI/AWWA A21.5/C104 Standards, latest revision. Zinc coating shall conform to ISO 8179-1, latest revision.

#### Hardware/Joints:

All hardware shall be stainless steel. All bolts shall be standard T-Bolts with anti-rotation in accordance with AWWA C111 Standards, latest revision. All joints shall be restrained. Mechanical joint restraints shall be Megalug Series 1100 or approved equal. Gaskets used for push-on joints shall conform to ANSI/AWWA A21.11/C111 Standards, latest revision.

#### Hydrants:

Fire hydrants shall conform to the requirements of AWWA C502. Hydrants shall have breakaway mountings, set a maximum of 4 inches above grade. If the hydrant nozzles are blocked by guardrail or another obstruction, the hydrant shall be mounted on a riser such that the

nozzles are no longer obstructed. Hydrants shall be painted lemon yellow, or an approved alternate color.

Gate Valves:

Buried Gate Valves shall conform to AWWA C500, latest revision.

Concrete:

Concrete for thrust blocks shall conform to the provisions of Section 6.01.

Warning Tape:

Warning tape shall be alkali and acid resistant polyethylene plastic with a 6-inch minimum width, 0.003-inch minimum thickness, and color-coded in blue (for water systems) with warning and identification imprinted in black bold letters continuously over the length of the tape. Warning and identification shall read “CAUTION – BURIED WATER LINE BELOW” or similar warning. The tape shall have a minimum lengthwise strength of 1,500 psi, minimum crosswise strength of 1,250 psi, and a maximum elongation of 350%.

Other Materials:

All other materials used for this work shall conform to those specified by the Noank Water Company’s Regulations and Specifications or as directed by the Engineer.

**Construction Methods:**

Pipe Cutting:

Cutting pipe for insertion of valves, fittings, or closure pieces shall be done in conformance with all safety recommendations of the manufacturer of the cutting equipment. Field cutting of ductile iron pipe shall only be done on “gauged” pipe (pipe so marked at the factory as to be within the proper O.D. Diameter and out of round tolerance for proper jointing at any position along the length). Cutting shall not damage the pipe or its linings. Ductile-iron pipe may be cut using an abrasive pipe saw, rotary wheel cutter, guillotine pipe saw, or milling wheel saw. Cut ends and rough edges shall be ground smooth, and for push-on joint connections, the cut end shall be beveled.

Water Main Installation:

Proper implements, tools and facilities shall be provided and used for the safe and convenient performance of the work. All pipe, fittings, valves and hydrants shall be lowered carefully into the trench by means of derrick, ropes or other suitable tools or equipment in such a manner as to prevent damage to water main materials and protective coatings and linings. Under no circumstances shall water main materials be dropped or dumped into the trench.

All pipes, fittings, valves, hydrants and other appurtenances shall be examined carefully for damage and other defects immediately before installation. Defective materials shall be marked and held for inspection by the Engineer, who may prescribe corrective repairs or reject the materials.

All lumps, blisters and excess coating shall be removed from the socket and plain ends of each pipe, and the outside of the plain end and the inside of the bell shall be wiped clean and dry and be free from dirt, sand, grit or any foreign materials before the pipe is laid.

Foreign material shall be prevented from entering the pipe while it is being placed in the trench. No debris, tools, clothing or other materials shall be placed in the pipe at any time.

As each length of the pipe is placed in the trench, the joint shall be assembled, and the pipe brought to correct line and grade. Three brass wedges shall be installed at each pipe and fitting joint. The pipe shall be secured in place with approved backfill material.

At times when pipe laying is not in progress, the open ends of pipe shall be closed by a water tight plug or other means approved by the Engineer. The plug shall be fitted with a means for venting. When practical, the plug shall remain in place until the trench is pumped completely dry. Care must be taken to prevent pipe flotation should the trench fill with water. Prior to removal of the plug for extending the line or any other reason, air and/or water pressure in the line shall be released.

Special attention is called to the existing concrete sidewalk and curbing on streets where required for construction, the contractor shall saw cut sidewalk and curbing at existing construction/scored joints. Following installation, backfill, and compaction of subgrade, sidewalk and curbing shall be replaced to match preconstruction thickness, dimensions, and finish. Concrete driveways and other pads shall be addressed in the same manner.

#### Water Main Joint Assembly:

##### *Push-On Joints:*

Thoroughly clean the groove and bell socket and insert the gasket, making sure that it faces the proper direction and that it is correctly seated.

After cleaning dirt or foreign material from the plain end, apply lubricant in accordance with the pipe manufacturer's recommendations. The lubricant is supplied in sterile cans. Contaminated lubricant shall be discarded.

The Contractor shall ensure that the plain end is beveled; square or sharp edges may damage or dislodge the gasket and cause a leak. Field cutting of ductile iron pipe shall only be done on "gauged" pipe, that is, pipe so marked at the factory as to be within proper O.D. diameter and out of round tolerance for proper jointing at any position along the length. Push the plain end into the bell of the pipe. Keep the joint straight while pushing. Make deflection after the joint is assembled. Small pipe can be pushed into the bell socket with a long bar. Large pipe requires additional power, such as a jack, lever puller or backhoe. A timber header should be used between the pipe and jack or backhoe bucket to avoid damage to the pipe.

##### *Mechanical Joints:*

The Contractor shall wipe clean the socket and the plain end. The plain end, socket and gasket should be washed with a soap solution to improve gasket seating. Place the gland on the plain

end with the lip extension toward the plain end, followed by the gasket with the narrow edge of the gasket toward the plain end. Use EBAA Series 1100 MEGALUG mechanical joint restraint system when the joint is at a fitting, valve, hydrant, plug end, or when requested by the Engineer. Insert the pipe into the socket and press the gasket firmly and evenly into the gasket recess. Keep the joint straight during assembly. Make deflection after joint assembly but before tightening bolts. Push the gland toward the socket and center it around the pipe with the gland lip against the gasket. Insert bolts and hand-tighten nuts. Tighten the bolts to the normal range of bolt torque while at all times maintaining approximately the same distance between the gland and the face of the flange at all points around the socket.

This can be accomplished by partially tightening the bottom bolt first, then the top bolt, next the bolts at either side, finally the remaining bolts. Repeat the process until all bolts are within the appropriate range of torque.

#### Hydrostatic Testing:

Perform pressure and leakage tests of new water main to meet the requirements of the Noank Water Company. Test shall be conducted between valved sections. When, in the opinion of the Engineer, local conditions require that trenches be backfilled immediately after pipe has been laid, the pressure test may be made after backfilling has been completed, but before permanent pavement replacement. A test shall be made only after part or all backfilling has been completed, and at least 36 hours after the last concrete thrust block has been cast with high early strength concrete; or at least 7 days after the last concrete thrust block has been cast with standard concrete.

#### Equipment for Testing:

The Contractor shall make all necessary arrangements to obtain, supply, furnish all pumps, piping, hose, gauges, installing corporation cocks, if necessary, etc., and remove same, except corporation cocks, when work is completed.

The meter equipment and gauges shall be tested for accuracy by the manufacturer prior to shipping and written certification shall be given to the Engineer.

#### Disinfection of Water Main:

After the water main installation has been accepted, the mains shall be flushed and disinfected in accordance with AWWA C651 and as follows:

1. Disinfection solution shall be prepared using calcium hypochlorite in granular form; tablets are not permitted.
2. The Continuous Feed Method shall be used.
3. Flushing and disinfection shall be conducted only at times approved by the Engineer.
4. Water for flushing and disinfection shall be introduced into the main only at locations and methods approved by the Engineer.
5. Flushing water shall be drained only at locations approved by the Engineer. The Contractor shall neutralize residual chlorine in flush water in accordance with AWWA C651 – Appendix B.

6. Disinfection solution shall be introduced into the water main through a tap no more than 10-feet downstream from the beginning of the new water main. The solution shall be introduced by a chemical feed pump designed for this purpose.
7. Taps installed for bleeding air at dead ends and other points shall be tightly plugged after disinfection and testing is complete.
8. Chlorine residual measurements shall be made at location and times required by the Engineer.
9. After the main has been flushed and the chlorine concentration of the water leaving the main is no greater than that generally prevailing in the system or is acceptable for domestic use, samples shall be taken by the District for bacteriological and physical tests.

The water main shall be placed in service only if the aforementioned tests meet the DOHS standards for potable water. Failing tests will require the Contractor to repeat the entire disinfection process.

Abandon Existing Water Main:

Abandon existing water main in place by disconnecting and plugging the main/tee as designated on the contract documents and/or designated by the Engineer.

For all other Sub-Items:

All other means of construction (including but not limited to pipe installation and installation of thrust blocks) shall conform to the Noank Water Company Regulations and Specifications, unless otherwise directed by the Engineer.

**Method of Measurement:**

This work shall not be measured for payment, as it is being paid for on a lump sum basis.

**Basis of Payment:**

This work shall be paid for at the contract lump sum price for "Relocation of Water Mains". Price shall include concrete for thrust blocks, ductile iron pipe and all appropriate fittings, steel casing pipe, casing pipe inserts, risers, and end seals, insulation for water main, polyvinyl chloride (PVC) vent pipes, gate valves, installation and relocation of fire hydrants, as well as all materials, equipment, tools, and labor incidental thereto.

The Contractor shall submit to the Department a schedule of payment values for review prior to payment.

## **ITEM #1301019A – TEMPORARY RELOCATION OF WATER MAINS**

### **Description:**

Work under this item shall include all labor, tools, equipment, materials, disposal of spoils, and acceptance testing necessary for the installation of the temporary water mains as shown on the plans or as directed by the Engineer. Work under this item includes trenching, excavation, and backfilling as required.

This item shall also include all labor, tools, equipment, and materials necessary for removing and/or abandoning the existing and temporary water mains as shown on the plans or as directed by the Engineer.

For the existing water main on the South fascia of existing Bridge #03903, the removal of the water main between the existing bridge abutments shall not be governed by this item, it shall instead be governed by the provisions of Section 5.03 – Removal of Superstructure.

Work performed for the support system of the temporary water main at the South fascia of existing Bridge #03903 shall not be governed by this item, it shall instead be governed by the provisions of Item No. 1504010A – Temporary Support of Utilities.

Work performed and materials used under this item shall conform to the Noank Fire District – Water Department [herein as Noank Water Company] “Regulations and Specifications for Installation of Water Mains and Appurtenances in Subdivision Tracts” [herein as Regulations and Specifications] dated June of 1973, supplemented by this special provision, unless otherwise directed by the Engineer.

Work over Amtrak Right Of Way shall be in accordance with the Railroad Specifications. Coordinate all activities over Amtrak Property with Amtrak.

### **Materials:**

The Contractor shall submit to the Engineer manufacturer's specifications, data, catalogue cuts, etc., for all water distribution system materials and products incorporated into the work. The District reserves the right to inspect and approve all materials furnished by the Contractor at the manufacturer's plant. All pipe and appurtenances shall be subject to inspection by the District at the point of delivery.

Material found to be defective due to manufacture or damage in shipment shall be rejected, recorded on the bill of lading and removed from the job site. The District may perform tests as specified in the applicable AWWA standard to ensure conformance with the standard. In case of failure of the pipe or appurtenance to comply with such specifications, the replacement of the defective materials shall become the responsibility of the Contractor.



All pipe, fittings, valves, hydrants and accessories shall be loaded and unloaded by lifting with hoists or skidding in order to avoid shock or damage. Under no circumstances shall such material be dropped. Pipe handled on skidways shall not be rolled or skidded against pipe on the ground. Slings, hooks or pipe tongs shall be padded and used in such a manner as to prevent damage to the exterior surface or internal lining of the pipe. All Materials shall be kept safe from damage. The interior of all pipes, fittings and other appurtenances shall be kept free from dirt or foreign matter at all times. Valves and hydrants shall be drained and stored in such a manner to protect them from damage by freezing. The bottom tier shall be kept off the ground on timbers, rails or concrete. Pipe in tiers shall be alternated: bell, plain end; bell, plain end. At least two rows of timbers shall be placed between tiers and chocks, affixed to each in order to prevent movement. The timbers shall be large enough to prevent contact between the pipes in adjacent tiers.

All Gaskets for mechanical and push-on joints shall be stored in a cool location protected from direct sunlight. Gaskets shall NOT come in contact with petroleum products. Gaskets shall be used on a first-in, first out basis. Mechanical-joint bolts shall be handled and stored in such a manner to ensure proper use with respect to types and sizes.

Temporary Water Main At-Grade:

The temporary water main at-grade shall consist of polyvinyl chloride (PVC) pipe and shall be at least 10-inches in diameter. Temporary at-grade water main shall be placed along the existing bridge structure sidewalk and shall not exceed 12 inches in diameter in order to satisfy ADA compliance requirements. The pipe and all appropriate fittings shall be of sufficient strength, construction, and pressure rating as to withstand the forces of the waterflow within. The contractor is responsible for protecting the water main from damage as a result of external sources (vehicular traffic, inclement weather, etc.).

Ductile Iron Pipe:

Pipe used for the water main shall be ductile iron, double cement mortar lined on the inside, double-bituminous seal coated on the outside, Class 52 or 54 thickness, and in accordance with ANSI/AWWA A21.5/C151 Standards, latest revision. Cement mortar shall conform to ANSI/AWWA A21.5/C104 Standards, latest revision. All joints shall be push-on type, unless otherwise specified, using a single elongated rubber gasket and conform to ANSI/AWWA A21.11/C111 Standards, latest revision. All pipe shall be marked with Class, Manufacturer, Weight, and Date of Manufacture.

Casing Pipe:

Steel casing pipe shall meet the requirements of ASTM A106, Type S, Class B, STD.

Fittings:

Fittings include but are not limited to: Bends, couplings, caps, and plugs.

All fittings shall be ductile iron, double cement mortar lined on the inside, double-bituminous seal coated on the outside, and conform to ANSI/AWWA A21.10/C110 Standards, latest

revision. Cement mortar shall conform to ANSI/AWWA A21.5/C104-08 Standards, latest revision.

Hardware/Joints:

All hardware shall be stainless steel. All bolts shall be standard T-Bolts with anti-rotation in accordance with AWWA C111 Standards, latest revision. All joints shall be restrained. Mechanical joint restraints shall be Megalug Series 1100 or approved equal. Gaskets used for push-on joints shall conform to ANSI/AWWA A21.11/C111 Standards, latest revision.

Gate Valves:

Buried Gate Valves shall conform to AWWA C500, latest revision.

Concrete:

Concrete for thrust blocks shall conform to the provisions of Section 6.01.

Warning Tape:

Warning tape shall be alkali and acid resistant polyethylene plastic with a 6-inch minimum width, 0.003-inch minimum thickness, and color-coded in blue (for water systems) with warning and identification imprinted in black bold letters continuously over the length of the tape. Warning and identification shall read "CAUTION – BURIED WATER LINE BELOW" or similar warning. The tape shall have a minimum lengthwise strength of 1,500psi, minimum crosswise strength of 1,250psi, and a maximum elongation of 350%.

Other Materials:

All other materials used for this work shall conform to those specified by the Noank Water Company's Regulations and Specifications or as directed by the Engineer.

**Construction Methods:**

For Removal of Water Main:

The Contractor shall only remove the portions of existing and/or temporary water main called for on the plans or as directed by the Engineer. Portions of existing and/or temporary water main within the proposed areas of Soil Stabilization (GRS) shall be removed. Under no circumstances shall portions of abandoned water main remain within the GRS Area after the completion of construction. Contractor shall remove the sections of water main in their entirety including any valves, fittings, thrust blocks, or other incidental appurtenances. Removal of existing water main below grade shall be paid for as incidental to "Structure Excavation".

Pipe Cutting:

Cutting pipe for insertion of valves, fittings, or closure pieces shall be done in conformance with all safety recommendations of the manufacturer of the cutting equipment. Field cutting of ductile iron pipe shall only be done on "gauged" pipe (pipe so marked at the factory as to be within the proper O.D. Diameter and out of round tolerance for proper jointing at any position along the length). Cutting shall not damage the pipe or its linings. Ductile-iron pipe may be cut using an

abrasive pipe saw, rotary wheel cutter, guillotine pipe saw, or milling wheel saw. Cut ends and rough edges shall be ground smooth, and for push-on joint connections, the cut end shall be beveled.

Water Main Installation:

Proper implements, tools and facilities shall be provided and used for the safe and convenient performance of the work. All pipe, fittings, valves and hydrants shall be lowered carefully into the trench by means of derrick, ropes or other suitable tools or equipment in such a manner as to prevent damage to water main materials and protective coatings and linings. Under no circumstances shall water main materials be dropped or dumped into the trench.

All pipes, fittings, valves, hydrants and other appurtenances shall be examined carefully for damage and other defects immediately before installation. Defective materials shall be marked and held for inspection by the Engineer, who may prescribe corrective repairs or reject the materials.

All lumps, blisters and excess coating shall be removed from the socket and plain ends of each pipe, and the outside of the plain end and the inside of the bell shall be wiped clean and dry and be free from dirt, sand, grit or any foreign materials before the pipe is laid.

Foreign material shall be prevented from entering the pipe while it is being placed in the trench. No debris, tools, clothing or other materials shall be placed in the pipe at any time.

As each length of the pipe is placed in the trench, the joint shall be assembled, and the pipe brought to correct line and grade. Three brass wedges shall be installed at each pipe and fitting joint. The pipe shall be secured in place with approved backfill material.

At times when pipe laying is not in progress, the open ends of pipe shall be closed by a water tight plug or other means approved by the Engineer. The plug shall be fitted with a means for venting. When practical, the plug shall remain in place until the trench is pumped completely dry. Care must be taken to prevent pipe flotation should the trench fill with water. Prior to removal of the plug for extending the line or any other reason, air and/or water pressure in the line shall be released.

Special attention is called to the existing concrete sidewalk and curbing on streets where required for construction, the contractor shall saw cut sidewalk and curbing at existing construction/scored joints. Following installation, backfill, and compaction of subgrade, sidewalk and curbing shall be replaced to match preconstruction thickness, dimensions, and finish. Concrete driveways and other pads shall be addressed in the same manner.

Water Main Joint Assembly:

*Push-On Joints:*

Thoroughly clean the groove and bell socket and insert the gasket, making sure that it faces the proper direction and that it is correctly seated.

After cleaning dirt or foreign material from the plain end, apply lubricant in accordance with the pipe manufacturer's recommendations. The lubricant is supplied in sterile cans. Contaminated lubricant shall be discarded.

The Contractor shall ensure that the plain end is beveled; square or sharp edges may damage or dislodge the gasket and cause a leak. Field cutting of ductile iron pipe shall only be done on "gauged" pipe, that is, pipe so marked at the factory as to be within proper O.D. diameter and out of round tolerance for proper jointing at any position along the length. Push the plain end into the bell of the pipe. Keep the joint straight while pushing. Make deflection after the joint is assembled. Small pipe can be pushed into the bell socket with a long bar. Large pipe requires additional power, such as a jack, lever puller or backhoe. A timber header should be used between the pipe and jack or backhoe bucket to avoid damage to the pipe.

#### *Mechanical Joints:*

The Contractor shall wipe clean the socket and the plain end. The plain end, socket and gasket should be washed with a soap solution to improve gasket seating. Place the gland on the plain end with the lip extension toward the plain end, followed by the gasket with the narrow edge of the gasket toward the plain end. Use EBAA Series 1100 MEGALUG mechanical joint restraint system when the joint is at a fitting, valve, hydrant, plug end, or when requested by the Engineer. Insert the pipe into the socket and press the gasket firmly and evenly into the gasket recess. Keep the joint straight during assembly. Make deflection after joint assembly but before tightening bolts. Push the gland toward the socket and center it around the pipe with the gland lip against the gasket. Insert bolts and hand-tighten nuts. Tighten the bolts to the normal range of bolt torque while at all times maintaining approximately the same distance between the gland and the face of the flange at all points around the socket.

This can be accomplished by partially tightening the bottom bolt first, then the top bolt, next the bolts at either side, finally the remaining bolts. Repeat the process until all bolts are within the appropriate range of torque.

#### Hydrostatic Testing:

Perform pressure and leakage tests of new water main to meet the requirements of the Noank Water Company. Test shall be conducted between valved sections. When, in the opinion of the Engineer, local conditions require that trenches be backfilled immediately after pipe has been laid, the pressure test may be made after backfilling has been completed, but before permanent pavement replacement. A test shall be made only after part or all backfilling has been completed, and at least 36 hours after the last concrete thrust block has been cast with high early strength concrete; or at least 7 days after the last concrete thrust block has been cast with standard concrete.

#### Equipment for Testing:

The Contractor shall make all necessary arrangements to obtain, supply, furnish all pumps, piping, hose, gauges, installing corporation cocks, if necessary, etc., and remove same, except corporation cocks, when work is completed.

The meter equipment and gauges shall be tested for accuracy by the manufacturer prior to shipping and written certification shall be given to the Engineer.

Disinfection of Water Main:

After the water main installation has been accepted, the mains shall be flushed and disinfected in accordance with AWWA C651 and as follows:

1. Disinfection solution shall be prepared using calcium hypochlorite in granular form; tablets are not permitted.
2. The Continuous Feed Method shall be used.
3. Flushing and disinfection shall be conducted only at times approved by the Engineer.
4. Water for flushing and disinfection shall be introduced into the main only at locations and methods approved by the Engineer.
5. Flushing water shall be drained only at locations approved by the Engineer. The Contractor shall neutralize residual chlorine in flush water in accordance with AWWA C651 – Appendix B.
6. Disinfection solution shall be introduced into the water main through a tap no more than 10-feet downstream from the beginning of the new water main. The solution shall be introduced by a chemical feed pump designed for this purpose.
7. Taps installed for bleeding air at dead ends and other points shall be tightly plugged after disinfection and testing is complete.
8. Chlorine residual measurements shall be made at location and times required by the Engineer.
9. After the main has been flushed and the chlorine concentration of the water leaving the main is no greater than that generally prevailing in the system or is acceptable for domestic use, samples shall be taken by the District for bacteriological and physical tests.

The water main shall be placed in service only if the aforementioned tests meet the DOHS standards for potable water. Failing tests will require the Contractor to repeat the entire disinfection process.

For all other Sub-Items:

All other means of construction (including but not limited to pipe installation, valve installation, hydrant relocation, installation of thrust blocks, and pressure/leak testing) shall conform to the Noank Water Company Regulations and Specifications, unless otherwise directed by the Engineer.

**Method of Measurement:**

This work shall not be measured for payment, as it is being paid for on a lump sum basis.

**Basis of Payment:**

This work shall be paid for at the contract lump sum price for “Temporary Relocation of Water Mains”. Price shall include concrete for thrust blocks, ductile iron pipe and all appropriate

fittings, steel casing pipe, casing pipe inserts, risers, and end seals, insulation for water main, polyvinyl chloride (PVC) vent pipes, PVC pipe for water main at grade, gate valves, supports necessary on grade beyond the limits paid for under Item No. 1504010A, as well as all materials, equipment, tools, and labor incidental thereto.

The Contractor shall submit to the Department a schedule of payment values for review prior to payment.

## **ITEM #1504010A - TEMPORARY SUPPORT OF UTILITIES**

### **Description:**

Work under this item shall consist of furnishing, placing, maintaining, and subsequently removing temporary support bridge for the existing utilities to be relocated as shown on the plans and accordance with these specifications or as ordered by the Engineer in conjunction with the appropriate utility approval.

Work under this item shall include, but may not be limited to, excavation and backfill, construction of foundations and concrete structures, steel and steel erection, bonding and grounding, bolts, threaded rods, adjustable roll guide assemblies, and other appurtenances or attachments, and all other labor, materials and incidental work.

Relocation of utilities, including but not limited to all pipe, conduit, bends and fittings on the temporary support system shall be paid separately under the appropriate pay items.

It shall be the responsibility of the Contractor to coordinate this Work with the Utilities. Any damage to the Utilities caused by the Contractor's operations, which affects the operation of the utility service, shall be repaired by the Utilities at the Contractor's expense.

Prior to construction, the Contractor shall arrange and meet with the Railroad and Utilities for scheduling and coordination regarding this work. The Contractor shall then, within 5 days, file documentation of that meeting and the resulting agreements in a project memorandum to the Engineer. The Engineer shall be given advance notification of this meeting by the Contractor to allow the opportunity to be in attendance.

The Contractor shall exercise extreme caution when installing the temporary supports and during construction. When installing the temporary supports the respective utility company representatives shall be present. Refer to "Section 1.07 - Legal Relations and Responsibilities" contained elsewhere herein for specific contact information.

### **Materials:**

The materials for this work shall conform to the following requirements:

Structural Steel shall conform to AASHTO M270 Grade 50T2

Bolts shall conform to ASTM F3125 Grade A325

Threaded rods shall conform to ASTM A307

Portland Cement Concrete shall be "Footing Concrete" per Section M.03.

Adjustable Roll Guides: Each Adjustable Roll Guides shall include four adjustable sockets and two roll axles with non-conducting rollers; each assembly mounted on two vertical threaded rods and fastened to the temporary structure with hex nuts. Contractor shall furnish product submittal detailing dimensions, weight and maximum loading for roller assembly.

**Construction Methods:**

The Contractor shall prepare shop drawings for the temporary utility support system shown on the plans. The support systems shall safely carry all utility dead loads as well as any imposed loadings under all possible construction conditions. Said supports shall be constructed in a manner that will not interfere with the proposed superstructure replacement or interfere with railroad and vehicular traffic.

Temporary utility support system shall be set level and in the location and to the dimensions shown on the plans. The contractor shall locate the temporary utility support system by field survey and shall verify rail clearance requirements with the Engineer in the field prior to hoisting the temporary steel structure into place.

No work will be allowed in the vicinity of any utility until the Contractor receives approval of his shop drawings from both the Engineer and the respective Railroad and Utility companies.

The Contractor shall use every effort to protect all utilities from damage of any nature which might result from carelessness or negligence in any of his operations. He shall be held solely and strictly responsible for any damage resulting from such carelessness or negligence.

A periodic inspection of the temporary utility supports shall be conducted by the Contractor as directed by the Engineer.

**Method of Measurement:**

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

**Basis of Payment:**

This work shall be paid for at the contract lump sum price for “Temporary Support of Utilities” which price shall include the furnishing, installing, maintaining the temporary utility support bridge and the satisfactory removal and disposal of the temporary utility support system when it is no longer required, including all materials, equipment, tools, labor and work incidental thereto.

A schedule of values for payment shall be submitted to the Department for review and comment prior to payment.

<u>Pay Item</u>	<u>Pay Unit</u>
Temporary Support of Utilities	L.S.



## **PERMITS AND/OR REQUIRED PROVISIONS**

The following Permits and/or and Required Provisions follow this page are hereby made part of this Contract.

- **PERMITS AND/OR PERMIT APPLICATIONS**

*Coastal Area Management Consistency Review (OLISP)*

- **Construction Contracts - Required Contract Provisions (FHWA Funded Contracts)**



**CONNECTICUT DEPARTMENT OF TRANSPORTATION**  
**Office of Environmental Planning**  
**Water and Natural Resources**  
**COASTAL CONSISTENCY REVIEW FORM**

---

*This form must be completed when a state project falls within the coastal boundary as defined in subsection (b) of section 22a-94 of the Connecticut General Statutes. The following information is being provided to the Office of Environmental Planning (OEP) for review with consistency with the Coastal Goals and Policies defined in CGS section 22a-92.*

---

**State Project #:** 58-336

**Designer:** Hardesty & Hanover, LLC    **Phone:** 203-772-2857

**Project Description:** Rehabilitation of Bridge No. 03903

**Date of submittal:** January 31, 2019

**Anticipated Construction Start Date:** Spring 2020

**Town:** Groton

**Required Attachments:** Location map; project description; pertinent plan sheets (including E & S), and site photos.

**Stormwater Treatment Concerns**

- Does the project result in an increase in impervious surface? If so, how much (square feet) and what percentage increase over existing does that represent? **The project does not result in an increase in impervious surface.**
- If drainage systems are being upgraded or modified, what Primary and Secondary Stormwater Treatment measures (as defined by the 2004 DEP Stormwater Quality Manual) have been incorporated into the design? **The proposed drainage will continue to sheet flow as it currently does. Drainage systems will not be upgraded or modified due to the lack of existing systems and the limited ROW and opportunity to provide upgrades.**
- The ultimate outfall of any drainage on the project must be identified on the plans provided. Please provide a status on the stability of that outfall and if any improvements are required in conformance with the DOT Drainage Manual: **N/a. All outfalls have been determined to be stable and in good condition. Improvements are not proposed.**

**Erosion & Sedimentation Control**

- Does the project result in ground disturbance / erodible surface? If so, how much? (acres): **0.6 ac.**
- What is the anticipated construction duration? **One construction season**
- Have staging and storage, constructability, and access needs been incorporated into the plan and considered? **Yes, a staging area is proposed to be constructed at the northwest corner of the bridge. This area is proposed to be restored after construction.**

- Are engineered measures for E & S necessary during construction? Describe how the project is in accordance with the 2002 CT E & S Guidelines: **Yes, the project adheres to the 2002 Connecticut Sedimentation and Erosion Guidelines. Proper sedimentation and erosion control measures will be in place during all phases of construction.**

**THIS SECTION TO BE COMPLETED BY ENVIRONMENTAL PLANNING**

---

It has been determined that:

- This project has been reviewed and found to be consistent with the Coastal Goals and Policies as defined in CGS section 22a-92.**
- More information is required at this time to ensure consistency with coastal goals and policies. Please provide the information listed below.**
- This project has been determined to not be in conformance with coastal goals or policies or may have an adverse impact on coastal resources. OEP has determined that a Coastal Consistency Review Form must be prepared and submitted to the Department of Energy and Environmental Protection (via OEP) for review and approval.**

*If the project design / scope of work changes, affecting water or natural resource impacts; the project must be resubmitted for review by Environmental Planning. All projects must be in conformance with Section 1.10 of the Form 816, Standard Specifications for Roads, Bridges and Incidental Construction. Any other Time of Year Restrictions, and permit special conditions for other programs must be adhered to at all times.*

**Required Information / Special Conditions / Notes:**

---

**Natural Diversity Database (NDDDB) and Drinking Water Resources**

Do the project limits possibly contain State or Federally listed species?  Yes  No If yes, further coordination with OEP is required for this project.

Does the project contain public watershed, a well head protection area, and/or aquifer protection area (APA)?  Yes  No If yes, further coordination with OEP and possibly the Department of Public Health and Water Company will be required for this project.

---



---



---



---

Reviewed By: Andrew Daus Extension: 2157 Date: 2/6/2019  
 Approved By: Andrew Daus Extension: 2157 Date: 2/6/2019

cc: Andrew H. Davis – Michael J. Salter  
Rabih M. Barakat – Andrew J. Cardinali – Dobieslaw Kania  
Donald P. Wurst – Mark Gardner (CME)

## **Attachments**

**Attachment A:** Project Location Map

**Attachment B:** Coastal Boundary Map

**Attachment C:** Project Description and Photos

**Attachment D:** Pertinent Design Plans

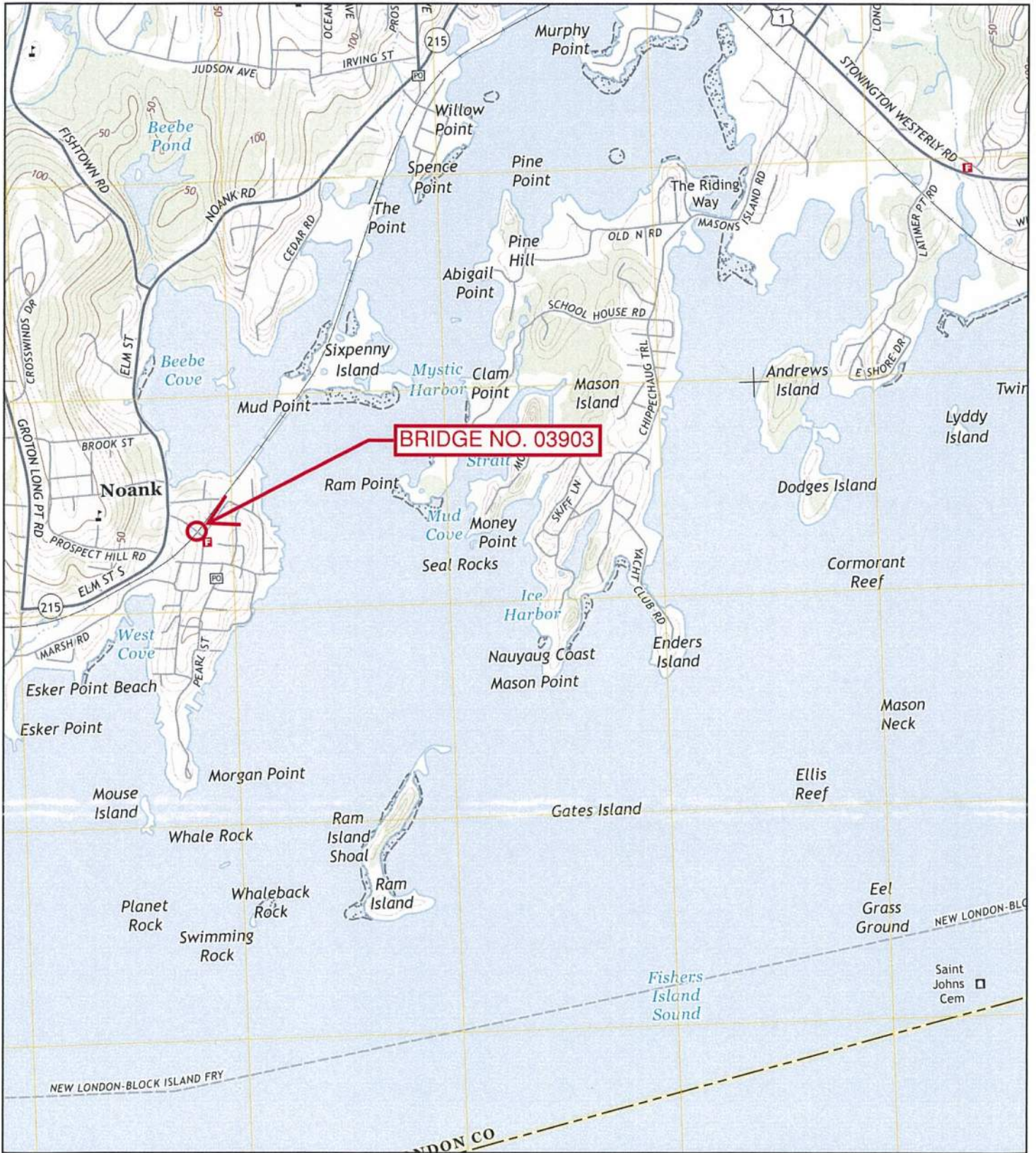
**Attachment A: Project Location Map**



Engineers  
 Designers  
 Consultants  
 Planners  
 Scientists  
 101 East River Drive, 1<sup>st</sup> Floor \* East Hartford, CT 06108  
 T 860.290.4100 \* www.cmeengineering.com

# USGS QUAD MAP

BRIDGE NO. 03903 IN GROTON, CT  
 MOSHER AVE OVER AMTRAK RAILROAD



USGS QUAD  
 MYSTIC,  
 CONNECTICUT

1 INCH = 2,000 FEET



**Attachment B: Coastal Boundary Map**



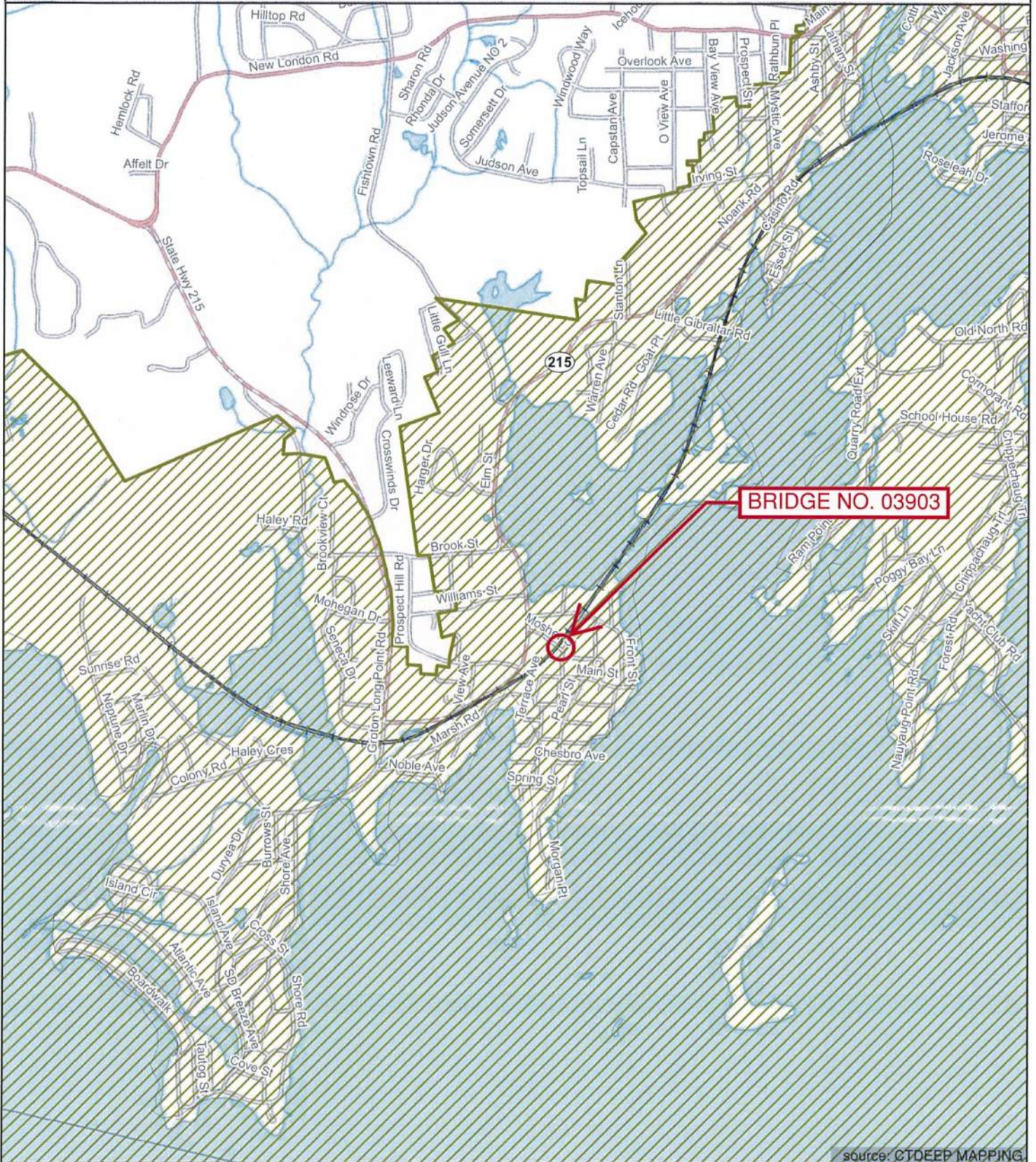


Engineers  
Designers  
Consultants  
Planners  
Scientists  
101 East River Drive, 1<sup>st</sup> Floor • East Hartford, CT 06108  
T 860 250 4100 • www.cmeengineering.com

# COASTAL BOUNDARY MAP

## BRIDGE NO. 03903 GROTON, CT

### MOSHER AVE OVER AMTRAK RAILROAD



source: CTDEEP MAPPING



CTDEEP COASTAL  
BOUNDARY MAP  
GROTON,  
CONNECTICUT



Coastal Boundary: 

1 INCH = 2,000 FEET



**Attachment C: Project Description and Photos**

## **PROJECT DESCRIPTION**

State Project No. 58-336

Bridge No. 03903 in Groton

Mosher Avenue over Amtrak Railroad

### **Existing Conditions**

Bridge No. 03903 is a single-span steel girder and concrete deck structure that carries Mosher Avenue over Amtrak Railroad in the Town of Groton. It has a total length of 106 ft., an out-to-out dimension of 46ft., and a 5ft. wide sidewalk on the north and south sides of the structure. The structure was originally constructed in 1936 and rehabilitated in 1993 which included new pavement at the approaches and on the deck, partial and full-depth deck patching, the installation of a waterproofing membrane, and repairs to the concrete encasement of the beams. The superstructure consists of a 12 in. reinforced concrete deck supported by 11 transverse concrete encased steel floor beams and 2 longitudinal concrete encased steel girders. The substructure consists of two abutments supported by a combination of stone masonry and reinforced concrete. The wingwalls are parallel-type and perpendicular to the superstructure. The west end of the girders rest upon expansion bearings that are retrofitted steel bearings over elastomeric bearing pads, while the east end has steel fixed bearings.

### **Purpose and Need Statement**

The purpose of the project is to address items identified during inspection. Based on field inspections, engineering analysis, a review of ConnDOT's Bridge Inspection Reports, Bridge No. 03903 was found to be in poor condition. The inspection report noted the following concerns with the current state of Bridge No. 03903:

- Deck deterioration of the underside concrete
- Bearings exhibiting laminated rust
- Riveted plate girders exhibit heavy rust
- 100% paint failure on exposed steel below bridge deck
- Cracks in masonry mortar

### **Proposed Project**

The project proposes to remove the existing steel plate girder and concrete deck superstructure, repair the existing concrete and stone masonry abutments and reconstruct beam seats. Accelerated bridge construction (ABC) methods and components will be utilized to establish an alternating one-way traffic and pedestrian access on partial superstructure after an 8 week closure period. The new superstructure will provide 21.5 feet of vertical clearance to the Amtrak tracks below structure and will provide a 5.5 foot wide sidewalk on one side of the structure. Concrete parapets meeting applicable MASH standards and solid fencing will be installed along the slope. The abutments will need to be modified to support the new superstructure. As a result, a modest amount of excavation behind each abutment will be required. A 3 inch bituminous overlay over spray-applied membrane waterproofing will be applied to the deck. Grading and paving along Mosher Avenue and Ward Avenue, including the intersection of Mosher Avenue and Ward Avenue east of the bridge to accommodate the profile raising. Provide ADA compliant sidewalks and crosswalks.

### **Environmental Resources**

The project location is approximately 1000 feet south of Beebe Cove and 1200 feet north of West Cove, both which are inlets of Fishers Island Sound. The project location is within the Coastal Boundary. Bridge No. 03903 is located within the Southeast Shoreline sub-regional drainage basin (#2000) of the Southeast Coast major drainage basin. Bridge No. 03903 is not within a mapped Natural Diversity Database Area per December 2018 mapping, and no critical habitats are identified in the vicinity of the project. The project bridge is not located within an aquifer protection area or located within FEMA 100-year floodplain; however, the 500-year floodplain is mapped along the Amtrak Railroad tracks under the bridge. A site inspection found no coastal or inland wetlands in the immediate vicinity of the bridge.



Aerial photo of Bridge 03903 (Google)



Bridge No. 03903 looking approximately northwest



Amtrak railroad under Bridge No. 03903 looking at west abutment



Amtrak railroad under Bridge No. 03903 looking at west abutment



Sidewalk at north side of Bridge No. 03903

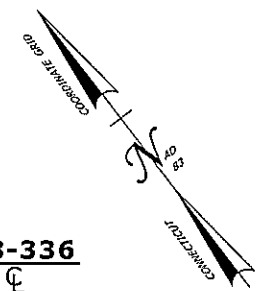


Looking northeast along Amtrak rail from Bridge No. 03903

**Attachment D: Pertinent Design Plans**

**NOTES:**

1. ALL TREES AND VEGETATION WITHIN THE CLEAR ZONE (14') WITH A WIDTH GREATER THAN 4" SHALL BE REMOVED PER CONNDOT HDM.
2. FOR UTILITY INFORMATION, SEE UTILITY PLAN DWG-XX.
3. LINEAR FOOTAGE STATED ON THE PLANS INCLUDES TRANSITION PIECES AS SHOWN ON CTDOT STD SHEET HW-910-25.
4. THIS PROJECT IS WITHIN A COASTAL BOUNDARY AS DEFINED IN SUBSECTION (B) OF SECTION 22A-94 OF THE CONNECTICUT GENERAL STATUTE. THE COASTAL JURISDICTION LINE IS OUTSIDE OF THE PROJECT LIMITS.



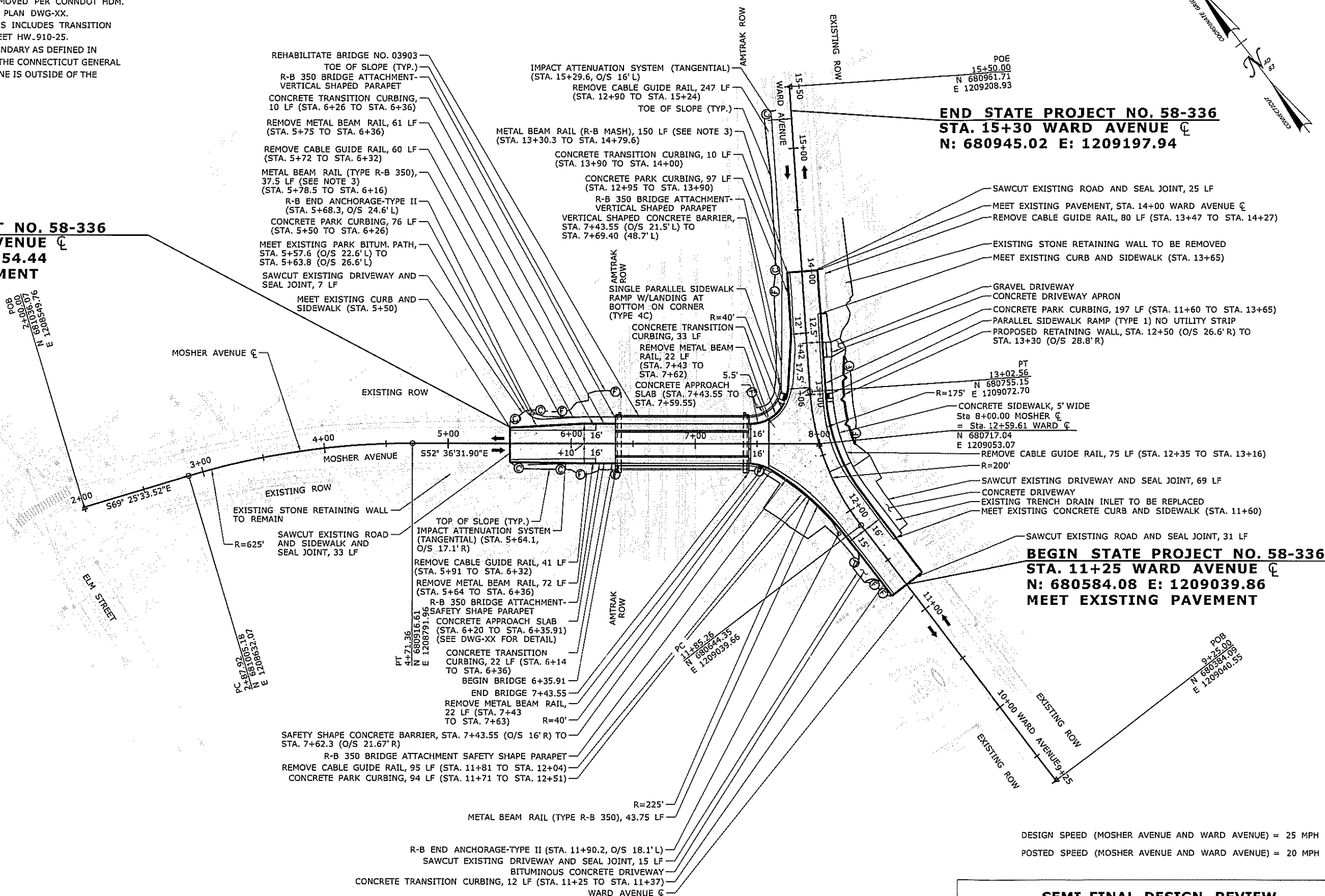
**END STATE PROJECT NO. 58-336**  
**STA. 15+30 WARD AVENUE** ☐  
**N: 680945.02 E: 1209197.94**

**BEGIN STATE PROJECT NO. 58-336**  
**STA. 5+50 MOSHER AVENUE** ☐  
**N: 680868.86 E: 1208854.44**  
**MEET EXISTING PAVEMENT**

**BEGIN STATE PROJECT NO. 58-336**  
**STA. 11+25 WARD AVENUE** ☐  
**N: 680584.08 E: 1209039.86**  
**MEET EXISTING PAVEMENT**

**LEGEND**

- ☐ CUT SLOPE
- ☐ FILL SLOPE
- ▨ MILL & VARIABLE OVERLAY
- ▨ FULL DEPTH PAVEMENT
- ⇄ DIRECTION OF TRAVEL

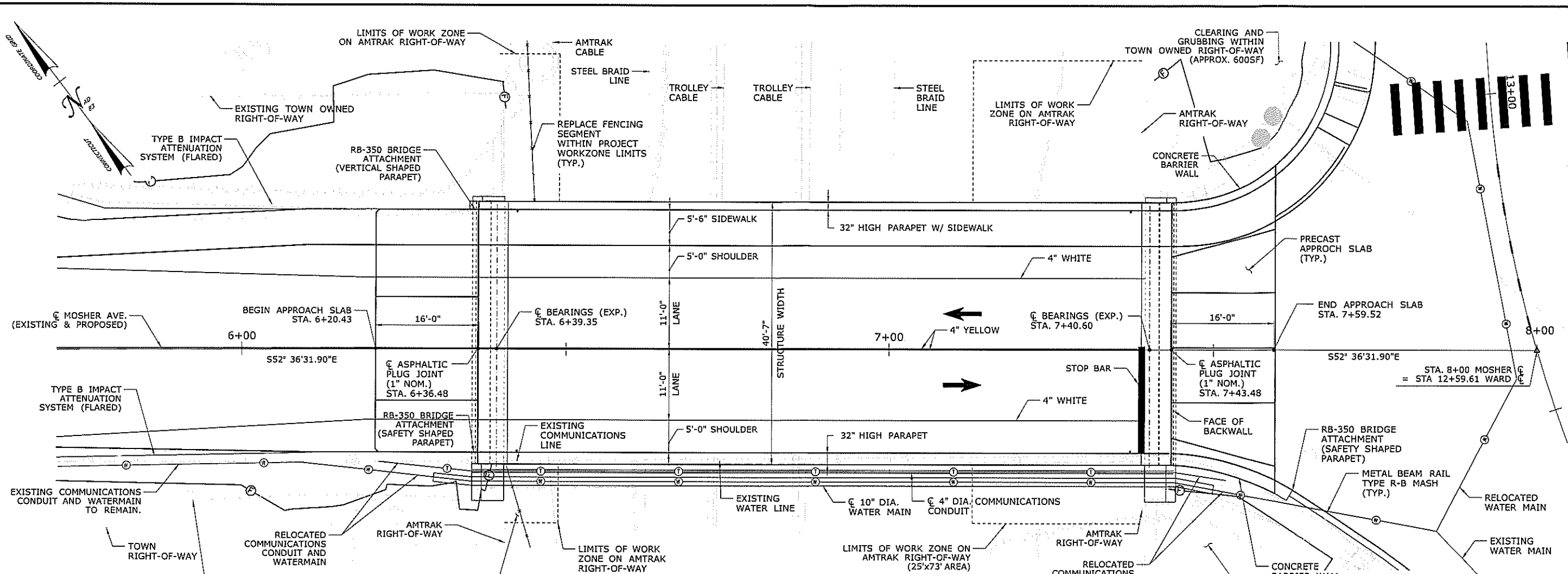


DESIGN SPEED (MOSHER AVENUE AND WARD AVENUE) = 25 MPH  
 POSTED SPEED (MOSHER AVENUE AND WARD AVENUE) = 20 MPH

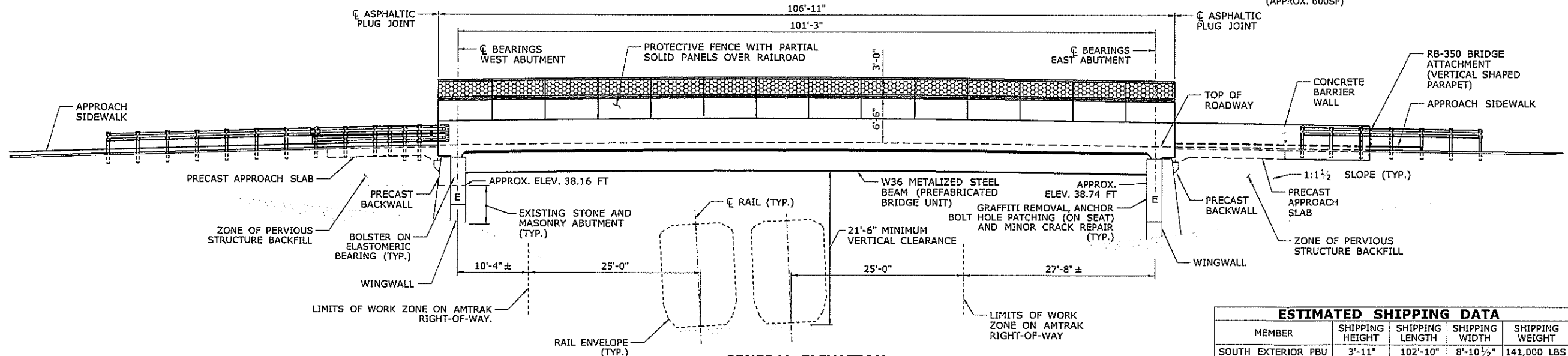
**SEMI FINAL DESIGN REVIEW**

THE INFORMATION, INCLUDING ESTIMATED QUANTITIES OF WORK, SHOWN ON THESE SHEETS IS BASED ON LIMITED INVESTIGATIONS BY THE STATE AND IS IN NO WAY WARRANTED TO INDICATE THE CONDITIONS OF ACTUAL QUANTITIES OF WORK WHICH WILL BE REQUIRED.		DESIGNER/DRAFTER: <b>RM</b> CHECKED BY: <b>BM</b> SCALE IN FEET  SCALE 1"=40'	<p><b>STATE OF CONNECTICUT</b>  <b>DEPARTMENT OF TRANSPORTATION</b></p>	SIGNATURE/ BLOCK:	PROJECT TITLE: <b>REHABILITATION OF BRIDGE NO. 03903 MOSHER AVE. OVER AMTRAK RAILROAD</b>	TOWN: <b>GROTON</b>	PROJECT NO. <b>58-336</b> DRAWING NO. <b>PLN-01</b> SHEET NO. <b>3.07</b>
REV.	DATE	REVISION DESCRIPTION	SHEET NO.	Plotted Date: 11/9/2018	Filename: ...VHW.MSH.58.336.PLN-01.dgn		





**BRIDGE PLAN**  
SCALE: 1/8" = 1'-0"



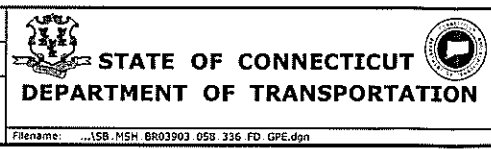
**GENERAL ELEVATION**  
SCALE: 1/8" = 1'-0"  
(LOOKING NORTH)

ESTIMATED SHIPPING DATA				
MEMBER	SHIPPING HEIGHT	SHIPPING LENGTH	SHIPPING WIDTH	SHIPPING WEIGHT
SOUTH EXTERIOR PBU	3'-11"	102'-10"	8'-10 1/2"	141,000 LBS

**SEMI FINAL DESIGN REVIEW**

REV.	DATE	REVISION DESCRIPTION	SHEET NO.

DESIGNER/DRAFTER: **SS BSH**  
 CHECKED BY: **SS BSH**  
 SCALE IN FEET: 1" = 40'  
 Plotted Date: 11/12/2018

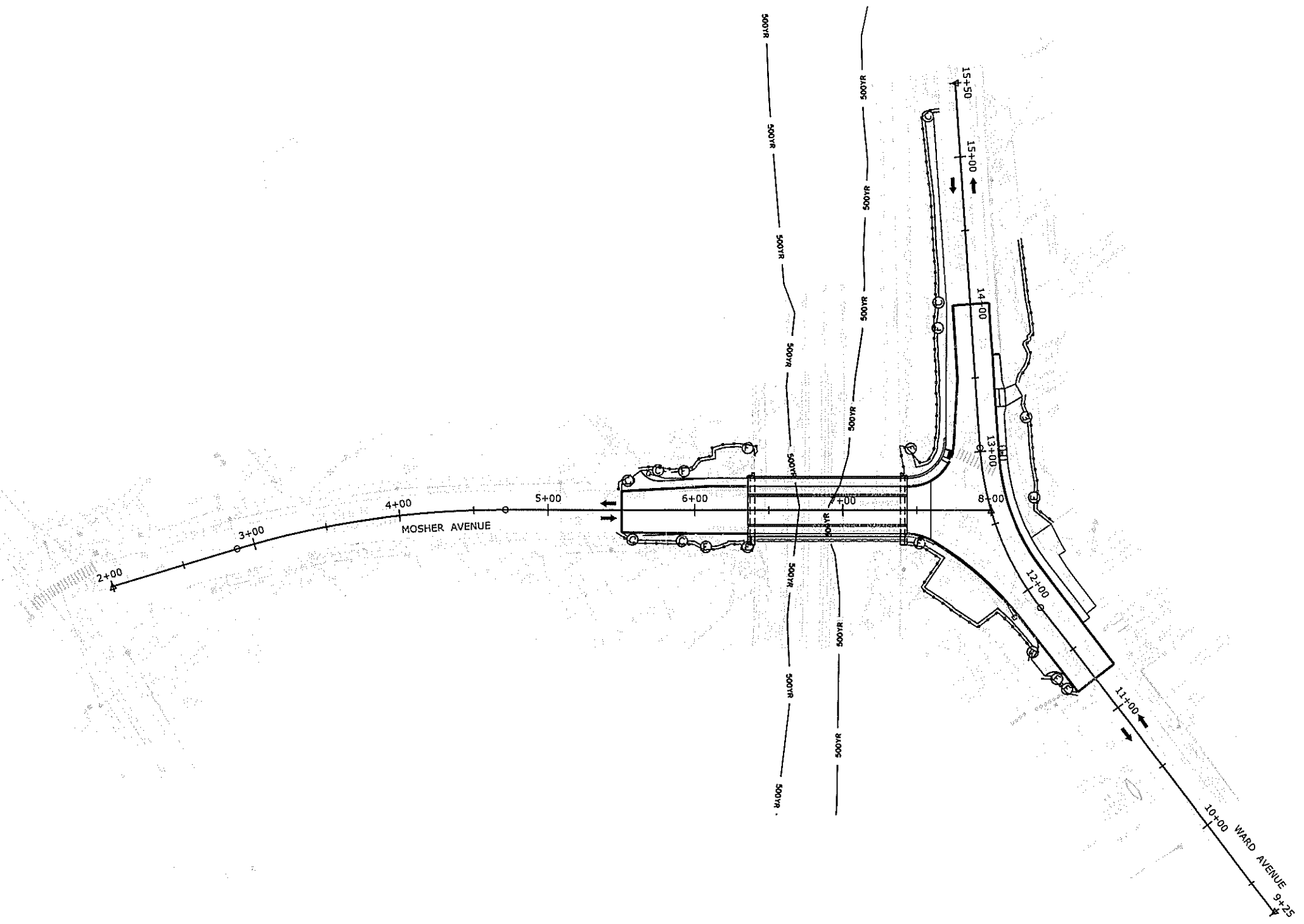
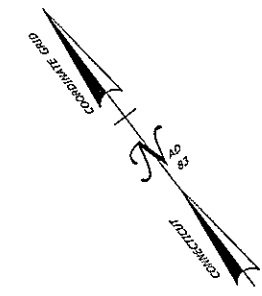


SIGNATURE/BLOCK: \_\_\_\_\_  
 PROJECT TITLE: **REHABILITATION OF BRIDGE NO. 03903 MOSHER AVE. OVER AMTRAK RAILROAD**

TOWN: **GROTON**  
 DRAWING TITLE: **GENERAL PLAN & ELEVATION**

PROJECT NO.: **58-336**  
 DRAWING NO.: **S-02**  
 SHEET NO.: **05.02**





LEGEND	
	500YR - FEMA 500 YEAR FLOOD LINE
	SEDIMENT CONTROL SYSTEM
	DIRECTION OF TRAVEL

**SEMI FINAL DESIGN REVIEW**

THE INFORMATION, INCLUDING ESTIMATED QUANTITIES OF WORK, SHOWN ON THESE SHEETS IS BASED ON LIMITED INVESTIGATIONS BY THE STATE AND IS IN NO WAY WARRANTED TO INDICATE THE CONDITIONS OF ACTUAL QUANTITIES OF WORK WHICH WILL BE REQUIRED.	DESIGNER/DRAFTER: <b>RM</b>	STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION	SIGNATURE/ BLOCK:	PROJECT TITLE: <b>REHABILITATION OF BRIDGE          NO. 03903 MOSHER AVE.          OVER AMTRAK RAILROAD</b>	TOWN: <b>GROTON</b>	PROJECT NO. <b>58-336</b>
	CHECKED BY: <b>BM</b>					
Plotted Date: 11/9/2019	SCALE IN FEET SCALE 1"=40'	Filename: ...\\WV.MSH.58.336.SED-01.dgn	DRAWING TITLE: <b>EROSION AND          SEDIMENT CONTROL PLAN</b>	SHEET NO. <b>3.12</b>		

REV	DATE	REVISION DESCRIPTION	SHEET NO.

## **Construction Contracts - Required Contract Provisions (FHWA Funded Contracts)**

### **Index**

1. Federal Highway Administration (FHWA) Form 1273 (Revised May 1, 2012)
2. Title VI of the Civil Rights Act of 1964 / Nondiscrimination Requirements
3. Contractor Work Force Utilization (Federal Executive Order 11246) / Specific Equal Employment Opportunity
4. Requirements of Title 49, CFR, Part 26, Participation by DBEs
5. Contract Wage Rates
6. Americans with Disabilities Act of 1990, as Amended
7. Connecticut Statutory Labor Requirements
  - a. Construction, Alteration or Repair of Public Works Projects; Wage Rates
  - b. Debarment List - Limitation on Awarding Contracts
  - c. Construction Safety and Health Course
  - d. Awarding of Contracts to Occupational Safety and Health Law Violators Prohibited
  - e. Residents Preference in Work on Other Public Facilities (Not Applicable to Federal Aid Contracts)
8. Tax Liability - Contractor's Exempt Purchase Certificate (CERT – 141)
9. Executive Orders (State of CT)
10. Non Discrimination Requirement (pursuant to section 4a-60 and 4a-60a of the Connecticut General Statutes, as revised)
11. Whistleblower Provision
12. Connecticut Freedom of Information Act
  - a. Disclosure of Records
  - b. Confidential Information
13. Service of Process
14. Substitution of Securities for Retainages on State Contracts and Subcontracts
15. Health Insurance Portability and Accountability Act of 1996 (HIPAA)
16. Forum and Choice of Law

17. Summary of State Ethics Laws
18. Audit and Inspection of Plants, Places of Business and Records
19. Campaign Contribution Restriction
20. Tangible Personal Property
21. Bid Rigging and/or Fraud – Notice to Contractor
22. Consulting Agreement Affidavit
23. Federal Cargo Preference Act Requirements (46 CFR 381.7(a)-(b))

**Index of Exhibits**

- EXHIBIT A – FHWA Form 1273 (Begins on page 14)
- EXHIBIT B – Title VI Contractor Assurances (page 34)
- EXHIBIT C – Contractor Work Force Utilization (Federal Executive Order 11246) / Equal Employment Opportunity (page 36)
- EXHIBIT D – Health Insurance Portability and Accountability Act of 1996 (HIPAA) (page 43)
- EXHIBIT E - Campaign Contribution Restriction (page 51)
- EXHIBIT F – Federal Wage Rates (Attached at the end)
- EXHIBIT G - State Wage Rates (Attached at the end)

### **1. Federal Highway Administration (FHWA) Form 1273**

The Contractor shall comply with the Federal Highway Administration (FHWA), Form 1273 attached at Exhibit A, as revised, which is hereby made part of this contract. The Contractor shall also require its subcontractors to comply with the FHWA – Form 1273 and include the FHWA – Form 1273 as an attachment to all subcontracts and purchase orders.

### **2. 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 B, all of which are hereby made a part of this Contract.

### **3. Contractor Work Force Utilization (Federal Executive Order 11246) / Equal Employment Opportunity**

- (a) The Contractor shall comply with the Contractor Work Force Utilization (Federal Executive Order 11246) / Equal Employment Opportunity requirements attached at Exhibit C 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.

### **4. Requirements of Title 49, Code of Federal Regulations (CFR), Part 26, Participation by DBEs, as may be revised.**

Pursuant to 49 CFR 26.13, the following paragraph is part of this Contract and shall be included in each subcontract the Contractor enters into with a subcontractor:

“The Contractor, subrecipient or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The Contractor shall carry out applicable requirements of 49 CFR Part 26, Participation by DBEs, in the award and administration of U.S. DOT-assisted contracts. Failure by the Contractor to carry out these requirements is a material breach of this Contract, which may result in the termination of this contract or such other remedy as ConnDOT (recipient) deems appropriate, which may include, but is not limited to: (1) Withholding monthly progress payments, (2) Assessing sanctions, (3) Liquidated damages; and/or, (4) Disqualifying the contractor from future bidding as non-responsible.”

## **5. Contract Wage Rates**

The Contractor shall comply with:

The Federal and State wage rate requirements indicated in Exhibits F and G hereof, as revised, are hereby made part of this Contract. The Federal wage rates (Davis-Bacon Act) applicable to this Contract shall be the Federal wage rates that are current on the US Department of Labor website (<http://www.wdol.gov/dba.aspx>) as may be revised 10 days prior to bid opening. These applicable Federal wage rates will be physically incorporated in the final contract document executed by both parties. The Department will no longer physically include revised Federal wage rates in the bid documents or as part of addenda documents, prior to the bid opening date. During the bid advertisement period, bidders are responsible for obtaining the appropriate Federal wage rates from the US Department of Labor website.

To obtain the latest Federal wage rates go to the US Department of Labor website (link above). Under Davis-Bacon Act, choose "Selecting DBA WDs" and follow the instruction to search the latest wage rates for the State, County and Construction Type. Refer to the Notice to Contractor (NTC) - Federal Wage Determinations (Davis Bacon Act).

If a conflict exists between the Federal and State wage rates, the higher rate shall govern.

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.

## **6. 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.

## **7. 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

## **8. 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).

## 9. 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.

**10. 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:

- (1) "Commission" means the Commission on Human Rights and Opportunities;
- (2) "Contract" and "contract" include any extension or modification of the Contract or contract;
- (3) "Contractor" and "contractor" include any successors or assigns of the Contractor or contractor;
- (4) "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.
- (5) "good faith" means that degree of diligence which a reasonable person would exercise in the performance of legal duties and obligations;
- (6) "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;

- (7) "marital status" means being single, married as recognized by the state of Connecticut, widowed, separated or divorced;
- (8) "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;
- (9) "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
- (10) "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 of Connecticut, including, but not limited to municipalities, unless the contract is a municipal public works contract or quasi-public agency project contract, (2) any other state of the United States, including but not limited to, the District of Columbia, Puerto Rico, U.S. territories and possessions, and federally recognized Indian tribal governments, as defined in Connecticut General Statutes § 1-267, (3) the federal government, (4) a foreign government, or (5) an agency of a subdivision, state or government described in subdivision (1), (2), (3), or (4) of this subsection.

- (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, status as a veteran, 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, status as a veteran, 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.

Please be aware the Nondiscrimination Certifications can be found at the Office of Policy and Management website:

<https://portal.ct.gov/OPM/Fin-PSA/Forms/Nondiscrimination-Certification>

## 11. 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.

## 12. 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.

### **13. 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.

### **14. 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.

### **15. 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 D, and hereby made part of this Contract.

### **16. 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.

## **17. 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.

## **18. 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.

## **19. 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 E.

**20. 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.

**21. 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.

## **22. 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.

## **23. Cargo Preference Act Requirements (46 CFR 381.7(a)-(b)) – Use of United States Flag Vessels**

The Contractor agrees to comply with the following:

### **(a) *Agreement Clauses.***

- (1) Pursuant to Pub. L. 664 ([43 U.S.C. 1241\(b\)](#)) at least 50 percent of any equipment, materials or commodities procured, contracted for or otherwise obtained with funds granted, guaranteed, loaned, or advanced by the U.S. Government under this agreement, and which may be transported by ocean vessel, shall be transported on privately owned United States-flag commercial vessels, if available.
- (2) Within 20 days following the date of loading for shipments originating within the United States or within 30 working days following the date of loading for shipments originating outside the United States, a legible copy of a rated, ‘on-board’ commercial ocean bill-of-lading in English for each shipment of cargo described in paragraph (a)(1) of this section shall be furnished to both the Contracting Officer (through the prime contractor in the case of subcontractor bills-of-lading) and to the Division of National Cargo, Office of Market Development, Maritime Administration, Washington, DC 20590.

### **(b) *Contractor and Subcontractor Clauses.*** The contractor agrees—

- (1) To utilize privately owned United States-flag commercial vessels to ship at least 50 percent of the gross tonnage (computed separately for dry bulk carriers, dry cargo liners, and tankers) involved, whenever shipping any equipment, material, or commodities pursuant to this contract, to the extent such vessels are available at fair and reasonable rates for United States-flag commercial vessels.
- (2) To furnish within 20 days following the date of loading for shipments originating within the United States or within 30 working days following the date of loading for shipments originating outside the United States, a legible copy of a rated, ‘on-board’ commercial ocean bill-of-lading in English for each shipment of cargo described in paragraph (b) (1) of this section to both the Contracting Officer (through the prime contractor in the case of subcontractor bills-of-lading) and to the Division of National Cargo, Office of Market Development, Maritime Administration, Washington, DC 20590.
- (3) To insert the substance of the provisions of this clause in all subcontracts issued pursuant to this contract.



## **EXHIBIT A**

FHWA-1273 -- Revised May 1, 2012

### **REQUIRED CONTRACT PROVISIONS FEDERAL-AID CONSTRUCTION CONTRACTS**

- I. General
- II. Nondiscrimination
- III. Nonsegregated Facilities
- IV. Davis-Bacon and Related Act Provisions
- V. Contract Work Hours and Safety Standards Act Provisions
- VI. Subletting or Assigning the Contract
- VII. Safety: Accident Prevention
- VIII. False Statements Concerning Highway Projects
- IX. Implementation of Clean Air Act and Federal Water Pollution Control Act
- X. Compliance with Governmentwide Suspension and Debarment Requirements
- XI. Certification Regarding Use of Contract Funds for Lobbying

#### **I. GENERAL**

1. Form FHWA-1273 must be physically incorporated in each construction contract funded under Title 23 (excluding emergency contracts solely intended for debris removal). The contractor (or subcontractor) must insert this form in each subcontract and further require its inclusion in all lower tier subcontracts (excluding purchase orders, rental agreements and other agreements for supplies or services).

The applicable requirements of Form FHWA-1273 are incorporated by reference for work done under any purchase order, rental agreement or agreement for other services. The prime contractor shall be responsible for compliance by any subcontractor, lower-tier subcontractor or service provider.

Form FHWA-1273 must be included in all Federal-aid design-build contracts, in all subcontracts and in lower tier subcontracts (excluding subcontracts for design services, purchase orders, rental agreements and other agreements for supplies or services). The design-builder shall be responsible for compliance by any subcontractor, lower-tier subcontractor or service provider.

Contracting agencies may reference Form FHWA-1273 in bid proposal or request for proposal documents, however, the Form FHWA-1273 must be physically incorporated (not referenced) in all contracts, subcontracts and lower-tier subcontracts (excluding purchase orders, rental agreements and other agreements for supplies or services related to a construction contract).

2. Subject to the applicability criteria noted in the following sections, these contract provisions shall apply to all work performed on the contract by the contractor's own organization and with the assistance of workers under the contractor's immediate superintendence and to all work performed on the contract by piecework, station work, or by subcontract.

3. A breach of any of the stipulations contained in these Required Contract Provisions may be sufficient grounds for withholding of progress payments, withholding of final payment, termination of the contract, suspension / debarment or any other action determined to be appropriate by the contracting agency and FHWA.

4. Selection of Labor: During the performance of this contract, the contractor shall not use convict labor for any purpose within the limits of a construction project on a Federal-aid highway unless it is labor performed by convicts who are on parole, supervised release, or probation. The term Federal-aid highway does not include roadways functionally classified as local roads or rural minor collectors.

## II. NONDISCRIMINATION

The provisions of this section related to 23 CFR Part 230 are applicable to all Federal-aid construction contracts and to all related construction subcontracts of \$10,000 or more. The provisions of 23 CFR Part 230 are not applicable to material supply, engineering, or architectural service contracts.

In addition, the contractor and all subcontractors must comply with the following policies: Executive Order 11246, 41 CFR 60, 29 CFR 1625-1627, Title 23 USC Section 140, the Rehabilitation Act of 1973, as amended (29 USC 794), Title VI of the Civil Rights Act of 1964, as amended, and related regulations including 49 CFR Parts 21, 26 and 27; and 23 CFR Parts 200, 230, and 633.

The contractor and all subcontractors must comply with: the requirements of the Equal Opportunity Clause in 41 CFR 60-1.4(b) and, for all construction contracts exceeding \$10,000, the Standard Federal Equal Employment Opportunity Construction Contract Specifications in 41 CFR 60-4.3.

Note: The U.S. Department of Labor has exclusive authority to determine compliance with Executive Order 11246 and the policies of the Secretary of Labor including 41 CFR 60, and 29 CFR 1625-1627. The contracting agency and the FHWA have the authority and the responsibility to ensure compliance with Title 23 USC Section 140, the Rehabilitation Act of 1973, as amended (29 USC 794), and Title VI of the Civil Rights Act of 1964, as amended, and related regulations including 49 CFR Parts 21, 26 and 27; and 23 CFR Parts 200, 230, and 633.

The following provision is adopted from 23 CFR 230, Appendix A, with appropriate revisions to conform to the U.S. Department of Labor (US DOL) and FHWA requirements.

**1. Equal Employment Opportunity:** Equal employment opportunity (EEO) requirements not to discriminate and to take affirmative action to assure equal opportunity as set forth under laws, executive orders, rules, regulations (28 CFR 35, 29 CFR 1630, 29 CFR 1625-1627, 41 CFR 60 and 49 CFR 27) and orders of the Secretary of Labor as modified by the provisions prescribed herein, and imposed pursuant to 23 U.S.C. 140 shall constitute the EEO and specific affirmative action standards for the contractor's project activities under this contract. The provisions of the Americans with Disabilities Act of 1990 (42 U.S.C. 12101 et seq.) set forth under 28 CFR 35 and 29 CFR 1630 are incorporated by reference in this contract. In the execution of this contract, the contractor agrees to comply with the following minimum specific requirement activities of EEO:

a. The contractor will work with the contracting agency and the Federal Government to ensure that it has made every good faith effort to provide equal opportunity with respect to all of its terms and conditions of employment and in their review of activities under the contract.

b. The contractor will accept as its operating policy the following statement:

"It is the policy of this Company to assure that applicants are employed, and that employees are treated during employment, without regard to their race, religion, sex, color, national origin, age or disability. Such action shall include: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship, pre-apprenticeship, and/or on-the-job training."

**2. EEO Officer:** The contractor will designate and make known to the contracting officers an EEO Officer who will have the responsibility for and must be capable of effectively administering and promoting an active EEO program and who must be assigned adequate authority and responsibility to do so.

**3. Dissemination of Policy:** All members of the contractor's staff who are authorized to hire, supervise, promote, and discharge employees, or who recommend such action, or who are substantially involved in such action, will be made fully cognizant of, and will implement, the contractor's EEO policy and contractual responsibilities to provide EEO in each grade and classification of employment. To ensure that the above agreement will be met, the following actions will be taken as a minimum:

a. Periodic meetings of supervisory and personnel office employees will be conducted before the start of work and then not less often than once every six months, at which time the contractor's EEO policy and its implementation will be reviewed and explained. The meetings will be conducted by the EEO Officer.

b. All new supervisory or personnel office employees will be given a thorough indoctrination by the EEO Officer, covering all major aspects of the contractor's EEO obligations within thirty days following their reporting for duty with the contractor.

c. All personnel who are engaged in direct recruitment for the project will be instructed by the EEO Officer in the contractor's procedures for locating and hiring minorities and women.

d. Notices and posters setting forth the contractor's EEO policy will be placed in areas readily accessible to employees, applicants for employment and potential employees.

e. The contractor's EEO policy and the procedures to implement such policy will be brought to the attention of employees by means of meetings, employee handbooks, or other appropriate means.

**4. Recruitment:** When advertising for employees, the contractor will include in all advertisements for employees the notation: "An Equal Opportunity Employer." All such advertisements will be placed in publications having a large circulation among minorities and women in the area from which the project work force would normally be derived.

a. The contractor will, unless precluded by a valid bargaining agreement, conduct systematic and direct recruitment through public and private employee referral sources likely to yield qualified minorities and women. To meet this requirement, the contractor will identify sources of potential minority group employees, and establish with such identified sources procedures whereby minority and women applicants may be referred to the contractor for employment consideration.

b. In the event the contractor has a valid bargaining agreement providing for exclusive hiring hall referrals, the contractor is expected to observe the provisions of that agreement to the extent that the system meets the contractor's compliance with EEO contract provisions. Where implementation of such an agreement has the effect of discriminating against minorities or women, or obligates the contractor to do the same, such implementation violates Federal nondiscrimination provisions.

c. The contractor will encourage its present employees to refer minorities and women as applicants for employment. Information and procedures with regard to referring such applicants will be discussed with employees.

**5. Personnel Actions:** Wages, working conditions, and employee benefits shall be established and administered, and personnel actions of every type, including hiring, upgrading, promotion, transfer, demotion, layoff, and termination, shall be taken without regard to race, color, religion, sex, national origin, age or disability. The following procedures shall be followed:

a. The contractor will conduct periodic inspections of project sites to insure that working conditions and employee facilities do not indicate discriminatory treatment of project site personnel.

b. The contractor will periodically evaluate the spread of wages paid within each classification to determine any evidence of discriminatory wage practices.

c. The contractor will periodically review selected personnel actions in depth to determine whether there is evidence of discrimination. Where evidence is found, the contractor will promptly take corrective action. If the review indicates that the discrimination may extend beyond the actions reviewed, such corrective action shall include all affected persons.

d. The contractor will promptly investigate all complaints of alleged discrimination made to the contractor in connection with its obligations under this contract, will attempt to resolve such complaints, and will take appropriate corrective action within a reasonable time. If the investigation indicates that the discrimination may affect persons other than the complainant, such corrective action shall include such other persons. Upon completion of each investigation, the contractor will inform every complainant of all of their avenues of appeal.

## **6. Training and Promotion:**

a. The contractor will assist in locating, qualifying, and increasing the skills of minorities and women who are applicants for employment or current employees. Such efforts should be aimed at developing full journey level status employees in the type of trade or job classification involved.

b. Consistent with the contractor's work force requirements and as permissible under Federal and State regulations, the contractor shall make full use of training programs, i.e., apprenticeship, and on-the-job training programs for the geographical area of contract performance. In the event a special provision for training is provided under this contract, this subparagraph will be superseded as indicated in the special provision. The contracting agency may reserve training positions for persons who receive welfare assistance in accordance with 23 U.S.C. 140(a).

c. The contractor will advise employees and applicants for employment of available training programs and entrance requirements for each.

d. The contractor will periodically review the training and promotion potential of employees who are minorities and women and will encourage eligible employees to apply for such training and promotion.

**7. Unions:** If the contractor relies in whole or in part upon unions as a source of employees, the contractor will use good faith efforts to obtain the cooperation of such unions to increase opportunities for minorities and women. Actions by the contractor, either directly or through a contractor's association acting as agent, will include the procedures set forth below:

a. The contractor will use good faith efforts to develop, in cooperation with the unions, joint training programs aimed toward qualifying more minorities and women for membership in the unions and increasing the skills of minorities and women so that they may qualify for higher paying employment.

b. The contractor will use good faith efforts to incorporate an EEO clause into each union agreement to the end that such union will be contractually bound to refer applicants without regard to their race, color, religion, sex, national origin, age or disability.

c. The contractor is to obtain information as to the referral practices and policies of the labor union except that to the extent such information is within the exclusive possession of the labor union and such labor union refuses to furnish such information to the contractor, the contractor shall so certify to the contracting agency and shall set forth what efforts have been made to obtain such information.

d. In the event the union is unable to provide the contractor with a reasonable flow of referrals within the time limit set forth in the collective bargaining agreement, the contractor will, through independent recruitment efforts, fill the employment vacancies without regard to race, color, religion, sex, national origin, age or disability; making full efforts to obtain qualified and/or qualifiable minorities and women. The failure of a union to provide sufficient referrals (even though it is obligated to provide exclusive referrals under the terms of a collective bargaining agreement) does not relieve the contractor from the requirements of this paragraph. In the event the union referral practice prevents the contractor from meeting the obligations pursuant to Executive Order 11246, as amended, and these special provisions, such contractor shall immediately notify the contracting agency.

**8. Reasonable Accommodation for Applicants / Employees with Disabilities:** The contractor must be familiar with the requirements for and comply with the Americans with Disabilities Act and all rules and regulations established there under. Employers must provide reasonable accommodation in all employment activities unless to do so would cause an undue hardship.

**9. Selection of Subcontractors, Procurement of Materials and Leasing of Equipment:** The contractor shall not discriminate on the grounds of race, color, religion, sex, national origin, age or disability in the selection and retention of subcontractors, including procurement of materials and leases of equipment. The contractor shall take all necessary and reasonable steps to ensure nondiscrimination in the administration of this contract.

a. The contractor shall notify all potential subcontractors and suppliers and lessors of their EEO obligations under this contract.

b. The contractor will use good faith efforts to ensure subcontractor compliance with their EEO obligations.

**10. Assurance Required by 49 CFR 26.13(b):**

a. The requirements of 49 CFR Part 26, and the State DOT's U.S. DOT-approved DBE program are incorporated by reference.

b. The contractor or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The contractor shall carry out applicable requirements of 49 CFR Part 26, in the award and administration of DOT-assisted contracts. Failure by the contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy as the contracting agency deems appropriate.

**11. Records and Reports:** The contractor shall keep such records as necessary to document compliance with the EEO requirements. Such records shall be retained for a period of three years following the date of the final payment to the contractor for all contract work and shall be available at reasonable times and places for inspection by authorized representatives of the contracting agency and the FHWA.

a. The records kept by the contractor shall document the following:

(1) The number and work hours of minority and non-minority group members and women employed in each work classification on the project;

(2) The progress and efforts being made in cooperation with unions, when applicable, to increase employment opportunities for minorities and women; and

(3) The progress and efforts being made in locating, hiring, training, qualifying, and upgrading minorities and women;

b. The contractors and subcontractors will submit an annual report to the contracting agency each July for the duration of the project, indicating the number of minority, women, and non-minority group employees currently engaged in each work classification required by the contract work. This information is to be reported on [Form FHWA-1391](#). The staffing data should represent the project work force on board in all or any part of the last payroll period preceding the end of July. If on-the-job training is being required by special provision, the contractor will be required to collect and report training data. The employment data should reflect the work force on board during all or any part of the last payroll period preceding the end of July.

### **III. NONSEGREGATED FACILITIES**

This provision is applicable to all Federal-aid construction contracts and to all related construction subcontracts of \$10,000 or more.

The contractor must ensure that facilities provided for employees are provided in such a manner that segregation on the basis of race, color, religion, sex, or national origin cannot result. The contractor may neither require such segregated use by written or oral policies nor tolerate such use by employee custom. The contractor's obligation extends further to ensure that its employees are not assigned to perform their services at any location, under the contractor's control, where the facilities are segregated. The term "facilities" includes waiting rooms, work areas, restaurants and other eating areas, time clocks, restrooms, washrooms, locker rooms, and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing provided for

employees. The contractor shall provide separate or single-user restrooms and necessary dressing or sleeping areas to assure privacy between sexes.

#### **IV. DAVIS-BACON AND RELATED ACT PROVISIONS**

This section is applicable to all Federal-aid construction projects exceeding \$2,000 and to all related subcontracts and lower-tier subcontracts (regardless of subcontract size). The requirements apply to all projects located within the right-of-way of a roadway that is functionally classified as Federal-aid highway. This excludes roadways functionally classified as local roads or rural minor collectors, which are exempt. Contracting agencies may elect to apply these requirements to other projects.

The following provisions are from the U.S. Department of Labor regulations in 29 CFR 5.5 “Contract provisions and related matters” with minor revisions to conform to the FHWA-1273 format and FHWA program requirements.

##### **1. Minimum wages**

a. All laborers and mechanics employed or working upon the site of the work, will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by regulations issued by the Secretary of Labor under the Copeland Act (29 CFR part 3)), the full amount of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the contractor and such laborers and mechanics.

Contributions made or costs reasonably anticipated for bona fide fringe benefits under section 1(b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of paragraph 1.d. of this section; also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in 29 CFR 5.5(a)(4). Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein: Provided, That the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classification and wage rates conformed under paragraph 1.b. of this section) and the Davis-Bacon poster (WH-1321) shall be posted at all times by the contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers.

b. (1) The contracting officer shall require that any class of laborers or mechanics, including helpers, which is not listed in the wage determination and which is to be employed under the contract shall be classified in conformance with the wage determination. The contracting officer shall approve an additional classification and wage rate and fringe benefits therefore only when the following criteria have been met:

(i) The work to be performed by the classification requested is not performed by a classification in the wage determination; and

(ii) The classification is utilized in the area by the construction industry; and

(iii) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.

(2) If the contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and the contracting officer agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken shall be sent by the contracting officer to the Administrator of the Wage and Hour Division, Employment Standards Administration, U.S. Department of Labor, Washington, DC 20210. The Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

(3) In the event the contractor, the laborers or mechanics to be employed in the classification or their representatives, and the contracting officer do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), the contracting officer shall refer the questions, including the views of all interested parties and the recommendation of the contracting officer, to the Wage and Hour Administrator for determination. The Wage and Hour Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

(4) The wage rate (including fringe benefits where appropriate) determined pursuant to paragraphs 1.b.(2) or 1.b.(3) of this section, shall be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.

c. Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the contractor shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.

d. If the contractor does not make payments to a trustee or other third person, the contractor may consider as part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program, Provided, That the Secretary of Labor has found, upon the written request of the contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the contractor to set aside in a separate account assets for the meeting of obligations under the plan or program.

## **2. Withholding**

The contracting agency shall upon its own action or upon written request of an authorized representative of the Department of Labor, withhold or cause to be withheld from the contractor under this contract, or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to Davis-Bacon prevailing wage requirements, which is held by the same



prime contractor, so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees, and helpers, employed by the contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee, or helper, employed or working on the site of the work, all or part of the wages required by the contract, the contracting agency may, after written notice to the contractor, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.

### **3. Payrolls and basic records**

a. Payrolls and basic records relating thereto shall be maintained by the contractor during the course of the work and preserved for a period of three years thereafter for all laborers and mechanics working at the site of the work. Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in section 1(b)(2)(B) of the Davis-Bacon Act), daily and weekly number of hours worked, deductions made and actual wages paid. Whenever the Secretary of Labor has found under 29 CFR 5.5(a)(1)(iv) that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in section 1(b)(2)(B) of the Davis-Bacon Act, the contractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs.

b. (1) The contractor shall submit weekly for each week in which any contract work is performed a copy of all payrolls to the contracting agency. The payrolls submitted shall set out accurately and completely all of the information required to be maintained under 29 CFR 5.5(a)(3)(i), except that full social security numbers and home addresses shall not be included on weekly transmittals. Instead the payrolls shall only need to include an individually identifying number for each employee ( e.g. , the last four digits of the employee's social security number). The required weekly payroll information may be submitted in any form desired. Optional Form WH-347 is available for this purpose from the Wage and Hour Division Web site at <http://www.dol.gov/esa/whd/forms/wh347instr.htm> or its successor site. The prime contractor is responsible for the submission of copies of payrolls by all subcontractors. Contractors and subcontractors shall maintain the full social security number and current address of each covered worker, and shall provide them upon request to the contracting agency for transmission to the State DOT, the FHWA or the Wage and Hour Division of the Department of Labor for purposes of an investigation or audit of compliance with prevailing wage requirements. It is not a violation of this section for a prime contractor to require a subcontractor to provide addresses and social security numbers to the prime contractor for its own records, without weekly submission to the contracting agency..

(2) Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the contractor or subcontractor or his or her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:

(i) That the payroll for the payroll period contains the information required to be provided under §5.5 (a)(3)(ii) of Regulations, 29 CFR part 5, the appropriate information is being maintained under §5.5 (a)(3)(i) of Regulations, 29 CFR part 5, and that such information is correct and complete;

(ii) That each laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in Regulations, 29 CFR part 3;

(iii) That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.

(3) The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 shall satisfy the requirement for submission of the “Statement of Compliance” required by paragraph 3.b.(2) of this section.

(4) The falsification of any of the above certifications may subject the contractor or subcontractor to civil or criminal prosecution under section 1001 of title 18 and section 231 of title 31 of the United States Code.

c. The contractor or subcontractor shall make the records required under paragraph 3.a. of this section available for inspection, copying, or transcription by authorized representatives of the contracting agency, the State DOT, the FHWA, or the Department of Labor, and shall permit such representatives to interview employees during working hours on the job. If the contractor or subcontractor fails to submit the required records or to make them available, the FHWA may, after written notice to the contractor, the contracting agency or the State DOT, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.

#### **4. Apprentices and trainees**

a. Apprentices (programs of the USDOL).

Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Office of Apprenticeship Training, Employer and Labor Services, or with a State Apprenticeship Agency recognized by the Office, or if a person is employed in his or her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Office of Apprenticeship Training, Employer and Labor Services or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice.

The allowable ratio of apprentices to journeymen on the job site in any craft classification shall not be greater than the ratio permitted to the contractor as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise

employed as stated above, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a contractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman's hourly rate) specified in the contractor's or subcontractor's registered program shall be observed.

Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeymen hourly rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination.

In the event the Office of Apprenticeship Training, Employer and Labor Services, or a State Apprenticeship Agency recognized by the Office, withdraws approval of an apprenticeship program, the contractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

b. Trainees (programs of the USDOL).

Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the U.S. Department of Labor, Employment and Training Administration.

The ratio of trainees to journeymen on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration.

Every trainee must be paid at not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman wage rate on the wage determination which provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed.

In the event the Employment and Training Administration withdraws approval of a training program, the contractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

c. Equal employment opportunity. The utilization of apprentices, trainees and journeymen under this part shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR part 30.

d. Apprentices and Trainees (programs of the U.S. DOT).

Apprentices and trainees working under apprenticeship and skill training programs which have been certified by the Secretary of Transportation as promoting EEO in connection with Federal-aid highway construction programs are not subject to the requirements of paragraph 4 of this Section IV. The straight time hourly wage rates for apprentices and trainees under such programs will be established by the particular programs. The ratio of apprentices and trainees to journeymen shall not be greater than permitted by the terms of the particular program.

**5. Compliance with Copeland Act requirements.** The contractor shall comply with the requirements of 29 CFR part 3, which are incorporated by reference in this contract.

**6. Subcontracts.** The contractor or subcontractor shall insert Form FHWA-1273 in any subcontracts and also require the subcontractors to include Form FHWA-1273 in any lower tier subcontracts. The prime contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all the contract clauses in 29 CFR 5.5.

**7. Contract termination: debarment.** A breach of the contract clauses in 29 CFR 5.5 may be grounds for termination of the contract, and for debarment as a contractor and a subcontractor as provided in 29 CFR 5.12.

**8. Compliance with Davis-Bacon and Related Act requirements.** All rulings and interpretations of the Davis-Bacon and Related Acts contained in 29 CFR parts 1, 3, and 5 are herein incorporated by reference in this contract.

**9. Disputes concerning labor standards.** Disputes arising out of the labor standards provisions of this contract shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the Department of Labor set forth in 29 CFR parts 5, 6, and 7. Disputes within the meaning of this clause include disputes between the contractor (or any of its subcontractors) and the contracting agency, the U.S. Department of Labor, or the employees or their representatives.

**10. Certification of eligibility.**

a. By entering into this contract, the contractor certifies that neither it (nor he or she) nor any person or firm who has an interest in the contractor's firm is a person or firm ineligible to be awarded Government contracts by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

b. No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

c. The penalty for making false statements is prescribed in the U.S. Criminal Code, 18 U.S.C. 1001.

## V. CONTRACT WORK HOURS AND SAFETY STANDARDS ACT

The following clauses apply to any Federal-aid construction contract in an amount in excess of \$100,000 and subject to the overtime provisions of the Contract Work Hours and Safety Standards Act. These clauses shall be inserted in addition to the clauses required by 29 CFR 5.5(a) or 29 CFR 4.6. As used in this paragraph, the terms laborers and mechanics include watchmen and guards.

**1. Overtime requirements.** No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek.

**2. Violation; liability for unpaid wages; liquidated damages.** In the event of any violation of the clause set forth in paragraph (1.) of this section, the contractor and any subcontractor responsible therefor shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph (1.) of this section, in the sum of \$10 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph (1.) of this section.

**3. Withholding for unpaid wages and liquidated damages.** The FHWA or the contracting agency shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph (2.) of this section.

**4. Subcontracts.** The contractor or subcontractor shall insert in any subcontracts the clauses set forth in paragraph (1.) through (4.) of this section and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs (1.) through (4.) of this section.

## VI. SUBLETTING OR ASSIGNING THE CONTRACT

This provision is applicable to all Federal-aid construction contracts on the National Highway System.

1. The contractor shall perform with its own organization contract work amounting to not less than 30 percent (or a greater percentage if specified elsewhere in the contract) of the total original contract price, excluding any specialty items designated by the contracting agency. Specialty items may be

performed by subcontract and the amount of any such specialty items performed may be deducted from the total original contract price before computing the amount of work required to be performed by the contractor's own organization (23 CFR 635.116).

a. The term “perform work with its own organization” refers to workers employed or leased by the prime contractor, and equipment owned or rented by the prime contractor, with or without operators. Such term does not include employees or equipment of a subcontractor or lower tier subcontractor, agents of the prime contractor, or any other assignees. The term may include payments for the costs of hiring leased employees from an employee leasing firm meeting all relevant Federal and State regulatory requirements. Leased employees may only be included in this term if the prime contractor meets all of the following conditions:

- (1) the prime contractor maintains control over the supervision of the day-to-day activities of the leased employees;
- (2) the prime contractor remains responsible for the quality of the work of the leased employees;
- (3) the prime contractor retains all power to accept or exclude individual employees from work on the project; and
- (4) the prime contractor remains ultimately responsible for the payment of predetermined minimum wages, the submission of payrolls, statements of compliance and all other Federal regulatory requirements.

b. "Specialty Items" shall be construed to be limited to work that requires highly specialized knowledge, abilities, or equipment not ordinarily available in the type of contracting organizations qualified and expected to bid or propose on the contract as a whole and in general are to be limited to minor components of the overall contract.

2. The contract amount upon which the requirements set forth in paragraph (1) of Section VI is computed includes the cost of material and manufactured products which are to be purchased or produced by the contractor under the contract provisions.

3. The contractor shall furnish (a) a competent superintendent or supervisor who is employed by the firm, has full authority to direct performance of the work in accordance with the contract requirements, and is in charge of all construction operations (regardless of who performs the work) and (b) such other of its own organizational resources (supervision, management, and engineering services) as the contracting officer determines is necessary to assure the performance of the contract.

4. No portion of the contract shall be sublet, assigned or otherwise disposed of except with the written consent of the contracting officer, or authorized representative, and such consent when given shall not be construed to relieve the contractor of any responsibility for the fulfillment of the contract. Written consent will be given only after the contracting agency has assured that each subcontract is evidenced in writing and that it contains all pertinent provisions and requirements of the prime contract.

5. The 30% self-performance requirement of paragraph (1) is not applicable to design-build contracts; however, contracting agencies may establish their own self-performance requirements.

## **VII. SAFETY: ACCIDENT PREVENTION**

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

1. In the performance of this contract the contractor shall comply with all applicable Federal, State, and local laws governing safety, health, and sanitation (23 CFR 635). The contractor shall provide all safeguards, safety devices and protective equipment and take any other needed actions as it determines, or as the contracting officer may determine, to be reasonably necessary to protect the life and health of employees on the job and the safety of the public and to protect property in connection with the performance of the work covered by the contract.
2. It is a condition of this contract, and shall be made a condition of each subcontract, which the contractor enters into pursuant to this contract, that the contractor and any subcontractor shall not permit any employee, in performance of the contract, to work in surroundings or under conditions which are unsanitary, hazardous or dangerous to his/her health or safety, as determined under construction safety and health standards (29 CFR 1926) promulgated by the Secretary of Labor, in accordance with Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C. 3704).
3. Pursuant to 29 CFR 1926.3, it is a condition of this contract that the Secretary of Labor or authorized representative thereof, shall have right of entry to any site of contract performance to inspect or investigate the matter of compliance with the construction safety and health standards and to carry out the duties of the Secretary under Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C.3704).

#### **VIII. FALSE STATEMENTS CONCERNING HIGHWAY PROJECTS**

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

In order to assure high quality and durable construction in conformity with approved plans and specifications and a high degree of reliability on statements and representations made by engineers, contractors, suppliers, and workers on Federal-aid highway projects, it is essential that all persons concerned with the project perform their functions as carefully, thoroughly, and honestly as possible. Willful falsification, distortion, or misrepresentation with respect to any facts related to the project is a violation of Federal law. To prevent any misunderstanding regarding the seriousness of these and similar acts, Form FHWA-1022 shall be posted on each Federal-aid highway project (23 CFR 635) in one or more places where it is readily available to all persons concerned with the project:

18 U.S.C. 1020 reads as follows:

"Whoever, being an officer, agent, or employee of the United States, or of any State or Territory, or whoever, whether a person, association, firm, or corporation, knowingly makes any false statement, false representation, or false report as to the character, quality, quantity, or cost of the material used or to be used, or the quantity or quality of the work performed or to be performed, or the cost thereof in connection with the submission of plans, maps, specifications, contracts, or costs of construction on any highway or related project submitted for approval to the Secretary of Transportation; or

Whoever knowingly makes any false statement, false representation, false report or false claim with respect to the character, quality, quantity, or cost of any work performed or to be performed, or materials furnished or to be furnished, in connection with the construction of any highway or related project approved by the Secretary of Transportation; or

Whoever knowingly makes any false statement or false representation as to material fact in any statement, certificate, or report submitted pursuant to provisions of the Federal-aid Roads Act approved July 1, 1916, (39 Stat. 355), as amended and supplemented;

Shall be fined under this title or imprisoned not more than 5 years or both."

## **IX. IMPLEMENTATION OF CLEAN AIR ACT AND FEDERAL WATER POLLUTION CONTROL ACT**

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

By submission of this bid/proposal or the execution of this contract, or subcontract, as appropriate, the bidder, proposer, Federal-aid construction contractor, or subcontractor, as appropriate, will be deemed to have stipulated as follows:

1. That any person who is or will be utilized in the performance of this contract is not prohibited from receiving an award due to a violation of Section 508 of the Clean Water Act or Section 306 of the Clean Air Act.
2. That the contractor agrees to include or cause to be included the requirements of paragraph (1) of this Section X in every subcontract, and further agrees to take such action as the contracting agency may direct as a means of enforcing such requirements.

## **X. CERTIFICATION REGARDING DEBARMENT, SUSPENSION, INELIGIBILITY AND VOLUNTARY EXCLUSION**

This provision is applicable to all Federal-aid construction contracts, design-build contracts, subcontracts, lower-tier subcontracts, purchase orders, lease agreements, consultant contracts or any other covered transaction requiring FHWA approval or that is estimated to cost \$25,000 or more – as defined in 2 CFR Parts 180 and 1200.

### **1. Instructions for Certification – First Tier Participants:**

a. By signing and submitting this proposal, the prospective first tier participant is providing the certification set out below.

b. The inability of a person to provide the certification set out below will not necessarily result in denial of participation in this covered transaction. The prospective first tier participant shall submit an explanation of why it cannot provide the certification set out below. The certification or explanation will be considered in connection with the department or agency's determination whether to enter into this transaction. However, failure of the prospective first tier participant to furnish a certification or an explanation shall disqualify such a person from participation in this transaction.

c. The certification in this clause is a material representation of fact upon which reliance was placed when the contracting agency determined to enter into this transaction. If it is later determined that the prospective participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the contracting agency may terminate this transaction for cause of default.



d. The prospective first tier participant shall provide immediate written notice to the contracting agency to whom this proposal is submitted if any time the prospective first tier participant learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.

e. The terms "covered transaction," "debarred," "suspended," "ineligible," "participant," "person," "principal," and "voluntarily excluded," as used in this clause, are defined in 2 CFR Parts 180 and 1200. "First Tier Covered Transactions" refers to any covered transaction between a grantee or subgrantee of Federal funds and a participant (such as the prime or general contract). "Lower Tier Covered Transactions" refers to any covered transaction under a First Tier Covered Transaction (such as subcontracts). "First Tier Participant" refers to the participant who has entered into a covered transaction with a grantee or subgrantee of Federal funds (such as the prime or general contractor). "Lower Tier Participant" refers any participant who has entered into a covered transaction with a First Tier Participant or other Lower Tier Participants (such as subcontractors and suppliers).

f. The prospective first tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency entering into this transaction.

g. The prospective first tier participant further agrees by submitting this proposal that it will include the clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transactions," provided by the department or contracting agency, entering into this covered transaction, without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions exceeding the \$25,000 threshold.

h. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant is responsible for ensuring that its principals are not suspended, debarred, or otherwise ineligible to participate in covered transactions. To verify the eligibility of its principals, as well as the eligibility of any lower tier prospective participants, each participant may, but is not required to, check the Excluded Parties List System website (<https://www.epls.gov/>), which is compiled by the General Services Administration.

i. Nothing contained in the foregoing shall be construed to require the establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of the prospective participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

j. Except for transactions authorized under paragraph (f) of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency may terminate this transaction for cause or default.

\* \* \* \* \*

**2. Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion – First Tier Participants:**

a. The prospective first tier participant certifies to the best of its knowledge and belief, that it and its principals:

(1) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participating in covered transactions by any Federal department or agency;

(2) Have not within a three-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;

(3) Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph (a)(2) of this certification; and

(4) Have not within a three-year period preceding this application/proposal had one or more public transactions (Federal, State or local) terminated for cause or default.

b. Where the prospective participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

**2. Instructions for Certification - Lower Tier Participants:**

(Applicable to all subcontracts, purchase orders and other lower tier transactions requiring prior FHWA approval or estimated to cost \$25,000 or more - 2 CFR Parts 180 and 1200)

a. By signing and submitting this proposal, the prospective lower tier is providing the certification set out below.

b. The certification in this clause is a material representation of fact upon which reliance was placed when this transaction was entered into. If it is later determined that the prospective lower tier participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the department, or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

c. The prospective lower tier participant shall provide immediate written notice to the person to which this proposal is submitted if at any time the prospective lower tier participant learns that its certification was erroneous by reason of changed circumstances.

d. The terms "covered transaction," "debarred," "suspended," "ineligible," "participant," "person," "principal," and "voluntarily excluded," as used in this clause, are defined in 2 CFR Parts 180 and

1200. You may contact the person to which this proposal is submitted for assistance in obtaining a copy of those regulations. "First Tier Covered Transactions" refers to any covered transaction between a grantee or subgrantee of Federal funds and a participant (such as the prime or general contract). "Lower Tier Covered Transactions" refers to any covered transaction under a First Tier Covered Transaction (such as subcontracts). "First Tier Participant" refers to the participant who has entered into a covered transaction with a grantee or subgrantee of Federal funds (such as the prime or general contractor). "Lower Tier Participant" refers any participant who has entered into a covered transaction with a First Tier Participant or other Lower Tier Participants (such as subcontractors and suppliers).

e. The prospective lower tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency with which this transaction originated.

f. The prospective lower tier participant further agrees by submitting this proposal that it will include this clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transaction," without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions exceeding the \$25,000 threshold.

g. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant is responsible for ensuring that its principals are not suspended, debarred, or otherwise ineligible to participate in covered transactions. To verify the eligibility of its principals, as well as the eligibility of any lower tier prospective participants, each participant may, but is not required to, check the Excluded Parties List System website (<https://www.epls.gov/>), which is compiled by the General Services Administration.

h. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

i. Except for transactions authorized under paragraph e of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

\* \* \* \* \*

**Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion--Lower Tier Participants:**

1. The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participating in covered transactions by any Federal department or agency.

2. Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

\* \* \* \* \*

## **XI. CERTIFICATION REGARDING USE OF CONTRACT FUNDS FOR LOBBYING**

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts which exceed \$100,000 (49 CFR 20).

1. The prospective participant certifies, by signing and submitting this bid or proposal, to the best of his or her knowledge and belief, that:

a. No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

b. If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

2. This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by 31 U.S.C. 1352. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

3. The prospective participant also agrees by submitting its bid or proposal that the participant shall require that the language of this certification be included in all lower tier subcontracts, which exceed \$100,000 and that all such recipients shall certify and disclose accordingly.

**EXHIBIT B**

**TITLE VI CONTRACTOR ASSURANCES  
APPENDIX A**

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 (hereinafter includes consultants) will comply with the Regulations relative to Nondiscrimination in Federally-assisted programs of the United States Department of Transportation Federal Highway Administration and Federal Transit Administration, as they may be amended from time to time, 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, will not discriminate on the grounds of race, color, national origin, sex, age, disability, income or Limited English Proficiency in the selection and retention of subcontractors, including procurements of materials and leases of equipment. The contractor will not participate directly or indirectly in the discrimination prohibited by the Acts and Regulations, including employment practices when the contract covers any activity, project, or program set forth in Appendix B of 49 CFR Part 21.

3. **Solicitations for Subcontracts, Including Procurements of Materials and Equipment:** In all solicitations, either by 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 will be notified by the contractor of the contractor's obligations under this contract and Acts and the Regulations relative to Non-discrimination on the grounds of race, color, or national origin.

4. **Information and Reports:** The contractor will provide all information and reports required by the Acts, the Regulations, and directives issued pursuant thereto and will permit access to its books, records, accounts, other sources of information, and its facilities as may be determined by the Recipient or the Federal Highway Administration or Federal Transit Administration to be pertinent to ascertain compliance with such Acts, Regulations, 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 will so certify to the Recipient or the Federal Highway Administration or the Federal Transit Administration, as appropriate, and will set forth what efforts it has made to obtain the information.

5. **Sanctions for Non-compliance:** In the event of the contractor's non-compliance with the Non-discrimination provisions of this contract, the Recipient will impose such contract sanctions as it or the Federal Highway Administration or the Federal Transit Administration may determine to be appropriate, including, but not limited to:

- a. withholding contract payments to the contractor under the contract until the contractor complies; and/or
- b. cancelling, terminating, or suspending a contract, in whole or in part.

6. **Incorporation of Provisions:** The contractor will include the provisions of paragraphs one through six in every subcontract, including procurements of materials and leases of equipment, unless exempt by the Acts, the Regulations and directives issued pursuant thereto. The contractor will take action with respect to any subcontract or procurement as the Recipient or the Federal Highway Administration or the Federal Transit Administration may direct as a means of enforcing such provisions including sanctions for noncompliance. Provided, that if the contractor becomes involved in, or is threatened with, litigation by a subcontractor, or supplier because of such direction, the contractor may request the Recipient to enter into any litigation to protect the interests of the Recipient. In addition, the contractor may request the United States to enter into the litigation to protect the interests of the United States.

## TITLE VI CONTRACTOR ASSURANCES APPENDIX E

During the performance of this contract, the contractor, for itself, its assignees, and successors in interest (hereinafter referred to as the "contractor") agrees to comply with the following nondiscrimination statutes and authorities; including but not limited to:

- Title VI of the Civil Rights Act of 1964 (78 Stat. 252, 42 U.S.C. § 2000d et seq.), (prohibits discrimination on the basis of race, color, national origin), as implemented by 49 C.F.R. § 21.1 et seq. and 49 C.F.R. part 303;
- The Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, (42 U.S.C. § 4601) (prohibits unfair treatment of persons displaced or whose property has been acquired because of Federal or Federal-aid programs and projects);
- Federal-Aid Highway Act of 1973 (23 U.S.C. § 324 et seq.) (prohibits discrimination on the basis of sex);
- Section 504 of the Rehabilitation Act of 1973, as amended (29 U.S.C. § 794 et seq.) (prohibits discrimination on the basis of disability); and 49 C.F.R. part 27;
- The Age Discrimination Act of 1975, as amended (42 U.S.C. § 6101 et seq.) (prohibits discrimination on the basis of age);
- Airport and Airway Improvement Act of 1982 (Pub. L. 97-248 (1982)), as amended (prohibits discrimination based on race, creed, color, national origin, or sex);
- The Civil Rights Restoration Act of 1987 (102 Stat. 28) ("*... which restore[d] the broad scope of coverage and to clarify the application of Title IX of the Education Amendments of 1972, section 504 of the Rehabilitation Act of 1973, the Age Discrimination Act of 1975, and Title VI of the Civil Rights Act of 1964.*");
- Titles II and III of the Americans with Disabilities Act, which prohibit discrimination on the basis of disability in the operation of public entities, public and private transportation systems, places of public accommodation, and certain testing entities (42 U.S.C. §§ 12131 --12189), as implemented by Department of Justice regulations at 28 C.F.R. parts 35 and 36, and Department of Transportation regulations at 49 C.F.R. parts 37 and 38;
- The Federal Aviation Administration's Non-discrimination statute (49 U.S.C. § 47123) (prohibits discrimination on the basis of race, color, national origin, and sex);
- Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, which ensures non-discrimination against minority populations by discouraging programs, policies, and activities with disproportionately high and adverse human health or environmental effects on minority and low-income populations;

- Executive Order 13166, Improving Access to Services for Persons with Limited English Proficiency, and resulting agency guidance, national origin discrimination includes discrimination because of limited English proficiency (LEP). To ensure compliance with Title VI, you must take reasonable steps to ensure that LEP persons have meaningful access to your programs (70 Fed. Reg. at 74087 to 74100);
- Title of the Education Amendments of 1972, as amended, which prohibits you from discriminating because of sex in education programs or activities (20 U.S.C. § 1681 et seq).

## EXHIBIT C

### CONTRACTOR WORKFORCE UTILIZATION (FEDERAL EXECUTIVE ORDER 11246) / EQUAL EMPLOYMENT OPPORTUNITY (Federal - FHWA)

#### 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 attached Appendix A.

#### 2. Executive Order 11246

The Contractor's compliance with Executive Order 11246 and 41-CFR Part 60-4 shall be based on its implementation of the specific affirmative action obligations required by the specifications set forth in 41 CFR 60-4.3(A) and its efforts to meet the goals established for the geographical area where the contract is to be performed. The hours of minority and female employment and training must be substantially uniform throughout the length of the contract, and in each trade, and the contractor shall make a good faith effort to employ minorities and women evenly on each of its projects. The transfer of minority or female employees or trainees from contractor to contractor or from project to project for the sole purpose of meeting the contractor's goals shall be a violation of the contract, the Executive Order and the regulations in 41 CFR Part 60-4. Compliance with the goals will be measured against the total work hour performed.

If the Contractor is participating (pursuant to 41 CFR 60-4.5) in a Hometown Plan approved by the U.S. Department of Labor in the covered area either individually or through an association, its affirmative action obligations on all work in the Plan area (including goals and timetables) shall be in accordance with that Plan for those trades which have unions participating in the Plan.

Contractors must be able to demonstrate their participation in and compliance with the provisions of any such Hometown Plan. Each Contractor or Subcontractor participating in an approved Plan is individually required to comply with its obligations under the EEO clause, and to make a good faith effort to achieve each goal under the Plan in each trade in which it has employees. The overall good faith performance by other Contractors or subcontractors toward a goal in an approved Pan does not excuse any covered Contractor's of subcontractor's failure to take good faith efforts to achieve the plan goals and timetables.

The Contractor shall implement the specific affirmative action standards provided in a through p of these specifications. The goals set forth in the solicitation from which this contract resulted are expressed as percentages of the total hours of employment and training of minority and female utilization the Contractor should reasonably be able to achieve in each construction trade in which it has employees in the covered area. Covered Construction contractors performing construction work in geographical areas where they do not have a federal or federally assisted construction contract shall apply the minority and female goals established for the geographical area where the work is being performed. Goals are published periodically in the Federal Register in notice form and such notices may be obtained from any Office of Federal Contract Compliance Programs (OFCCP) Office or from Federal procurement contracting officers. The Contractor is expected to make substantially uniform progress in meeting its goals in each craft during the period specified.

Neither the provisions of any collective bargaining agreement, nor the failure by a union with whom the Contractor has a collective bargaining agreement, to refer either minorities or women shall excuse the Contractors obligations under these specifications, Executive Order 11246, or the regulations promulgated pursuant hereto.

In order for the nonworking training hours of apprentices and trainees to be counted in meeting the goals, such apprentices and trainees must be employed by the Contractor during the training period, and the Contractor must have made a commitment to employ the apprentices and trainees at the completion of their training, subject to the availability of employment opportunities. Trainees must be trained pursuant to training programs approved by the U.S. Department of Labor.

The Contractor shall take specific affirmative actions to ensure equal employment opportunity. The evaluation of the Contractor's compliance with these specifications shall be based upon its effort to achieve maximum results from its actions. The Contractor shall document these efforts fully, and shall implement affirmative action steps at least as extensive as the following:

- a. Ensure and maintain a working environment free of harassment, intimidation, and coercion at all sites; and in all facilities at which the Contractor's employees are assigned to work. The Contractor, where possible, will assign two or more women to each construction project. The Contractor shall specifically ensure that all foremen, superintendents, and other on-site supervisory personnel are aware of and carry out the Contractor's obligation to maintain such a working environment, with specific attention to minority or female individuals working at such sites or in such facilities.
- b. Establish and maintain a current list of minority and female recruitment sources, provide written notification to minority and female recruitment sources and to community



organizations when the Contractor or its unions have employment opportunities available, and maintain a record of the organizations' responses.

- c. Maintain a current file of the names, addresses and telephone numbers of each minority and female off the street applicant and minority or female referral from a union, a recruitment source or community organization and of what action was taken with respect to each such individual. If such individual was sent to the union hiring hall for referral and was not referred back to the Contractor by the union or, if referred, not employed by the Contractor, this shall be documented in the file with the reason thereafter; along with whatever additional actions the Contractor may have taken.
- d. Provide immediate written notification to the Director when the Union or Unions with which the Contractor has a collective bargaining agreement has not referred to the Contractor a minority person or women sent by the Contractor, or when the Contractor has other information that the Union referral process has impeded the Contractor's efforts to meet its obligations.
- e. Develop on-the-job training opportunities and/or participate in training programs for the area which expressly include minorities and women, including upgrading programs and apprenticeship and trainee programs relevant to the Contractor's employment needs, especially those programs funded or approved by the Department of Labor. The Contractor shall provide notice of these programs to the sources compiled under b above.
- f. Disseminate the Contractor's EEO policy by providing notice of the policy to unions and training programs and requesting their cooperation in assisting the Contractor in meeting its EEO obligations; by including it in any policy manual and collective bargaining agreement; by publicizing it in the company newspaper, annual report, etc.; by specific review of the policy with all management personnel and with all minority and female employees at least once a year; and by posting the company EEO Policy on bulletin boards accessible to all employees at each location where construction work is performed.
- g. Review, at least annually, the company EEO Policy and affirmative action obligations under these specifications with all employees having any responsibility for hiring, assignment, layoff, termination or other employment, decisions including specific Foreman, etc. prior to the initiation of construction work at any job site. A written record shall be made and maintained identifying the time and place of these meetings, persons attending, subject matter discussed, and disposition of the subject matter.
- h. Disseminate the Contractor's EEO Policy externally by including it in any advertising in the news media, specifically including minority and female news media, and providing written notification to and discussing the Contractor's EEO policy with other Contractors and subcontractors with whom the Contractor does or anticipates doing business.
- i. Direct its recruitment efforts, both oral and written, to minority female and community organizations, to schools with minority and female students and to minority and female recruitment and training organizations serving the Contractor's recruitment area and employment needs. Not later than one month prior to the date for the acceptance of applications for apprenticeship or other training by any recruitment source, the contractor

shall send written notification to organizations such as the above, describing the openings, screening procedures and tests to be used in the selection process.

- j. Encourage present minority and female employees to recruit other minority persons and women and, where reasonable, provide after school, summer and vacation employment to minority and female youth both on the site and in other areas of a Contractor's work-force.
- k. Validate all tests and other selection requirements where there is an obligation to do so under 41 CFR Part 60-3.
- l. Conduct, at least annually, an inventory and evaluation at least of all minority and female personnel for promotional opportunities and encourage these employees to seek or to prepare for, through appropriate training, etc., such opportunities.
- m. Ensure that seniority practices, job classifications, work assignments and other personnel practices, do not have a discriminatory effect by continually monitoring all personnel and employment related activities to ensure that the EEO policy and the Contractor's obligations under these specifications are being carried out.
- n. Ensure that all facilities and company activities are non-segregated except that separate or single user toilet and necessary changing facilities shall be provided to assure privacy between the sexes.
- o. Document and maintain a record of all solicitations of offers for subcontracts from minority and female construction contractors and suppliers, including circulation of solicitations to minority and female contractor associations and other business associations.
- p. Conduct a review at least annually of all supervisors' adherence to and performance under the Contractor's EEO policies and affirmative action obligations.

Contractors are encouraged to participate in voluntary associations which assist in fulfilling one or more of their affirmative action obligations (a through p). The efforts of a contractor association, joint contractor union, contractor community, or other similar group of which the contractor is a member and participant, may be asserted as fulfilling any one or more of its obligations under a through p of these specifications provided that the contractor actively participates in the group, makes every effort to assure that the group has a positive impact on the employment of minorities and women in the industry, ensures that the concrete benefits of the program are reflected in the Contractor's minority and female work-force participation, makes a good faith effort to meet with individual goals and timetables, and can provide access to documentation which demonstrates the effectiveness of actions taken on behalf of the Contractor. The obligation to comply, however, is the Contractor's and failure of such a group to fulfill an obligation shall not be a defense for the Contractor's noncompliance.

A single goal for minorities and a separate single goal for women have been established. The Contractor, however, is required to provide equal employment opportunity and to take affirmative action for all minority groups, both male and female, and all women, both minority and non-minority. Consequently, the Contractor may be in violation of Executive Order 11246 if a particular group is employed in a substantially disparate manner, (for example, even though the

Contractor has achieved its goals for women generally, the Contractor may be in violation of the Executive Order if a specific minority group of women is under utilized).

The Contractor shall not use the goals and timetables or affirmative action standards to discriminate against any person because of race, color, religion, sex, or national origin.

The Contractor shall not enter into any Subcontract with any person or firm debarred from Government contracts pursuant to Executive Order 11246.

The Contractor shall carry out such sanctions and penalties for violation of these specifications and of the Equal Opportunity Clause, including suspension, termination and cancellation of existing subcontracts as may be imposed or ordered pursuant to Executive Order 11246, as amended, and its implementing regulations by the Office of Federal Contract Compliance Programs. Any Contractor who fails to carry out such sanctions and penalties shall be in violation of these specifications and Executive Order 11246, as amended.

The Contractor, in fulfilling its obligations under these specifications, shall implement specific affirmative action steps, at least as extensive as those standards prescribed in these specifications, so as to achieve maximum results from its efforts to ensure equal employment opportunity. If the Contractor fails to comply with the requirements of the Executive Order, the implementing regulations, or these specifications, the Director shall proceed in accordance with 41 CFR 60-4.8.

The Contractor shall designate a responsible official to monitor all employment related activity to ensure that the company EEO policy is being carried out, to submit reports relating to the provisions hereof as may be required by the Government and to keep records. Records shall at least include for each employee the name, address, telephone numbers, construction trade, union affiliation if any, employee identification number when assigned, social security number, race, sex, status, (e.g. mechanic, apprentice, trainee, helper, or laborer) dates of changes in status, hours worked per week in the indicated trade, rate of pay, and locations at which the work was performed. Records shall be maintained in an easily understandable and retrievable form; however, to the degree that existing records satisfy this requirement, contractors shall not be required to maintain separate records.

Nothing herein provided shall be construed as a limitation upon the application of their laws which establish different standards of compliance or upon the application of requirements for the hiring of local or other area residents (e.g. those under the Public Works Employment Act of 1977 and the Community Development Block Grant Program).

The Director of the Office of Federal Contract Compliance Programs, from time to time, shall issue goals and timetables for minority and female utilization which shall be based on appropriate work-force, demographic or other relevant data and which shall cover construction projects or construction contracts performed in specific geographical areas. The goals, which shall be applicable to each construction trade in a covered contractor's or timetables, shall be published as notices in the Federal Register, and shall be inserted by the Contracting officers and applicants, as applicable, in the Notice required by 41 CFR 60-4.2.

**FEDERALLY FUNDED OR ASSISTED PROJECTS**  
**APPENDIX A**  
**(Labor Market Goals)**

**Standard Metropolitan Statistical Area (SMSA)**

**Female**

**Minority**

<b>Bridgeport – Stamford – Norwalk – Danbury</b>	<b>10.2%</b>
<b>6.9%</b>	

Bethel	Bridgeport	Brookfield	Danbury
Darien	Derby	Easton	Fairfield
Greenwich	Milford	Monroe	New Canaan
New Fairfield	Newton	Norwalk	Redding
Shelton	Stamford	Stratford	Trumbull
Weston	Westport	Wilton	

<b>Hartford – Bristol – New Britain</b>	<b>6.9%</b>
<b>6.9%</b>	

Andover	Avon	Berlin	Bloomfield
Bolton	Bristol	Burlington	Canton
Colchester	Columbia	Coventry	Cromwell
East Granby	East Hampton	East Hartford	East Windsor
Ellington	Enfield	Farmington	Glastonbury
Granby	Hartford	Hebron	Manchester
Marlborough	New Britain	New Hartford	Newington
Plainville	Plymouth	Portland	Rocky Hill
Simsbury	South Windsor	Southington	Stafford
Suffield	Tolland	Vernon	West Hartford
Wethersfield	Willington	Windsor	Windsor Locks

<b>New Haven – Waterbury – Meriden</b>	<b>9.0%</b>
<b>6.9%</b>	

Beacon Falls	Bethany	Branford	Cheshire
Clinton	East Haven	Guilford	Hamden
Madison	Meriden	Middlebury	Naugatuck
New Haven	North Branford	North Haven	Orange
Prospect	Southbury	Thomaston	Wallingford
Waterbury	Watertown	West Haven	Wolcott
Woodbridge	Woodbury		

<b>New London – Norwich</b>	<b>4.5%</b>
<b>6.9%</b>	

Bozrah	East Lyme	Griswold	Groton
Ledyard	Lisbon	Montville	New London

Norwich                      Old Lyme                      Old Saybrook                      Preston  
 Sprague                      Stonington                      Waterford

**Non SMSA**

**Female**

**Minority**

<b>Litchfield – Windham</b>	<b>5.9%</b>
-----------------------------	-------------

Abington	Ashford	Ballouville	Bantam
Barkhamsted	Bethlehem	Bridgewater	Brooklyn
Canaan	Canterbury	Central Village	Cahplin
Colebrook	Cornwall	Cornwall Bridge	Danielson
Dayville	East Canaan	East Killingly	East Woodstock
Eastford	Falls Village	Gaylordsville	Goshen
Grosvenor Dale	Hampton	Harwinton	Kent
Killignly	Lakeside	Litchfield	Moosup
Morris	New Milford	New Preston	New Preston Marble Dale
Norfolk	North Canaan	No. Grosvenordale	North Windham
Oneco	Pequabuck	Pine Meadow	Plainfield
Pleasant Valley	Pomfret	Pomfret Center	Putnam
Quinebaug	Riverton	Rogers	Roxbury
Salisbury	Scotland	Sharon	South Kent
South Woodstock	Sterling	Taconic	Terryville
Thompson	Torrington	Warren	Warrenville
Washington	Washington Depot	Wauregan	West Cornwall
Willimantic	Winchester	Winchester Center	Windham
Winsted	Woodstock	Woodstock Valley	

**EXHIBIT D**

**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 (1)(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 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 (f) (2) 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/sec](http://www.ct.gov/sec). 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 fundraising 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, serving on the committee that is hosting a fundraising event, introducing the candidate or making other public remarks at a fundraising event, being honored or otherwise recognized at a fundraising event, 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 F**

(Federal wage rate package will be inserted here for final executed contract only. Refer to NTC – Federal Wage Determinations)



**EXHIBIT G**

(State wages will be inserted here)

Project: State Project No. 58-336; Rehabilitation Of Bridge No. 03903

**Minimum Rates and Classifications  
for Heavy/Highway Construction**

**Connecticut Department of Labor  
Wage and Workplace Standards Division**

ID#: H 26684

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: 58-336

Project Town: Groton

FAP Number:

State Number:

Project: State Project No. 58-336; Rehabilitation Of Bridge No. 03903

<b>CLASSIFICATION</b>	<b>Hourly Rate</b>	<b>Benefits</b>
1) Boilermaker	33.79	34% + 8.96
1a) Bricklayer, Cement Masons, Cement Finishers, Plasterers, Stone Masons	34.72	32.15
2) Carpenters, Piledrivermen	33.53	25.66
2a) Diver Tenders	33.53	25.66

**As of:** Wednesday, November 06, 2019

Project: State Project No. 58-336; Rehabilitation Of Bridge No. 03903

3) Divers	41.99	25.66
03a) Millwrights	34.04	26.09
4) Painters: (Bridge Construction) Brush, Roller, Blasting (Sand, Water, etc.), Spray	51.00	21.80
4a) Painters: Brush and Roller	34.62	21.80
4b) Painters: Spray Only	36.62	21.80
4c) Painters: Steel Only	35.62	21.80
4d) Painters: Blast and Spray	37.62	21.80

*As of:* Wednesday, November 06, 2019

Project: State Project No. 58-336; Rehabilitation Of Bridge No. 03903

4e) Painters: Tanks, Tower and Swing	36.62	21.80
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)	38.50	28.61+3% of gross wage
6) Ironworkers: Ornamental, Reinforcing, Structural, and Precast Concrete Erection	36.67	35.77 + a
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)	43.62	32.06
----LABORERS-----		
8) Group 1: Laborer (Unskilled), Common or General, acetylene burner, concrete specialist	30.75	20.84
9) Group 2: Chain saw operators, fence and guard rail erectors, pneumatic tool operators, powdermen	31.00	20.84

Project: State Project No. 58-336; Rehabilitation Of Bridge No. 03903

10) Group 3: Pipelayers	31.25	20.84
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	31.25	20.84
12) Group 5: Toxic waste removal (non-mechanical systems)	32.75	20.84
13) Group 6: Blasters	32.50	20.84
Group 7: Asbestos/lead removal, non-mechanical systems (does not include leaded joint pipe)	31.75	20.84
Group 8: Traffic control signalmen	18.00	20.84
Group 9: Hydraulic Drills	29.30	18.90

*As of:* Wednesday, November 06, 2019

Project: State Project No. 58-336; Rehabilitation Of Bridge No. 03903

----LABORERS (TUNNEL CONSTRUCTION, FREE AIR). Shield Drive and  
Liner Plate Tunnels in Free Air.----

13a) Miners, Motormen, Mucking Machine Operators, Nozzle Men, Grout Men, Shaft & Tunnel Steel & Rodmen, Shield & Erector, Arm Operator, Cable Tenders	32.98	20.84 + a
---	-------	-----------

13b) Brakemen, Trackmen	32.01	20.84 + a
-------------------------	-------	-----------

----CLEANING, CONCRETE AND CAULKING TUNNEL----

14) Concrete Workers, Form Movers, and Strippers	32.01	20.84 + a
--	-------	-----------

15) Form Erectors	32.34	20.84 + a
-------------------	-------	-----------

----ROCK SHAFT LINING, CONCRETE, LINING OF SAME AND TUNNEL  
IN FREE AIR:----

*As of:* Wednesday, November 06, 2019

Project: State Project No. 58-336; Rehabilitation Of Bridge No. 03903

16) Brakemen, Trackmen, Tunnel Laborers, Shaft Laborers	32.01	20.84 + a
17) Laborers Topside, Cage Tenders, Bellman	31.90	20.84 + a
18) Miners	32.98	20.84 + a
----TUNNELS, CAISSON AND CYLINDER WORK IN COMPRESSED AIR: ----		
18a) Blaster	39.47	20.84 + a
19) Brakemen, Trackmen, Groutman, Laborers, Outside Lock Tender, Gauge Tenders	39.27	20.84 + a
20) Change House Attendants, Powder Watchmen, Top on Iron Bolts	37.29	20.84 + a

*As of:* Wednesday, November 06, 2019

Project: State Project No. 58-336; Rehabilitation Of Bridge No. 03903

21) Mucking Machine Operator	40.06	20.84 + a
------------------------------	-------	-----------

----TRUCK DRIVERS----(\*see note below)

Two axle trucks	29.51	24.52 + a
-----------------	-------	-----------

Three axle trucks; two axle ready mix	29.62	24.52 + a
---------------------------------------	-------	-----------

Three axle ready mix	29.67	24.52 + a
----------------------	-------	-----------

Four axle trucks, heavy duty trailer (up to 40 tons)	29.72	24.52 + a
--	-------	-----------

Four axle ready-mix	29.77	24.52 + a
---------------------	-------	-----------

*As of:* Wednesday, November 06, 2019



Project: State Project No. 58-336; Rehabilitation Of Bridge No. 03903

Heavy duty trailer (40 tons and over)	29.98	24.52 + a
Specialized earth moving equipment other than conventional type on-the road trucks and semi-trailer (including Euclids)	29.77	24.52 + a
----POWER EQUIPMENT OPERATORS----		
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)	40.97	24.80 + a
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)	40.64	24.80 + a
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)	39.88	24.80 + a
Group 4: Trenching Machines; Lighter Derrick; Concrete Finishing Machine; CMI Machine or Similar; Koehring Loader (Skooper)	39.48	24.80 + a

*As of:* Wednesday, November 06, 2019

Project: State Project No. 58-336; Rehabilitation Of Bridge No. 03903

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) 38.87 24.80 + a

Group 5 continued: Side Boom; Combination Hoe and Loader; Directional Driller. 38.87 24.80 + a

Group 6: Front End Loader (3 up to 7 cubic yards); Bulldozer (rough grade dozer). 38.55 24.80 + a

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). 38.20 24.80 + a

Group 8: Mechanic, Grease Truck Operator, Hydroblaster, Barrier Mover, Power Stone Spreader; Welder; Work Boat under 26 ft.; Transfer Machine. 37.79 24.80 + a

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). 37.34 24.80 + a

Group 10: Vibratory Hammer, Ice Machine, Diesel and Air Hammer, etc. 35.24 24.80 + a

*As of:* Wednesday, November 06, 2019

Project: State Project No. 58-336; Rehabilitation Of Bridge No. 03903

Group 11: Conveyor, Earth Roller; Power Pavement Breaker (whiphammer), Robot Demolition Equipment.	35.24	24.80 + a
Group 12: Wellpoint Operator.	35.18	24.80 + a
Group 13: Compressor Battery Operator.	34.58	24.80 + a
Group 14: Elevator Operator; Tow Motor Operator (Solid Tire No Rough Terrain).	33.41	24.80 + a
Group 15: Generator Operator; Compressor Operator; Pump Operator; Welding Machine Operator; Heater Operator.	32.99	24.80 + a
Group 16: Maintenance Engineer/Oiler	32.32	24.80 + a
Group 17: Portable asphalt plant operator; portable crusher plant operator; portable concrete plant operator.	36.76	24.80 + a

Project: State Project No. 58-336; Rehabilitation Of Bridge No. 03903

Group 18: Power Safety Boat; Vacuum Truck; Zim Mixer; Sweeper; (minimum for any job requiring CDL license).	34.26	24.80 + a
--	-------	-----------

\*\*NOTE: SEE BELOW

---LINE CONSTRUCTION---(Railroad Construction and Maintenance)---

20) Lineman, Cable Splicer, Technician	48.19	6.5% + 22.00
--	-------	--------------

21) Heavy Equipment Operator	42.26	6.5% + 19.88
------------------------------	-------	--------------

22) Equipment Operator, Tractor Trailer Driver, Material Men	40.96	6.5% + 19.21
--	-------	--------------

23) Driver Groundmen	26.50	6.5% + 9.00
----------------------	-------	-------------

*As of:* Wednesday, November 06, 2019

Project: State Project No. 58-336; Rehabilitation Of Bridge No. 03903

23a) Truck Driver	40.96	6.5% + 17.76
-------------------	-------	--------------

---LINE CONSTRUCTION---

24) Driver Groundmen	30.92	6.5% + 9.70
----------------------	-------	-------------

25) Groundmen	22.67	6.5% + 6.20
---------------	-------	-------------

26) Heavy Equipment Operators	37.10	6.5% + 10.70
-------------------------------	-------	--------------

27) Linemen, Cable Splicers, Dynamite Men	41.22	6.5% + 12.20
---	-------	--------------

28) Material Men, Tractor Trailer Drivers, Equipment Operators	35.04	6.5% + 10.45
--	-------	--------------

*As of:* Wednesday, November 06, 2019

Project: State Project No. 58-336; Rehabilitation Of Bridge No. 03903

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\*\***

Project: State Project No. 58-336; Rehabilitation Of Bridge No. 03903

*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:** Wednesday, November 06, 2019

Project: State Project No. 58-336; Rehabilitation Of Bridge No. 03903

*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:* Wednesday, November 06, 2019



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(d).

***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. If unsure, the employer should seek guidelines for CTDOL.***

**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. RESILEINT 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.

- **LABORER, CLEANING**

- The clean up of any construction debris and the general (heavy/light) cleaning, including sweeping, wash down, mopping, wiping of the construction facility and its furniture, washing, polishing, and dusting.

- **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 or 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 require 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 require equal composite workforce.

- **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.

- **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), decorative security fence (non-metal)).

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. (demolition 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, 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. 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. To include testing and air –balancing ancillary to installation and construction.

- **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**

~How to pay truck drivers delivering asphalt is under REVISION~

Truck Drivers are required to be paid prevailing wage for time spent "working" directly on the site. These drivers remain covered by the prevailing wage for any time spent transporting between the actual construction location and facilities (such as fabrication, plants, mobile factories, batch plant, borrow pits, job headquarters, tool yards, etc.) dedicated exclusively, or nearly so, to performance of the contract or project, which are so located in proximity to the actual construction location that it is reasonable to include them. ***\*License required, drivers only, per Connecticut General Statutes.***

***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