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>
<thead>
<tr>
<th>ITEM #</th>
<th>DESCRIPTION</th>
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<tbody>
<tr>
<td>0514228A</td>
<td>PRESTRESSED DECK UNITS (4'-0&quot; X 1'-9&quot;)</td>
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<td>PRESTRESSED DECK UNITS (3'-0&quot; X 1'-9&quot;)</td>
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<td>ASPHALT ADJUSTMENT COST</td>
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<td>FINE MILLING OF BITUMINOUS CONCRETE (0 TO</td>
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<td>JOINT AND CRACK SEALING OF BITUMINOUS</td>
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<td>TURBIDITY CONTROL CURTAINS</td>
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<td>JOINT AND CRACK SEALING OF BITUMINOUS</td>
</tr>
<tr>
<td>M.06</td>
<td>METALS</td>
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<tr>
<td>M.04</td>
<td>BITUMINOUS CONCRETE MATERIALS</td>
</tr>
<tr>
<td>M.03</td>
<td>PORTLAND CEMENT CONCRETE</td>
</tr>
<tr>
<td>M.01</td>
<td>CONCRETE FOR STRUCTURES</td>
</tr>
<tr>
<td>M.03</td>
<td>STRUCTURAL STEEL</td>
</tr>
<tr>
<td>M.06</td>
<td>METALS</td>
</tr>
<tr>
<td>0406194A</td>
<td>JOINT AND CRACK SEALING OF BITUMINOUS</td>
</tr>
<tr>
<td>0406275A</td>
<td>FINE MILLING OF BITUMINOUS CONCRETE (0 TO 4 INCHES)</td>
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<td>0406999A</td>
<td>ASPHALT ADJUSTMENT COST</td>
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<td>PRESTRESSED DECK UNITS (3'-0&quot; X 1'-9&quot;)</td>
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<tr>
<td>0514228A</td>
<td>PRESTRESSED DECK UNITS (4'-0&quot; X 1'-9&quot;)</td>
</tr>
</tbody>
</table>
ITEM #0601276A – PRECAST SUBSTRUCTURE ELEMENTS ............................................................... 163
ITEM #0603233A – GALVANIZING STRUCTURAL STEEL (SITE NO. 1) ........................................... 173
ITEM #0603900A – CATHODIC PROTECTION SYSTEM ................................................................. 176
ITEM #0703008A – HEAVY RIPRAP .............................................................................................. 182
ITEM #0707009A – MEMBRANE WATERPROOFING (COLD LIQUID) ......................................... 183
ELASTOMERIC) ......................................................................................................................... 183
ITEM #0819002A – PENETRATING SEALER PROTECTIVE-compound .............................................. 189
ITEM #0912502A – REMOVE METAL BEAM RAIL (BRIDGE) ........................................................ 192
ITEM #0917010A – REPAIR GUIDERAIL ..................................................................................... 193
ITEM #0949875A – WETLAND PLANTINGS ................................................................................. 195
ITEM #0950202A – SHORELINE GRASS ESTABLISHMENT ........................................................... 196
ITEM #0969062A – CONSTRUCTION FIELD OFFICE, MEDIUM .................................................. 203
ITEM #0971100A – MAINTENANCE AND PROTECTION OF TRAFFIC ........................................... 211
ITEM #1206202A – REMOVAL AND RELOCATION OF EXISTING SIGNS ..................................... 231
ITEM #1208931A – SIGN FACE - SHEET ALUMINUM (TYPE IX RETROREFLECTIVE SHEETING) ............................................................. 232
ITEM #1300007A – EXCAVATION AND DISPOSAL OF UNSUITABLE MATERIAL (WATER MAIN) ........................................................................................................... 234
ITEM #1300061A – WATER MAIN SUPPORT SYSTEM ................................................................. 240
ITEM #1301017A – FURNISHING AND INSTALLING TEMPORARY WATER MAIN CROSSING ............................................................. 241
ITEM 1301084A – 12” DUCTILE IRON PIPE (WATER MAIN) .......................................................... 249
ITEM 1301516A – 12” 45 DEGREE MECHANICAL JOINT BEND (WATER MAIN) ............................................................. 249
ITEM 1301654A – 12” DUCTILE IRON PIPE INSTALLED ON BRIDGE ................................................ 249
ITEM #1301900A – HYDROSTATIC PRESSURE TEST .................................................................. 266
ITEM #1302051A – RESET VALVE BOX (WATER MAIN) ................................................................. 269
ITEM #1304065A – REMOVE WATER MAIN .................................................................................. 276
ITEM #1304123A – COMPACTED GRAVEL FILL (WATER MAIN) .................................................. 281
ITEM #1309301A – DISINFECTION OF WATER MAIN ................................................................. 287
PERMITS AND/OR REQUIRED PROVISIONS: ........................................................................... 291
November 13, 2019
FEDERAL AID PROJECT NO. N/A
STATE PROJECT NO. 0105-0215

REPLACEMENT OF BRIDGE NO. 02708
ROUTE 154 OVER PLUM BANK CREEK

Town of Old Saybrook
Federal Aid Project No. N/A

The State of Connecticut, Department of Transportation, Standard Specifications for Roads, Bridges, Facilities and Incidental Construction, Form 817, 2016, as revised by the Supplemental Specifications dated January 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 Replacement of Bridge No. 02708 Carrying Route 154 Over Plum Bank Creek in the Town of Old Saybrook.

**CONTRACT TIME AND LIQUIDATED DAMAGES**

Two Hundred Eighty Five (285) calendar days will be allowed for completion of the work on this Contract and the liquidated damages charge to apply will be One Thousand Five Hundred Dollars ($1,500.00) per calendar day.
MILESTONE LIQUIDATED DAMAGES PROVISIONS

In order to minimize the hazard, obstruction, inconvenience, and cost to the public, pollution of the environment, and detriment to area businesses, 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.

A maximum of 84 consecutive days will be allowed for the closure of Route 154 and Bridge No. 02708 beginning on Tuesday, September 8, 2020 at 12:00 a.m. and ending on or before Milestone Completion Date of Monday, November 30, 2020 at 11:59 p.m. A corresponding approximate 4.5 mile detour will service the traffic as detailed within the Contract. The reopening of the noted bridge and route is defined below.

The tasks are:

- The closure time frame begins with the uncovering of the detour signage required on the Detour Plan
- Remove Temporary Precast Concrete Barrier Curb installed prior to the road closure.
- Remove any appurtenances attached to the concrete curb and parapets.
- Remove existing bituminous overlay on approaches and bridge.
- Remove existing roadway subbase.
- Install debris shield.
- Remove existing concrete deck slab, and parapets.
- Install fully enclosed cofferdams and excavate inside cofferdams.
- Complete abutment pile installation.
- Install cathodic protection system for cofferdam left in material protection.
- Install precast abutments and wingwalls, construct closure pours and fill abutment voids.
- Dampproof and backfill abutment and wingwalls.
- Excavate behind the existing abutments and cut off the cofferdam material.
- Install turbidity curtains.
- Construct revetments and place riprap.
- Partially remove existing abutments and wingwalls.
- Install elastomeric bearings and prestressed deck units. Post-tension the deck units.
- Form deck, install reinforcement, and place concrete deck.
- Construct cast-in-place wingwall stems and parapets.
- Perform full-depth roadway reconstruction and regrade slopes.
- Install waterproofing membrane and place HMA on bridge. Saw and seal pavement joints.
- Apply Penetrating Sealer Protective Compound.
- Install metal beam rail.
- Install temporary pavement markings.
- Removal of all signs pertaining to the closure of Route 154, as shown on the Detour Plan
• **MILESTONE:** The closure timeframe ends with the completion of all above tasks and ancillary work thereto and with the reopening of Route 154 to normal traffic operations, exclusive of temporary alternating one-way traffic operations, as specified within the contract, that may be necessary to complete the project. “Normal traffic operations” are defined as one lane of traffic open in each direction with full shoulders.

**Readiness Plan**

Prior to beginning work on the project, the Contractor shall furnish to the Engineer for approval a Readiness Plan consisting of a Critical Path Method (CPM) schedule that details all of the day-to-day operations necessary to complete the above tasks during the eighty-four day detour timeframe. The schedule shall include:

- activity descriptions, activity durations and interdependence between activities, where applicable. The activities are to be described so that the work is readily identifiable and the progress on each activity can be readily measured and monitored during the noted timeframe.
- the anticipated number of shifts, the hours per shift, and the anticipated number of personnel staffed per shift
- schedules of anticipated critical path utility relocations that, if not completed as scheduled, would delay the start of the scheduled closure period and/or tasks to be completed during that period
- anticipated submittal and approval dates
- anticipated material delivery dates

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

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

All Department comments regarding the above Readiness Plan and CPM must be addressed in writing by the Contractor a minimum of fourteen (14) calendar days prior to the scheduled closure date, including any outstanding readiness items. Five (5) days prior to the start of the closure, the Contractor shall meet with the Department to review any outstanding readiness items and coordinate final details for the implementation of the road closure.

The Contractor must notify the Engineer and the Town of Old Saybrook of the proposed closure date of Route 154 at least four weeks prior to the closure.

**Milestone Liquidated Damages Terms and Conditions**

If the Contractor fails to complete, as accepted by the Engineer, the above-listed tasks by the Milestone Completion Date, the Contractor will be assessed a liquidated damage charge of $16,800 (Sixteen Thousand Eight Hundred Dollars) on the first minute after the defined timeframe period has expired, and shall be assessed additional liquidated damage charges at the rate of $16,800 (Sixteen Thousand Eight Hundred Dollars) per day thereafter until the tasks and corresponding milestone are complete and accepted by the Engineer. The maximum assessment
of Milestone Liquidated Damages shall be capped at $336,000 (Three Hundred and Thirty-Six Thousand Dollars) and shall be considered separate from any Liquidated Damages assessed to the Contractor for failure to complete the project on time per Section 1.08.09 of the Standard Specifications.

The Contractor is responsible for determining the full scope of labor and equipment resources and anticipated accelerated operations needed to complete the milestone tasks by the Milestone Completion Date, and shall bid the on-time completion of the work accordingly.

Any and all costs or detrimental effects incurred by the Contractor in accelerating his work in an attempt to meet the Milestone Completion Date, regardless of the effects of any delay, disruption, inefficiency or other detrimental effect including, but not limited to, the deletion of Contract work, the issuing of construction orders, the execution of supplemental agreements, the discovery of differing site conditions, the adding of extra work to the Contract, the emergence of right-of-way conflicts, problems with the obtaining or the terms of permits, action or inaction by persons or entities working on the project or by third parties, delays in the process of reviewing or approving shop drawings, expansion of the physical limits of the Project, the effects of weather conditions on Project activities, the occurrence of weekends or holidays, the suspension of any Project operation, or other events, forces or factors that affect highway construction work, shall be solely the Contractor's responsibility, and may not be used as the basis for any claim by the Contractor for additional compensation.

The Contractor is directed to follow the procedures of Section 1.08.08 of the Form 817 Standard Specifications for any request presented to the Engineer for an adjustment of the Milestone Completion Date for any unforeseeable causes noted in Section 1.08.08 that have resulted in the need for an adjusted date. There will be no adjustment to the Milestone Completion Date for events, forces or factors, as noted above, that the Contractor was to have foreseen and included in the cost and schedule of his work.
NOTICE TO CONTRACTOR – DETOUR PREREQUISITES

The Contractor shall complete the following tasks prior to the initiation of detour:

1- All prestressed deck units shall be cured minimum 28 days.

2- All shop and working drawings shall be submitted for review and shall be approved.

3- All precast substructure elements shall be cast and approved.

4- All materials needed for the project shall be onsite.
NOTICE TO CONTRACTOR – NOTIFY OF ROAD CLOSURE

The Contractor shall provide advanced notices of the closure of Route 154, Huntington Road, which include at least a 4-week notice, to the following parties:

Town of Old Saybrook:
302 Main Street.
Old Saybrook, CT 06475
Phone number: 860-395-3123
NOTICE TO CONTRACTOR – SCENIC ROADS

The Contractor is hereby advised that the stretch of Route 154 in which the project is located has been designated as a Connecticut Scenic Road. In prosecuting the work included in this contract, the Contractor shall make every effort to minimize impacts to the surrounding landscape to the greatest extent possible. Extra care shall be taken during the construction activities to preserve the historic character of Route 154 and its scenic, natural, and recreational resources.

Upon completion of work at the site the Contractor shall, at the discretion of the Engineer, restore the area to a condition consistent with its pre-construction appearance and befitting of its designation as a scenic road. Methods of site restoration shall include, but not be limited to: turf establishment, seeding, or plantings. In the event specific items for the site restoration are not included in the contract, this effort may be construed as included in the general cost of the work.
NOTICE TO CONTRACTOR – UTILITY GENERATED SCHEDULE

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

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

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

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

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

**CTDOT Project Number:** 105-215  
**Town:** Old Saybrook

**Project Description:** Replacement of Plum Bank River Bridge

**CTDOT Utilities Engineer:** Xiuyun Cai  
**Phone:** (860)594-3269  
**Email:** xiuyun.cai@ct.gov

**Utility Company:** Eversource (Electric)  
**Prepared By:** Richard Russo  
**Date Prepared:** 3/8/2019  
**Phone:** 203-245-5440  
**Email:** richard.russo@eversource.com

## Scope of Work

The following is a description of all utility work planned to be completed in conjunction with the CTDOT project. The narrative describes all work to be carried out by the utility or its contractor, including temporary and permanent work required by the project as well as any additional utility infrastructure work the utility intends on performing within the project limits during the construction of the project.

Replace 1 pole and install 2 poles and primaries with neutral parallel to bridge giving clearance to work being done while adhering to Coast Guard regulations. Switches will be installed on pole 950 to facilitate deenergizing primaries briefly in order to safely shift conductors to permanent location. Once bridge replacement work is complete, pole will be installed near former location and conductors will be shifted to permanent location. Temporary poles in marsh will be removed once communications lines have been removed.

## Special Considerations and Constraints

The following describes the limiting factors that must be planned for in the scheduling and performance of the utility work. For example, restrictions on cut-overs, outages, limitations on customer service interruptions (e.g. nights, weekends, holidays), seasonal and environmental shutdown periods, long lead material procurements, etc..
<table>
<thead>
<tr>
<th>Duration (Working Days)</th>
<th>Activity</th>
<th>Description of Utility Work Activity</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.5</td>
<td>Shift Work Completed by Communications</td>
<td>Remove Temporary Poles 22 - 0, 24 + 45</td>
<td>21 - 5 to 24 + 50</td>
</tr>
<tr>
<td>2</td>
<td>Erection work completed</td>
<td>Erection work completed</td>
<td>Permanent location 21 - 5 to 24 + 50</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>Frame New pole and shift primary and neutral to New pole 960 to be set</td>
<td></td>
</tr>
<tr>
<td>0.5</td>
<td></td>
<td>Install ES pole 960 23 - 30</td>
<td>Once bridge work is completed</td>
</tr>
<tr>
<td>0.5</td>
<td></td>
<td>Install BS poles 2 - 23 - 30</td>
<td>21 - 5, 22 - 30</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>Communications performed Shift work</td>
<td>21 - 5 to 24 + 50</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>Replace ES pole 961 and Install Stud pole 6-300</td>
<td>21 - 5, 22 - 30, 23 + 45</td>
</tr>
<tr>
<td>0.5</td>
<td></td>
<td>Contractor To Install Traps For poles 960 and NN</td>
<td>Station to Station</td>
</tr>
</tbody>
</table>

The above schedule describes each major activity of utility work in sequential order to be performed by the utility contractor. The location of each activity of work is designated by the location column.

Schedule

Prepared By: Richard Russo

Utility Company: Eversource Energy (Electric)

CDOT Project Number: 105-215

UTILITY WORK SCHEDULE REV 3/2015
Scope of Work
The following is a description of all utility work planned to be completed in conjunction with the CTDOT project. The narrative describes all work to be carried out by the utility or its contractor, including temporary and permanent work required by the project as well as any additional utility infrastructure work the utility intends on performing within the project limits during the construction of the project.

Relocation of cable plant to new pole line for bridge repair. Replace feeder tank and relocate fiber. Move plant back to original pole line once bridge is complete.

Special Considerations and Constraints
The following describes the limiting factors that must be planned for in the scheduling and performance of the utility work. For example, restrictions on cut-overs, outages, limitations on customer service interruptions (e.g., nights, weekends, holidays), seasonal and environmental shutdown periods, long lead material procurements, etc.
<table>
<thead>
<tr>
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<th>Location</th>
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<tr>
<td></td>
<td></td>
<td>Cable Plant back after Chop is Complete</td>
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<tr>
<td></td>
<td></td>
<td>Clyp to finish there final move back</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>Replace Trunk Cable and relocate 2 Telephone Lines Moving</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Clyp set new poles and complete trench</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Relocate Stand cable and Fiber across I Bridge Replacements</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Plumback RD</td>
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</table>

**Schedule**

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**Utility Work Schedule**

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**Prepared by:**

**Utility Company:**

**Contractor of Claim:**

**Claimant:**
NOTICE TO CONTRACTOR – WATER MAIN RELOCATION

The State’s Contractor is hereby notified that The Connecticut Water Company (CWC) has an existing 8” water main along the south curb line of Route 154 which crosses over Plum Bank Creek adjacent to the proposed Bridge 02708 replacement. A temporary 8” water main and utility bridge must be installed upstream, activated and the existing water main in the vicinity of the brook abandoned before any work can commence on the new bridge. A permanent 12” water main will also be installed by the contractor as part of this project in accordance with CWC Requirements.

The State’s Contractor will be responsible for the design, construction, maintenance and removal of the temporary utility structure to carry the temporary water main as detailed in the special provisions. The State’s Contractor will install, maintain and remove the temporary water main and restore the area upon completion of the permanent water main installation.

The Water Main Relocation plans provide information on the work the State’s Contractor will be performing within the project area and show the approximate location where the State’s Contractor is anticipated to install the temporary water main support.

The State’s Contractor will also be responsible to install the pre-insulated 12” water main support assemblies on the bridge deck over the Plum Bank Creek. The work required of the State’s Contractor is shown on the Water Main Relocation plans and described in the Special Provisions.
NOTICE TO CONTRACTOR – CATHODIC PROTECTION SYSTEM

The Contractor shall design, furnish, and install a galvanic anode cathodic protection system for all the portions of the fully enclosed cofferdam system required to be left in place for scour protection in accordance with the requirements of Special Provision for Item No. 0603900A – Cathodic Protection System.
NOTICE TO CONTRACTOR – SALVAGE

The following items have been determined to be salvageable:

Metal Beam Rail:

1) Metal Beam Rail Elements (MBR Elements) 12'-6". MBR Elements must be single lengths only with all hardware removed by wrench, not by torch. MBR Elements must be bundled using double metal bands, with 25 pieces per bundle.

2) Metal Beam Rail Posts (MBR Posts). MBR Posts must be in good condition and have the brackets still attached. Existing MBR Posts consist of the following types: RI, RB and Bridge Attached.

The Contractor will deliver the material to CT DOT District 2 – Bridge Maintenance garage at 660 Middlesex Turnpike, Old Saybrook, CT 06475. The material shall be delivered on a flatbed to be off-loaded by Department forces. The Contractor shall provide a week notice prior to delivery of the material and coordinate the delivery of the material with Alan Ference (860) 388-3366.

To be considered salvageable, the above items must be in good condition as determined by the Engineer. Prior to removing and stockpiling the material, the Contractor shall obtain the Engineer's approval as to the item's salvable value.

The Contractor shall exercise reasonable care in the removal, dismantling, transportation and loading of the salvageable materials, and shall be responsible for any unnecessary damage caused by his actions.

Salvaged items shall be delivered to the location specified above and coordinate a specific delivery date and time with appropriate personnel.

The Contractor will not receive payment for this work. The cost for removal, dismantling, transporting and loading of salvageable materials shall be included in the overall cost of this project. If the Stores Facilities cannot accept all of the salvageable metal beam rail materials, the Contractor shall dispose of remaining materials at his own cost.
NOTICE TO CONTRACTOR – GLOBAL POSITIONING SYSTEM (GPS) COORDINATES FOR SIGNS

The Contractor shall obtain and provide to the Engineer sign installation data, including Global Positioning System (GPS) latitude and longitude coordinates, for all new State owned and maintained signs. The Engineer shall forward the sign data to the Division of Traffic Engineering for upload into the Highway Sign Inventory and Maintenance Management Program (SIMS). Sign data submissions or questions relating to SIMS or GPS shall be sent to DOT-SignInventory@ct.gov. Refer to the special provision for Section 12.00 General Clauses For Highway Signing.
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 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 – CONTRACT DURATION

The Contractor is hereby notified that this is not to be considered an ordinary project by any means and that due to the inconvenience to the traveling public that it causes, extra manpower, equipment and workshifts may be required to complete the work in accordance within the specified contract time.
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 – ALL-INCLUSIVE DRAINAGE

ADDED SECTIONS:

- **2.86 – DRAINAGE TRENCH EXCAVATION**
  - ROCK IN DRAINAGE TRENCH EXCAVATION
- **5.86 – CATCH BASINS, MANHOLES AND DROP INLETS**
- **6.86 – DRAINAGEPIPES**
  - DRAINAGE PIPE ENDS

This Contract contains the above-noted Special Provisions for all-inclusive drainage, developed to replace the following Sections in their entireties:

- Section 5.07 – *Catch Basins, Manholes and Drop Inlets*
- Section 6.51 – *Culverts*
- Section 6.52 – *Culvert Ends*

The Section 5.86 and 6.86 items include excavation and bedding material in the drainage structure, pipe and pipe end unit prices.

Section 2.05 *Trench Excavation* may be included for miscellaneous trenching, where necessary, but will not be used with all-inclusive drainage items.

Other Standard Specifications, Supplemental Specifications or Special Provisions may contain references to Articles or Subarticles from previous versions of Sections 5.07, 6.51 and 6.52 which are no longer valid.

The following Standard Specifications Sections or Supplements contain references to Articles or Subarticles from Section 2.05 which shall remain in effect:

- Section 2.06 – *Ditch Excavation*
- Section 5.06 – *Retaining Walls, Endwalls and Steps*
- Section 7.51 – *Underdrains and Outlets*
- Section 10.01 – *Trenching and Backfilling*

‘Rock in Drainage Trench Excavation’ is now defined in Section 2.86. ‘Rock in Trench Excavation’ will remain in Section 2.05 and may be used with trenching not associated with all-inclusive drainage items.

Any references to Articles beginning with “5.07,” “6.51,” or “6.52” shall refer to the pertinent topic or materials in the new Special Provisions contained herein.
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

<table>
<thead>
<tr>
<th>New Mix Classification (Class PCCXXXXYZ&lt;sup&gt;1&lt;/sup&gt;)</th>
<th>Former Mix Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class PCC03340</td>
<td>Class “A”</td>
</tr>
<tr>
<td>Class PCC03360</td>
<td>Class “C”</td>
</tr>
<tr>
<td>Class PCC04460&lt;sup&gt;2&lt;/sup&gt;</td>
<td>Class “F”</td>
</tr>
<tr>
<td>Class PCC04462&lt;sup&gt;2&lt;/sup&gt;</td>
<td>High Performance Concrete</td>
</tr>
<tr>
<td>Class PCC04481, PCC05581</td>
<td>Class “S”</td>
</tr>
</tbody>
</table>

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 ≥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.

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

<table>
<thead>
<tr>
<th>Coating Category</th>
<th>Phase I manufactured prior to May 1, 2018 VOC content limit (g/L)</th>
<th>Phase II manufactured on or after May 1, 2018 VOC content limit (g/L)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Multi-color coating</td>
<td>250</td>
<td>250</td>
</tr>
<tr>
<td>Nonflat coating</td>
<td>150</td>
<td>100</td>
</tr>
<tr>
<td>Nonflat high gloss coating²</td>
<td>250</td>
<td>150</td>
</tr>
<tr>
<td>Nuclear coating</td>
<td>450</td>
<td>450</td>
</tr>
<tr>
<td>Pre-treatment wash primer</td>
<td>420</td>
<td>420</td>
</tr>
<tr>
<td>Primer, sealer and undercoater</td>
<td>200</td>
<td>100</td>
</tr>
<tr>
<td>Quick-dry enamel</td>
<td>250</td>
<td>---¹</td>
</tr>
<tr>
<td>Quick-dry primer, sealer and undercoater</td>
<td>200</td>
<td>---¹</td>
</tr>
<tr>
<td>Reactive penetrating carbonate stone sealer²</td>
<td>---¹</td>
<td>500</td>
</tr>
<tr>
<td>Reactive penetrating sealer²</td>
<td>---¹</td>
<td>350</td>
</tr>
<tr>
<td>Recycled coating</td>
<td>250</td>
<td>250</td>
</tr>
<tr>
<td>Roof coating</td>
<td>250</td>
<td>250</td>
</tr>
<tr>
<td>Rust preventive coating²</td>
<td>400</td>
<td>250</td>
</tr>
<tr>
<td>Shellac Clear</td>
<td>730</td>
<td>730</td>
</tr>
<tr>
<td>Shellac Opaque</td>
<td>550</td>
<td>550</td>
</tr>
<tr>
<td>Specialty primer, sealer and undercoater²</td>
<td>350</td>
<td>100</td>
</tr>
<tr>
<td>Stain</td>
<td>250</td>
<td>250</td>
</tr>
<tr>
<td>Stone consolidant²</td>
<td>---¹</td>
<td>450</td>
</tr>
<tr>
<td>Swimming pool coating</td>
<td>340</td>
<td>340</td>
</tr>
<tr>
<td>Thermoplastic rubber coating and mastic</td>
<td>550</td>
<td>550</td>
</tr>
<tr>
<td>Traffic marking coating</td>
<td>150</td>
<td>100</td>
</tr>
<tr>
<td>Traffic marking coating</td>
<td>150</td>
<td>100</td>
</tr>
<tr>
<td>Tub and tile refinish</td>
<td>---¹</td>
<td>420</td>
</tr>
<tr>
<td>Waterproofing membrane</td>
<td>---¹</td>
<td>250</td>
</tr>
<tr>
<td>Waterproofing sealer</td>
<td>250</td>
<td>---¹</td>
</tr>
<tr>
<td>Wood coating²</td>
<td>---¹</td>
<td>275</td>
</tr>
<tr>
<td>Wood preservative</td>
<td>350</td>
<td>350</td>
</tr>
<tr>
<td>Zinc-rich primer²</td>
<td>---¹</td>
<td>340</td>
</tr>
</tbody>
</table>

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 – ELECTRONIC ENGINEERING DATA (EED)

The EED is an assembly of engineering data files that were used to produce the Contract plans. Electronic Engineering Data (EED) is provided for information purposes only. In case of conflict between the EED and the Contract plans and specifications, the contract plans and specifications shall govern. The EED has been reviewed by the Department for quality control purposes, but it is the Contractor’s responsibility to build the Project per the contract plans and specifications.

The EED is being provided to the Engineer for GPS/RTS inspection. The Contractor may use the EED to assist in bidding, layout and Automated Machine Control/Guidance.

The EED includes geospatially-correct 2D CAD files and may include horizontal and vertical alignment data files, 3D surface model files (break-line features and triangles) and a preference file. The data is being provided in two formats:

- Native Format
  - Bentley MicroStation CAD files (dgn)
  - Bentley SS2 InRoads Alignment Files (alg)
  - Bentley SS2 InRoads Digital Terrain Models (dtm)
  - Bentley SS2 InRoads Preference File (xin)

- Converted Format (for use in GPS/RTS Site equipment)
  - AutoCAD CAD files (dxf)
  - Alignment files (xml)
  - Surface Models (xml)

For a complete list of EED files, see the EED file manifest (PDF) located in the EED_XXXX-XXXX.zip file (XXXX-XXXX is the project number) which is posted with the contract PS&E’s on the State Contracting portal.
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 July 2017) Article 1.05.03 – “Conformity with Plans and Specifications (including Quality Control).”
SECTION 1.02 – PROPOSAL REQUIREMENTS AND CONDITIONS

1.02.01—Contract Bidding and Award:

After the first sentence of the third paragraph, add the Following:

In accordance with the provisions of the Construction Contract Bidding and Award Manual, bidders must be prequalified for (Type Work 8 – Minor Bridges), to be eligible to bid on this project. Bidders that are not prequalified for this work classification will not be approved to bid on this project.

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

Replace the third sentence of the last paragraph with:

The Department cannot ensure a response to inquiries received later than ten (10) days prior to the original scheduled opening of the related bid.
SECTION 1.05 – CONTROL OF THE WORK

Replace Article 1.05.02 with the following:

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

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

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

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

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

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

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 1.07 – LEGAL RELATIONS AND RESPONSIBILITIES

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.”

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

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

The Connecticut Water Company
Mr. Daniel Lesnieski
Infrastructure Rehabilitation Manager
446 Smith Street
Middletown, CT 06457
Phone: (860) 292-2834
Email: dlesnieski@ctwater.com

Comcast of Connecticut, Inc.
Mr. Jim Bitzas
Regional Construction Director
1110 East Mountain Road
Westfield, MA 01085
Phone: (413) 642-8582 ETX. Mobil: (617) 279-7485
Email: jim_bitzas@cable.comcast.com

The Connecticut Light & Power Company dba Eversource Energy - Electric Distribution
Mr. Thomas Woronik
Supervisor - Construction Engineering
22 East High Street
East Hampton, CT 06424
Phone: (860) 267-3891
Email: Thomas.Woronik@eversource.com
SECTION 1.08 – PROSECUTION AND PROGRESS

Article 1.08.04 - Limitation of Operations - Add the following:

In order to provide for traffic operations as outlined in the Special Provision "Maintenance and Protection of Traffic," the Contractor will not be permitted to perform any work which will interfere with the described traffic operations on all project roadways as follows:

Route 154

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 the replacement of bridge 02708, the Contractor will be allowed to close Route 154 in the vicinity of the bridge being replaced and detour traffic for a maximum duration of 84 consecutive days beginning on Tuesday, September 8, 2020 at 12:00 a.m. and ending on or before Milestone Completion Date of Monday, November 30, 2020 at 11:59 p.m.

The Contractor shall notify the Engineer at least 14 days in advance of the start of the Route 154 closure.

All Other Roadways

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

Night Work Restriction

No work shall be permitted to take place between the hours of 8:00PM and 7:00AM on any roadway during any stage of construction.
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."

<table>
<thead>
<tr>
<th>Pay Item</th>
<th>Pay Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rock in Drainage Trench Excavation 0' - 10' Deep</td>
<td>c.y.</td>
</tr>
<tr>
<td>Rock in Drainage Trench Excavation 0' - 20' Deep</td>
<td>c.y.</td>
</tr>
</tbody>
</table>
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-weighing scales, storage scales, and material feeds capable of producing a delivery ticket containing the information below.

   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>
<thead>
<tr>
<th>Option</th>
<th>Fixture Configuration</th>
<th>Fixture Quantity</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Type A</td>
<td>3</td>
<td>Mount over screed area</td>
</tr>
<tr>
<td></td>
<td>Type B (narrow) or Type C (spot)</td>
<td>2</td>
<td>Aim to auger and guideline</td>
</tr>
<tr>
<td></td>
<td>Type B (wide) or Type C (flood)</td>
<td>2</td>
<td>Aim 25 feet behind paving machine</td>
</tr>
<tr>
<td>2</td>
<td>Type D Balloon</td>
<td>2</td>
<td>Mount over screed area</td>
</tr>
</tbody>
</table>
**Table 4.06-2: Minimum Roller Lighting**

<table>
<thead>
<tr>
<th>Option</th>
<th>Fixture Configuration</th>
<th>Fixture Quantity</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Type B (wide)</td>
<td>2</td>
<td>Aim 50 feet in front of and behind roller</td>
</tr>
<tr>
<td></td>
<td>Type B (narrow)</td>
<td>2</td>
<td>Aim 100 feet in front of and behind roller</td>
</tr>
<tr>
<td>2</td>
<td>Type C (flood)</td>
<td>2</td>
<td>Aim 50 feet in front of and behind roller</td>
</tr>
<tr>
<td></td>
<td>Type C (spot)</td>
<td>2</td>
<td>Aim 100 feet in front of and behind roller</td>
</tr>
<tr>
<td>3</td>
<td>Type D Balloon</td>
<td>1</td>
<td>Mount above the roller</td>
</tr>
</tbody>
</table>

*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.

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**Project No. 0105-0215**
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:

<table>
<thead>
<tr>
<th>Posted Speed Limit</th>
<th>Permanent Transition Length Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt; 35 mph</td>
<td>30 feet per inch of elevation change</td>
</tr>
<tr>
<td>35 mph or less</td>
<td>15 feet per inch of elevation change</td>
</tr>
</tbody>
</table>

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:

<table>
<thead>
<tr>
<th>Posted Speed Limit</th>
<th>Temporary Transition Length Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt; 50 mph</td>
<td>Leading Transition: 15 feet per inch of vertical change (thickness)</td>
</tr>
<tr>
<td></td>
<td>Trailing Transition: 6 feet per inch of vertical change (thickness)</td>
</tr>
<tr>
<td>40, 45 or 50 mph</td>
<td>Leading and Trailing: 4 feet per inch of vertical change (thickness)</td>
</tr>
<tr>
<td>35 mph or less</td>
<td>Leading and Trailing: 3 feet per inch of vertical change (thickness)</td>
</tr>
</tbody>
</table>

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°F ± 10°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 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>
<thead>
<tr>
<th>Mixture Designation</th>
<th>Lift Tolerance</th>
</tr>
</thead>
<tbody>
<tr>
<td>S1</td>
<td>+/- 3/8 inch</td>
</tr>
<tr>
<td>S0.25, S0.375, S0.5</td>
<td>+/- 1/4 inch</td>
</tr>
</tbody>
</table>

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 Pour 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.

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 inplace 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_hmaPlacement.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).
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.

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)

<table>
<thead>
<tr>
<th>Lot Type</th>
<th>No. of Mat Cores</th>
<th>No. of Joint Cores</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard Lot &lt; 500 Tons</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Standard Lot ≥ 500 Tons</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Combo Lot &lt; 500 Tons</td>
<td>2 plus</td>
<td>1 per bridge (≤ 300')</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2 per bridge (301’ – 500’')</td>
</tr>
<tr>
<td>Combo Lot ≥ 500 Tons(1)</td>
<td>4 plus</td>
<td>4 plus</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 per bridge (≤ 300)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2 per bridge (301’ – 500’')</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Length of Bridge(s) (Feet)</th>
<th>Minimum No. of Mat Cores</th>
<th>Minimum No. of Joint Cores</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 500</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>501 – 1,500</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>1,501 – 2,500</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>2,501 and greater</td>
<td>5</td>
<td>5</td>
</tr>
</tbody>
</table>

**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 sublot 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_A) = [(L x W_{adj})/9] x (t) x 0.0575 Tons/SY/inch = (-) tons

Where: L = Length (ft)

(t) = Actual thickness (inches)
W_{adj} = (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:

**Quantity Adjusted for Thickness (T_{T}) = A \times t_{adj} \times 0.0575 = (-) tons**

Where: 
- \(A = \text{Area} = \left\{ \frac{L \times (\text{Design width} + \text{tolerance (lift thickness)/12})}{9} \right\} \)
- \(t_{adj} = \text{Adjusted thickness} = \left\{ (D_{t} + \text{tolerance}) - \text{Actual thickness} \right\} \)
- \(D_{t} = \text{Designed thickness (inches)} \)

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:

**Quantity Adjusted for Weight (T_{W}) = GVW - DGW = (-) tons**

Where: \(DGW = \text{Delivered gross weight as shown on the delivery ticket or measured on a certified scale} \)

### 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:

\[
\text{Tons Adjusted for Superpave Design (T_{SD}) = \left\{ \frac{(AdjAV_{i} + AdjPB_{i})}{100} \right\} \times \text{Tons} \]

Where: 
- \(\text{AdjAV}_{i} = \text{Percent adjustment for air voids} \)
- \(\text{AdjPB}_{i} = \text{Percent adjustment for asphalt binder} \)
- \(\text{Tons} = \text{Weight of material (tons) in the lot adjusted by 4.06.4-1} \)

Percent Adjustment for Air Voids = \(\text{AdjAV}_{i} = \left\{ \frac{\text{AdjAV}_{1} + \text{AdjAV}_{2} + \text{AdjAV}_{i} + \ldots + \text{AdjAV}_{n}}{n} \right\} \)

Where: 
- \(\text{AdjAV}_{i} = \text{Total percent air void adjustment value for the lot} \)
- \(\text{AdjAV}_{i} = \text{Adjustment value from Table 4.06-6 resulting from each sub lot or the average of the adjustment values resulting from multiple tests within a sub lot, as approved by the Engineer} . \)
- \(n = \text{number of sub lots based on Table M.04.03-2} \)
TABLE 4.06-6: Adjustment Values for Air Voids

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

Percent Adjustment for Asphalt Binder = AdjPB = [(AdjPB1 + AdjPB2 + AdjPBi + … + AdjPBn)] /n

Where: AdjPB = Total percent liquid binder adjustment value for the lot
AdjPBi = 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

<table>
<thead>
<tr>
<th>Adjustment Value (AdjAV) (%)</th>
<th>S0.25, S0.375, S0.5, S1 Pb</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.0</td>
<td>JMF Pb ± 0.3</td>
</tr>
<tr>
<td>- 10.0</td>
<td>≤ JMF Pb - 0.4 or ≥ JMF Pb + 0.4</td>
</tr>
</tbody>
</table>

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 or PB or VMAi) = (55 + 0.5 PWL) - 100
For PWL at and above 90%: Adj(AV or PB or VMAi) = (77.5 + 0.25 PWL) - 100
Where: AdjAVi = Total percent AV adjustment value for the lot
AdjPBi = Total percent PB adjustment value for the lot
AdjVMAi = 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_{sd}) = [(0.5AdjAV + 0.25AdjPB + 0.25 AdjVMA) / 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: \( T_{SD} \times \text{Unit Price} = \text{Est. (P}_i\)\)

Where:
- Unit Price = Contract unit price per ton per type of mixture
- Est. (P\(_i\)) = 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.

   \( \text{Tons Adjusted for Density (T}_{D}\) = \[\{(\text{P}_{AM} \times 0.50) + (\text{P}_{A_{J}} \times 0.50)\} / 100\] X Tons

Where:
- \( \text{P}_{AM} \) = Mat density percent adjustment from Table 4.06-8
- \( \text{P}_{A_{J}} \) = 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

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

**Notes:**

1. ACRPD = Average Core Result Percent Density
2. All Percent Adjustments to be rounded to the second decimal place; for example round 1.667 to 1.67.
<table>
<thead>
<tr>
<th>Percent Joint Density</th>
<th>Percent Adjustment (Bridge and Non-Bridge) (^{(1)}(2))</th>
</tr>
</thead>
<tbody>
<tr>
<td>97.1 – 100</td>
<td>-1.667(^\ast)(ACRPD-98.5)</td>
</tr>
<tr>
<td>93.5 – 97.0</td>
<td>+2.5</td>
</tr>
<tr>
<td>92.0 – 93.4</td>
<td>+1.667(^\ast)(ACRPD-92)</td>
</tr>
<tr>
<td>91.0 – 91.9</td>
<td>0</td>
</tr>
<tr>
<td>89.0 – 90.9</td>
<td>-7.5(^\ast)(91-ACRPD)</td>
</tr>
<tr>
<td>88.0 – 88.9</td>
<td>-15(^\ast)(90-ACRPD)</td>
</tr>
<tr>
<td>87.0 – 87.9</td>
<td>-30</td>
</tr>
<tr>
<td>86.9 or less</td>
<td>Remove and Replace (curb to curb)</td>
</tr>
</tbody>
</table>

Notes:

\(^{(1)}\) ACRPD = Average Core Result Percent Density

\(^{(2)}\) 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 \(_M\) or \(_J\) = 0.25 \times PWL – 22.50
For PWL at and above 90%: PA \(_M\) or \(_J\) = 0.125 \times 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:

\[ \text{Tons Adjusted for Mat Density (TMD)} = \frac{PA_M}{100} \times \text{Tons} \]

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})** = \( \frac{P_{AJ}}{100} \times J \_\text{Tons} \)

Tons Adjusted for Joint Density will be calculated at the end of each project or project phase.

Where: \( J \_\text{Tons} = \text{Tons in project or phase adjusted by } 4.06.4 - 1 \times \frac{\text{Lot joint length}}{\text{Joint length in project or phase}} \)

All bridge density lot adjustments will be evaluated in accordance with 4.06.04-2.b)i.

Additionally, any sublot 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

\( \text{Est. (Di)} = \text{Pay Unit in dollars representing incentive or disincentive per simple average density lot} \)

\( \text{Est. (DMi)} = \text{Pay Unit in dollars representing incentive or disincentive per PWL mat lot} \)

\( \text{Est. (D Ji)} = \text{Pay Unit in dollars representing incentive or disincentive per PWL joint lot} \)

Additionally, any sublot 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: \( \sum \text{Est } (P_i) = \text{Est. (P)} \)
   Density Lot (Simple Average Lots): \( \sum \text{Est } (D_i) = \text{Est. (D)} \)
   Density Lot (PWL): \( \sum \text{Est } (D_{Mi}) + \sum \text{Est } (D_{Ji}) = \text{Est. (D)} \)
   Bituminous Concrete Adjustment Cost= \( \text{Est. (P) + Est. (D)} \)

   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."

<table>
<thead>
<tr>
<th>Pay Item</th>
<th>Pay Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>HMA S*</td>
<td>ton</td>
</tr>
<tr>
<td>PMA S*</td>
<td>ton</td>
</tr>
<tr>
<td>Bituminous Concrete Adjustment Cost</td>
<td>est.</td>
</tr>
<tr>
<td>Material for Tack Coat</td>
<td>gal.</td>
</tr>
<tr>
<td>Material Transfer Vehicle</td>
<td>ton</td>
</tr>
</tbody>
</table>
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.

GENERAL
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, catch basins and drop inlets** 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.

<table>
<thead>
<tr>
<th>Pay Item</th>
<th>Pay Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Type) Catch Basin – 0' to 10' Deep</td>
<td>ea.</td>
</tr>
<tr>
<td>(Type) Catch Basin – 0' to 20' Deep</td>
<td>ea.</td>
</tr>
<tr>
<td>Manhole (Size) – 0' to 10' Deep</td>
<td>ea.</td>
</tr>
<tr>
<td>Manhole (Size) – 0' to 20' Deep</td>
<td>ea.</td>
</tr>
<tr>
<td>(Type) Drop Inlet</td>
<td>ea.</td>
</tr>
<tr>
<td>Reset Catch Basin</td>
<td>ea.</td>
</tr>
<tr>
<td>Reset Manhole</td>
<td>ea.</td>
</tr>
<tr>
<td>Reset Drop Inlet</td>
<td>ea.</td>
</tr>
<tr>
<td>Convert Catch Basin to (Type) Catch Basin</td>
<td>ea.</td>
</tr>
<tr>
<td>Convert Catch Basin to (Type) Manhole</td>
<td>ea.</td>
</tr>
<tr>
<td>Convert Manhole to (Type) Catch Basin</td>
<td>ea.</td>
</tr>
<tr>
<td>Manhole Frame and Cover</td>
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</tr>
<tr>
<td>(Type) Catch Basin Top</td>
<td>ea.</td>
</tr>
<tr>
<td>Remove Drainage Structure – 0' to 10' Deep</td>
<td>ea.</td>
</tr>
<tr>
<td>Remove Drainage Structure – 0' to 20' Deep</td>
<td>ea.</td>
</tr>
<tr>
<td>Abandon Drainage Structure</td>
<td>ea.</td>
</tr>
</tbody>
</table>
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 prestressing steel, and forms that is supported shall be assumed to be not less than:
1. Normal-weight concrete: 0.16 kip/ft$^3$
2. Lightweight concrete: 0.13 kip/ft$^3$

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$^2$ 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.

(c) 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...

SECTON 6.01
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) **Anchorages:** 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**

<table>
<thead>
<tr>
<th>Structure Element</th>
<th>Minimum Time Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arch Centers, centering under beams, pier caps, and unsupported elements</td>
<td>14 days</td>
</tr>
<tr>
<td>Slabs on grade, Abutments and Walls</td>
<td>24 hours</td>
</tr>
<tr>
<td>Columns</td>
<td>2 days</td>
</tr>
<tr>
<td>Bridge Decks</td>
<td>28 days</td>
</tr>
</tbody>
</table>

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**

<table>
<thead>
<tr>
<th>Standard Mix Class</th>
<th>Air Content</th>
<th>Slump$^3$</th>
<th>Concrete Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCC0334Z$^1$ (3300 psi)</td>
<td>6.0 +/- 1.5%</td>
<td>As submitted</td>
<td>60º-90º F</td>
</tr>
<tr>
<td>PCC0336Z$^1$ (3300 psi)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PCC0446Z$^1$ (4400 psi)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PCCXXX8Z$^1$</td>
<td>7.5 +/- 1.5%</td>
<td>As submitted</td>
<td></td>
</tr>
<tr>
<td>Modified Standards$^2$</td>
<td>6.0 +/- 1.5%</td>
<td>As submitted</td>
<td></td>
</tr>
<tr>
<td>Special Provision Mix$^4$</td>
<td>As specified</td>
<td>As submitted</td>
<td></td>
</tr>
</tbody>
</table>

$^1$“Z” denotes the Exposure Factor 0, 1 or 2 as described in Table M.03.02-1a

$^2$ 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.

$^3$ If the only modification is the addition of HRWR, the maximum allowable slump shall be 7 inches.

$^4$ 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 60ºF and 90ºF. 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.

Variances 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.
SECTION 6.01

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>
<thead>
<tr>
<th>Specified Entrained air (%)*</th>
<th>Pay factor (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.0 +/- 1.5%</td>
<td>7.5 +/- 1.5%</td>
</tr>
<tr>
<td>4.3 and 4.4</td>
<td>7.6 and 7.7</td>
</tr>
<tr>
<td>4.1 and 4.2</td>
<td>7.8 and 7.9</td>
</tr>
<tr>
<td>3.9 and 4.0</td>
<td>8.0 and 8.1</td>
</tr>
<tr>
<td>3.7 and 3.8</td>
<td>8.2 and 8.3</td>
</tr>
<tr>
<td>3.5 and 3.6</td>
<td>8.4 and 8.5</td>
</tr>
</tbody>
</table>

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.

*Air content measured at time and point of placement

The pay factors listed in Table 6.01.05-2a apply for Standard and Modified Standard Mix classes with regard to compressive strength.

<table>
<thead>
<tr>
<th>Compressive Strength (%)</th>
<th>Pay factor (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>95 or greater</td>
<td>1.00 (100)</td>
</tr>
<tr>
<td>90 to 94.9</td>
<td>0.95 (95)</td>
</tr>
<tr>
<td>85 to 89.9</td>
<td>0.90 (90)</td>
</tr>
</tbody>
</table>

*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**

<table>
<thead>
<tr>
<th>Surface Resistivity (kΩ-cm)*</th>
<th>Pay factor (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>29 or greater</td>
<td>1 (100)</td>
</tr>
<tr>
<td>25 to 28.9</td>
<td>0.85 (85)</td>
</tr>
<tr>
<td>21 to 24.9</td>
<td>0.75 (75)</td>
</tr>
</tbody>
</table>

*Measured at 56 days

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**

\[
\text{Adj (air)} = (1 - \text{air pay factor}) \times \text{Index Price} \times \text{lot size (c.y. or l.f.)}
\]

\[
\text{Adj (strength)} = (1 - \text{strength pay factor}) \times \text{Index Price} \times \text{lot size (c.y. or l.f.)}
\]

\[
\text{Adj (permeability)} = (1 - \text{permeability pay factor}) \times \text{Index Price} \times \text{lot size (c.y. or l.f.)}
\]

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**

\[
\text{Adj (air)} = (1 - \text{air pay factor}) \times \$200/\text{c.f.} \times \text{lot size (c.f.)}
\]

\[
\text{Adj (strength)} = (1 - \text{strength pay factor}) \times \$200/\text{c.f.} \times \text{lot size (c.f.)}
\]

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.

<table>
<thead>
<tr>
<th>Pay Item</th>
<th>Pay Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Footing Concrete</td>
<td>c.y.</td>
</tr>
<tr>
<td>Footing Concrete (Mass)</td>
<td>c.y.</td>
</tr>
<tr>
<td>Abutment and Wall Concrete</td>
<td>c.y.</td>
</tr>
<tr>
<td>Abutment and Wall Concrete (Mass)</td>
<td>c.y.</td>
</tr>
<tr>
<td>Column and Cap Concrete</td>
<td>c.y.</td>
</tr>
<tr>
<td>Column and Cap Concrete (Mass)</td>
<td>c.y.</td>
</tr>
<tr>
<td>Bridge Deck Concrete</td>
<td>c.y.</td>
</tr>
<tr>
<td>Bridge Deck Concrete (SIP Forms)</td>
<td>c.y.</td>
</tr>
<tr>
<td>Parapet Concrete</td>
<td>l.f.</td>
</tr>
<tr>
<td>Bridge Sidewalk Concrete</td>
<td>c.y.</td>
</tr>
<tr>
<td>Approach Slab Concrete</td>
<td>c.y.</td>
</tr>
<tr>
<td>Barrier Wall Concrete</td>
<td>c.y.</td>
</tr>
<tr>
<td>Underwater Concrete</td>
<td>c.y.</td>
</tr>
<tr>
<td>Surface Repair Concrete</td>
<td>c.f.</td>
</tr>
<tr>
<td>Structural Repair Concrete</td>
<td>c.f.</td>
</tr>
<tr>
<td>Class PCCXXXXYZ Concrete</td>
<td>c.y.</td>
</tr>
<tr>
<td>(Thickness and Type) Joint Filler for Bridges</td>
<td>s.f.</td>
</tr>
<tr>
<td>(Thickness) Closed Cell Elastomer</td>
<td>c.i.</td>
</tr>
</tbody>
</table>
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*

<table>
<thead>
<tr>
<th>Bolt Diameter (Inches)</th>
<th>ASTM F3125 Grade A325</th>
<th>ASTM F3125 Grade A490</th>
</tr>
</thead>
<tbody>
<tr>
<td>5/8</td>
<td>19</td>
<td>24</td>
</tr>
<tr>
<td>3/4</td>
<td>28</td>
<td>35</td>
</tr>
<tr>
<td>7/8</td>
<td>39</td>
<td>49</td>
</tr>
<tr>
<td>1</td>
<td>51</td>
<td>64</td>
</tr>
<tr>
<td>1 1/8</td>
<td>64</td>
<td>80</td>
</tr>
<tr>
<td>1 1/4</td>
<td>81</td>
<td>102</td>
</tr>
<tr>
<td>1 3/8</td>
<td>97</td>
<td>121</td>
</tr>
<tr>
<td>1 1/2</td>
<td>118</td>
<td>148</td>
</tr>
</tbody>
</table>

*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:

<table>
<thead>
<tr>
<th>Internal Pipe Diameter</th>
<th>Required Bedding Material Backfill</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 48 inches*</td>
<td>25% of total height of the pipe</td>
</tr>
<tr>
<td>≥ 48 inches*</td>
<td>12 inches above the top of the pipe</td>
</tr>
</tbody>
</table>

*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," "Relaid 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).

<table>
<thead>
<tr>
<th>Pay Item</th>
<th>Pay Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Size and Type) Pipe (Thickness) – 0' to 10' Deep</td>
<td>1.f.</td>
</tr>
<tr>
<td>(Size and Type) Pipe (Thickness) – 0' to 20' Deep</td>
<td>1.f.</td>
</tr>
<tr>
<td>(Size and Type) Pipe Arch (Thickness) – 0' to 10' Deep</td>
<td>1.f.</td>
</tr>
<tr>
<td>(Size and Type) Pipe Arch (Thickness) – 0' to 20' Deep</td>
<td>1.f.</td>
</tr>
<tr>
<td>Relaid (Size and Type) Pipe – 0' to 10' Deep</td>
<td>1.f.</td>
</tr>
<tr>
<td>Relaid (Size and Type) Pipe – 0' to 20' Deep</td>
<td>1.f.</td>
</tr>
<tr>
<td>(Size and Type) Relaid Pipe Arch – 0' to 10' Deep</td>
<td>1.f.</td>
</tr>
<tr>
<td>(Size and Type) Relaid Pipe Arch – 0' to 20' Deep</td>
<td>1.f.</td>
</tr>
<tr>
<td>(Size) Reinforced Concrete Drainage Pipe End</td>
<td>ea.</td>
</tr>
<tr>
<td>(Size) Metal Drainage Pipe End</td>
<td>ea.</td>
</tr>
<tr>
<td>(Size and Type) Corrugated Metal Pipe Elbow</td>
<td>1.f.</td>
</tr>
<tr>
<td>Concrete Pipe Connection</td>
<td>ea.</td>
</tr>
<tr>
<td>Remove Existing Pipe – 0' to 10' Deep</td>
<td>1.f.</td>
</tr>
<tr>
<td>Remove Existing Pipe – 0' to 20' Deep</td>
<td>1.f.</td>
</tr>
</tbody>
</table>
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

<table>
<thead>
<tr>
<th>Class</th>
<th>Max. Water/Cement</th>
<th>Min. Cement Content - lb./c.y.</th>
<th>Air Content %</th>
<th>Electrical Resistivity (Permeability) kΩ-cm AASHTO T 358</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCC0223Z</td>
<td>0.69</td>
<td>455</td>
<td></td>
<td>NA</td>
</tr>
<tr>
<td>PCC0334Z</td>
<td>0.48</td>
<td>615</td>
<td></td>
<td>NA</td>
</tr>
<tr>
<td>PCC0336Z</td>
<td>0.50</td>
<td>564</td>
<td></td>
<td>NA</td>
</tr>
<tr>
<td>PCC0354Z</td>
<td>0.49</td>
<td>615</td>
<td></td>
<td>NA</td>
</tr>
<tr>
<td>PCC0446Z</td>
<td>0.44</td>
<td>658</td>
<td>6 +/- 1.5</td>
<td>29 minimum</td>
</tr>
<tr>
<td>PCC04462</td>
<td>0.42</td>
<td></td>
<td></td>
<td>29 minimum</td>
</tr>
<tr>
<td>PCC0556Z</td>
<td>0.40</td>
<td></td>
<td></td>
<td>15 maximum</td>
</tr>
<tr>
<td>PCC05562</td>
<td>0.40</td>
<td></td>
<td></td>
<td>29 minimum</td>
</tr>
<tr>
<td>PCCXXX81³</td>
<td>0.46</td>
<td>7.5 +/- 1.5</td>
<td></td>
<td>29 minimum</td>
</tr>
<tr>
<td>PCCXXX82</td>
<td>0.40</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1 PCCXXXYZ 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)

2 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.

3 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

<table>
<thead>
<tr>
<th>Exposure</th>
<th>Application</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Benign</td>
</tr>
<tr>
<td>1</td>
<td>Moderate</td>
</tr>
<tr>
<td>2</td>
<td>Severe</td>
</tr>
</tbody>
</table>

Elements not exposed to weather (buried, enclosed)

Elements not in contact with salt water or deicing chemicals

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
SECTION M.03

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 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:

<table>
<thead>
<tr>
<th>CRCG Grading Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sieve Size</td>
</tr>
<tr>
<td>------------</td>
</tr>
<tr>
<td>3/8 inch</td>
</tr>
<tr>
<td>No. 4</td>
</tr>
<tr>
<td>No. 200</td>
</tr>
</tbody>
</table>

   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.

<table>
<thead>
<tr>
<th>Type of silo cylinder</th>
<th>Maximum storage time for all classes (hr)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>HMA</td>
</tr>
<tr>
<td>Open Surge</td>
<td>4</td>
</tr>
<tr>
<td>Unheated - Non-insulated</td>
<td>8</td>
</tr>
<tr>
<td>Unheated - Insulated</td>
<td>18</td>
</tr>
<tr>
<td>Heated - No inert gas</td>
<td>TBD by the Engineer</td>
</tr>
</tbody>
</table>

*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:

<table>
<thead>
<tr>
<th>Each Aggregate Component</th>
<th>±1.5% of individual or cumulative target weight for each bin</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mineral Filler</td>
<td>±0.5% of the total batch</td>
</tr>
<tr>
<td>Bituminous Material</td>
<td>±0.1% of the total batch</td>
</tr>
<tr>
<td>Zero Return (Aggregate)</td>
<td>±0.5% of the total batch</td>
</tr>
<tr>
<td>Zero Return (Bituminous Material)</td>
<td>±0.1% of the total batch</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Mix</th>
<th>Curb Mix</th>
<th>Production Tolerances from JMF Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grade of PG</td>
<td>PG 64S-22</td>
<td>0.4</td>
</tr>
<tr>
<td>Binder content %</td>
<td>6.5 - 9.0</td>
<td></td>
</tr>
<tr>
<td>Sieve Size</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No. 200</td>
<td>3.0 - 8.0 (b)</td>
<td>2.0</td>
</tr>
<tr>
<td>No. 50</td>
<td>10 - 30</td>
<td></td>
</tr>
<tr>
<td>No. 30</td>
<td>20 - 40</td>
<td></td>
</tr>
<tr>
<td>No. 8</td>
<td>40 - 70</td>
<td></td>
</tr>
<tr>
<td>No. 4</td>
<td>65 - 87</td>
<td></td>
</tr>
<tr>
<td>1/4 inch</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3/8 inch</td>
<td>95 - 100</td>
<td></td>
</tr>
<tr>
<td>1/2 inch</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>3/4 inch</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 inch</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 inch</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Additionally, the fraction of material retained between any 2 consecutive sieves shall not be less than 4%.

### Mixture Temperature

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Binder</td>
<td>325°F maximum</td>
</tr>
<tr>
<td>Aggregate</td>
<td>280-350°F</td>
</tr>
<tr>
<td>Mixtures</td>
<td>265-325°F</td>
</tr>
</tbody>
</table>

### Mixture Properties

<table>
<thead>
<tr>
<th>Air Voids (VA) %</th>
<th>0 – 4.0 (a)</th>
</tr>
</thead>
</table>

**Notes:**
(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

<table>
<thead>
<tr>
<th>Sieve</th>
<th>S0.25</th>
<th>S0.375</th>
<th>S0.5</th>
<th>S1</th>
</tr>
</thead>
<tbody>
<tr>
<td>inches</td>
<td>Min (%)</td>
<td>Max (%)</td>
<td>Min (%)</td>
<td>Max (%)</td>
</tr>
<tr>
<td>2.0</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>1.5</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>1.0</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>3/4</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>1/2</td>
<td>100</td>
<td>-</td>
<td>100</td>
<td>-</td>
</tr>
<tr>
<td>3/8</td>
<td>97</td>
<td>100</td>
<td>90</td>
<td>100</td>
</tr>
<tr>
<td>No. 4</td>
<td>72</td>
<td>90</td>
<td>-</td>
<td>72</td>
</tr>
<tr>
<td>No. 8</td>
<td>32</td>
<td>67</td>
<td>32</td>
<td>67</td>
</tr>
<tr>
<td>No. 16</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>No. 30</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>No. 50</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>No. 100</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>No. 200</td>
<td>2.0</td>
<td>10.0</td>
<td>2.0</td>
<td>10.0</td>
</tr>
<tr>
<td>VMA (%)</td>
<td>16.5 ± 1</td>
<td>16.0 ± 1</td>
<td>15.0 ± 1</td>
<td>13.0 ± 1</td>
</tr>
<tr>
<td>VA (%)</td>
<td>4.0 ± 1</td>
<td>4.0 ± 1</td>
<td>4.0 ± 1</td>
<td>4.0 ± 1</td>
</tr>
<tr>
<td>Gse</td>
<td>JMF value</td>
<td>JMF value</td>
<td>JMF value</td>
<td>JMF value</td>
</tr>
<tr>
<td>Gmm</td>
<td>JMF ± 0.030</td>
<td>JMF ± 0.030</td>
<td>JMF ± 0.030</td>
<td>JMF ± 0.030</td>
</tr>
<tr>
<td>Dust / effective binder</td>
<td>0.6 - 1.2</td>
<td>0.6 - 1.2</td>
<td>0.6 - 1.2</td>
<td>0.6 - 1.2</td>
</tr>
<tr>
<td>TSR</td>
<td>≥ 80%</td>
<td>≥ 80%</td>
<td>≥ 80%</td>
<td>≥ 80%</td>
</tr>
<tr>
<td>T-283 Stripping</td>
<td>Minimal as determined by the Engineer</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(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\text{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 Producers 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 \(P_b\) 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

<table>
<thead>
<tr>
<th>Traffic Level</th>
<th>Design ESALs (80kN) Millions</th>
<th>Coarse Aggregate Angularity(^{(1)}) ASTM D5821, Minimum %</th>
<th>Fine Aggregate Angularity AASHTO T 304, Method A Minimum %</th>
<th>Flat and Elongated Particles(^{(2)}) ASTM D4791, Maximum %</th>
<th>Sand Equivalent AASHTO T 176, Minimum %</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>&lt; 0.3</td>
<td>55/- -</td>
<td>40</td>
<td>10</td>
<td>40</td>
</tr>
<tr>
<td>2</td>
<td>0.3 to &lt; 3.0</td>
<td>75/- -</td>
<td>40</td>
<td>10</td>
<td>40</td>
</tr>
<tr>
<td>3</td>
<td>≥ 3.0</td>
<td>95/90</td>
<td>45</td>
<td>10</td>
<td>45</td>
</tr>
</tbody>
</table>

Notes:
\(^{(1)}\) 95/90 denotes that a minimum of 95% of the coarse aggregate, by mass, shall have one fractured face and that a minimum of 90% shall have two fractured faces.
\(^{(2)}\) Criteria presented as maximum Percent by mass of flat and elongated particles of materials retained on the No. 4 sieve, determined at 5:1 ratio.

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

<table>
<thead>
<tr>
<th>Traffic Level</th>
<th>Design ESALs (million)</th>
<th>Number of Gyration by Superpave Gyratory Compactor</th>
<th>Percent Density of Gmm from HMA/WMA Specimen</th>
<th>Voids Filled with Asphalt (VFA) Based on Nominal Mix Size - Inch</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N(<em>{\text{ini}}) N(</em>{\text{des}}) N(_{\text{max}})</td>
<td>N(<em>{\text{ini}}) N(</em>{\text{des}}) N(_{\text{max}})</td>
<td>N(<em>{\text{ini}}) N(</em>{\text{des}}) N(_{\text{max}})</td>
<td>0.25 0.375 0.5 1</td>
</tr>
<tr>
<td>1</td>
<td>&lt;0.3 6 50 75</td>
<td>≤91.5 96.0 ≤98.0</td>
<td>70-80 70-80 70-80</td>
<td>67-80 67-80 67-80</td>
</tr>
<tr>
<td>2</td>
<td>0.3 to &lt;3.0 7 75 115</td>
<td>≤90.5 96.0 ≤98.0</td>
<td>65-78 65-78 65-78</td>
<td>65-78 65-78 65-78</td>
</tr>
<tr>
<td>3</td>
<td>≥3.0 7 75 115</td>
<td>≤90.0 96.0 ≤98.0</td>
<td>65-77 65-76 65-75</td>
<td>65-75 65-75 65-75</td>
</tr>
</tbody>
</table>
### TABLE M.04.02-5:
Superpave Minimum Binder Content by Mix Type and Level

<table>
<thead>
<tr>
<th>Mix Type</th>
<th>Level</th>
<th>Binder Content Minimum</th>
</tr>
</thead>
<tbody>
<tr>
<td>S0.25</td>
<td>1</td>
<td>5.80</td>
</tr>
<tr>
<td>S0.25</td>
<td>2</td>
<td>5.70</td>
</tr>
<tr>
<td>S0.25</td>
<td>3</td>
<td>5.70</td>
</tr>
<tr>
<td>S0.375</td>
<td>1</td>
<td>5.70</td>
</tr>
<tr>
<td>S0.375</td>
<td>2</td>
<td>5.60</td>
</tr>
<tr>
<td>S0.375</td>
<td>3</td>
<td>5.60</td>
</tr>
<tr>
<td>S0.5</td>
<td>1</td>
<td>5.10</td>
</tr>
<tr>
<td>S0.5</td>
<td>2</td>
<td>5.00</td>
</tr>
<tr>
<td>S0.5</td>
<td>3</td>
<td>5.00</td>
</tr>
<tr>
<td>S1</td>
<td>1</td>
<td>4.60</td>
</tr>
<tr>
<td>S1</td>
<td>2</td>
<td>4.50</td>
</tr>
<tr>
<td>S1</td>
<td>3</td>
<td>4.50</td>
</tr>
</tbody>
</table>

#### 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 sublot 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 Department’s 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

<table>
<thead>
<tr>
<th>Protocol</th>
<th>Reference</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>AASHTO T 30(M)</td>
<td>Mechanical Analysis of Extracted Aggregate</td>
</tr>
<tr>
<td>2</td>
<td>AASHTO T 168</td>
<td>Sampling of Bituminous Concrete</td>
</tr>
<tr>
<td>3</td>
<td>AASHTO T 308</td>
<td>Binder Content by Ignition Oven Method (adjusted for aggregate correction factor)</td>
</tr>
<tr>
<td>4</td>
<td>AASHTO T 209(M)(2)</td>
<td>Theoretical Maximum Specific Gravity and Density of Bituminous Paving Mixtures</td>
</tr>
<tr>
<td>5</td>
<td>AASHTO T 312(2)</td>
<td>Superpave Gyratory Molds Compacted to N_{des}</td>
</tr>
<tr>
<td>6</td>
<td>AASHTO T 329</td>
<td>Moisture Content of Hot-Mix Asphalt (HMA) by Oven Method</td>
</tr>
</tbody>
</table>

**Notes:**

1. One (1) set equals 2 each of 6-inch molds. Molds to be compacted to 50 gyrations.
2. 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:
  - cold feed percentages over 5%,
  - target combined gradation over 5%,
  - target binder over 0.15%,
  - 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:**

<table>
<thead>
<tr>
<th>Daily Quantity Produced in Tons (Lot)</th>
<th>Number of Sub Lots/Tests</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 125</td>
<td>0, Unless requested by the Engineer</td>
</tr>
<tr>
<td>126 to 500</td>
<td>1</td>
</tr>
<tr>
<td>501 to 1,000</td>
<td>2</td>
</tr>
<tr>
<td>1,001 to 1,500</td>
<td>3</td>
</tr>
<tr>
<td>1,500 or greater</td>
<td>1 per 500 tons or portions thereof</td>
</tr>
</tbody>
</table>
The following test procedures shall be used for acceptance:

### TABLE M.04.03-3: Superpave Acceptance Testing Procedures

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

**Notes:**

1. One (1) set equals 2 each of 6-inch molds. Molds to be compacted to N$_{max}$ for PPTs and to N$_{des}$ for production testing. The first sub lot of the year shall be compacted to N$_{max}$.

2. 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 |

<table>
<thead>
<tr>
<th>Sieve</th>
<th>Control Points</th>
<th>Control Points</th>
<th>Control Points</th>
<th>Control Points</th>
<th>Tolerances</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>S0.25</td>
<td>S0.375</td>
<td>S0.5</td>
<td>S1</td>
<td></td>
</tr>
<tr>
<td>inches</td>
<td>Min (%)</td>
<td>Max (%)</td>
<td>Min (%)</td>
<td>Max (%)</td>
<td>Min (%)</td>
</tr>
<tr>
<td>1.5</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>1.0</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>3/4</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>100</td>
</tr>
<tr>
<td>1/2</td>
<td>100</td>
<td>-</td>
<td>100</td>
<td>-</td>
<td>90</td>
</tr>
<tr>
<td>3/8</td>
<td>97</td>
<td>100</td>
<td>90</td>
<td>100</td>
<td>-</td>
</tr>
<tr>
<td>No. 4</td>
<td>72</td>
<td>90</td>
<td>-</td>
<td>72</td>
<td>-</td>
</tr>
<tr>
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<td>No. 16</td>
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<td>No. 200</td>
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<td>10.0</td>
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<td>10.0</td>
<td>2.0</td>
</tr>
<tr>
<td>Pb</td>
<td>JMF value</td>
<td>JMF value</td>
<td>JMF value</td>
<td>JMF value</td>
<td>0.3(3)</td>
</tr>
<tr>
<td>VMA (%)</td>
<td>16.5</td>
<td>16.0</td>
<td>15.0</td>
<td>13.0</td>
<td>1.0(4)</td>
</tr>
<tr>
<td>VA (%)</td>
<td>4.0</td>
<td>4.0</td>
<td>4.0</td>
<td>4.0</td>
<td>1.0(5)</td>
</tr>
<tr>
<td>Gmm</td>
<td>JMF value</td>
<td>JMF value</td>
<td>JMF value</td>
<td>JMF value</td>
<td>0.030</td>
</tr>
<tr>
<td>Mix Temp. – HMA(6)</td>
<td>265-325°F (1)</td>
<td>265-325°F (1)</td>
<td>265-325°F (1)</td>
<td>265-325°F (1)</td>
<td></td>
</tr>
<tr>
<td>Mix Temp. – PMA(6)</td>
<td>285-335°F (1)</td>
<td>285-335°F (1)</td>
<td>285-335°F (1)</td>
<td>285-335°F (1)</td>
<td></td>
</tr>
<tr>
<td>Prod. TSR</td>
<td>N/A</td>
<td>N/A</td>
<td>≥80%</td>
<td>N/A</td>
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</tr>
<tr>
<td>T-283 Stripping</td>
<td>N/A</td>
<td>N/A</td>
<td>Minimal TBD by the Engineer</td>
<td>N/A</td>
<td></td>
</tr>
</tbody>
</table>

**Notes:**

- (1) 300°F minimum after October 15.
- (2) JMF tolerances shall be defined as the limits for production compliance.
- (3) 0.4 for PWL lots
- (4) 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
- (5) 1.2 for PWL lots
- (6) Also applies to placement
### Table M.04.03-5:
Modifications to Standard AASHTO and ASTM Test Specifications and Procedures

<table>
<thead>
<tr>
<th>AASHTO Standard Method of Test</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>T 30</strong> Section 7.2 through 7.4</td>
<td>Samples are not routinely washed for production testing</td>
</tr>
</tbody>
</table>
| **T 209** Section 7.2 | The average of 2 bowls is used proportionally in order to satisfy minimum mass requirements.  
8.3 Omit Pycnometer method. |
| **T 283** | 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. |

<table>
<thead>
<tr>
<th>AASHTO Standard Recommended Practices</th>
<th>Modification</th>
</tr>
</thead>
</table>
| **R 26** | All laboratory technician(s) responsible for testing PG binders shall be certified or Interim Qualified by NETTCP as a PG Asphalt Binder Lab Technician.  
All laboratories testing binders for the Department are required to be accredited by the AMRL.  
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.  
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.  
All AASHTO M 320 references shall be replaced with AASHTO M 332.  
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. |
SECTION M.06 – METALS

Section M.06 is amended as follows:

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 µm 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."
ON-THE-JOB TRAINING (OJT) WORKFORCE DEVELOPMENT PILOT:

Description

To provide construction industry related job opportunities to minorities, women and economically disadvantaged individuals; and to increase the likelihood of a diverse and inclusive workforce on Connecticut Department of Transportation (ConnDOT) projects.

All contractors (existing and newcomers) will be automatically placed in the Workforce Development Pilot. Standard OJT requirements typically associated with individual projects will no longer be applied at the project level for new projects. Instead, these requirements will be applicable on an annual basis for each contractor performing work on ConnDOT projects.

The OJT Workforce Development Pilot will allow a contractor to train employees on Federal, State and privately funded projects located in Connecticut. However, contractors should give priority to training employees on ConnDOT Federal-Aid funded projects.

Funding

The Department will establish an OJT fund annually from which contractors may bill the Department directly for eligible trainee hours. The funds for payment of trainee hours on federal-aid projects will be allocated from the ½ of 1% provided for OJT funding, and will be based on hours trained, not to exceed a maximum of $25,000.00 per year; per contractor.

Minorities and Women

Developing, training and upgrading of minorities, women and economically disadvantaged individuals toward journeyperson level status is the primary objective of this special training provision. Accordingly, the Contractor shall make every effort to enroll minority, women and economically disadvantaged individuals as trainees to the extent that such persons are available within a reasonable area of recruitment. This training commitment is not intended, and shall not be used, to discriminate against any applicant for training whether a member of a minority group or not.

Assigning Training Goals

The Department, through the OJT Program Coordinator, will assign training goals for a calendar year based on the contractor’s past two year’s activities and the contractor’s anticipated upcoming year’s activity with the Department. At the beginning of each year, all contractors eligible will be contacted by the Department to determine the number of trainees that will be assigned for the upcoming calendar year. At that time, the Contractor shall enter into an agreement with the Department to provide a self-imposed on-the-job training program for the calendar year. This agreement will include a specific number of annual training goals agreed to by both parties. The number of training assignments may range from one (1) to six (6) per
contractor per calendar year. Each January, a summary of the trainees required and the OJT Workforce Development Pilot package will be sent to participating contractors. The number of trainees assigned to each contractor in the summary will increase proportionately not to exceed 6, as shown in the following table. This package will also be provided to contractors as they become newly eligible for the OJT Workforce Development Pilot throughout the remainder of the year. Projects awarded after September 30 will be included in the following year’s Program.

The dollar thresholds for training assignments are as follows:

- $4.5 – 8 million = 1 trainee
- $ 9 – 15 million = 2 trainees
- $16 – 23 million = 3 trainees
- $24 – 30 million = 4 trainees
- $31 – 40 million = 5 trainees
- $41 – and above = 6 trainees

**Training Classifications**

Preference shall be given to providing training in the following skilled work classifications. However, the classifications established are not all-inclusive:

- Equipment Operators
- Laborers
- Carpenters
- Concrete Finishers
- Pipe Layers
- Electricians
- Painters
- Iron / Reinforcing Steel Workers
- Mechanics
- Welders

The Department has on file common training classifications and their respective training requirements; that may be used by the contractors. Contractors shall submit new classifications for specific job functions that their employees are performing. The Department will review and recommend for acceptance the new classifications proposed by contractors, if applicable. New classifications shall meet the following requirements:

Proposed training classifications are reasonable and realistic based on the job skill classification needs, and the number of training hours specified in the training classification is consistent with common practices and provides enough time for the trainee to obtain journeyman level status.

Where feasible, 25% percent of apprentices or trainees in each occupation shall be in their first year of apprenticeship or training. The number of trainees shall be distributed among the work classifications on the basis of the contractor’s needs and the availability of journeymen in the various classifications within a reasonable area of recruitment.

No employee shall be employed as a trainee in any classification in which they have successfully completed a training course leading to journeyman level status or in which they have been employed as a journeyman.
Records and Reports

The Contractor shall maintain enrollment in the program and submit all required reports documenting company compliance under these contract requirements. These documents and any other information shall be submitted to the OJT Program Coordinator as requested.

Upon the trainee’s completion and graduation from the program, the Contractor shall provide each trainee with a certification Certificate showing the type and length of training satisfactorily completed.

Trainee Interviews

In order to determine the continued effectiveness of the OJT Program in Connecticut, the department will periodically conduct personal interviews with current trainees and may survey recent graduates of the program. This enables the OJT Program Coordinator to modify and improve the program as necessary. Trainee interviews are generally conducted at the job site to ensure that the trainees’ work and training is consistent with the approved training program.

Trainee Wages

Contractors shall compensate trainees on a graduating pay scale based upon a percentage of the prevailing minimum journeyman wages (Davis-Bacon Act). Minimum pay shall be as follows:

<table>
<thead>
<tr>
<th>Percentage</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>60 percent</td>
<td>of the journeyman wage for the first half of the training period</td>
</tr>
<tr>
<td>75 percent</td>
<td>of the journeyman wage for the third quarter of the training period</td>
</tr>
<tr>
<td>90 percent</td>
<td>of the journeyman wage for the last quarter of the training period</td>
</tr>
</tbody>
</table>

*In no case, will the trainee be paid less than the prevailing rate for general laborer as shown in the contract wage decision (must be approved by the Department of Labor).*

Achieving or Failing to Meet Training Goals

The Contractor will be credited for each trainee currently enrolled or who becomes enrolled in the approved training program and providing they receive the required training under the specific training program. Trainees will be allowed to be transferred between projects if required by the Contractor’s schedule and workload. The OJT Program Coordinator must be notified of transfers within five (5) days of the transfer or reassignments by e-mail (Phylisha.Coles@ct.gov).

Where a contractor does not or cannot achieve its annual training goal with female or minority trainees, they must produce adequate Good Faith Efforts documentation. Good Faith Efforts are those designed to achieve equal opportunity through positive, aggressive, and continuous result-oriented measures. 23 CFR § 230.409(g) (4). Contractors should request minorities and females from unions when minorities and females are under-represented in the contractor’s workforce.
Whenever a contractor requests ConnDOT approval of someone other than a minority or female, the contractor must submit documented evidence of its Good Faith Efforts to fill that position with a minority or female. When a non-minority male is accepted, a contractor must continue to attempt to meet its remaining annual training goals with females and minorities.

Where a contractor has neither attained its goal nor submitted adequate Good Faith Efforts documentation, ConnDOT will issue a letter of non-compliance. Within thirty (30) days of receiving the letter of non-compliance, the contractor must submit a written Corrective Action Plan (CAP) outlining the steps that it will take to remedy the non-compliance. The CAP must be approved by ConnDOT. Failure to comply with the CAP may result in your firm being found non-responsive for future projects.

**Measurement and Payment**

Optional reimbursement will be made to the contractor for providing the required training under this special provision on ConnDOT Federal-Aid funded projects only.

Contractor will be reimbursed at $0.80 for each hour of training given to an employee in accordance with an approved training or apprenticeship program. This reimbursement will be made even though the Contractor receives additional training program funds from other sources, provided such other source does not specifically prohibit the contractor from receiving other reimbursement.

Reimbursement for training is made annually or upon the trainees completion and not on a monthly basis. No payment shall be made to the Contractor if either the failure to provide the required training, or the failure to hire the trainee as a journeyperson, is caused by the Contractor.

Program reimbursements will be made directly to the prime contractor on an annual basis. To request reimbursement, prime contractors must complete the Voucher for OJT Workforce Development Pilot Hourly Reimbursement for each trainee in the OJT Program. This form is included in the OJT Workforce Development Pilot package and is available on the Department’s web site at:

[www.ct.gov/dot](http://www.ct.gov/dot)

The completed form must be submitted to the Office of Contract Compliance for approval. The form is due on the 15th day of January for each trainee currently enrolled and for hours worked on ConnDOT Federal-Aid funded projects only.
SMALL CONTRACTOR AND SMALL CONTRACTOR MINORITY BUSINESS ENTERPRISES (SET-ASIDE)

March, 2001

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

I. GENERAL

A. The Contractor shall cooperate with the Connecticut Department of Transportation (CONNDOT) in implementing the required contract obligations concerning "Small Contractor" and "Small Contractor Minority Business Enterprise" use on this Contract in accordance with Section 4a-60g of the Connecticut General Statutes as revised. References, throughout this "Special Provision", to "Small Contractors" are also implied references to "Small Contractor Minority Business Enterprises" as both relate to Section IIA of these provisions. The Contractor shall also cooperate with CONNDOT in reviewing the Contractor's activities relating to this provision. This "Special Provision" is in addition to all other equal opportunity employment requirements of this Contract.

B. For the purpose of this "Special Provision", the "Small Contractor(s)" and "Minority Business Enterprise(s)" named to satisfy the set-aside requirement must be certified by the Department of Administrative Services, Business Connections/ Set-Aside Unit [(860) 713-5236 www.das.state.ct.us/busopp.htm] as a "Small Contractor" and "Minority Business Enterprises" as defined by Section 4a-60g Subsections (1) and (3) of the Connecticut General Statutes as revised and is subject to approval by CONNDOT to do the work for which it is nominated pursuant to the criteria stipulated in Section IIC-3.

C. Contractors who allow work which they have designated for "Small Contractor" participation in the pre-award submission required under Section IIC to be performed by other than the approved "Small Contractor" organization and prior to concurrence by CONNDOT, will not be paid for the value of the work performed by organizations other than the "Small Contractor" designated.

D. If the Contractor is unable to achieve the specified contract goals for "Small Contractor" participation, the Contractor shall submit written documentation to CONNDOT's Manager of Construction Operations indicating his/her good faith efforts to satisfy goal requirements. Documentation is to include but not be limited to the following:

GENERAL
1. A detailed statement of the efforts made to select additional subcontract opportunities for work to be performed by each "Small Contractor" in order to increase the likelihood of achieving the stated goal.

2. A detailed statement, including documentation of the efforts made to contact and solicit contracts with each "Small Contractor", including the names, addresses, dates and telephone numbers of each "Small Contractor" contacted, and a description of the information provided to each "Small Contractor" regarding the scope of services and anticipated time schedule of items proposed to be subcontracted and the nature of response from firms contacted.

3. For each "Small Contractor" that placed a subcontract quotation which the Contractor considered not to be acceptable, provide a detailed statement of the reasons for this conclusion.

4. Documents to support contacts made with CONNDOT requesting assistance in satisfying the contract specified or adjusted "Small Contractor" dollar requirements.

5. Document other special efforts undertaken by the Contractor to meet the defined goal.

E. Failure of the Contractor to have at least the specified dollar amount of this contract performed by "Small Contractor" as required in Section IIA of this "Special Provision" will result in the reduction in contract payment to the Contractor by an amount equivalent to that determined by subtracting from the specific dollar amount required in Section IIA, the dollar payments for the work actually performed by each "Small Contractor". The deficiency in "Small Contractor" achievement, will therefore, be deducted from the final contract payment. However, in instances where the Contractor can adequately document or substantiate its good faith efforts made to meet the specified or adjusted dollar amount to the satisfaction of CONNDOT, no reduction in payments will be imposed.

F. All records must be retained for a period of three (3) years following completion of the contract and shall be available at reasonable times and places for inspection by authorized representatives of CONNDOT.

G. Nothing contained herein, is intended to relieve any contractor or subcontractor or material supplier or manufacturer from compliance with all applicable Federal and State legislation or provisions concerning equal employment opportunity, affirmative action, nondiscrimination and related subjects during the term of this Contract.
II. SPECIFIC REQUIREMENTS

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

A. Not less than 13 (%) percent of the final value of this Contract shall be subcontracted to and performed by, and/or supplied by, manufactured by and paid to "Small Contractors" and/or "Small Contractors Minority Business Enterprises".

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

B. The Contractor shall assure that each "Small Contractor" will have an equitable opportunity to compete under this "Special Provision", particularly by arranging solicitations, time for the preparation of Quotes, Scope of Work, and Delivery Schedules so as to facilitate the participation of each "Small Contractor".

C. The Contractor shall provide to CONNDOT's Manager of Contracts within Seven (7) days after the bid opening the following items:

1. An affidavit (Exhibit I) completed by each named "Small Contractor" subcontractor listing a description of the work and indicating the dollar amount of all contract(s) and/or subcontract(s) that have been awarded to him/her for the current State Fiscal Year (July 1 - June 30) does not exceed the Fiscal Year limit of $10,000,000.00.

2. A certification of work to be subcontracted (Exhibit II) signed by both the Contractor and the "Small Contractor" listing the work items and the dollar value of the items that the nominated "Small Contractor" is to perform on the project to achieve the minimum percentage indicated in Section IIA above.

3. A certification of past experience (Exhibit III) indicating the scope of work the nominated "Small Contractor" has performed on all projects, public and private, for the past two (2) years.

4. In instances where a change from the originally approved named "Small Contractor" (see Section IB) is proposed, the Contractor is required to submit, in a reasonable and expeditious manner, a revised submission, comprised of the documentation required in Section IIC, Paragraphs 1, 2 and 3 and Section E together with documentation to substantiate and
justify the change, (i.e., documentation to provide a basis for the change) to CONNDOT's Manager of Construction Operations for its review and approval prior to the implementation of the change. The Contractor must demonstrate that the originally named "Small Contractor" is unable to perform in conformity to specifications, or unwilling to perform, or is in default of its contract, or is overextended on other jobs. The Contractor's ability to negotiate a more advantageous contract with another "Small Contractor" is not a valid basis for change. Documentation shall include a letter of release from the originally named "Small Contractor" indicating the reason(s) for the release.

D. After the Contractor signs the Contract, the Contractor will be required to meet with CONNDOT's Manager of Construction Operations or his/her designee to review the following:

1. What is expected with respect to the "Small Contractor" set aside requirements.

2. Failure to comply with and meet the requirement can and will result in monetary deductions from payment.

3. Each quarter after the start of the "Small Contractor" the Contractor shall submit a report to CONNDOT's Manager of Construction Operations indicating the work done by, and the dollars paid to each "Small Contractor" to date.

4. What is required when a request to sublet to a "Small Contractor" is submitted.

E. The Contractor shall submit to CONNDOT's Manager of Construction Operations all requests for subcontractor approvals on standard forms provided by the Department.

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

In addition, the following documents are to be attached:
(1) A statement explaining any method or arrangement for renting equipment. If rental is from a Contractor, a copy of Rental Agreement must be submitted.

(2) A statement addressing any special arrangements for manpower.

(3) A statement addressing who will purchase material.

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

G. Material Suppliers or Manufacturers

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

1. An executed Affidavit Small Contractor (Set-Aside) Connecticut Department of Transportation Affidavit Supplier or Manufacturer (sample attached), and

2. Substantiation of payments made to the supplier or manufacturer for materials used on the project.

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

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

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

1. Reasonable fees or commissions charged for providing a bona fide service such as professional, technical, consultant or managerial services and assistance in the procurement of essential personnel, facilities, equipment, material or supplies necessary for the performance of the contract provided that the fee or commission is determined by the Department of Transportation to be reasonable and consistent with fees customarily allowed for similar services.
2. The fees charged for delivery of materials and supplies required on a job site (but not the cost of the materials and supplies themselves) when the hauler, trucker, or delivery service is not also the manufacturer of or a regular dealer in the materials and supplies, provided that the fee is determined by the Department of Transportation to be reasonable and not excessive as compared with fees customarily allowed for similar services.

3. The fees or commissions charged for providing any bonds or insurance specifically required for the performance of the Contract, provided that the fee or commission is determined by the Department of Transportation to be reasonable and not excessive as compared with fees customarily allowed for similar services.

III. BROKERING

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

IV. PRE-AWARD WAIVERS:

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

1. Information described in Section ID.

2. For each "Small Contractor" contacted but unavailable, a statement from each "Small Contractor" confirming its unavailability.

Upon receipt of the submission requesting a waiver, the CONNDOT's Manager of Contracts shall submit the documentation to the Director of the Office of Contract Compliance who shall review it for completeness. After completion of the Director of Contract Compliance's review, she/he should write a narrative of his/her findings of the application for a waiver, which is to include his/her recommendation. The Director of Contract Compliance shall submit the written narrative to the Chairperson of the DBE Screening Committee at least five (5) working days before the scheduled meeting. The Contractor shall be invited to attend the meeting and present his/her position. The DBE Screening Committee shall render a decision on the waiver request within five (5)
working days after the meeting. The DBE Screening Committee's decision shall be final. Waiver applications are available from the CONNDOT Manager of Contracts.
SMALL CONTRACTOR**MINORITY BUSINESS ENTERPRISE
(*Delete if not applicable)
SET-ASIDE PROGRAM
(QUALIFICATION AFFIDAVIT)

PROJECT(s) ____________________________________________________________
(INCLUDING TOWN & DESCRIPTION)

STATE OF ________________________________ CONNnecticut _______________________

COUNTY OF ________________________________

________________________________________ NAME OF PARTY SIGNING AFFIDAVIT

________________________________________ DO HEREBY CERTIFY

PERSON FIRM OR ORGANIZATION

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

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<tr>
<th>Col. 1</th>
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<td>TOWN AND PROJECT NUMBER</td>
<td>STATE AGENCY WHICH AWARDED CONTRACT</td>
<td>CONTRACT AMOUNT AWARDED UNDER THIS PROGRAM</td>
<td>AMOUNT OF WORK SUBCONTRACTED FROM OTHER FIRMS UNDER THIS PROGRAM</td>
<td>TOTAL AMOUNT OF ALL WORK UNDER THIS PROGRAM Col. 3 Plus Col. 4</td>
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. TOTALS $ $ $


NAME OF PERSON, FIRM OR ORGANIZATION

(FIRM SEAL)

SIGNATURE & TITLE OF OFFICIAL

SWORN TO AND SUBSCRIBED BEFORE ME BY ____________________________________________

WHO IS PERSONALLY KNOWN TO ME, THIS ________________ DAY OF ___________________, 20________

________________________________________

(NOTARY PUBLIC)

MY COMMISSION EXPIRES ____________________________ SEAL

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

GENERAL
MARCH, 2001

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

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

State Project No. ____________________________________________
Federal Aid Project No. ______________________________________
Description of Project _________________________________________

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

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

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

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

_________________________________________________________
(Signature and Title of Official making the Affidavit)

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

Notary Public (Commissioner of the Superior Court)
My Commission Expires __________________________

Project No. 0105-0215 145 GENERAL
CERTIFICATE OF CORPORATION

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

______________________________                        ______________
(Signature of Person Certifying)                          (Date)

(Corporate Seal)
ITEM # 0210306 A – TURBIDITY CONTROL CURTAINS

Description:

This work consists of furnishing, constructing, installing, maintaining, and ultimately removing a turbidity curtain to minimize the drift of suspended sediment in the river. Construction of the turbidity curtains shall be as indicated and as directed by the Engineer.

Submit the following in accordance with Article 1.05.02 and NOTICE TO CONTRACTOR – CONSTRUCTION CONTRACTOR DIGITAL SUBMISSIONS.

1. Product Data: the manufacturer’s drawings and technical specifications to the Engineer for approval.

Materials:

A. Curtain: The curtain shall be a synthetic material coated with suitable elastomeric or polymeric compound and have a high resistance to weathering, hydrocarbons, fresh and salt water, and temperature extremes. The material shall have a tensile strength of not less than 200 lb (890 N) when measured lengthwise or crosswise. Seams, if required, shall be either vulcanized welded or sewn and shall develop the full strength of the material.

B. Flotation Units: Flotation units shall be flexible, buoyant units contained in a flotation sleeve or collar attached to the turbidity curtain. Buoyancy provided by the flotation units shall be sufficient to support the required width of the turbidity curtain and maintain a freeboard of at least 3" (75 mm) above the water surface level.

C. Load Lines: Load lines shall be fabricated into the top and bottom of the turbidity curtain. The top load line shall consist of woven webbing or vinyl sheathed steel cable and shall have a minimum breaking strength of 10,000 lb (44.6 kN). The bottom loadline shall consist of a 3" (6 mm) galvanized steel chain incorporated into the bottom hem of the turbidity curtain to act as ballast. The load lines shall have suitable devices which develop the full breaking strength for connecting to load lines in adjacent sections.

D. Fasteners: Fasteners shall be either 5/8" (16 mm) long brass or copper staples, or 17 gage (1.37 mm) galvanized or aluminized steel tie wires long enough to securely attach the fabric to the posts.

E. Anchors: Anchors shall be standard marine type boat anchors. The Contractor shall use Danforth type anchors for sandy bottoms, or kedge or mushroom type anchors for mud bottoms. The size, weight, and overall number of the anchors shall be sufficient to hold the turbidity curtain in its intended location. Alternate anchoring methods such as heavy concrete weights, driven pilings, or stakes may be used if approved, prior to use, by the Engineer. Such alternative materials shall be sufficient for holding Turbidity Control Curtains in place.
F. Rope: Rope shall be polypropylene, 5/8" (16 mm) diameter, with a minimum breaking strength of 800 lb (3.6 kN).

**Construction Methods:**

A. General:

1. When assembling and installing a turbidity curtain, the Contractor shall follow the directions of the turbidity curtain manufacturer.
2. Unless otherwise directed by the Engineer, the Contractor shall begin installation at high tide from a shoreline anchorage and work along with the current in a downstream direction.
3. The turbidity curtain shall form a continuous vertical and horizontal barrier to suspended sediment. The bottom of the turbidity curtain shall rest in contact with the bottom of the river for the entire length of the turbidity curtain. The top of the turbidity curtain shall extend above the water surface with at least a 3" (75 mm) freeboard for all stages of water levels.
4. All construction activities which generate any sediment or turbidity into the river shall be contained within the turbidity curtain.

B. Installation of Floating Turbidity Curtain:

1. The turbidity curtain shall be floated into position, attached to the anchor lines, and then unfurled.
2. The Contractor shall securely attach curtain panel ends together using rope lashings. The top lashing shall be securely tied to the anchor line.
3. The Contractor shall place the anchors such that the turbidity curtain remains in the Plan location and none of the flotation devices are pulled under the water surface. If directed by the Engineer, the Contractor shall supply and place additional anchorage.

C. Maintenance of Turbidity Curtain:

1. Throughout the Project construction period, the Contractor shall maintain the turbidity curtain so that no sediment caused by the Project enters the river beyond the turbidity curtain.
2. All turbidity curtain damaged prior to installation, during installation, or during the life of the Contract shall be repaired or replaced to the satisfaction of the Engineer.
D. Removal of Turbidity Curtain:

1. The turbidity curtain shall remain in place until the Project is complete and the turbidity has settled to no more than what existed prior to the start of construction.
2. When directed by the Engineer, the turbidity curtain shall be furled in place, then released from its anchors and towed out of the water. The turbidity curtain and all materials incidental to the construction of the turbidity curtain shall be removed in such a manner as to minimize turbidity to adjacent waters.
3. The turbidity curtain and related components shall become the property of the Contractor and shall be removed from the Project.

Method of Measurement:

The quantity of floating and staked turbidity curtain will be measured, from edge to edge of the turbidity curtain along the support cable, as the actual number of linear feet of turbidity curtain placed and accepted.

Basis of Payment:

The quantity of floating turbidity curtain will be paid for at the Contract unit price per linear foot of curtain. Price and payment will constitute full compensation for furnishing, assembling, installing, maintaining, and removing the turbidity curtain and all materials incidental to the construction and installation of the turbidity curtain, and for all labor, tools, equipment, and incidentals required to complete the work.

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<tr>
<td>Turbidity Control Curtains</td>
<td>L.F.</td>
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ITEM #0406194A – JOINT AND CRACK SEALING OF BITUMINOUS CONCRETE PAVEMENT

Description: This work consists of furnishing and applying hot-applied rubberized asphalt crack sealer to bituminous concrete pavement joints and cracks. It shall be constructed in close conformity with the lines, grades, thicknesses, and typical cross sections shown on the plans or established by the Engineer. Joint and Crack Sealing of Bituminous Concrete Pavement may be used in conjunction with other repair treatments including, but not limited to, joint and crack filling or patching, in which case the sequence of treatments will be provided in the Contract Documents or directed by the Engineer.

For the purposes of this document, the word “crack” includes all longitudinal (along the direction of travel) and transverse (perpendicular to the direction of travel) cracks and joints. All work specified for “crack(s)” herein shall apply to all types of cracks and joints unless otherwise specified.

Materials:

1. Crack Seal: The crack seal material shall be composed of a hot-applied, rubberized asphalt meeting AASHTO M 324 Type II requirements. The crack seal material will also contain a minimum of 10% crumb rubber by weight. The Contractor must submit to the Engineer all Material Safety Data Sheet documents from the material manufacturer prior to the commencement of work. During work progress, the Contractor must submit to the Engineer the manufacturer’s Material Certificate for compliance to AASHTO M 324 Type II requirements for each batch or lot of material utilized on the Contract.

2. Optional Barrier Material – Backer Rod: The backer rod shall be a heat resistant material compatible with the crack sealant and acceptable to the manufacturer of the sealant. No bond or reaction shall occur between the sealant and the rod. It shall be of a non-water absorbent material and shall not melt or shrink when hot sealant is poured on it.

   The backer rod shall have a maximum of 5% absorption when immersed in water for 24 hours with the ends sealed. The backer rod shall be of such a size that compression is required for installation in the crack, so that it maintains its position during the sealing operation. Backer rod shall be dry.

3. Optional Barrier Material – Hot Mix Asphalt (HMA): Any HMA placed in the bottom of a crack between 1.5 and 2 inches wide shall be HMA S0.25 Traffic Level 2 and shall meet all requirements of Section 4.06 - Bituminous Concrete.

The Contractor must submit to the Engineer all Material Safety Data Sheet documents from the material manufacturer(s) prior to the commencement of work. During work progress, the Contractor must submit to the Engineer the manufacturer’s Material Certificate for compliance to applicable specifications for each batch or lot of material utilized on the Contract.
Construction Methods: The crack sealing operation shall proceed in accordance with the requirements of the “Maintenance and Protection of Traffic” and “Prosecution and Progress” specifications.

1. Equipment: The equipment used by the Contractor shall include, but not be limited to, the following:

   a. Melter Applicator: The unit shall consist of a boiler kettle equipped with pressure pump, hose, and applicator wand; the boiler kettle may be a combination melter and pressurized applicator of a double-boiler type with space between the inner and outer shells filled with heat transfer oil. Heat transfer oil shall have a flash point of not less than 600°F. The kettle shall include a temperature control indicator. The kettle shall be capable of maintaining the crack seal material at the manufacturer’s specified application temperature range. The kettle shall include an insulated applicator hose and application wand. The hose shall be equipped with a shutoff control. The kettle shall include a mechanical full sweep agitator to provide continuous blending. The unit shall be equipped with thermometers to monitor the material temperature and the heating oil temperature. The unit shall be equipped with thermostatic controls that allow the operator to regulate material temperature up to at least 425°F.

   b. Application Wand and Squeegee Applicator: The material shall be applied with a wand followed by a squeegee applicator. The squeegee applicator shall be of commercial/industrial quality designed with a “U” shaped configuration. It shall be of a size adequate to strike off, flush with the surrounding pavement surface and without overflow around the sides, all crack seal material placed. This tool shall be either attached to the applicator wand or used separately as its own long handled tool.

   c. Hot Air Lance: The unit shall be designed for cleaning and drying the pavement surface cracks. Minimum compressed air capacity shall be 100 psi. The compressed air emitted from the tip of the lance shall be capable of achieving a temperature of at least 1500°F.

   d. Vertically Mounted Power Driven Wire Brush: This tool shall be used to remove any dirt, debris, or vegetation to the depths specified that cannot be removed by the hot air lance. It shall be of adequate size and power to remove all material from cracks as specified.

2. Weather Requirements: Work shall not be performed unless the pavement is dry. No frost, snow, ice, or standing water may be present on the roadway surface or within the cracks. The ambient temperature must be 40°F and rising during the field application operations for work to proceed.
3. **Material Mixing Procedure:** The prepackaged material shall be added to the melter applicator in the presence of the Engineer. It shall then be mixed and heated to the recommended application temperature. The crack seal material shall never exceed 400°F.

4. **Determination of Cracks to be Sealed:** The width and depth requirements for cracks to be sealed are as follows:

   All crack width determinations shall be made by measuring the crack width flush at the surface of the pavement prior to being sealed. A straightedge shall be used whenever necessary to establish the location or limits of the flush surface of the pavement.

   All cracks from \( \frac{1}{8} \) inch up to 1.5 inches wide shall be prepared and sealed as stated below. Cracks that are between \( \frac{1}{8} \) inch and 1.5 inches wide, but eventually taper in width below the minimum \( \frac{1}{8} \) inch, shall also be prepared and sealed as stated below. Only cracks that are less than \( \frac{1}{8} \) inch wide throughout their entire length shall be excluded.

   Transverse cracks, where a portion of the crack (50% or less) exceeds a width of 1.5 inches, up to 2 inches, shall also be prepared and sealed as stated below.

   All joints to be sealed that are raveled (loss of the pavement surface material) shall be at least ½ inch in depth at the joint’s deepest point. The minimum width of a raveled joint must be ½ inch. The maximum width of a raveled joint to be sealed is 3 inches.

   Any cracks exceeding the width and depth requirements specified above shall be repaired using separate items.

5. **Crack Preparation:** Cracks to be sealed shall be treated with a hot air lance prior to application of the crack seal material. Two (2) passes minimum shall be made with the hot air lance. The hot air lance operation shall proceed at a rate no greater than 120 feet per minute. There shall be no more than 10 minutes between the second hot air lance treatment and the material application.

   The use of the hot air lance is not intended to heat the crack. It is to be used to blow all debris from the crack to the depths specified below and to remove any latent moisture from the crack until the inside of the crack is completely dry as determined by the Engineer. “Moisture” does not include standing water. The hot air lance is not to be used to boil off or blow standing water from the bottom of a crack. If standing water is present in the bottom of any crack, the sealing operation shall be postponed until such time that the standing water evaporates naturally. The Contractor may use compressed, oil-free air (not heated) to blow standing water from a crack to help accelerate the natural evaporation process. If standing water remains after using compressed air, the crack shall be allowed to dry naturally until remaining standing water evaporates. The hot air lance shall be used after visible water has evaporated. If a crack is already completely dry as determined by the Engineer, the hot air lance shall be operated at its lowest temperature possible.
The hot air lance is to be used to blow all debris from cracks (not including raveled joints) to a depth of at least ¾ inch for cracks between ¼ inch and ¾ inch wide, and to a depth of 1.25 inches for cracks between ¾ inch and 2 inches wide. The hot air lance shall be used to blow all debris from raveled joints to a depth of 1 inch or the full depth of the joint, whichever is smaller.

In the event that cracks are packed tightly with debris, dirt, vegetation, or other material, except previously placed sealant or filler, the Contractor shall use a vertically mounted power driven wire brush to remove all material and burnish the sides of the crack to the depths specified above. Cracks treated with the power driven wire brush shall subsequently be treated with a hot air lance as described in this section. The use of both the power driven wire brush and the hot air lance shall result in the complete removal of all material in the crack (except previously placed sealant or filler) to the depths specified above such that the sides of the crack are completely free and clean of any debris and moisture.

In the event that cracks have depths greater than 2 inches below the pavement surface, the Contractor may place a barrier composed of backer rod as specified herein. The backer rod shall be placed in a manner leaving 1.25 inches below the elevation of the pavement surface for crack seal material. Use of backer rod will not be allowed for cracks wider than 1.5 inches or less than ½ inch wide. For cracks between 1.5 and 2 inches wide, HMA S0.25 Traffic Level 2 may be placed in the bottom of the prepared crack. HMA shall be placed and compacted with a steel T-bar approved by the Engineer in a manner leaving 1.25 inches below the elevation of the pavement surface for crack seal material.

6. Crack Sealing: As soon as cracks have been prepared, they shall be filled to refusal along their entire length with the crack sealant material. The treatment material shall be maintained at the manufacturer’s specified/recommended application temperature range at all times. The sealing operation shall be suspended if the temperature of the crack seal material falls outside the specified temperature range and shall remain suspended until the crack seal material is brought within the specified temperature range. Sealed cracks are to be squeegeed immediately following application of the crack seal material, striking excess sealer flat to the adjacent pavement surface. There shall be no build-up of treatment material above or adjacent to the crack at any time. If the initial application of crack sealant material fails to fill the crack or shrinks upon cooling such that there is a depression formed of at least ¼ inch or greater, a second application of sealant shall be placed over the first application.

7. Protection of Sealed Cracks: Traffic shall not be permitted on the pavement until the crack seal material is set so that the material does not track and is not deformed or pulled out by tires. If the work under this item is being performed prior to placing a hot mix overlay or other surface treatment, a detackifier or blotting agent will not be allowed. If work under this item is not followed by placement of an overlay of any kind, a detackifier or blotting agent may be used. If a detackifier or blotting agent is used, it shall be one recommended by the supplier of the crack seal material and shall be used as recommended by the supplier, except that no paper, cotton, or other organic materials shall be allowed. Information on the type and
usage of a detackifier or blotting agent shall be presented to the Engineer for their written acceptance prior to use.

8. **Removal and Disposal of Material:** All debris generated from the operations described above shall be removed from the roadway by the Contractor.

   Treatment material remaining in the Contractor’s kettle at the close of the daily work session shall be discarded. At no time shall treatment material be re-heated for use in subsequent crack sealing applications unless permitted by the Engineer following a review of specific circumstances.

   All debris and surplus treatment material shall be properly disposed in accordance with Article 1.10.03 and State of Connecticut law.

9. **Acceptance of Work:** When work is complete, an inspection shall be scheduled with the Engineer. The Engineer will note all deficiencies including, but not limited to, areas exhibiting adhesion failure, cohesion failure, tracking of sealant material, and missed cracks. Work identified by the Engineer as not acceptable shall be repaired at the Contractor’s expense. The Contractor shall notify the Engineer upon completion of any corrective work performed.

**Method of Measurement:** This work will be measured by the total number of linear feet of cracks sealed as indicated in the Contract plans and as measured, verified, and accepted by the Engineer.

**Basis of Payment:** This work will be paid for at the Contract unit price per linear foot for “Joint and Crack Sealing of Bituminous Concrete Pavement” complete and accepted in place. The price shall include all submittals, materials, equipment, tools, and labor incidental thereto. No payment will be made to the Contractor prior to submittal of required documents.

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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 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.
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.

<table>
<thead>
<tr>
<th>Pay Item</th>
<th>Pay Unit</th>
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<tr>
<td>Fine Milling of Bituminous Concrete (0 to 4 Inches)</td>
<td>S.Y.</td>
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ITEM #0406999A – ASPHALT ADJUSTMENT COST

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

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

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

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

I. For HMA and PMA mixtures:
   a. The HMA or PMA mixture for which the adjustment would be applied is listed as a Contract item with a pay unit of tons.
   b. The total quantity for all HMA and PMA mixtures in the Contract or individual purchase order (Department of Administrative Service contract awards) exceeds 1000 tons or the Project duration is greater than 6 months.
   c. The difference between the posted Asphalt Base Price and Asphalt Period Price varies by more than $5.00 per ton.

II. For Ultra-Thin Bonded HMA mixtures:
   a. The Ultra-Thin Bonded HMA mixture for which the adjustment would be applied is listed as a Contract item.
   b. The total quantity for Ultra-Thin Bonded HMA mixture in the Contract exceeds:
      i. 800 tons if the Ultra-Thin Bonded HMA item has a pay unit of tons.
      ii. 30,000 square yards if the Ultra-Thin Bonded HMA item has a pay unit of square yards.
   Note: The quantity of Ultra-Thin Bonded HMA measured in tons shall be determined from the material documentation requirements set forth in the Ultra-Thin Bonded HMA item Special Provision.
   c. The difference between the posted Asphalt Base Price and Asphalt Period Price varies by more than $5.00 per ton.
   d. No Asphalt Adjustment Cost will be applied to the liquid emulsion that is specified as part of the Ultra-Thin Bonded HMA mixture system.

III. Regardless of the binder used in all HMA or PMA mixtures, the Asphalt Adjustment Cost will be based on PG 64-22.

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

**Method of Measurement:**

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

where

- **HMA:**
  1. For HMA, PMA, and Ultra-Thin Bonded HMA mixtures with pay units of tons:
     The quantity in tons of accepted HMA, PMA, or Ultra-Thin Bonded HMA mixture measured and accepted for payment.
  2. For Ultra-Thin Bonded HMA mixtures with pay units of square yards:
     The quantity of Ultra-Thin Bonded HMA mixture delivered, placed, and accepted for payment, calculated in tons as documented according to the Material Documentation provision (Construction Methods, paragraph G) of the Ultra-Thin Bonded HMA Special Provision.

- **Asphalt Base Price:** The asphalt price posted on the CTDOT website 28 days before the actual bid opening posted.

- **Asphalt Period Price:** The asphalt price posted on the CTDOT website during the period the HMA or PMA mixture was placed.

- **PG%:** Performance-Graded Binder percentage
  1. For HMA or PMA mixes:
     - PG% = 4.5 for HMA S1 and PMA S1
     - PG% = 5.0 for HMA S0.5 and PMA S0.5
     - PG% = 6.0 for HMA S0.375, PMA S0.375, HMA S0.25 and PMA S0.25
  2. For Ultra-Thin Bonded HMA mixes:
     PG% = Design % PGB (Performance Graded Binder) in the approved job mix formula, expressed as a percentage to the tenth place (e.g. 5.1%)

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

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

The sum of money shown on the Estimate and in the itemized proposal as "Estimated Cost" for this item will be considered the bid price although the adjustment will be made as described above. The estimated cost figure is not to be altered in any manner by the bidder. If the bidder should alter the amount shown, the altered figure will be disregarded and the original cost figure will be used to determine the amount of the bid for the Contract.
ITEM #0514204A – PRESTRESSED DECK UNITS (3’-0” X 1’-9”)

Work under these items shall conform to the requirements of Section 5.14 amended as follows:

Article 5.14.01—Description: Add the following:

All prestressed deck units shall be cast and approved prior to initiation of the Route 154 detour.

Article 5.14.03—Construction Methods: 1. Shop Drawings: Add the following:

Prior to fabrication, the Contractor shall submit working drawings and supporting computations for the embedded lifting and seating devices required for the handling and installation of the prestressed deck units to the Engineer for review in accordance with 1.05.02. The working drawings for the lifting hooks shall include complete details and substantiating calculations including any manufacturer’s data. Prior to applying load to the embedded devices, the concrete shall attain the minimum concrete compressive strength associated with the safe working load of the device.

Prior to installation of the prestressed deck units, the Contractor shall submit working drawings and supporting computations for the lifting and placement of the prestressed deck units, to the Engineer for review in accordance with 1.05.02. Cranes shall be operated in accordance with the Connecticut Department of Public Safety regulations. The Contractor shall be responsible for verifying the weight of each lift. The working drawing submittal shall include, but not be limited to the following:

- Plan of the work area showing all structures, roads, railroad tracks, Federal and State regulated areas as depicted on the plans, overhead and subsurface utilities, property lines, or any other information relative to erection. No picks shall be allowed over vehicular, pedestrian, railway or vessel traffic.
- A detailed narrative describing the lifting and installation sequence.
- Manufacturer’s data sheet for the crane(s) including the load/capacity chart. The capacity of the crane shall be adequate for the total lift/pick load including rigging, spreaders and other materials. In the area of railroads and navigable waterways, the capacity shall be as required by the regulatory authorities.
- Manufacturer’s data sheets and product data sheets for all rigging (slings, spreader bars, blocks, etc.), lifting devices, and other connecting equipment and hardware listing the number, type, size, arrangement and capacity of each.
- Location of each crane for each pick.
- Crane support measures, including any support beneath the outriggers such as bearing pads, crane mats, planking or special decking, or other means to transfer the crane’s total weight (including the lifted load) into the earth or structure beneath it.
- Delivery location of each component.
- Boom length and the lift and setting radius for each pick (or maximum lift radius).
- Pick point location(s) on each component.
- Lifting weight of each component including rigging (clamps, spreader beams, etc.)
ITEM #0514228A – PRESTRESSED DECK UNITS (4’-0” X 1’-9”)

Work under these items shall conform to the requirements of Section 5.14 amended as follows:

**Article 5.14.01—Description:** Add the following:

All prestressed deck units shall be cast and approved prior to initiation of the Route 154 detour.

**Article 5.14.03—Construction Methods: 1. Shop Drawings:** Add the following:

Prior to fabrication, the Contractor shall submit working drawings and supporting computations for the embedded lifting and seating devices required for the handling and installation of the prestressed deck units to the Engineer for review in accordance with 1.05.02. The working drawings for the lifting hooks shall include complete details and substantiating calculations including any manufacturer’s data. Prior to applying load to the embedded devices, the concrete shall attain the minimum concrete compressive strength associated with the safe working load of the device.

Prior to installation of the prestressed deck units, the Contractor shall submit working drawings and supporting computations for the lifting and placement of the prestressed deck units, to the Engineer for review in accordance with 1.05.02. Cranes shall be operated in accordance with the Connecticut Department of Public Safety regulations. The Contractor shall be responsible for verifying the weight of each lift. The working drawing submittal shall include, but not be limited to the following:

- Plan of the work area showing all structures, roads, railroad tracks, Federal and State regulated areas as depicted on the plans, overhead and subsurface utilities, property lines, or any other information relative to erection. No picks shall be allowed over vehicular, pedestrian, railway or vessel traffic.
- A detailed narrative describing the lifting and installation sequence.
- Manufacturer’s data sheet for the crane(s) including the load/capacity chart. The capacity of the crane shall be adequate for the total lift/pick load including rigging, spreaders and other materials. In the area of railroads and navigable waterways, the capacity shall be as required by the regulatory authorities.
- Manufacturer’s data sheets and product data sheets for all rigging (slings, spreader bars, blocks, etc.), lifting devices, and other connecting equipment and hardware listing the number, type, size, arrangement and capacity of each.
- Location of each crane for each pick.
- Crane support measures, including any support beneath the outriggers such as bearing pads, crane mats, planking or special decking, or other means to transfer the crane’s total weight (including the lifted load) into the earth or structure beneath it.
- Delivery location of each component.
- Boom length and the lift and setting radius for each pick (or maximum lift radius).
- Pick point location(s) on each component.
- Lifting weight of each component including rigging (clamps, spreader beams, etc.)
ITEM #0601276A – PRECAST SUBSTRUCTURE ELEMENTS

Description:

Work under this item shall consist of furnishing, erecting and installing all precast substructure elements (abutment stems and wingwall stems), including all necessary materials and equipment to complete the work as shown on the plans. The use of cast-in-place concrete will not be considered for substitution.

This item shall also include the development of an Assembly Plan for the erection of the precast elements.

All precast abutment elements shall be cast and approved prior to initiation of the Route 154 detour. The Assembly Plan shall be approved prior to the initiation of the Route 154 detour.

Materials:

1. The concrete mix design for all precast elements shall meet the requirements of M.03.02, Class PCC05562, and shall be submitted to the Engineer.

2. The concrete mix design for the cast-in-place elements and components, such as shear keys and voids, shall meet the requirements of M.03.02, Class PCC05562, and shall be submitted to the Engineer.

3. The reinforcement shall be galvanized and shall conform to the requirements of Article M.06.01.

4. Corrugated metal pipe shall conform to the requirements of AASHTO M 36 or AASHTO M 245.

5. All lifting fixtures, keys, threaded inserts, bolts, devices, attachments, and miscellaneous hardware cast into precast concrete component shall be of a design satisfactory for the purpose intended and shall be galvanized in accordance with ASTM A153 or ASTM B695, grade 50, or be stainless steel. All portions of the lifting and seating devices shall be recessed from the finished concrete surface.

6. The dowel bar splicer system shall be galvanized and shall conform to the requirements of Subarticle M.06.02.

7. Non-shrink grout shall meet the requirements of M.03.05 and be suitable for submerged applications.

8. Leveling Methods: Precast elements shall be placed on leveling devices that are adjustable and can support the anticipated loads. Leveling devices shall be designed by the contractor. Flowable grout or controlled low strength material may be used after the
placement on the leveling devices if further leveling of the precast elements deemed necessary. The leveling devices shall be shown on the working drawings.

**Construction Methods:**

1. **Submittals:** All submittals shall include a title sheet with the following:
   - Project number, town and crossing.
   - Bridge number, when shown on the plans.
   - Design code, as applicable.
   - Contact information for fabricator – contact information shall include name and address of the fabricator and the name of contact person with phone number and email address.

(a) **Shop Drawings - Precast Concrete Components:** Prior to fabrication, the Contractor shall submit shop drawings to the Engineer for approval in accordance with the plans, Subarticle 1.05.02-3, and as follows:

   - Submit shop drawings for each precast substructure element.
   - Prepare shop drawings.
   - Show all lifting inserts, dowel bar splicer system, hardware, or devices and locations on the shop drawings for Engineer’s approval.
   - Show locations and details of the lifting devices, including supporting calculations, type, and amount of any additional reinforcing required for lifting. Design all lifting devices based on the no cracking criteria in Chapter 8 of the PCI Design Handbook (seventh edition).
   - Suggest shop drawings be dimensioned from working points or working lines to prevent the cumulation of dimensional tolerances.
   - Show minimum compressive strength attained prior to handling the precast elements.
   - Show details of leveling devices or vertical adjusting hardware.
   - Do not order materials or begin work until receiving final approval of the shop detail drawings.
   - The Department will reject any elements fabricated before receiving written approval, or any elements that deviate from the approved drawings. The Contractor is responsible for costs incurred due to faulty detailing or fabrication.

(b) **Working Drawings - Lifting and Seating Devices:** Prior to fabrication, the Contractor shall submit working drawings and supporting computations for the embedded lifting and seating devices required for the handling and installation of the precast concrete components to the Engineer for review in accordance with 1.05.02. Prior to applying load to the embedded devices, the concrete shall attain the minimum concrete compressive strength associated with the safe working load of the device.
(c) **Working Drawings - Installation of Precast Substructure Elements:** Prior to installation of the precast elements, the Contractor shall submit working drawings and supporting computations for the lifting and placement of the precast concrete components, to the Engineer for review in accordance with 1.05.02. Cranes shall be operated in accordance with the Connecticut Department of Public Safety regulations. The Contractor shall be responsible for verifying the weight of each lift. The working drawing submittal shall include, but not be limited to the following:

- Plan of the work area showing all structures, roads, railroad tracks, Federal and State regulated areas as depicted on the plans, overhead and subsurface utilities, property lines, or any other information relative to erection. No picks shall be allowed over vehicular, pedestrian, railway or vessel traffic.

- A detailed narrative describing the lifting and installation sequence.

- Manufacture’s data sheet for the crane(s) including the load/capacity chart. The capacity of the crane shall be adequate for the total lift/pick load including rigging, spreaders and other materials. In the area of railroads and navigable waterways, the capacity shall be as required by the regulatory authorities.

- Manufacturer’s data sheets and product data sheets for all rigging (slings, spreader bars, blocks, etc.), lifting devices, and other connecting equipment and hardware listing the number, type, size, arrangement and capacity of each.

- Location of each crane for each pick.

- Crane support measures, including any support beneath the outriggers such as bearing pads, crane mats, planking or special decking, or other means to transfer the crane’s total weight (including the lifted load) into the earth or structure beneath it.

- Delivery location of each component.

- Boom length and the lift and setting radius for each pick (or maximum lift radius).

- Pick point location(s) on each component.

- Lifting weight of each component including rigging (clamps, spreader beams, etc.)

(d) **Assembly Plan:** The Assembly Plan is a document prepared by the Contractor and a qualified Engineer with specific knowledge of the Contractors equipment and “means and methods” for constructing the precast elements required to complete the work on this 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 Assembly Plan will be reviewed by both the Engineer of Record and the District Construction personnel similar to a Working Drawing and shall be approved prior to the initiation of road closure. The approved Assembly Plan will serve as the governing specification with respect to progressing with construction prior to necessary material
strengths as stated in Form 817.

The following is the minimum required for the Assembly Plan Submission:

- Include details and/or cut sheets of all equipment that will be employed for the assembly of the substructure.
- Include details of all equipment to be used to lift substructure elements including cranes, excavators, lifting slings, sling hooks, and jacks. Include crane locations, operation radii, and lifting calculations. Factors of safety for all lifting calculations of elements will be 125% of the weight of the element being lifted.
- Follow Chapter 8 of the PCI Design Handbook (seventh edition) for handling, erection, and bracing requirements. 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.
- Include a work area plan, depicting all affected utilities, drainage, and protective measures that will be employed throughout the construction activities.
- Submit full size 22”x34” sheets depicting the assembly procedures for the precast substructure elements.
- Include a detailed schedule with a timeline for all operations. In development of the schedule the Contractor shall account for setting and cure time for void concrete and concrete closure pours.
- Include calculations for the interim stages of construction. These calculations will provide the necessary material strengths required to proceed to the next stage in construction. A minimum factor of safety of 2.0 is required in preparation of the calculations and testing performed by the Contractor will be required before the Contractor is allowed to proceed.
- Include methods of providing temporary support of the elements. Include methods of adjusting and securing the element after placement.
- Include procedures for controlling erection tolerances for both the horizontal and vertical direction. Include details of any alignment jigs including bi-level templates for reinforcing anchor dowels.
- Include methods for forming and curing closure pour concrete and concrete to fill voids.
- Include methods for leveling of precast elements.
- 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.

(e) Product Data – Field Installed Materials: Prior to installation of the precast concrete components, the Contractor shall submit product data for field installed materials, such as flowable grout, controlled low strength material, etc., not addressed in other submissions to the Engineer for review in accordance with 1.05.02.
2. Fabrication and Manufacture: The fabrication and manufacture of the precast elements shall conform to the latest edition of the AASHTO LRFD Bridge Design Specifications, including the latest interim specifications, as supplemented by the following:

2-1. Forms and Forming Material: Forms shall be mortar-tight and sufficiently strong to prevent misalignment of adjacent precast sections. Forms 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 sufficiently strong to avoid possible damage to the concrete. Forms shall not be removed without approval being granted by the Engineer. Damage to the concrete due to early removal of the forms shall be cause for rejection.

All forming materials used for casting cylindrical openings for lifting holes or holes for grouting deformed steel bars shall be removed. All non-plastic material used as forms for casting weepholes shall also be removed.

2-2. Concrete Mix: The Contractor shall design and submit to the Engineer for review a concrete mix that shall attain a minimum 28 day compressive strength, $f'_{c}$, of 5,000 psi.

2-3. Reinforcement Steel: Shall be subject to the provisions of Articles 6.02.03-2 through 6.02.03-8. The welding of reinforcement, unless specifically indicated in the Plans, shall not be permitted.

2-4. Placing Concrete: Concrete shall not be deposited in the forms until the Engineer has verified the presence and proper location of the reinforcing steel, the couplers, and other components, and has given his approval thereof.

Provide the Engineer a tentative casting schedule at least two (2) weeks in advance to make inspection and testing arrangements. A similar notification is required for the shipment precast elements to the job site.

Concrete shall not be deposited into the forms when the ambient temperature is below 40°F or above 100°F, unless adequate heating or cooling procedures are provided and have been previously approved by the Engineer. The concrete temperature shall be within the range of 60°F to 90°F at the time of placement.

Truck-mixed or transit-mixed concrete will not be allowed.

Production during the winter season, from November 15 to March 15 inclusive, will be permitted only in a completely enclosed structure of suitable size and dimension that provides a controlled atmosphere for the protection of both the casting operation and the product.
Outside concreting operations will not be permitted during rainfall unless the operation is completely under cover.

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, forms, or other components. There shall be no interruption in the pouring of any of the members. Concrete shall be carefully placed in the forms and sufficiently vibrated to produce a surface that is free from imperfections such as honeycombing, segregation, cracking, or checking. Any deficiencies noted in the members may be cause for rejection.

2-5. Test Cylinders:

During the casting of the substructure elements, the Contractor shall make test cylinders under the supervision of a representative of the Department. 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 ($f'_c$). The Engineer also reserves the right to request and test core specimens from the sections to determine their adequacy.

2-6. Finishing: All fins, runs, or mortar shall be removed from the concrete surfaces which will remain exposed. Form marks on exposed surfaces shall be smoothed by grinding. All exposed, outside concrete surfaces shall be given a grout clean-down finish in accordance with Subarticle 6.01.03.02.

2-7. Handling and Storage: Care shall be taken during storage, transporting, hoisting and handling of all pieces 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 Department. All storage and handling operations shall be as directed by the Engineer.

The substructure elements shall not be shipped to the job site until the 28 day strength ($f'_c$) has been attained.

2-8. Repairs: The Engineer shall evaluate the acceptability and the cause of the defects and the service condition of the substructure elements. 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 substructure elements are delivered to the job site. The Contractor shall bear the costs of all repair work.

2-9. Working Lines: One common working line shall be used for all transverse and longitudinal measurements.
2-10. Fabrication Tolerances: The length of each precast element measured along its longitudinal axes shall be equal to that shown on the plans plus or minus ¼”. The thickness of each precast element shall be equal to that shown on the plans plus or minus ¼”. The height of each precast element, measured from the bottom to the top of the of the precast elements, shall be equal to that shown on the plans plus or minus ¼”.

2-11. Erection Tolerances: The top of precast substructure element elevation shall be equal to that shown on the plans plus or minus ¼”. The end squareness, dimension “A” in the elevation below, shall not exceed plus or minus ⅛”. Dimension “B”, as shown in the section below, shall not exceed plus or minus ¼” for every 10’ of precast element height.

2-12. Shop-fitting: Adjacent precast substructure element connections shall be dry fit at the casting yard prior to shipment of the precast concrete sections.

3. Quality Assurance:
   1. All precast elements shall be fabricated by a CTDOT approved PCI certified fabricator with a minimum certification of "B1".
   2. Permanently mark each precast element with date of casting and supplier identification. Stamp markings in fresh concrete.
   3. Prevent cracking or damage of precast elements during handling and storage.
   4. Replace defects and breakage of precast elements:
      - Members that sustain damage or surface defects during fabrication, handling, storage, hauling, or erection are subject to review or rejection.
• Obtain approval before performing repairs.
• Repair work must reestablish the elements’ structural integrity, durability, and aesthetics to the satisfaction of the Engineer.
• Determine the cause when damage occurs and take corrective action.
• Failure to take corrective action, leading to similar repetitive damage, can be cause for rejection of the damaged element.
• 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.
• Full depth cracking and breakage greater than one foot are cause for rejection.


The plant will document all test results. The quality control file will contain at least the following information:

a. Element identification.
b. Date and time of cast.
c. Concrete cylinder test results.
d. Quantity of used concrete and the batch printout.
e. Form-stripping date and repairs if applicable.
f. Location/number of blockouts and lifting inserts.
g. Temperature and moisture of curing period.
h. Document lifting device details, requirements, and inserts.

6. The concrete strengths required for various operations shall be indicated on the Assembly Plan. The Contractor shall demonstrate that these minimum strengths have been met through the use of material testing. As such, the Contractor will be required to perform strength testing at the Contractor's own expense, and shall be responsible for taking a sufficient number of concrete cylinders and/or cubes to meet this requirement. The Contractor shall not rely solely on compressive tests conducted by CTDOT, as the CTDOT testing schedule may not be changed to accommodate Contractor’s scheduling requirements for interim testing.

4. Installation: The installation of the precast substructure elements shall be in accordance with the plans and the following:

The installation of the precast substructure elements shall proceed as required by the sequence of construction, stage construction plans, the special provisions entitled “Prosecution and Progress” and “Maintenance and Protection of Traffic”, and shall be in accordance with the method outlined in Assembly Plan.

The Contractor shall review 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.

Concrete shall be placed in all shear keys and precast element voids only after the horizontal and vertical alignment within the tolerances specified herein is warranted. The precast elements after placement shall be protected from damage, rotation, and displacement during the concrete placement.

Concrete to be placed inside the precast element voids around the pile tops shall be allowed to flow partially under the stem. The entire underside of the stem need not be filled with concrete.

The installation of elements above the abutment stems is not permitted until the compressive test result of the cylinders for the concrete used for the shear keys and voids has reached the specified minimum values in the approved Assembly Plan.

Exposed surfaces of all shear keys and voids shall form a smooth and continuous plane, free from irregularities, with the adjacent concrete.

After its installation, any precast substructure element, as determined by the Engineer, not acceptable in vertical or horizontal alignment for any reason, including but not limited to settlement, displacement, misfit, shall be removed by the Contractor and correctly installed, as directed by the Engineer and at the Contractor’s expense.

All portions of the lifting and seating devices that extend to or beyond the finished concrete surface shall be removed. All fixtures or holes cast into the sections for lifting or seating shall be completely filled with non-shrink grout and finished smooth and flush with the adjacent concrete surface.

**Method of Measurement:**

This work will be measured for payment by the cubic yards of precast elements, of the size indicated, complete and accepted.

For all precast elements the various materials to fill voids and shear keys cast into the elements shall be considered included in this Item and not measured separately for payment. The calculation of the volume of concrete used for the payment of this Item shall include all voids and keys and be based on the overall plan and elevation dimensions of the elements.

**Basis of Payment:**

Payment for this work will be made at the contract unit price per cubic yard for "Precast Substructure Elements", complete and accepted in place, which price shall include all equipment, materials, tools and labor incidental to the manufacture, shipping, repair, temporary bracing and installation of all precast concrete elements, development of Assembly Plan, and work incidental thereto, including heating and cooling, curing and all admixtures. Price includes all concrete, reinforcement, leveling devices, corrugated metal pipes, dowel bar splicer system, and lifting hardware required to install the precast substructure elements in accordance with the plans or as
ordered by the Engineer.

<table>
<thead>
<tr>
<th>Pay Item</th>
<th>Pay Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Precast Substructure Elements</td>
<td>C.Y.</td>
</tr>
</tbody>
</table>
ITEM #0603233A – GALVANIZING STRUCTURAL STEEL (SITE NO. 1)

Description:

Work under this item shall consist of the surface preparation, galvanizing, shipping and storage, and repair of structural steel members and components as shown on the plans, as directed by the Engineer and in accordance with these specifications.

Materials:

All new structural steel shall conform to M.06.02 and M.06.03 prior to galvanizing. The final color shall be FS 26270 (Medium Gray).

Construction Methods:

Galvanizer Qualifications:

NACE Level 2 Inspector

Requirements:

Where construction requires matching specific pieces, piece marks with metal tags shall be used to ensure identification of members after galvanizing.

Submittals:

Quality Control Inspection Plan
Certificate of Compliance

Notification:

Contact the Division of Materials Testing at DOT.Steel@ct.gov a minimum of 2 weeks prior to the start of work.

Fabrication:

1. Where construction requires matching specific pieces, piece marks with metal tags shall be used to ensure identification of members after galvanizing.
2. The Contractor shall consult with the galvanizer to ensure proper removal of grease, paint, and other deleterious materials prior to galvanizing.
3. Bolt holes for field splices shall be drilled full size or sub-drilled and reamed to size. Full sized punched bolt holes are not allowed.

Structural Steel Preparation:

1. Prior to galvanizing, all holes shall be deburred and all fins, scabs, or other surface/edge anomalies shall be ground or repaired as specified in ASTM A6.
2. If rust, mill scale, dirt, oil, grease, or other foreign substances have accumulated prior to
galvanizing, steel surfaces shall be cleaned by SSPC-SP1 (Solvent Cleaning).
3. Special attention shall be given to the cleaning of corners and reentrant angles.
4. In addition to above, the items shall then be cleaned as specified in Steel Structures Painting Council’s Surface Preparation (SSPC-SP) SSPC-SP10 (Near-White Blast Cleaning). All surfaces shall be inspected to verify no fins, scabs, or other defects are present.
5. A flux shall be applied to all steel surfaces to be galvanized.
6. Any surfaces that will receive field-installed stud shear connectors shall not be galvanized.
7. The following steel surfaces of bearing shall not be galvanized: stainless steel surfaces, surfaces that will be machined, and surfaces that have TFE, elastomer, or stainless steel bonded to them.
8. The cleaned surfaces shall be galvanized within 8 hours after cleaning.

Application of Hot Dip Galvanized Coating:

1. Before hot dip galvanizing, the galvanizing tanks shall be cleaned to remove surface and bottom contamination.
2. Steel members, fabrications, and assemblies shall be galvanized by the hot dip process in the shop in accordance with ASTM A123.
3. The structural steel members and components shall be single dip hot dip galvanized by completely submerging them in the galvanizing tank.
4. All steel should be safeguarded against embrittlement in accordance with ASTM A143. All galvanized steel work shall be handled in such manner as to avoid any mechanical damage to minimize distortion.
5. Beams and girders shall be supported during galvanizing to prevent permanent distortion.
6. All bolt holes shall be reamed or drilled to their specific diameters after galvanizing. All bolts shall be installed after galvanizing.

Hot Dip Galvanizing Coating Requirements:

1. Coating weight, surface finish, appearance, and adhesion shall conform to the requirements of ASTM A385 and ASTM A123.
2. Any high spots of zinc coating left in the galvanizing process in areas that are to be field connected, such as metal drip lines or rough edges, shall be removed by cleaning as specified in SSPC-SP2 (Hand Tool Cleaning) or SSPC-SP3 (Power Tool Cleaning). The zinc shall be removed until it is level with the surrounding area, leaving at least the minimum required zinc thickness.
3. Galvanized articles shall be free from uncoated areas, blisters, flux deposits, acid and black spots, and dross inclusions. Lumps, projections, globules, or heavy deposits of zinc will not be permitted. All holes shall be clean and free of excess zinc.

Testing and Inspection of Galvanized Coating:

1. Tests for coating thickness of the galvanized coating shall be performed by the methods in ASTM A123-8. The coating thickness shall meet the requirements outlined in ASTM A123-6 in the tables provided.
2. The material shall be inspected in accordance with ASTM A123-9.

Repair of Hot Dip Galvanized Coating:

1. Surfaces with inadequate zinc thickness shall be repaired in the shop according to ASTM A780 and ASTM A123.
2. Surfaces of galvanized steel that are damaged after the galvanizing operation shall be repaired in accordance with ASTM A780 whenever damage exceeds 0.1875 inch in width and/or 4 inches in length.
3. Damage that occurs in the shop shall be repaired in the shop.
4. Damage that occurs during transport or in the field shall be repaired in the field.

Construction Requirements:

If white rust is visible on the contact surfaces for any field connection, the steel surface shall be hand wire brush or cleaned per SSPC-SP7 (Brush-Off Blast Cleaning). Power wire brushing is not allowed.

Shipping and Storage:

1. The members and components shall be handled so that after galvanizing they will not freeze together on cooling.
2. The galvanized members and components shall be stored, at the fabricator, galvanizer and at the construction site, off the ground, with adequate spacers to promote ventilation between pieces and at a slight inclination to promote drainage to prevent wet storage stains. It shall be kept free from dirt, grease and other contaminants and shall be reasonably protected from corrosion.

Method of Measurement:

This item, 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 "Galvanizing Structural Steel (Site No. X)", complete and accepted, which price shall include all materials, equipment, tools, and labor incidental thereto.

<table>
<thead>
<tr>
<th>Pay Item</th>
<th>Pay Unit</th>
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<tbody>
<tr>
<td>Galvanizing Structural Steel (Site No. X)</td>
<td>L.S.</td>
</tr>
</tbody>
</table>
ITEM #0603900A – CATHODIC PROTECTION SYSTEM

Description: Work under this item shall consist of designing and supplying the materials, equipment, labor and supervision required to install a galvanic anode cathodic protection system for the portion of the cofferdam steel sheet piling that will remain in place for scour protection. The cathodic protection system shall protect both the soil side and water side of the piling and shall have a design life of minimum 25 years.

Materials:

Anode Materials:

1. Anodes for marine exposure shall be either aluminum meeting the requirements of U.S. MIL-A-24779(SH), or zinc meeting the requirements of MIL-A-18001-K. The composition of the anodes shall meet the following requirements:

2. Aluminum anode Composition (MIL-A-24779(SH))

<table>
<thead>
<tr>
<th>Metal</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zinc (Zn)</td>
<td>4.00%</td>
<td>6.50%</td>
</tr>
<tr>
<td>Indium (In)</td>
<td>0.014%</td>
<td>0.020</td>
</tr>
<tr>
<td>Silicon (Si)</td>
<td>0.08%</td>
<td>0.20%</td>
</tr>
<tr>
<td>Copper (Cu)</td>
<td>-------</td>
<td>0.004%</td>
</tr>
<tr>
<td>Iron (Fe)</td>
<td>-------</td>
<td>0.090%</td>
</tr>
<tr>
<td>Mercury (Hg)</td>
<td>-------</td>
<td>0.001%</td>
</tr>
<tr>
<td>Others, Each</td>
<td>-------</td>
<td>0.02%</td>
</tr>
<tr>
<td>Others, Total</td>
<td>-------</td>
<td>0.10%</td>
</tr>
<tr>
<td>Aluminum (Al)</td>
<td>Remainder</td>
<td>-------</td>
</tr>
</tbody>
</table>

a. Provide mill test certificates for the heat(s) used to produce the anodes.

b. Aluminum anodes shall have a nominal capacity of 1150 amp hours per pound and at least a nominal efficiency of 85%.

c. Aluminum anode native (open-circuit) potential in seawater shall be at least -1.00 V v Ag/AgCl 3.5M reference electrode at 25 degrees C.

3. Zinc Anode Composition (MIL-A-18001-K)

<table>
<thead>
<tr>
<th>Metal</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lead (Pb)</td>
<td>-------</td>
<td>0.006%</td>
</tr>
<tr>
<td>Iron (Fe)</td>
<td>-------</td>
<td>0.005%</td>
</tr>
<tr>
<td>Copper (Cu)</td>
<td>-------</td>
<td>0.005%</td>
</tr>
<tr>
<td>Cadmium (Cd)</td>
<td>0.025%</td>
<td>0.07%</td>
</tr>
<tr>
<td>Aluminum (Al)</td>
<td>0.1%</td>
<td>0.5%</td>
</tr>
<tr>
<td>Impurities, Total</td>
<td></td>
<td>0.10%</td>
</tr>
<tr>
<td>Zinc (Zn)</td>
<td>Remainder</td>
<td>-------</td>
</tr>
</tbody>
</table>
a. Provide mill test certificates for the heat(s) used to produce the anodes.

b. Zinc anodes shall have a nominal capacity of 360 amp hours per pound and a nominal efficiency of 95%.

c. Zinc anode native (open-circuit) potential in seawater shall be at least -0.940 V v Ag/AgCl 3.5M reference electrode at 25 degrees C.

4. Zinc soil anodes shall be prepackaged with a min 10 AWG XLPE USE-2 or HMWPE insulated copper wire.
   a. The zinc soil alloy composition shall meet the requirements of ASTM B-418 Type II.

<table>
<thead>
<tr>
<th>Metal</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lead (Pb)</td>
<td>-----</td>
<td>0.003%</td>
</tr>
<tr>
<td>Iron (Fe)</td>
<td>-----</td>
<td>0.0014%</td>
</tr>
<tr>
<td>Copper (Cu)</td>
<td>-----</td>
<td>0.002%</td>
</tr>
<tr>
<td>Cadmium (Cd)</td>
<td>0.025%</td>
<td>0.003%</td>
</tr>
<tr>
<td>Aluminum (Al)</td>
<td>0.1%</td>
<td>0.005%</td>
</tr>
<tr>
<td>Impurities, Total</td>
<td></td>
<td>0.10%</td>
</tr>
<tr>
<td>Zinc (Zn)</td>
<td>Remainder</td>
<td>-----</td>
</tr>
</tbody>
</table>

b. Prepackaged anodes shall contain backfill material consisting of 75% gypsum and 20% bentonite clay and 5% sodium sulfate.

c. Prepackaged anodes shall be wired through a monitoring station.

Wire and Accessories:

1. All wire shall be copper stranded cathodic protection cable with HMWPE insulation and sized as shown on the drawings.

2. Terminal lugs – tinned copper crimp and solder type

3. Heat shrink tubing – adhesive-lined medium or heavy wall 3:1 shrink ratio

4. Dielectric grease - waterproof corrosion inhibiting type

5. Liquid electrical tape

6. Monitoring station shall be standard type T3 with stainless steel binding posts.

Conduits, Fittings, and Fasteners:

1. Grade 316 stainless steel conduit and fittings sized in accordance with the design.
2. Conduit straps – Grade 316 stainless steel 2 hole clamp type.

3. Binding posts – Grade 316 stainless steel hex head cap screws, washers, and lock nut assemblies – ¼-20 x 1.5.

4. Insulator plastic – ultra-high molecular weight polyethylene (UHMWPE) or Teflon (PTFE) bar, and tubing sized as indicated on the drawings.

Engraved Labels:

1/8-inch thick vinyl with white letters on black, with labels.

Shunts:

COTT 0.01 ohm, 8 ampere test station shunt suitable for mounting onto two ¼ inch diameter binding posts.

Reference Electrodes:

1. Silver chloride reference with minimum 30-year life for soil applications.

2. Casing - 1.3 inch diameter by 12.5 inches long high-impact ABS plastic

Structure Connection Assembly (Monitoring Station)

1. A36 carbon steel 1/2-inch diameter rod 9 inches long with minimum 30 LF of 6 AWG HMWPE BLACK copper cathodic protection cable. End of rod shall be drilled axially ¼ inch diameter by ½-inch deep. Wire shall be silver-soldered inside the hole. Coat any bare metal with liquid tape, then seal with adhesive lined shrink tubing. Tubing shall extend at least 1-inch onto the rod and at least 1-inch onto the cable. Encapsulate the sealed connection inside a PVC conduit filled with marine-grade epoxy.

2. Terminate structure connection assembly wires at monitoring station with crimped and soldered lugs. Seal lug to cable connection with liquid tape and heat shrink tubing.

Monitored Anode Assemblies

1. Monitored marine anode cores shall have a minimum of 30 LF 6 AWG HMWPE RED copper cathodic protection cable attached. Wire may be connected to the anode core by direct brazing a 2-inch length of copper wire, or by drill and tap connection with lug terminals. The completed connection of either type shall be encased in an appropriate length of schedule 40 PVC conduit fitted with a cap. The anode surface at end of the PVC pipe shall have be a minimum 1/4-inch thick sheet of HDPE or PVC to isolate the anode.
from contact with the support bracket. The annulus space between the anode core and PVC pipe shall be completely encapsulated in 100% solids marine-grade epoxy.

2. Mechanical (drill and tap) connections shall use electrical contact grease between all mating parts. Use a Grade 316 stainless steel hex headed cap screw fasteners.

3. Terminate anode assembly wires at monitoring station. Seal connection with contact grease, liquid tape, or heat shrink tubing.

**Construction Methods:**

**Submittals:**

1. **Working Drawings:** Show fabrication and installation details for sacrificial anodes.
   
   a. Include plans, elevations, sections, showing layout of anodes along sheet piling along with details of connections.
   
   b. Provide product data showing anode composition and actual dimensions.
   
   c. Provide core fabrication working drawing.
   
   d. Identify appropriate weld filler metal.
   
   e. Provide calculations prepared by a professional engineer with NACE cathodic protection specialist certification for current demand, anode sizing, anode life and scour protection system life considering the available sacrificial thickness.

2. **Corrosion Engineer Credentials:** Provide resume, professional engineering license(s), and NACE certification(s).

3. **Welding Certificates:** Provide welding certificates for fabricator and underwater welding personnel.

4. **Installer Quality Assurance and Quality Control Procedures**
   
   a. Welding.
   
   b. Verification of electrical continuity between individual sheet piling sections and continuity correction;
   
   c. Verification that anode native potential is acceptable prior to installation
   
   d. Recording native corrosion potential prior to anode connection;
   
   e. Anode installation;
   
   f. Recording galvanic current produced by anodes;
g. Recording corrosion potential after anode connection;

h. Galvanic anode system monitoring.

i. Include criteria for cathodic protection and procedures to correct areas that do not achieve the criteria.

5. Closeout report containing all test data and certifying that:

a. The cathodic protection system was installed in accordance with the submitted design

b. Cathodic protection criteria have been achieved

c. The life of the cathodic protection system meets or exceeds 25 years

6. Provide “As-Built” drawing of any changes or additions to the cathodic protection system during construction.

Execution:

1. Layout

a. The Contractor shall layout the location of the anodes and monitoring station(s). Verify that each anode falls in a recess in the bulkhead sheet pile profile.

b. Confirm the location of monitoring stations with the Engineer.

2. Monitoring Station Installation

a. Install monitoring station conduit, reference electrodes, and structure connections before installing anodes. Terminate wires with crimped and soldered lugs and seal with heat shrink tubing.

b. Conduct native potential survey of the bulkhead prior to anode installation. Use a portable silver/seawater reference electrode to measure and record the potential of each structure exposed to seawater at three locations minimum and each permanent reference electrode. Measure and record the soil-side potential of each length wall at three locations.

c. Prepare monitored anode assemblies in the presence of the Corrosion Engineer. Attach the monitored anode assemblies in the normal sequence of anode installation.

d. Collect initial energizing measurements in the presence of the Corrosion Engineer using the permanent reference electrodes. Energizing measurements shall include monitored anode native potential, structure potential, and galvanic current.

e. Connect the wires to the monitoring station test panels upon completion of energizing measurements.
3. Interlock Welds
   a. Clean the immediate area of the interlock weld and remove any existing corrosion product, coating, or marine growth by grinding to clean metal.
   b. Connect all sheet pile interlocks with a minimum six-inch vertical weld along each interlock.
   c. The location of the interlock welds shall be consistent along the length of the structure.

4. Anode Installation
   a. Remove marine growth in the immediate area of the anode bracket welds and remove any existing corrosion product below the marine growth by grinding to clean metal.
   b. Weld the anode strap core to the piling at the locations indicated on the working drawings.
   c. Verify anode weld length, strength, and electrical continuity.
   d. Soil anodes shall be installed in augered holes or a trench that is separated at least 3 feet from the cofferdam steel sheet piling.

Quality Assurance

1. Welding: Qualify procedures and personnel according to AWS D1.1, "Structural Welding Code-Steel."

2. Corrosion Engineer: Corrosion Engineer refers to a registered professional engineer with certification, education, and at least 5 years’ experience in the design of cathodic protection of buried or submerged metal structures. Corrosion engineer shall be a person accredited or certified by NACE International at the level of Corrosion Specialist or Cathodic Protection Specialist

Delivery, Storage, and Handling

Store materials in a secure location that permits access for inspection and identification.

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

**Basis of Payment:** This work will be paid for at the contract lump sum price for “Cathodic Protection System” which price shall include the design of the cathodic protection system, all materials, equipment, tools, and labor incidental thereto.

<table>
<thead>
<tr>
<th>Pay Item</th>
<th>Pay Unit</th>
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<tbody>
<tr>
<td>Cathodic Protection System</td>
<td>L.S.</td>
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</tbody>
</table>
ITEM #0703008A – HEAVY RIPRAP

Work under this item shall conform to the requirements of Section 7.03 supplemented and amended as follows:

7.03.02 Materials:

1.0 Stone

*Delete this section in its entirety and replace with the following:*

Materials for this item shall consist of sound, tough, durable and angular rock, free from decomposed stones or other defects impairing its durability. The size of a stone as hereinafter specified shall be its least dimension. Neither the width nor the thickness of the angular shaped rock shall be less than one-third (1/3) its length. Broken concrete or rounded stones are not acceptable.

The material shall conform to the following gradation:

<table>
<thead>
<tr>
<th>Percent Finer by Weight (%)</th>
<th>Allowable Range of Stone Sizes (Inches)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Minimum</td>
</tr>
<tr>
<td>15</td>
<td>13.0</td>
</tr>
<tr>
<td>50</td>
<td>20.0</td>
</tr>
<tr>
<td>85</td>
<td>27.5</td>
</tr>
<tr>
<td>100</td>
<td>NA</td>
</tr>
</tbody>
</table>
ITEM #0707009A – MEMBRANE WATERPROOFING (COLD LIQUID ELASTOMERIC)

Description: Work under this item consists of furnishing and installing a seamless elastomeric waterproofing membrane system applied to a concrete or steel surface as shown on the plans, in accordance with this specification and as directed by the Engineer. Work shall also include conditioning of the surface to be coated and all quality-control testing noted herein.

The completed membrane system shall be comprised of a primer coat followed by the membrane coating which is applied in one or two layers for a minimum total thickness of 80 mil, an additional 40 mil membrane layer with aggregate broadcast into the material while still wet, and a bond coat of bitumen-based adhesive material.

Materials: The Contractor shall select a waterproofing membrane system from the Department’s current Qualified Product List (QPL) for Spray-Applied Membrane Waterproofing System. All materials incorporated in the works shall meet the Manufacturer’s specification for the chosen system. The Engineer will reject any system that is not on the QPL.

Materials Certificate: The Contractor shall submit to the Engineer a Materials Certificate for the primer and membrane and bond coat material in accordance with the requirements of Article 1.06.07.

Construction Methods: At least ten days prior to installation of the membrane system, the Contractor shall submit to the Engineer, the manufacturer’s recommended procedure for preparing the deck surface, pre-treatment or preparing at cracks and gaps, treatment at curbs, vertical surfaces or discontinuities, applying the primer and membrane, and placing of aggregated coat. Procedures shall also include recommended repairs of system non-compliant issues identified during application. The system shall be applied to the prepared area(s) as defined in the plans strictly in accordance with the Manufacturer’s recommendations.

A technical representative, in the direct employ of the manufacturer, shall be present on-site immediately prior to and during application of the membrane. The representative shall inspect and approve the surface prior to priming, and provide guidance on the handling, mixing and addition of components and observe application of the primer and membrane. The representative shall perform all required quality-control testing and remain on the Project site until the membrane has fully cured.

All quality-control testing, including verbal direction or observations on the day of the installation, shall be recorded and submitted to the Engineer for inclusion in the Project’s records. A submittal of the quality-control testing data shall be received by project personnel prior to any paving over the finished membrane or within 24 hours following completion of any staged portion of the work.
1. Applicator Approval: The Contractor’s membrane Applicator shall be fully trained and licensed by the membrane manufacturer and shall have successfully completed at least three spray membrane projects in the past five years. The Contractor shall furnish references from those projects, including names of contact persons and the names, addresses and phone numbers of persons who supervised the projects. This information shall be submitted to the Engineer prior to the start of construction. The Engineer shall have sole authority to determine the adequacy and compliance of the submitted information. Inadequate proof of ability to perform the work will be grounds to reject proposed applicators.

2. Job Conditions:

   (a) Environmental Requirements: Air and substrate temperatures shall be between 32°F and 104°F providing the substrate is above the dew point. Outside of this range, the Manufacturer shall be consulted.

       The Applicator shall be provided with adequate disposal facilities for non hazardous waste generated during installation of the membrane system. The applicator shall follow safety instructions regarding respirators and safety equipment.

   (b) Safety Requirements: All open flames and spark producing equipment shall be removed from the work area prior to commencement of application.

       “No Smoking” signs shall be visibly posted at the job site during application of the membrane waterproofing.

       Personnel not involved in membrane application shall be kept out of the work area.

3. Delivery, Storage and Handling:

   (a) Packaging and Shipping: All components of the membrane system shall be delivered to the site in the Manufacturer’s packaging, clearly identified with the products type and batch number.

   (b) Storage and Protection: The Applicator shall be provided with a storage area for all components. The area shall be cool, dry and out of direct sunlight and shall be in accordance with the Manufacturer’s recommendations and relevant health and safety regulations.

       Copies of Material Safety Data Sheets (MSDS) for all components shall be kept on site for review by the Engineer or other personnel.

   (c) Shelf Life - Membrane Components: Packaging of all membrane components shall include a shelf life date sealed by the Manufacturer. No membrane components whose shelf life has expired shall be used.

ITEM #0707009A
4. Surface Preparation:

(a) Protection: The Applicator shall be responsible for the protection of equipment and adjacent areas from over spray or other contamination. Parapets and bridge joints shall be masked prior to application of the materials.

(b) Surface Preparation: Sharp peaks and discontinuities shall be ground smooth. The surface profile of the prepared substrate is not to exceed 1/4 inch (peak to valley) and areas of minor surface deterioration of 1/2 inch and greater in depth shall also be repaired. The extent and location of the surface patches require the approval of the Engineer before the membrane system is applied.

Surfaces shall be free of oil, grease, curing compounds, loose particles, moss, algae, growth, laitance, friable matter, dirt, bituminous products, and previous waterproofing materials. If required, degreasing shall be done by detergent washing in accordance with ASTM D4258.

The surface shall be abrasively cleaned, in accordance with ASTM D4259, to provide a sound substrate free from laitance.

Voids, honeycombed areas, and blow holes on vertical surfaces shall be repaired in the same manner.

All steel components to receive membrane waterproofing shall be blast cleaned in accordance with SSPC SP6 and coated with the membrane waterproofing system within the same work shift.

5. Inspection and Testing: Prior to priming of the surface, the Engineer, Applicator and Manufacturer’s technical representative shall inspect and approve the prepared substrate.

(a) Random tests for deck moisture content shall be conducted on the substrate by the Applicator at the job site using a “Sovereign Portable Electronic Moisture Master Meter,” a “Tramex CMEXpertII Concrete Moisture Meter” or approved equal. The minimum frequency shall be one test per 1000 s.f. but not less than three tests per day per bridge. Additional tests may be required if atmospheric conditions change and retest of the substrate moisture content is warranted.

The membrane system shall not be installed on substrate with a moisture content greater than that recommended by the system’s manufacturer, but shall not be greater than 6%, whichever is less.

(b) Random tests for adequate tensile bond strength shall be conducted on the substrate using an adhesion tester in accordance with the requirements of ASTM D4541. The minimum frequency shall be one test per 5,000 s.f. but not less than three adhesion tests per bridge.
Adequate surface preparation will be indicated by tensile bond strengths of primer to the substrate greater than or equal to 150 psi or failure in a concrete surface and greater than or equal to 300 psi for steel surfaces.

If the tensile bond strength is lower than the minimum specified, the Engineer may request additional substrate preparation. Any primer not adequately applied shall be removed and a new primer applied at the Contractor’s expense, as directed by Engineer.

(c) Cracks and grouted joints shall be treated in accordance with the Manufacturer’s recommendations, as approved or directed by the Engineer.

6. Application:

(a) The System shall be applied in four distinct steps as follows:
1) Substrate preparation and gap/joint bridging preparation
2) Priming
3) Membrane application
4) Membrane with aggregate

(b) Immediately prior to the application of any components of the System, the surface shall be dry (see Section 5a of this specification) and any remaining dust or loose particles shall be removed using clean, dry oil-free compressed air or industrial vacuum.

(c) Where the area to be treated is bound by a vertical surface (e.g. curb or wall), the membrane system may be continued up the vertical, as shown on the plans or as directed by the Engineer.

(d) The handling, mixing and addition of components shall be performed in a safe manner to achieve the desired results, in accordance with the Manufacturer’s recommendations or as approved or directed by the Engineer.

(e) A neat finish with well defined boundaries and straight edges shall be provided by the Applicator.

(f) Primer: The primer shall consist of one coat with an overall coverage rate of 125 to 175 s.f./gal unless otherwise recommended in the manufacturer’s written instructions.

All components shall be measured and mixed in accordance with the Manufacturer’s recommendations.

The primer shall be spray applied using a single component spray system approved for use by the Manufacturer. If required by site conditions and allowed by the manufacturer, brush or roller application will be allowed.
The primer shall be allowed to cure tack-free for a minimum of 30 minutes or as required by the Manufacturer’s instructions, whichever time is greater, prior to application of the first lift of waterproofing membrane.

Porous concrete (brick) may require a second coat of primer should the first coat be absorbed.

(g) Membrane: The waterproofing membrane shall consist of one or two coats for a total dry film thickness of 80 mils. If applied in two coats, the second coat shall be of a contrasting color to aid in quality assurance and inspection.

The membrane shall be comprised of Components A and B and a hardener powder which is to be added to Component B in accordance with the Manufacturer’s recommendations.

The substrate shall be coated in a methodical manner.

Thickness checks: For each layer, checks for wet film thickness using a gauge pin or standard comb-type thickness gauge shall be carried out typically once every 100 s.f. Where rapid set time of the membrane does not allow for wet film thickness checks, ultrasonic testing (steel surfaces only), calibrated point-penetrating (destructive) testing, in-situ sampling (cutout of small sections for measuring thicknesses), or other methods approved by the Engineer shall be employed for determination of dry film thickness. The measured thickness of each and every individual test of the membrane shall be greater than or equal to the required thickness.

Bond Strength: Random tests for adequate tensile bond strength shall be conducted on the membrane in accordance with the requirements of ASTM D4541. The minimum test frequency shall be one test per 5,000 s.f. but no less than three adhesion tests per bridge. Adequate adhesion will be indicated by tensile bond strengths of the membrane to the substrate of greater than or equal to 150 psi or failure in a concrete surface and greater than or equal to 300 psi for steel surfaces.

Spark Testing: Following application of the membrane, test for pin holes in the cured membrane system over the entire application area in accordance with ASTM D4787-“Continuity Verification of Liquid or Sheet Linings Applied to Concrete Substrates.” Conduct the test at voltages recommended by the manufacturer to prevent damage to the membrane.

Repair the membrane system following destructive testing and correct any deficiencies in the membrane system or substrate noted during quality-control testing in accordance with the manufacturer’s recommendations to the satisfaction of the Engineer at no additional cost to the State.
(h) Repairs: If an area is left untreated or the membrane becomes damaged, a patch repair shall be carried out to restore the integrity of the system. The damaged areas shall be cut back to sound materials and wiped with solvent (e.g. acetone) up to a width of at least four inches on the periphery, removing any contaminants unless otherwise recommended by the manufacturer. The substrate shall be primed as necessary, followed by the membrane. A continuous layer shall be obtained over the substrate with a four inches overlap onto existing membrane.

Where the membrane is to be joined to existing cured material, the new application shall overlap the existing by at least four inches. Cleaning and surface preparation on areas to be lapped shall be as recommended in the manufacturer’s written instructions.

(i) Aggregated Finish:
1) Apply an additional 40 mil thick layer of the membrane material immediately followed by an aggregate coating, before the membrane cures, at a rate to fully cover the exposed area. The membrane and aggregate shall be fully integrated after the aggregate has been applied and the membrane cured.
2) Localized areas not fully coated shall be touched-up with additional membrane and aggregate as needed.
3) Remove loose and excess aggregate from the surface to the satisfaction of the Engineer and dispose of properly after application prior to allowing traffic onto finished surface or application of tack coat.

(j) Bond Coat:
Prior to application of a bituminous concrete overlay, the aggregated finish shall be coated with a bonding material. The bonding material shall be per the membrane waterproofing manufacturer’s recommendations.

7. Final Review: The Engineer and the Applicator shall jointly review the area(s) over which the completed System has been installed. Any irregularities or other items that do not meet the requirements of the Engineer shall be addressed at this time.

**Method of Measurement:** The quantity to be paid for under this item shall be the number of square yards of waterproofed surface completed and accepted.

**Basis of Payment:** This item will be paid for at the contract unit price per square yard of “Membrane Waterproofing (Cold Liquid Elastomeric),” complete in place, which price shall include all surface preparation, furnishing, storing and applying the system, technical representative and quality control tests, and any necessary repairs and remediation work as well as all materials, equipment, tools, labor incidental to this work.

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<th>Pay Item</th>
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<tr>
<td>Membrane Waterproofing (Cold Liquid Elastomeric)</td>
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ITEM #0707009A
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)

- **Aqunil 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
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.

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<tr>
<th>Pay Item</th>
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<tr>
<td>Penetrating Sealer Protective Compound</td>
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</table>
ITEM #0912502A – REMOVE METAL BEAM RAIL (BRIDGE)

Section 9.12 of Standard Form 817 shall be modified as follows:

9.12.01 – Description: This work shall include removing the bridge mounted metal beam rail assemblies. Work under this item shall also include salvaging the existing metal beam rail posts within the bridge limits.

9.12.03 – Construction Methods:
The existing bridge mounted metal beam rail shall not be removed until the work zone is adequately protected from intrusion of vehicles as approved by the Engineer in the field. Under no circumstances shall traffic be allowed to operate without a physical barrier in between traffic and the work zone. The barrier may be removed when all proposed metal beam rail is properly installed.

All components of the metal beam rail system shall be completely removed, with the exception of the embedded portion of anchor bolts in the existing concrete deck.

All rail elements and posts shall be removed. The removed posts shall be salvaged. The salvaged material shall be bound and secured to pallets, on flatbed trucks, and transported to the following location by the Contractor in accordance with directions given by authorized State personnel:

CT DOT District 2 – Bridge Maintenance, 660 Middlesex Turnpike Old Saybrook, CT 06475. The point of contact for all deliveries is Alan Ference at 860-388-3366, and shall be notified at least a week in advance between the hours of 8:00 am to 3:30 pm, Monday through Friday, excluding State holidays. All deliveries shall be conducted during business hours and be completed prior to the close of business.

9.12.04 – Method of Measurement:
This work shall be measured for payment by the number of linear feet of existing bridge mounted metal beam rail removed, measured horizontally between metal bridge rail posts. The existing metal beam rail posts to be salvaged will not be measured for payment.

9.12.05 – Basis of Payment: This work will be paid for at the contract unit price per linear foot for “Remove Metal Beam Rail (Bridge)”, which price shall include the removal, disposal, and all equipment, tools and labor incidental thereto.

<table>
<thead>
<tr>
<th>Pay Item</th>
<th>Pay Unit</th>
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<tr>
<td>Remove Metal Beam Rail (Bridge)</td>
<td>l.f.</td>
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</table>

ITEM #0912502A
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 construction 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.

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<tbody>
<tr>
<td>Repair Guiderail</td>
<td>est. (est.)</td>
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ITEM #0949875A – WETLAND PLANTINGS

Description: This work shall consist of furnishing, installing, and establishing specified wetland plants at the locations shown on the plans or as directed in the field by the Engineer.

Materials: The wetland plants included under wetland plantings are to match the size and quantities shown on the plans. The species included in this item are as follows:

<table>
<thead>
<tr>
<th>Botanical Name</th>
<th>Common Name</th>
<th>Size</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Baccharis halimifolia</em></td>
<td>Groundsel Bush</td>
<td>3’ – 4’ Ht. B.B.</td>
</tr>
<tr>
<td><em>Iva frutescens</em></td>
<td>High Tide Bush</td>
<td>2’ – 3’ Ht. B.B.</td>
</tr>
<tr>
<td><em>Spartina alternifolia</em></td>
<td>Smooth Cordgrass</td>
<td>2” Plugs</td>
</tr>
<tr>
<td><em>Spartina patens</em></td>
<td>Salt Meadow Cordgrass</td>
<td>2” Plugs</td>
</tr>
</tbody>
</table>

Construction Methods: Refer to Section 9.49 and Section M.13 of the Standard Specification Form 817.

Method of Measurement: This work shall be measured for payment upon the completion of installation; and acceptance by the environmental scientist.

Basis of Payment: Payment for this work will be paid at the lump sum price for “Wetland Plantings” completed and accepted. This price shall include all materials, equipment, tools, labor and work incidental thereto.

Pay Item       Pay Unit
Wetland Planting Lump Sum
ITEM #0950202A – SHORELINE GRASS ESTABLISHMENT

Description: This item includes furnishing and placing a seed mixture to establish shoreline grasses within the Tidal Wetland Mitigation Site(s) or other locations shown on the Plans and directed by the Engineer.

Materials: All shoreline grass seed mixture sources shall be local to the northeast (New England, New York, Pennsylvania, New Jersey, Delaware, or Maryland).

Three qualified shoreline grass seed mixtures are detailed below. An equal seed mixture may be submitted to the Engineer for approval.

1. **New England Coastal Salt Tolerant Grass Mix**, New England Wetland Plants, Inc. 820 West Street Amherst, MA 01002. Rate shall be 1 pound PLS per 1,250 square foot.

2. **NJ Salt Tolerant Basin Mix**, Ernst Conservation Seeds, Inc. 8884 Mercer Pike, Meadville, PA 16335. Rate shall be 1 pound PLS per 2,180 square foot.

3. **Shore Mix®**, Sylva Native Nursery & Seed Company, 3815 Roser Road, Glen Rock, PA 17327. Rate shall be 1 pound PLS per 1,100 square foot.

The placement of fertilizer, mulch or erosion control matting will not be allowed within any Tidal Wetland Mitigation Site(s).

All shoreline seed mixture sources shall be approved by the Engineer prior to application.

The Materials Certificate for all seed mixtures shall state that the seed mixture does not include any invasive species pursuant to CGS Sec. 22a-381d or any State-Threatened or State Endangered species pursuant to CGS Sec. 26-303. The seed tags from the bags are to be removed by the Engineer upon delivery and attached to the Materials Certificate. Seeding shall not occur if these requirements are not met.

All approved seed mixtures shall be obtained in sufficient quantities to meet the pure live seed (PLS) application rates as determined by the seed analysis of the mixture.

Construction Methods: Construction methods shall be those established as agronomically acceptable and feasible, and as approved by the Engineer.

Seeding for establishment of shoreline grasses in the Tidal Wetland Mitigation Site(s) shall occur after the completion of the Tidal Wetland Mitigation Site(s) and after 7 to 14 days of exposure to tidal cycles.

For establishment of shoreline grass in locations that are not in the Tidal Wetland Mitigation Site(s), seeding shall occur during the dates specified in Article 9.50.03-2.
If seed is purchased in bulk rather than PLS, the rate of application must be adjusted to meet the required PLS seeding rate. This seeding rate shall be increased by the appropriate percentage as determined by the following formula based on information on the seed tags at delivery:

\[(\text{Germination Percentage} \times \text{Purity Percentage}) / 100 = \text{PLS}\]

The Engineer will verify that the seed is applied at a rate that will allow for 100 percent PLS. Mowing will not be allowed within Site(s) that are seeded with shoreline grass seed mix.

**Method of Measurement:** This work will be measured for payment by the number of square yards of surface area of accepted established shoreline grasses as specified.

**Basis of Payment:** This work will be paid for at the Contract unit price per square yard for “Shoreline Grass Establishment,” which price shall include all materials, maintenance, equipment, tools, labor, transportation, operations and all work incidental thereto. Partial payment of up to 50% may be made for work completed, but not accepted. Full payment will be made when the work has been accepted by the Engineer.

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<tr>
<td>Shoreline Grass Establishment</td>
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ITEM #0952051A – CONTROL AND REMOVAL OF INVASIVE VEGETATION

Description: This work shall include the development and implementation of an Invasive Vegetation Removal Plan (IVRP) to outline the materials, labor, and equipment the Contractor plans to use for the complete eradication and treatment of the invasive vegetation. The work shall also include the identification, excavation, removal, and off-Site disposal of unwanted vegetation as indicated on the plan sheets, permits or as directed by the Engineer.

All invasive vegetation listed on the following websites will be subject to eradication:
- Connecticut Invasive Plant Working Group (CIPWG) Invasive Plants Council (http://cipwg.uconn.edu/invasive_plant_list/)

All vegetation designated for removal shall be eradicated in its entirety in accordance with the IVRP submitted by the Contractor and approved by the Engineer. Certain situations may require the full and complete mechanical excavation of invasive vegetation including its entire root system. The use of herbicides will not be permitted between the dates of October 1 and May 31.

Materials: All herbicides shall be registered for the species being treated and shall be formulated as applicable for target-species foliar treatment, cut surface, or injection applications. Where work in or immediately adjacent to wetlands is necessary, the product label(s) for any chemical/adjuvant formulation applied must indicate that the formulation is approved for aquatic environments.

Construction Methods:
1. IVRP: Prior to any ground disturbance within the Project limits, the Contractor shall submit an IVRP to the Engineer for review and approval. Within 30 days of receipt of the submittal, the Engineer will notify the Contractor whether the IVRP is approved, rejected or requires modifications by the Contractor. If any part of the plan is not approved, the Contractor shall promptly make any necessary changes and re-submit the entire plan for approval. The entire plan must be approved in writing prior to beginning any work on Site. In all cases, mechanical means shall be considered before the use of herbicides. If mechanical means is neither feasible nor recommended, an explanation must be provided in the IVRP. All removal methods shall prevent the spread of seeds – no mowing or “Brush Hog” equipment will be allowed. The approved methods must be capable of total removal and eradication of all identified invasive species in the designated areas throughout the Contract and the 1-Year Plant Establishment Period.

The IVRP shall include a schedule and outline with the following information:
1) The Contractor’s methods of determining invasive vegetation surveyed limits, including:
   a. Stake out the limits prior to the initial treatment
   b. Maintain a record of the staked limits throughout the life of the Contract
2) Identification of the type(s) of invasive species present within the field surveyed limits
3) A marked up plan sheet outlining the invasive species limits and identifying the types of invasive species present within those limits and total square yards of proposed removal

4) For each species present on-Site, the following shall be described:
   a. Methods to eradicate specific invasive plant species for the life of the Contract (e.g. mechanical, herbicide, etc.) shall include any initial, intermediate and 1-Year Plant Establishment Period Treatment eradication methods for each plant species
   b. Types and concentrations of any herbicides to be used, including any adjuvants, SDS sheets, types of tools or machinery to be used
   c. Schedules showing dates and eradication methods for the initial, intermediate, and 1-Year Plant Establishment Period Treatments. This schedule must take into consideration stage construction, the time period required between herbicide application, and the physical removal of the target species wherever such methodology is employed

5) All invasive species are considered controlled materials and are to be taken off-Site to an approved disposal facility. For disposal methods:
   a. Provide address of location, current permits / letters from the town authorizing such activity and a Site map (complete with regulated areas)
   b. Wood chips from invasive species are not allowed to be stockpiled or reused on-Site
   c. Wood chipping on-Site will be allowed if temporarily stored in a properly contained enclosure and removed at the end of the treatment cycle
   d. Invasive plants shall not be buried on-Site

6) Proof of CT DEEP licensure for herbicide application

7) A description of safety equipment required

8) Procedures for handling chemical spills

Where certain species of invasive vegetation are present and identified on the plan sheets, permits, or as identified in the field by the Engineer, the removal via bulk mechanical excavation of such vegetation and the underlying soils may be required as directed. The approved method must be capable of the removal of all soil to a depth where invasive plant material and root system is no longer evident, or as directed by the Engineer.

Whether the Contractor’s method of removal is by mechanical excavation or cutting and spraying of herbicides, invasive species must be removed separately from clearing and grubbing operations and disposed at an approved location as described in the Contractor’s IVRP.

No equipment or vehicles other than that required to complete the work will be permitted in the areas designated for invasive vegetation removal. Any equipment used to process invasive vegetation, such as chippers and transport vehicles, must be cleaned prior to further use.

Any invasive species control and removal work performed throughout the duration of the Contract that causes damage or soil disturbance shall be repaired at the Contractor’s expense within 7 days. It is the Contractor’s responsibility to identify additional areas of concern for invasive vegetation within the limits of the Project, notify the Engineer, and to amend the IVRP.
The Contractor shall be responsible to identify invasive vegetation at all times of the year and to prepare a plan for its eradication without assistance.

All treatments, with the exception of an initial mechanical excavation of invasive species, will not be allowed outside of the optimal growing season between the dates of October 1 and May 31.

Herbicide applications will not be permitted during any rain event or during windy conditions. Broadcast or uncontrolled spray application will not be permitted and care must be taken to avoid contacting non-target native species. If any non-target native species to remain within the Project limits are inadvertently treated with herbicide and perish, the Contractor will be responsible to replace in-kind species at no cost to the State.

Remove all twining vines in treetops to the greatest extent possible without damaging the branches of the supporting desired vegetation. Cut and remove vines overtopping tree canopies to the extent practical. Climbing spikes will not be permitted for aerial work.

The Contractor shall also:
1) Maintain the labels for herbicides being used in his/her possession
2) Conduct all herbicide formulations and applications, including the addition of appropriate surfactants and other adjuvants, in strict conformance with the manufacturer's recommendation and per requirements of regulatory agencies
3) Maintain a written record of herbicide application, including the formulation, concentration, area treated, and date for each application. The records are to be provided by the commercial applicator and submitted to the Engineer following each treatment

Flush cut brush and trees shall not be more than 2 inches above the ground line. Prune out any branches on non-treatment plants that are damaged during removal of vegetation. All corrective pruning shall conform to the National Arborists Association Pruning Standards.

Wherever removal operations result in exposed soils, disturbed areas shall be vegetatively stabilized with the appropriate seed mix and protected with hay, cellulosic fiber mulch, or erosion control matting.

Once the IVRP is approved, a field review shall be scheduled for the Contractor and Engineer to review the limits of invasive species removal (surveyed and flagged by the Contact prior to the meeting), the specific species required to be removed, and the Contractor’s submitted invasive species removal plan. At this time, the Engineer may identify additional invasive species or designate additional areas for removal that are not included with the Contractor’s submitted IVRP.

If changes are required to the approved IVRP during the life of the Contract, these changes shall be documented by the Contractor and resubmitted to the Engineer for review and approval a minimum of 10 days prior to beginning of the additional work associated with the change. The Contractor shall provide a 10 day work notice to the Engineer prior to proceeding with each treatment.
2. **Treatments:** The treatment schedule below may be modified based on field conditions at the discretion of the Engineer. The Contractor shall provide a 10 day work notice to the Engineer prior to proceeding with each treatment. In all cases, each treatment must be reviewed once the work is performed, and accepted before payment is made for that treatment stage.

*Initial Treatment:* Shall commence at the beginning of the Contract time, prior to clearing and grubbing activities. Any invasive species found within a proposed cut slope shall be fully eradicated to the satisfaction of the Engineer prior to any earth work operations. After the completion of the initial treatment, the work must be reviewed and accepted by the Engineer prior to any earth excavation in that area. If herbicide is the initial treatment method, a minimum of 14 days is required prior to clearing and grubbing operations, so the herbicide application can take effect.

*Intermediate Treatment(s):* Shall be conducted during the optimal growing season between the dates of June 1 and September 30 for invasive species up to and including 10 days prior to plant installation or at the end of the Project if no landscaping plan is in the Contract. Optimal treatment times may be specific to the species being treated and this must be considered and documented when developing the Invasive Vegetation Removal Plan. Several treatments may be required to treat all species that are present.

*1-Year Plant Establishment Period Treatment:* Treatments as needed or as directed by the Engineer shall be conducted throughout the 1-Year Plant Establishment Period or when required under another Contract item.

**Method of Measurement:** This work will be measured for payment by the number of square yards of invasive vegetation identified, surveyed, treated and eradicated as required including any required re-treatment of any regrowth or new growth. No additional payment will be made for subsequent treatments. The area for removal will be surveyed and flagged prior to treatment and measured. After a review of the surveyed limits, the Engineer may designate additional areas for removal that are not shown on the plans. These additional areas will be measured for payment and included as part of the Contract work.

Where selective removal is required, the square yards of the drip line of the invasive vegetation will be measured for payment.

**Basis of Payment:** This work will be paid for at the Contract unit price per square yard for "Control and Removal of Invasive Vegetation." This payment shall include all labor, surveys, materials, tools, and equipment necessary for limits of the invasive area(s); maintenance of the limits throughout the Project; species identification; and cutting, excavation, treating, re-treating, removal, and off-Site disposal of designated invasive plant material. Off-Site disposal of residue shall include the loading, transport, dumping, and fees associated with legal off-site disposal.

- Upon approval of the required IVRP, the Contractor will receive a payment equal to 10% of the estimated Contract value
• Upon initial herbicide or mechanical removal treatment methods as it is described in the IVRP, the Contractor will receive a payment equal to 20% of all areas receiving treatment
• Upon successful completion of the initial treatment period, as determined during the review by the Engineer, the Contractor will receive a payment equal to 20%
• Upon successful completion of the intermediate treatment period as determined during the Site review by the Engineer, the Contractor will receive a payment equal to 20%
• Upon successful completion of the 1-Year Plant Establishment Period covering all treated areas on the Project (or the last treatment for those Projects which may not include a 1-Year Plant Establishment Period), the Contractor will receive final payment equal to the measured areas in place and treated, less any previous payments

Where bulk excavation is required for removal, this work shall be covered under the Contract Item “Earth Excavation” for all excavation in excess of 2 feet. All other vegetation not designated as invasive vegetation shall be removed in compliance with the Item “Clearing and Grubbing” in accordance with Section 2.01.

Vegetative stabilization of disturbed areas will be paid for under the respective Contract Items: “Turf Establishment,” “Wetland Grass Establishment,” or “Conservation Seeding for Slopes.”

<table>
<thead>
<tr>
<th>Pay Item</th>
<th>Pay Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control and Removal of Invasive Vegetation</td>
<td>s.y.</td>
</tr>
</tbody>
</table>
ITEM #0969062A – CONSTRUCTION FIELD OFFICE, MEDIUM

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

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

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

<table>
<thead>
<tr>
<th>Description \ Office Size</th>
<th>Small</th>
<th>Med.</th>
<th>Large</th>
<th>Extra Large</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum Sq. Ft. of floor space with a minimum ceiling height of 7 ft.</td>
<td>400</td>
<td>400</td>
<td>1000</td>
<td>2000</td>
</tr>
<tr>
<td>Minimum number of exterior entrances.</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Minimum number of parking spaces.</td>
<td>7</td>
<td>7</td>
<td>10</td>
<td>15</td>
</tr>
</tbody>
</table>

**Office Layout:** The office shall have a minimum square footage as indicated in the table above, and shall be partitioned as shown on the building floor plan as provided by the Engineer.

**Tie-downs and Skirting:** Modular offices shall be tied-down and fully skirted to ground level.

**Lavatory Facilities:** For field offices sizes Small and Medium the Contractor shall furnish a toilet facility at a location convenient to the field office for use by CTDOT personnel and such assistants as they may engage; and for field offices sizes Large and Extra Large the Contractor shall furnish two (2) separate lavatories with toilet (men and women), in separately enclosed rooms that are properly ventilated and comply with applicable sanitary codes. Each lavatory shall have hot and cold running water and flush-type toilets. For all facilities the Contractor shall supply lavatory and sanitary supplies as required.

**Windows and Entrances:** The windows shall be of a type that will open and close conveniently, shall be sufficient in number and size to provide adequate light and ventilation, and shall be fitted with locking devices, blinds and screens. The entrances shall be secure, screened, and fitted with a lock for which four keys shall be furnished. All keys to the construction field office shall be furnished to the CTDOT and will be kept in their possession while State personnel are using the office. Any access to the entrance ways shall meet applicable building codes, with appropriate handrails. Stairways shall be ADA/ABA compliant and have non-skid tread surfaces. An ADA/ABA compliant ramp with non-skid surface shall be provided with the Extra-Large field office.
**Lighting:** The Contractor shall equip the office interior with electric lighting that provides a minimum illumination level of 100 foot-candles at desk level height, and electric outlets for each desk and drafting table. The Contractor shall also provide exterior lighting that provides a minimum illumination level of 2 foot-candles throughout the parking area and for a minimum distance of 10 ft. on each side of the field office.

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

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

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

A. 120/240 volt, 1 phase, 3 wire
B. Ampacity necessary to serve all equipment. Service shall be a minimum 100 amp dedicated to the construction field office.
C. The electrical panel shall include a main circuit breaker and branch circuit breakers of the size and quantity required.
D. Additional 120 volt, single phase, 20 amp, isolated ground dedicated power circuit with dual NEMA 5-20 receptacles will be installed at each desk and personal computer table (workstation) location.
E. Additional 120 volt, single phase, 20 amp, isolated ground dedicated power circuit with dual NEMA 5-20 receptacles will be installed, for use by the Telephone Company.
F. Additional 120-volt circuits and duplex outlets as required meeting National Electric Code requirements.
G. One exterior (outside) wall mounted GFI receptacle, duplex, isolated ground, 120 volt, straight blade.
H. After work is complete and prior to energizing, the State’s CTDOT electrical inspector, must be contacted at 860-594-2240. (Do Not Call Local Town Officials)
I. Prior to field office removal, the CTDOT Office of Information Systems (CTDOT OIS) must be notified to deactivate the communications equipment.

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

ITEM #0969062A
Telephone Service: The Contractor shall provide telephone service with unlimited nation-wide calling plan. For a Small, Medium and Large field office this shall consist of the installation of two (2) telephone lines: one (1) line for phone/voice service and one (1) line dedicated for the facsimile machine. For an Extra-Large field office this shall consist of four (4) telephone lines: three (3) lines for phone/voice service and one (1) line dedicated for facsimile machine. The Contractor shall pay all charges.

Data Communications Facility Wiring: Contractor shall install a Category 6 568B patch panel in a central wiring location and Cat 6 cable from the patch panel to each PC station, Smart Board location, Multifunction Laser Printer/Copier/Scanner/Fax, terminating in a (Category 6 568B) wall or surface mount data jack. The central wiring location shall also house either the data circuit with appropriate power requirements or a category 5 cable run to the location of the installed data circuit. The central wiring location will be determined by the CTDOT OIS staff in coordination with the designated field office personnel as soon as the facility is in place.

For Small, Medium and Large field offices the Contractor shall run a CAT 6 LAN cable a minimum length of 25 feet for each CTDOT networked device (including but not limited to: smartboards and Multi-Function Laser Printer/Copier/Scanner/Fax) to LAN switch area leaving an additional 10 feet of cable length on each side with terminated RJ45 connectors. For an Extra-Large field office the Contractor shall run CAT 6 LAN cables from workstations, install patch panel in data circuit demark area and terminate runs with RJ45 jacks at each device location. Terminate runs to patch panel in LAN switch area. Each run / jack shall be clearly labeled with an identifying Jack Number.

The Contractor shall supply cables to connect the Wi-Fi printer to the Contractor supplied internet router and to workstations/devices as needed. These cables shall be separate from the LAN cables and data Jacks detailed above for the CTDOT network.

The number of networked devices anticipated shall be at least equal to the number of personal computer tables, Multi-Function Laser Printer/Copier/Scanner/Fax, and smartboards listed below.

The installation of a data communication circuit between the field office and the CTDOT OIS in Newington will be coordinated between the CTDOT District staff, CTDOT OIS staff and the local utility company once the Contractor supplies the field office phone numbers and anticipated installation date. The Contractor shall provide the field office telephone number(s) to the CTDOT Project Engineer within 10 calendar days after the signing of the Contract as required by Article 1.08.02. This is required to facilitate data line and computer installations.

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

<table>
<thead>
<tr>
<th>Furnishing Description</th>
<th>Office Size</th>
</tr>
</thead>
</table>

ITEM #0969062A
<table>
<thead>
<tr>
<th>Item Description</th>
<th>Small</th>
<th>Med.</th>
<th>Large</th>
<th>Extra Large</th>
</tr>
</thead>
<tbody>
<tr>
<td>Office desk (2.5 ft. x 5 ft.) with drawers, locks, and matching desk chair that have pneumatic seat height adjustment and dual wheel casters on the base.</td>
<td>1</td>
<td>3</td>
<td>5</td>
<td>8</td>
</tr>
<tr>
<td>Standard secretarial type desk and matching desk chair that has pneumatic seat height adjustment and dual wheel casters on the base.</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>Personal computer tables (4 ft. x 2.5 ft.).</td>
<td>2</td>
<td>3</td>
<td>5</td>
<td>8</td>
</tr>
<tr>
<td>Drafting type tables (3 ft. x 6 ft.) and supported by wall brackets and legs; and matching drafters stool that have pneumatic seat height adjustment, seat back and dual wheel casters on the base.</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Conference table, 3 ft. x 12 ft.</td>
<td>-</td>
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<td>1</td>
</tr>
<tr>
<td>Table – 3 ft. x 6 ft.</td>
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<td>-</td>
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<td>1</td>
</tr>
<tr>
<td>Office Chairs.</td>
<td>2</td>
<td>4</td>
<td>8</td>
<td>20</td>
</tr>
<tr>
<td>Mail slot bin – legal size.</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Non-fire resistant cabinet.</td>
<td>-</td>
<td>-</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Fire resistant cabinet (legal size/4 drawer), locking.</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Storage racks to hold 3 ft. x 5 ft. display charts.</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Vertical plan racks for 2 sets of 2 ft. x 3 ft. plans for each rack.</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Double door supply cabinet with 4 shelves and a lock – 6 ft. x 4 ft.</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Case of cardboard banker boxes (Min 10 boxes/case)</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Open bookcase – 3 shelves – 3 ft. long.</td>
<td>-</td>
<td>-</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>White Dry-Erase Board, 36” x 48”min. with markers and eraser.</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Interior partitions – 6 ft. x 6 ft., soundproof type, portable and freestanding.</td>
<td>-</td>
<td>-</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>Coat rack with 20 coat capacity.</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>Wastebaskets - 30 gal., including plastic waste bags.</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Wastebaskets - 5 gal., including plastic waste bags.</td>
<td>1</td>
<td>3</td>
<td>6</td>
<td>10</td>
</tr>
<tr>
<td>Electric wall clock.</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>2</td>
</tr>
<tr>
<td>Telephone.</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>Full size stapler 20 (sheet capacity, with staples)</td>
<td>1</td>
<td>2</td>
<td>5</td>
<td>8</td>
</tr>
<tr>
<td>Desktop tape dispensers (with Tape)</td>
<td>1</td>
<td>2</td>
<td>5</td>
<td>8</td>
</tr>
<tr>
<td>8 Outlet Power Strip with Surge Protection.</td>
<td>3</td>
<td>4</td>
<td>6</td>
<td>9</td>
</tr>
<tr>
<td>Rain Gauge</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Business telephone system for three lines with ten handsets, intercom capability, and one speaker phone for conference table.</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>Mini refrigerator - 3.2 c.f. min.</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Item Description</td>
<td>Item #</td>
<td>1</td>
<td>1</td>
<td>1</td>
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<tr>
<td>---------------------------------------------------------------------------------</td>
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</tr>
<tr>
<td>Hot and cold water dispensing unit. Disposable cups and bottled water shall be</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>supplied by the Contractor for the duration of the project.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Microwave, 1.2 c.f., 1000W min.</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Fire extinguishers - provide and install type and *number to meet applicable</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>State and local codes for size of office indicated, including a fire</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>extinguisher suitable for use on a computer terminal fire.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Electric pencil sharpeners.</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Electronic office type printing calculators capable of addition, subtraction,</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>multiplication and division with memory and a supply of printing paper.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Small Multi-Function Laser Printer/Copier/Scanner/Fax combination unit, network</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>capable, as specified below under Computer Related Hardware and Software.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Large Multi-Function Laser Printer/Copier/Scanner/Fax combination unit, network</td>
<td>1</td>
<td></td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>capable, as specified below under Computer Related Hardware and Software.</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Field Office Wi-Fi Connection as specified below under Computer Related</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Hardware and Software.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wi-Fi Printer as specified below under Computer Related Hardware and Software.</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Digital Camera as specified below under Computer Related Hardware and Software.</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Video Projector as specified below under Computer Related Hardware and Software.</td>
<td></td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Smart Board as specified below under Computer Related Hardware and Software.</td>
<td></td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Infrared Thermometer, including annual third party certified calibration, case,</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>and cleaning wipes.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Concrete Curing Box as specified below under Concrete Testing Equipment.</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Concrete Air Meter and accessories as specified below under Concrete Testing</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Equipment as specified below. Contractor shall provide third party calibration</td>
<td></td>
<td></td>
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<tr>
<td>on a quarterly basis.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Concrete Slump Cone and accessories as specified below under Concrete Testing</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Equipment.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>First Aid Kit</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Flip Phones as specified under Computer Related Hardware and Software.</td>
<td></td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Smart Phones as specified under Computer Related Hardware and Software.</td>
<td></td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

ITEM #0969062A
The furnishings and equipment required herein shall remain the property of the Contractor. Any supplies required to maintain or operate the above listed equipment or furnishings shall be provided by the Contractor for the duration of the project.

**Computer Related Hardware and Software:** The CTDOT will supply by its own means the actual Personal Computers for the CTDOT representatives. The Contractor shall supply the Field Office Wi-Fi Connection, Wi-Fi Printer, Digital Camera(s), Flip Phones, Smart Phones, Multifunction Laser Printer/Copier/Scanner/Fax, Video Projectors, and Smart Board(s) as well as associated hardware and software, must meet the requirements of this specification as well as the latest minimum specifications posted, as of the project advertising date, at CTDOT's web site http://www.ct.gov/dot/cwp/view.asp?a=1410&q=563904

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

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

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

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

Once the Contract has been completed, the hardware and software will remain the property of the Contractor.
**First Aid Kit:** The Contractor shall supply a first aid kit adequate for the number of personnel expected based on the size of the field office specified and shall keep the first aid kit stocked for the duration that the field office is in service.

**Rain Gauge:** The Contractor shall supply install and maintain a rain gauge for the duration of the project, meeting these minimum requirements. The rain gauge shall be installed on the top of a post such that the opening of the rain gauge is above the top of the post an adequate distance to avoid splashing of rain water from the top of the post into the rain gauge. The Location of the rain gauge and post shall be approved by the Engineer. The rain gauge shall be made of a durable material and have graduations of 0.1 inches or less with a minimum total column height of 5 inches. If the rain gauge is damaged the Contractor shall replace it prior to the next forecasted storm event at no additional cost.

**Concrete Testing Equipment:** If the Contract includes items that require compressive strength cylinders for concrete, in accordance with the Schedule of Minimum Testing Requirements for Sampling Materials for Test, the Contractor shall provide the following equipment.

A) **Concrete Cylinder Curing Box** – meeting the requirements of Section 6.12 of the Standard Specifications.

B) **Air Meter** – The air meter provided shall be in good working order and meet the requirements of AASHTO T 152.

C) **Slump Cone Mold** – Slump cone, base plate, and tamping rod shall be provided in like-new condition and meet the requirements of AASHTO T119, Standard Test Method for Slump of Hydraulic-Cement Concrete.

All testing equipment will remain the property of the Contractor at the completion of the project.

**Insurance Policy:** The Contractor shall provide a separate insurance policy, with no deductible, in the minimum amount of five thousand dollars ($5,000) in order to insure all State-owned data equipment and supplies used in the office against all losses. The Contractor shall be named insured on that policy, and the CTDOT shall be an additional named insured on the policy. These losses shall include, but not be limited to: theft, fire, and physical damage. The CTDOT will be responsible for all maintenance costs of CTDOT owned computer hardware. In the event of loss, the Contractor shall provide replacement equipment in accordance with current CTDOT equipment specifications, within seven days of notice of the loss. If the Contractor is unable to provide the required replacement equipment within seven days, the CTDOT may provide replacement equipment and deduct the cost of the equipment from monies due or which may become due the Contractor under the Contract or under any other contract. The Contractor's financial liability under this paragraph shall be limited to the amount of the insurance coverage required by this paragraph. If the cost of equipment replacement required by this paragraph should exceed the required amount of the insurance coverage, the CTDOT will reimburse the Contractor for replacement costs exceeding the amount of the required coverage.

**Maintenance:** During the occupancy by the CTDOT, the Contractor shall maintain all facilities and furnishings provided under the above requirements, and shall maintain and keep the office...
quarters clean through the use of weekly professional cleaning to include, but not limited to, washing & waxing floors, cleaning restrooms, removal of trash, etc. Exterior areas shall be mowed and clean of debris. A trash receptacle (dumpster) with weekly pickup (trash removal) shall be provided. Snow removal, sanding and salting of all parking, walkway, and entrance ways areas shall be accomplished during a storm if on a workday during work hours, immediately after a storm and prior to the start of a workday. If snow removal, salting and sanding are not completed by the specified time, the State will provide the service and all costs incurred will be deducted from the next payment estimate.

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

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

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

<table>
<thead>
<tr>
<th>Pay Item</th>
<th>Pay Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construction Field Office, Medium</td>
<td>Month</td>
</tr>
</tbody>
</table>
ITEM #0971001A – MAINTENANCE AND PROTECTION OF TRAFFIC

Article 9.71.01 – Description is supplemented by the following:

The Contractor shall maintain and protect traffic as described by the following and as limited in the Special Provision "Prosecution and Progress":

**Route 154**

The Contractor shall maintain and protect a minimum of one lane of traffic in each direction, each lane on a paved travel path not less than 11 feet in width.

Excepted therefrom will be those periods, during the allowable periods, when the Contractor is actively working, at which time the Contractor shall maintain and protect at least an alternating one-way traffic operation, on a paved travel path not less than 11 feet in width. The length of the alternating one-way traffic operation shall not exceed 300 feet and there shall be no more than one alternating one-way traffic operation within the project limits without prior approval of the Engineer.

The Contractor will be allowed to close Route 154 to through traffic and detour traffic as shown on the Detour Plan contained in the contract plans.

**All Other Roadways**

The Contractor shall maintain and protect a minimum of one lane of traffic in each direction, each lane on a paved travel path not less than 11 feet in width.

Excepted therefrom will be those periods, during the allowable periods, when the Contractor is actively working, at which time the Contractor shall maintain and protect at least an alternating one-way traffic operation, on a paved travel path not less than 11 feet in width. The length of the alternating one-way traffic operation shall not exceed 300 feet and there shall be no more than one alternating one-way traffic operation within the project limits without prior approval of the Engineer.

**Commercial and Residential Driveways**

The Contractor shall maintain access to and egress from all commercial and residential driveways throughout the project limits. The Contractor will be allowed to close said driveways to perform the required work during those periods when the businesses are closed, unless permission is granted from the business owner to close the driveway during business hours. If a temporary closure of a residential driveway is necessary, the Contractor shall coordinate with the owner to determine the time period of the closure.
 Article 9.71.03 - Construction Method is supplemented as follows:

General

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.

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.

Existing Signing

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

The Contractor shall schedule a meeting with representatives from the Department including the offices of Maintenance and Traffic, and the 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**

<table>
<thead>
<tr>
<th>POSTED SPEED LIMIT MILES PER HOUR</th>
<th>MINIMUM TAPER LENGTH IN FEET FOR A SINGLE LANE CLOSURE</th>
</tr>
</thead>
<tbody>
<tr>
<td>30 OR LESS</td>
<td>180</td>
</tr>
<tr>
<td>35</td>
<td>250</td>
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<tr>
<td>40</td>
<td>320</td>
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<td>55</td>
<td>660</td>
</tr>
<tr>
<td>65</td>
<td>780</td>
</tr>
</tbody>
</table>
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:
<table>
<thead>
<tr>
<th>Message No.</th>
<th>Frame 1</th>
<th>Frame 2</th>
<th>Message No.</th>
<th>Frame 1</th>
<th>Frame 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>LEFT LANE CLOSED</td>
<td>MERGE RIGHT</td>
<td>9</td>
<td>LANES CLOSED AHEAD</td>
<td>REDUCE SPEED</td>
</tr>
<tr>
<td>2</td>
<td>2 LEFT LANES CLOSED</td>
<td>MERGE RIGHT</td>
<td>10</td>
<td>LANES CLOSED AHEAD</td>
<td>USE CAUTION</td>
</tr>
<tr>
<td>3</td>
<td>LEFT LANE CLOSED</td>
<td>REDUCE SPEED</td>
<td>11</td>
<td>WORKERS ON ROAD</td>
<td>REDUCE SPEED</td>
</tr>
<tr>
<td>4</td>
<td>2 LEFT LANES CLOSED</td>
<td>REDUCE SPEED</td>
<td>12</td>
<td>WORKERS ON ROAD</td>
<td>SLOW DOWN</td>
</tr>
<tr>
<td>5</td>
<td>RIGHT LANE CLOSED</td>
<td>MERGE LEFT</td>
<td>13</td>
<td>EXIT XX CLOSED</td>
<td>USE EXIT YY</td>
</tr>
<tr>
<td>6</td>
<td>2 RIGHT LANES CLOSED</td>
<td>MERGE LEFT</td>
<td>14</td>
<td>EXIT XX CLOSED</td>
<td>FOLLOW DETOUR</td>
</tr>
<tr>
<td>7</td>
<td>RIGHT LANE CLOSED</td>
<td>REDUCE SPEED</td>
<td>15</td>
<td>2 LANES SHIFT AHEAD</td>
<td>USE CAUTION</td>
</tr>
<tr>
<td>8</td>
<td>2 RIGHT LANES CLOSED</td>
<td>REDUCE SPEED</td>
<td>16</td>
<td>3 LANES SHIFT AHEAD</td>
<td>USE CAUTION</td>
</tr>
</tbody>
</table>

For any other message(s), approval must be received from the Office of Construction prior to their use. No more than two (2) displays shall be used within any message cycle.
SECTION 8. USE OF STATE POLICE OFFICERS

8.a) State Police may be utilized only on limited access highways and secondary roadways under their primary jurisdiction. One Officer may be used per critical sign pattern. Shoulder closures and right lane closures can generally be implemented without the presence of a State Police Officer. Likewise in areas with moderate traffic and wide, unobstructed medians, left lane closures can be implemented without State Police presence. Under some situations it may be desirable to have State Police presence, when one is available. Examples of this include: nighttime lane closures; left lane closures with minimal width for setting up advance signs and staging; lane and shoulder closures on turning roadways/ramps or mainline where sight distance is minimal; and closures where extensive turning movements or traffic congestion regularly occur, however they are not required.

8.b) Once the pattern is in place, the State Police Officer should be positioned in a non-hazardous location in advance of the pattern. If traffic backs up beyond the beginning of the pattern, then the State Police Officer shall be repositioned prior to the backup to give warning to the oncoming motorists. The State Police Officer and TMA should not be in proximity to each other.

8.c) Other functions of the State Police Officer(s) may include:

- Assisting entering/exiting construction vehicles within the work area.
- Enforcement of speed and other motor vehicle laws within the work area, if specifically requested by the project.

8.d) State Police Officers assigned to a work site are to only take direction from the Engineer.
SERIES 16 SIGNS

THE 16-S SIGN SHALL BE USED ON ALL PROJECTS THAT REQUIRE SIDEWALK RECONSTRUCTION OR RESTRICT PEDESTRIAN TRAVEL ON AN EXISTING SIDEWALK.

SERIES 16 SIGNS SHALL BE INSTALLED IN ADVANCE OF THE TRAFFIC CONTROL PATTERNS TO ALLOW MOTORISTS THE OPPORTUNITY TO AVOID A WORK ZONE. SERIES 16 SIGNS SHALL BE INSTALLED ON ANY MAJOR INTERSECTING ROADWAYS THAT APPROACH THE WORK ZONE. ON LIMITED-ACCESS HIGHWAYS, THESE SIGNS SHALL BE LOCATED IN ADVANCE OF THE NEAREST UPSTREAM EXIT RAMP AND ON ANY ENTRANCE RAMPS PRIOR TO OR WITHIN THE WORK ZONE LIMITS.

THE LOCATION OF SERIES 16 SIGNS CAN BE FOUND ELSEWHERE IN THE PLANS OR INSTALLED AS DIRECTED BY THE ENGINEER.

SIGNS 16-E AND 16-H SHALL BE POST-MOUNTED.

SIGN 16-E SHALL BE USED ON ALL EXPRESSWAYS.

SIGN 16-H SHALL BE USED ON ALL RAMPS, OTHER STATE ROADWAYS, AND MAJOR TOWN/CITY ROADWAYS.

SIGN 16-M SHALL BE USED ON OTHER TOWN ROADWAYS.

REGULATORY SIGN "ROAD WORK AHEAD, FINES DOUBLED"

THE REGULATORY SIGN "ROAD WORK AHEAD FINES DOUBLED" SHALL BE INSTALLED FOR ALL WORK ZONES THAT OCCUR ON ANY STATE HIGHWAY IN CONNECTICUT WHERE THERE ARE WORKERS ON THE HIGHWAY OR WHEN THERE IS OTHER THAN EXISTING TRAFFIC OPERATIONS.

THE "ROAD WORK AHEAD FINES DOUBLED" REGULATORY SIGN SHALL BE PLACED AFTER THE SERIES 16 SIGN AND IN ADVANCE OF THE "ROAD WORK AHEAD" SIGN.

"END ROAD WORK" SIGN

THE LAST SIGN IN THE PATTERN MUST BE THE "END ROAD WORK" SIGN.
NOTES FOR TRAFFIC CONTROL PLANS

1. IF A TRAFFIC STOPPAGE OCCURS IN ADVANCE OF SIGN (A), THEN AN ADDITIONAL SIGN (A) SHALL BE INSTALLED IN ADVANCE OF THE STOPPAGE.

2. SIGNS (A), (B), AND (C) SHOULD BE OMITTED WHEN THESE SIGNS HAVE ALREADY BEEN INSTALLED TO DESIGNATE A LARGER WORK ZONE THAN THE WORK ZONE THAT IS ENCOMPASSED ON THIS PLAN.

3. SEE TABLE 1 FOR ADJUSTMENT OF TAPERS IF NECESSARY.

4. IF THIS PLAN REMAINS IN CONTINUOUS OPERATION FOR MORE THAN 36 HOURS, THEN TRAFFIC DRUMS SHALL BE USED IN PLACE OF TRAFFIC CONES.

5. ANY LEGAL SPEED LIMIT SIGNS WITHIN THE LIMITS OF A ROADWAY / LANE CLOSURE AREA SHALL BE COVERED WITH AN OPAQUE MATERIAL WHILE THE CLOSURE IS IN EFFECT, AND UNCOVERED WHEN THE ROADWAY / LANE CLOSURE IS RE-OPENED TO ALL LANES OF TRAFFIC.

6. IF THIS PLAN REMAINS IN CONTINUOUS OPERATION FOR MORE THAN 36 HOURS, THEN ANY EXISTING CONFLICTING PAVEMENT MARKINGS SHALL BE ERADICATED OR COVERED, AND TEMPORARY PAVEMENT MARKINGS THAT DELINEATE THE PROPER TRAVELPATHS SHALL BE INSTALLED.

7. DISTANCES BETWEEN SIGNS IN THE ADVANCE WARNING AREA MAY BE REDUCED TO 100’ ON LOW-SPEED URBAN ROADS (SPEED LIMIT < 40 MPH).

8. IF THIS PLAN IS TO REMAIN IN OPERATION DURING THE HOURS OF DARKNESS, INSTALL BARRICADE WARNING LIGHTS - HIGH INTENSITY ON ALL POST-MOUNTED DIAMOND SIGNS IN THE ADVANCE WARNING AREA.

9. A CHANGEABLE MESSAGE SIGN SHALL BE INSTALLED ONE HALF TO ONE MILE IN ADVANCE OF THE LANE CLOSURE TAPER.

10 SIGN (P) SHALL BE MOUNTED A MINIMUM OF 7 FEET FROM THE PAVEMENT SURFACE TO THE BOTTOM OF THE SIGN.

TABLE 1 - MINIMUM TAPER LENGTHS

<table>
<thead>
<tr>
<th>POSTED SPEED LIMIT (MILES PER HOUR)</th>
<th>MINIMUM TAPER LENGTH FOR A SINGLE LANE CLOSURE</th>
</tr>
</thead>
<tbody>
<tr>
<td>30 OR LESS</td>
<td>180’ (55m)</td>
</tr>
<tr>
<td>35</td>
<td>250’ (75m)</td>
</tr>
<tr>
<td>40</td>
<td>320’ (100m)</td>
</tr>
<tr>
<td>45</td>
<td>540’ (165m)</td>
</tr>
<tr>
<td>50</td>
<td>600’ (180m)</td>
</tr>
<tr>
<td>55</td>
<td>660’ (200m)</td>
</tr>
<tr>
<td>65</td>
<td>780’ (240m)</td>
</tr>
</tbody>
</table>

METRIC CONVERSION CHART (1" = 25mm)

<table>
<thead>
<tr>
<th>ENGLISH</th>
<th>METRIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>12&quot;</td>
<td>300mm</td>
</tr>
<tr>
<td>18&quot;</td>
<td>450mm</td>
</tr>
<tr>
<td>24&quot;</td>
<td>600mm</td>
</tr>
<tr>
<td>30&quot;</td>
<td>750mm</td>
</tr>
<tr>
<td>36&quot;</td>
<td>900mm</td>
</tr>
</tbody>
</table>

CONSTRUCTION TRAFFIC CONTROL PLAN

NOTES

CONNECTICUT DEPARTMENT OF TRANSPORTATION
BUREAU OF ENGINEERING & CONSTRUCTION

APPROVED: Charles S. Hebron
                      2013/05/02 15:10:36 0402
  PRINCIPAL ENGINEER

ITEM #0971001A
WORK IN TRAVEL LANE AND SHOULDER
TWO LANE HIGHWAY
ALTERNATING ONE-WAY TRAFFIC OPERATIONS

DENOTES APPROXIMATE LOCATION OF
UNIFORMED FLAGGER, TRAFFIC PERSON
OTHER THAN POLICE OFFICERS SHALL
USE SIGN 80-9950 MOUNTED ON A 6' MIN. STAFF.

FROM THE MUTCD
(2009 EDITION)
Table 6E-1: Stopping Sight Distance
as a Function of Speed

<table>
<thead>
<tr>
<th>Speed (mph)</th>
<th>Distance (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>115</td>
</tr>
<tr>
<td>25</td>
<td>155</td>
</tr>
<tr>
<td>30</td>
<td>196</td>
</tr>
<tr>
<td>35</td>
<td>220</td>
</tr>
<tr>
<td>40</td>
<td>245</td>
</tr>
<tr>
<td>45</td>
<td>260</td>
</tr>
<tr>
<td>50</td>
<td>245</td>
</tr>
<tr>
<td>55</td>
<td>195</td>
</tr>
</tbody>
</table>

CONNECTICUT DEPARTMENT OF TRANSPORTATION
BUREAU OF ENGINEERING & CONSTRUCTION

PLAN 13 - SHEET 1 OF 2
SEE NOTES 1, 2, 4, 6, 7, 8

CONSTRUCTION TRAFFIC CONTROL PLAN

ITEM #0971001A
WORK IN TRAVEL LANE AND SHOULDER  
TWO LANE HIGHWAY  
ALTERNATING ONE-WAY TRAFFIC OPERATIONS

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/LOW SIGN PADDLE (SIGN NO. 90-9950) 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.
Article 9.71.05 – Basis of Payment is supplemented by the following:

The temporary relocation of signs and supports, and the furnishing, installation and removal of any temporary supports shall be paid for under the item “Maintenance and Protection of Traffic”. Temporary overhead sign supports and foundations shall be paid for under the appropriate item(s).

The cost of furnishing, installing, and removing the material for the 4H:1V traversable slope shall be paid for under the item “Maintenance and Protection of Traffic.”
ITEM #1206023A – REMOVAL AND RELOCATION OF EXISTING SIGNS

Section 12.06 is supplemented as follows:

**Article 12.06.01 – Description is supplemented with the following:**
Work under this item shall consist of the removal and/or relocation of designated side-mounted extruded aluminum and sheet aluminum signs, sign posts, sign supports, and foundations where indicated on the plans or as directed by the Engineer. Work under this item shall also include furnishing and installing new sign posts and associated hardware for signs designated for relocation.

**Article 12.06.03 – Construction Methods is supplemented with the following:**
The Contractor shall take care during the removal and relocation of existing signs, sign posts, and sign supports that are to be relocated so that they are not damaged. Any material that is damaged shall be replaced by the Contractor at no cost to the State.

Foundations and other materials designated for removal shall be removed and disposed of by the Contractor as directed by the Engineer and in accordance with existing standards for Removal of Existing Signage.

Sheet aluminum signs designated for relocation are to be re-installed on new sign posts.

**Article 12.06.04 – Method of Measurement is supplemented with the following:**
Payment under Removal and Relocation of Existing Signs shall be at the contract lump sum price which shall include all extruded aluminum and sheet aluminum signs, sign posts, and sign supports designated for relocation, all new sign posts and associated hardware for signs designated for relocation, all extruded aluminum signs, sheet aluminum signs, sign posts and sign supports designated for scrap, and foundations and other materials designated for removal and disposal, and all work and equipment required.

**Article 12.06.05 – Basis of Payment is supplemented with the following:**
This work will be paid for at the contract lump sum price for “Removal and Relocation of Existing Signs” which price shall include relocating designated extruded aluminum and sheet aluminum signs, sign posts, and sign supports, providing new posts and associated hardware for relocated signs, removing and disposing of foundations and other materials, and all equipment, material, tools and labor incidental thereto. This price shall also include removing, loading, transporting, and unloading of extruded aluminum signs, sheet aluminum signs, sign posts, and sign supports designated for scrap and all equipment, material, tools and labor incidental thereto.

<table>
<thead>
<tr>
<th>Pay Item</th>
<th>Pay Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Removal and Relocation of Existing Signs</td>
<td>L.S.</td>
</tr>
</tbody>
</table>
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)

<table>
<thead>
<tr>
<th>Number of Posts in Project =&gt;</th>
<th>51-100</th>
<th>101-250</th>
<th>251-1000</th>
<th>&gt;1000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample Size=&gt; 5 Posts</td>
<td>5 Posts</td>
<td>10 Posts</td>
<td>40 Posts</td>
<td>60 Posts</td>
</tr>
<tr>
<td>0 Defects</td>
<td>1.0</td>
<td>1.0</td>
<td>1.025</td>
<td>1.025</td>
</tr>
<tr>
<td>1 Defect</td>
<td>0.9</td>
<td>0.95</td>
<td>0.975</td>
<td>0.983</td>
</tr>
<tr>
<td>2 Defects Rejection</td>
<td></td>
<td>0.9</td>
<td>0.95</td>
<td>0.967</td>
</tr>
<tr>
<td>3 Defects Rejection Rejection</td>
<td></td>
<td></td>
<td>0.925</td>
<td>0.95</td>
</tr>
<tr>
<td>4 Defects Rejection</td>
<td></td>
<td></td>
<td>0.9</td>
<td>0.933</td>
</tr>
<tr>
<td>5 Defects Rejection Rejection</td>
<td></td>
<td></td>
<td></td>
<td>0.917</td>
</tr>
<tr>
<td>6 Defects Rejection</td>
<td></td>
<td></td>
<td></td>
<td>0.9</td>
</tr>
<tr>
<td>7 or more Defects</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: Projects with 50 or fewer posts will not include field testing
ITEM #1300007A – EXCAVATION AND DISPOSAL OF UNSUITABLE MATERIAL (WATER MAIN)

13.00.01 – Description:

Conform to the requirements of Section 2.05.01 of Form 817.

A. Work and materials required by this section of the Specifications consists of excavating, backfilling, compacting, as indicated, and refills of unsuitable material, removal of existing pipelines and all other incidental work necessary for the construction of pipelines, structures, pavement and appurtenant work in accordance with the Contract Documents.

B. The Work also includes installing shoring and bracing as the excavation proceeds; providing approved bank-run gravel from off-site sources when directed for backfills of excavations and disposal at locations directed by the Engineer of pavements, surplus and unsuitable materials; protection of existing pipelines, utilities and structures and of new work; compaction of trench bottom, backfills, refills and subgrades; and all other appurtenant work.

13.00.02 – Materials:

A. Compacted Gravel Fill shall be Bank Run Gravel and it shall conform to the requirements of M.02.06, Grading “C”.

B. Earth refill shall be from approved off-site borrow pits, and shall be a well-graded granular material, at least eighty (80%) percent of which must be sand and gravel. It shall be free from peat, organic matter and debris and shall not contain any stones or clay lumps in excess of 4 inches in their greatest dimensions. Any materials of whatever description which are too uniformly graded or saturated and not readily compactable shall not be utilized.

C. Bedding material shall be “Fine Gravel” which shall consist of clean, hard and durable particles or fragments of rock and shall be free from clay, organic matter and other objectionable material. Fine gravel shall conform to the following gradation limits:

<table>
<thead>
<tr>
<th>U.S. Standard Sieve Size</th>
<th>Percentage Passing By Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>¾ in</td>
<td>100</td>
</tr>
<tr>
<td>3/8 in</td>
<td>50-85</td>
</tr>
<tr>
<td>No. 4</td>
<td>25-70</td>
</tr>
<tr>
<td>No. 10</td>
<td>10-35</td>
</tr>
<tr>
<td>No. 40</td>
<td>0-10</td>
</tr>
<tr>
<td>No. 100</td>
<td>Less Than 5</td>
</tr>
</tbody>
</table>

D. Crushed Stone shall consist of clean, hard durable, crushed rock and shall be satisfactorily free from fine sand, silt or rock flour. Crushed stone shall conform to ASTM Designation.
D 693 (latest revision), shall be uniformly graded, and shall range in size from 0.75 inches to 1.25 inches.

E. Filter fabric shall be Mirafi 140, Filter-X or equal.

F. Utility warning/marking tape shall be provided for ALL UTILITIES INSTALLED UNDER THIS CONTRACT.

G. Tape shall be manufactured of poly-plastic 6 inches wide and shall be of a suitable color assigned to the type of facility for surface markings in section 16-345-5(h) of the State of Connecticut General Statutes.

H. Tape shall be of the “DETECTABLE” type and shall be durably imprinted with the name of the specific utility that the tape is above (i.e., “WATER MAIN”). Tape installation and use shall be in accordance with Section 16-345 of the State of Connecticut General Statutes and all other applicable State and/or Federal regulations.

I. Tape shall be installed continuously along the entire length of the underground water main pipe and placed at a point detailed on the Contract Drawings.

13.00.03 – Construction Methods:

Conform to the requirements of Section 2.02.03 and 2.05.03 of Form 817, including the following:

A. EXCAVATION AND DISPOSAL OF UNSUITABLE MATERIAL (WATER MAIN)

1. Unsuitable materials are herein defined as organic material, peat, organic silt or combinations thereof, all having unsuitable in-situ bearing properties and all materials of whatever description which are too loose or saturated for use as backfill or trench bottom to provide satisfactory bearing.

2. The Contractor shall satisfactorily excavate and remove all unsuitable material uncovered within the trench above the bottom of the bedding indicated on the drawings or as directed by the Engineer and shall satisfactorily dispose of such material off the site. Where unsuitable material is found below the bedding bottom, it shall be removed to a depth indicated by the Engineer.

3. All resulting unsuitable excavations outside the pipe bedding and trench limits shall be refilled with compacted bank-run gravel refill.

B. TRENCH EXCAVATION

1. Trench excavation shall include the excavation, removal and satisfactory disposal of all materials of whatever nature encountered from within the limits indicated or specified or as directed in writing, other than rock or ledge.
2. Excavation shall include, but not be limited to, earth materials such as peats, organic or inorganic silts, clay, sand and gravel; pavements; cobbles and boulders less than one (1) cubic yard in volume; soft or disintegrated rock which, in the opinion of the Engineer, can be removed without blasting or drilling; brick and concrete masonry and all obstructions not specifically included in another Section.

3. All excavation, sheeting, shoring and dewatering operations shall be accomplished to prevent the undermining or disturbing of existing pipelines, utilities and structures or of any completed construction.

4. Portions of the required excavations are below existing ground water levels. All excavations shall be kept dry at all times and all construction work shall be performed in the dry, unless otherwise authorized or directed by the Engineer.

5. Excavation shall be made to the lines and grades shown on the drawings or as modified by the Engineer/CWC. Excavations shall be accurately graded to allow satisfactory construction of the Contract work. Immediately after excavation to the indicated or directed trench bottom, the Contractor shall compact the exposed trench bottom surface with sufficient passes of an approved plate-type vibratory compactor.

6. Bell holes and depressions for joints shall be dug after the trench bottom has been graded and compacted and after gravel bedding, if required, has been placed and compacted. The bottom quadrant of each pipe barrel shall have complete and uniform bearing for the full length of each pipe. The trench bottom shall again be thoroughly compacted just prior to final shaping for bedding and installation of pipe.

7. Excavation operations adjacent to and below existing structures and utilities shall be done manually and in a manner to prevent disturbance of or damage to the existing structures and utilities. Butt bracing of utility poles shall be utilized where necessary.

8. Existing pavements and base courses that are to be removed shall be carefully saw cut and removed to obtain sound, vertical edges to the line indicated.

9. Existing pavements and base courses beyond the indicated lines which are to remain and which have been disturbed or damaged shall be restored or replaced by the Contractor to match existing pavements and base courses, at no additional expense to the Owner. Existing pavements and base courses to remain shall be protected by the Contractor.

10. The Contractor shall be responsible for keeping all excavated and construction material a safe distance back from the edge of excavations to avoid overloading the sides of excavations and to prevent slides or cave-ins.

11. If an excavation is made deeper or wider than that shown on the Drawings, unless directed in writing by the Engineer/CWC, there will be no extra payment for such
unauthorized excavation. Backfill and compaction of all unauthorized excavations shall be made by the Contractor with either selected materials from on-site excavations or compacted gravel fill, as directed by the Engineer/CWC and at no expense to the Owner.

12. If a pipe is to be placed in fill or on top of the pipe is within 24 inches of existing ground surface, the fill shall first be placed as specified herein to a height of not less than 24 inches over the top of the pipe and for a width of 5 feet beyond each side of the pipeline. Following placement of such fill, excavation and backfill shall proceed as specified herein.

13. All trench excavations over depths specified by all applicable CWC, Local, State and/or Federal Health and Safety Regulations shall be performed in vertically sheeted or shored trenches. The Contractor may elect to employ a steel trenching box in lieu of the use of sheeting or shoring. The use of a trenching box and the conditions and locations where the same shall be allowed, will be subject to the determination and approval of the Engineer. No shoring or steel trenching box shall be used in areas underlain by soft or unsuitable soils.

14. Shoring shall be adequately braced to prevent cave-ins or loss of ground, and portions of the shoring or bracing shall be left in place as directed by the Engineer to maintain stability as backfilling progresses.

15. No excessive trench widths will be allowed to avoid the use of sheeting. The trench width at and below a level 12 inches above the top of the pipe shall not exceed the payment limit indicated on the drawings for the size pipe being installed, unless otherwise permitted by the Engineer.

16. Where existing subsurface utilities or other facilities adjacent to or crossing through the excavation require temporary support or protection, such temporary support or protection shall be satisfactorily provided by the Contractor, at no additional expense to the Owner. All necessary measures shall be taken by the Contractor to prevent lateral movement or settlement of existing facilities or of work in progress.

17. Grading shall be done as necessary to prevent surface water from flowing into excavations and any water accumulating therein shall be removed by pumping or other approved method. The pipeline shall not, at any time, be used for trench drainage.

18. Steel plate crossings may be required in place of plank crossings to cover excavations, which are temporarily not in use by the Contractor. These excavations shall be bridged with at least 1 inch thick steel plates, which conform to ASTM A36 (latest revision), and weigh not less than 1,000 pounds each. The plates shall extend to a minimum of 24 inches beyond all edges of the excavation. Fastening shall be removable spike, with flush heads, or other suitable means to prevent vibratory

ITEM #1300007A

Project No. 0105-0215

237
movement. Any difference in elevation between top of plate and street surface shall be smoothed over or ramped with bituminous concrete.

19. The Contractor shall adhere to all Federal, State and local regulations regarding safety during the performance of this work, including Occupational and Health Administration (OSHA) Construction Standards for Excavations, 29 CFR part 1926 (latest revision).

C. BACKFILLING

1. Unless directed otherwise by the Engineer/CWC, excavations shall not be backfilled until all required pipeline tests have been satisfactorily performed and until the work as installed conforms to all requirements specified in these Sections. Each layer of backfill material shall be moistened and compacted in such manner as to permit the proper and desired compaction of the backfill, so that paving of excavated areas can proceed immediately after backfilling is completed.

2. All excavations shall be backfilled as soon as practicable with bank run gravel or approved excavated material, if directed by the Engineer/CWC. If suitable material as approved by the Engineer/CWC is not available from the excavations in the quantities required for proper backfilling of excavations, the Contractor shall provide the necessary bank run gravel for backfilling from off-site sources.

3. All backfill placed in trenches below a level 12 inches above the top of pipe shall consist of pipe bedding or selected backfill, as shown on the plans, placed in layers not exceeding 12 inches in loose depths. Selected backfill shall be select compactable excavated material or bank-run gravel, as applicable, as approved by the Engineer/CWC, sand and/or gravel, not frozen and free from clods of earth, organic matter, stones larger than 2 inches in diameter or unsuitable materials. The material shall be deposited uniformly on both sides of the pipe and shall be thoroughly compacted by tamping under and on each side of the pipe to provide uniform support around the pipe, free from voids. Compaction of each layer shall be ninety-five (95%) percent of maximum dry density as determined by ASTM Test Method D1557 (latest revision).

4. WARNING TAPE: Utility warning tape shall be installed in the trench above the bedding material along the entire length of the pipe.

5. The balance of backfill in trenches shall be bank-run gravel or approved materials obtained from the excavation, if directed and as approved by the Engineer/RWA, not frozen and without any stone larger than 3 inches in their greatest dimension. It shall be spread in layers not exceeding 12 inches in loose depth and each layer shall be compacted by at least four (4) inches of an approved plate-type vibratory compactor. All trench backfilling shall be carefully placed to avoid disturbance of new work and of existing utilities and structures. Each layer shall be compacted to ninety-five (95%) percent of maximum dry density determined by ASTM Test D1557 (latest revision).
revision), Method D. The moisture content of backfill shall be such that proper compaction will be obtained. Puddling of backfill with water will not be permitted. During construction periodic tests at the expense of the Owner will be made by personnel of a testing laboratory satisfactory to the Engineer to insure that the required compaction is being obtained.

6. During filling and backfilling operations, pipelines will be checked by the Engineer/CWC to determine whether any displacement of the pipe has occurred. If the inspection of the pipelines shows poor alignment, displaced pipe or any other defects, the defects designated by the Engineer/CWC shall be remedied in a satisfactory manner by the Contractor at no additional expense to the Owner.

13.00.04 - Method of Measurement

A. “Excavation and Disposal of Unsuitable Material (Water Main)”: Excavation of unsuitable material, outside of the trench limits as shown on the Drawings, or where directed by the Engineer/CWC, will be measured by the actual number of cubic yards of unsuitable material removed and disposed of to the satisfaction of the Engineer.

13.00.05 - Basis of Payment

A. “Excavation and Disposal of Unsuitable Material (Water Main) outside of the trench limits will be paid at the unit price bid per cubic yard.

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ITEM #1300061A – WATER MAIN SUPPORT SYSTEM

Description: This work will include the installation of the galvanized assemblies required to carry the 12in. ductile iron water main with 2 inches of insulation in a black HDPE casing over the new Bridge 02708 over Plum Bank Creek and along the face of north parapet wall.

Materials: The materials for this work shall conform to the following:
Threaded rod shall be 7/8” A449 galvanized steel of the length shown with HD hex nuts and washers as required. The base and gusset plates shall be fabricated from 1/2” grade A36 steel, hot dip galvanized after welding and drilling of holes. Pipe rollers shall be Pipe Rollers for the size of the main as indicated with Pipe Roller Chair Assemblies w/ Adjustable Socket Fittings, all to be hot dipped galvanized. Galvanized Insulation Protection Shields shall be installed at all support locations. Materials for water main support system will be furnished by The Connecticut Water Company.

Construction Methods: Water main Pipe Roller Support Assemblies shall be anchored to the concrete bridge deck with 3/4in. x 6in. wedge style stainless steel anchors drilled and set in place.

All welding details, procedures and nondestructive testing shall conform to the requirements of AWS D1.1 Structural Welding Code - Steel. Visual inspection of all welds shall be made by the Contractor and the engineer. Welds or sections of welds containing imperfections and judged unacceptable by the engineer shall be removed and rewelded by the Contractor at his expense. Shop welds shall be inspected and tested for the fabricator by an established and approved laboratory whose equipment shall have a rated capacity for the work to be done. Certified copies of these inspections shall be submitted to the engineer and The Connecticut Water Company for examination and approval.

Shop drawings shall be required for the components of the water main support system as detailed on the water main relocation drawings and shall be submitted to the State and CWC for review and approval prior to fabrication and installation.

Method of Measurement: The water main support system, being paid for at a lump sum price, shall not be measured for payment. The cost of weld testing, inspection and certification will not be measured for payment.

Basis of Payment: The water main support system will be paid for at the contract lump sum price for “Water Main Support System,” including all components, complete in place, which price shall include, transporting, erecting, surface preparation, galvanizing, inspection, testing, certifying and all materials, labor, tools and work incidental thereto.

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ITEM #1300061A
ITEM #1301017A – FURNISHING AND INSTALLING TEMPORARY WATER MAIN CROSSING

Description: Work under this item shall consist of the design, construction, installation, maintenance and removal of a temporary utility structure to carry an 8 inch ductile iron water main over Plum Bank Creek upstream of existing Bridge 02708 including superstructure, substructure and all associated work. Coordination and cooperation will be required with The Connecticut Water Company (CWC). The State’s Contractor will install the 8in. water main on the temporary structure and will be responsible to connect and maintain the water main on the temporary structure until installation of the permanent 12in. water main is completed. When the temporary 8in. water main is no longer required, the States Contractor will disconnect and remove the temporary connections to the water main at the branch line valve and install mechanical joint plugs. The temporary structure with water main shall then be removed by the State’s Contractor and the banks of the brook restored by the State’s Contractor.

Materials: Unless otherwise specified by the Engineer all ductile iron water main, fittings and appurtenances will be provided by CWC for installation by the State’s Contractor.

1. Ductile iron water main to be installed will be Class 52 with mechanical joint pipe with joint restraint glands.

2. The materials for the water main support system (pipe roller assemblies) shall be those proposed by CWC and approved by the State and the CWC.

Construction Methods: The State’s Contractor shall be fully responsible for the design, detailing and any additional specifications or permits required. The designer of the water main support system shall be a qualified Professional Engineer licensed in the State of Connecticut. Signed and sealed working drawings and calculations, including foundation calculations shall be provided. The water main support system must not create any obstruction within the High Tide Line (HTL) elevation of 4.2. Said structure and supports shall provide sufficient anchorage to resist the force of the 100 year flood. The support system shall be designed per CWC Requirements. Shop drawings shall be provided to CWC for approval.

The construction drawings for the water main support system shall include the following minimum information:

1. Type and grade of structural materials.
2. Allowable material stresses in bending, compression and shear.
3. Modulus of elasticity “E”.
4. References for load data used for standardized, manufactured components.
5. Specification references for design criteria.
6. The live loads used.
7. The bearing value of the soil as determined by the Contractor when footing type foundations are to be used.
8. The total design reaction at each substructure foundation.
9. Details showing how the water main will be supported and held in place.

The temporary water main is anticipated to be a 8in. diameter ductile iron pipe, Class 52 mechanical joint pipe (29.3lbs. /ft. empty, 51.96lbs. /ft. full). The water main shall be placed on rollers spaced not more than 10 feet apart, minimum 2 supports per pipe length and held in place bolted to a steel H beam per the contract drawings.

The temporary water main crossing shall be in place prior to any disruption of the existing 8in. water main and shall remain in place during the staged construction of the new bridge until the new 12in. water main on the bridge is fully operational. It shall be the responsibility of the State’s Contractor to coordinate his work schedule, where required, with that of the CWC.

1. Pressure and Leakage Testing

Pressure and leakage testing and disinfection shall be the responsibility of the State’s Contractor. If any test of pipe laid discloses leakage greater specified requirements, the Contractor shall locate and repair the defective materials until the leakage is within the specified allowance.

2. Water quality testing shall be carried out by the CWC.

3. Removal of Temporary Structure

Once the new, permanent 12in. water main has been installed on the bridge and placed into service the State’s Contractor shall then remove the temporary utility bridge and above grade water main structure from the project area for disposal, remove and dispose of any temporary foundations and restore the area to original condition.

GENERAL REQUIREMENTS FOR WORKING WITH OR AROUND PROPERTY AND FACILITIES OF THE CONNECTICUT WATER COMPANY.

Article 1 – Scope of Work:

A. The State’s Contractor shall furnish all plant, materials (except as specified below), equipment, supplies, labor and other facilities and all other things necessary or proper for or incidental to the work contemplated by the Contract as required by and in strict accordance with the Drawings, Specifications and Addendum (or Addenda), and/or required by and in strict accordance with such changes as are ordered and approved pursuant to this Contract for installation of the water main and appurtenances. Contractor shall further perform all other obligations imposed on him by this Contact. Contractor shall be responsible for all materials (except as specified below) delivered and work performed until completion and final acceptance. Upon completion of the Contract, the Work shall be delivered complete, undamaged and in full, proper operating order.
B. The Connecticut Water Co. (CWC) will furnish all pipeline materials required for the proposed relocation work including the insulated and non-insulated pipe sections, valves, fittings and other water appurtenances shown and detailed on the drawings. The Contractor shall unload all materials delivered to the jobsite as coordinated with CWC’s material supplier.

C. The Contractor shall coordinate with The Connecticut Water Co. for operation of any valves, hydrants, or blow-offs. CWC WILL OPERATE ALL VALVES.

Article 2 - Qualifications of Water Main Contractor:

A. The Water Main Installation Contractor shall be experienced in the kind of Work to be performed, shall have the necessary equipment therefore, and shall possess sufficient capital to properly execute the Work within the time allowed and be approved by the CWC. CWC shall evaluate the proposed Contractor’s qualifications in order to confirm that the Contractor for the water main is capable of performing the work in the best interest of CWC. The judgement of the Contractor’s experience, in order for approval of any water main work, shall be at the sole discretion of CWC.

B. To demonstrate qualifications to perform the Work, Contractor shall submit, within 5 days of CWC’s request, written evidence such as financial data, previous experience, references, present commitments, and other such data as may be called for below. Each contractor must provide evidence of Contractor's qualification to do business in Connecticut or covenant to obtain such qualification prior to contract award.

C. The Contractor shall have successfully completed at least five (5) water main projects of similar design meeting the requirements of CWC in the last ten years. Further, the applicant must have been the primary contractor with the work performed by personnel directly employed by the applicant for all of the five (5) projects. The following items must have been included in one or more of the projects referenced:
- constructed within right-of-way and/or through a road intersection
- retrofitting of joint restraints on existing piping larger than 6 inches in diameter
- connections to existing cast iron water mains larger than 6 inches in diameter
- installation of polyethylene encasement on ductile iron water mains to the manufacturer’s guidelines
- successful performance of hydrostatic pressure testing of water mains to the satisfaction of the client
- required traffic diversion/maintenance
- included the installation of a water main over a bridge crossing
- coordination and work in conjunction with other existing utilities

D. Contractor Safety / CWC’s Qualification Program Submittal: Construction projects can affect the safety of CWC’s Contractor's employees, equipment, buildings, and the quality and quantity of the water provided to our customers. So we may assure that the contractors chosen for CWC projects are of the highest quality in both performance and safety, the following process shall be used prior to awarding contracts. The process
makes it mandatory that the past safety record of a contractor be considered as part of the qualifying process.

E. The intent of this program is to identify and hire those contractors who can meet the safety requirements as shown below. A contractor should be able to meet the requirements of E.1.a or E.1.b. The Authority may choose to award the contract to a contractor not meeting E.1.a or E.1.b based on review of the information requested under E.1.c or E.1.d at its sole discretion.

1. Safety Requirements:
   a. The most recent Workers Compensation Experience Modification Rating* (EMR) shall be less than or equal to 1.0.
   b. The three-year average of the injury and illness rate of the Contractor is less than or equal to the most recent rate as published by the Bureau of Labor Statistics (BLS) Occupational Injury and Illness incidence rate (for the appropriate North American Industrial Classification System Code).
   c. Three-year trend showing a decrease in EMR and/or annual number of recordable injuries as shown on the OSHA log. Contractors with less than ten (10) employees who are not required to fill out the OSHA 300A form must still provide the number of injuries for the previous three years.
   d. Documented references from two recent previous customers of the Contractor acknowledging appropriate safety performance on the job.

*EMR – The EMR is a percentage modifier that is applied to the basic insurance premium established for a company. A company with an EMR of 0.6 would pay 60% of the base insurance premium, while a company with a poorer accident frequency rate and an EMR of 1.4 would pay 140% of the base insurance premium.

Article 3 - Special Considerations:

A. The Contractor shall provide to CWC prior to the start of construction operations, with a telephone number and location of a place where the Contractor and at least three (3) responsible people, including the superintendent, employed by the Contractor, can be contacted at any time during the duration of the Contract.
B. CWC reserves the right to disqualify any contractor that does not meet the requirements of Article 2.

**Article 4 - Work to be Accomplished in Accord with Drawings and Specifications**

A. The Work, during its progress and its completion, shall conform to the lines and grades shown on the Drawings and to such specific written directions given by the Owner, subject to such modifications or additions as the Owner may determine to be necessary during the execution of the Work. In no case will any work be paid for which is in excess of the requirements specifically delineated in the Contract Documents.

B. Any change or delineation in the Work as called for in the Contract Documents, shall have the prior written approval of CWC.

C. It is the intent of these Contract Documents that the Work included under each Section of the Specifications shall cover the manufacture, fabrication, assembly, delivery, and installation and/or erection, with all related and incidental work thereto, unless otherwise noted or specified.

D. The itemization of tasks under the Specification subsection "Work Included" is intended to be general and in no way limits or qualifies the requirements of the Contract.

E. It is the intent of these Contract Documents to provide for a complete, fully functional installation of all portions of the Work. Except where the work, or a portion thereof, is specifically labeled as "Not in Contract" (NIC), it shall be understood that all items, materials, and equipment are to be installed complete, ready for operation and use.

F. Wherever any additional materials and/or details are not shown or specified in the Contract Documents, but are obviously required to complete the Work required by the intent of the Documents, the Contractor shall provide such materials or detailed work as part of the original work and at no additional cost to the Owner.

**Article 5 - Contractor to Check Dimensions and Schedules**

A. Contractor will be required to check all dimensions and quantities shown on the drawings or schedules, and shall notify the Owner of any and all errors that may exist therein, which the Contractor may discover by examining and checking the same. Contractor shall not take advantage of any error or omission in the Specifications, Drawings, or schedules. Owner will furnish all instructions should such error of omission be discovered, and the Contractor shall carry out such instructions as if originally specified.

**Article 6 - Protection Against High Water and Storms**

ITEM #1301017A
A. Contractor shall take all precautions to prevent damage to the work or equipment caused by flooding, high water, or by storms, including hurricanes.

B. Owner may prohibit the carrying out of work at any time when, in his judgment, high waters or storm conditions are not suited for continuing the work, or at any time regardless of weather when proper precautions are not being taken by the Contractor to safeguard his or the Owner's personnel or the completed work or work in progress.

C. In case of damage caused by the failure of the Contractor to take adequate precautions, the Contractor shall repair or replace Work or equipment damaged and shall make such repairs or rebuild such parts of the damaged Work, as the Owner may require, at no additional costs of the Owner.

Article 7 - Competent Help to be Employed:

A. Contractor shall employ only experienced forepersons, crafters, and other workers competent in the specific work in which they are to be engaged.

Article 8 - Water

A. The municipal water system in the Project area is owned by The Connecticut Water Company (CWC).

B. Contractor shall comply with all rules, regulations, and requirements of CWC.

C. Contractor shall make arrangements with CWC for the use of water and shall pay for all water used and any facilities required to convey the water to and about the Work. CWC will provide, WITHOUT CHARGE, all water needed by the Contractor to fill, flush, test and disinfect the water mains to be installed under this Contract. The Contractor is expressly prohibited from opening or using water from any fire hydrants without the express, written, prior authority of CWC.

D. Article 9 - Defective Materials, Inspection and Testing of Materials Furnished and Sampling

A. No materials shall be laid or used in the Work which are, in any manner, defective. Notice shall be given to the Owner of any defective of imperfect material. Defective or unfit material found to have been installed shall be removed and replaced by the Contractor with approved quality material, at no additional expense to the Owner.

B. All materials furnished by the Contractor are subject to inspection and testing by the Owner.

C. Contractor shall provide samples of the type and quantity of the various materials used in the work, as determined by these Contract Documents.
Article 10 - Indemnity of the Owner By Contractor

A. Contractor shall pay and make good all losses or damages arising out of any cause connected with this Contract and shall indemnify and save harmless The Connecticut Water Company, and its respective officers, agents, and employees from any and all claims and any and all liability or responsibility of every nature and kind for any loss, damage or injury which any person or persons may sustain or suffer (including death) or for any property damage occurring by reason of or in any way arising out of the Contract whether or not caused by:

(a) officers, agents and employees of The Connecticut Water Company
(b) the Contractor, its subcontractors or suppliers, or
(c) any other persons

B. Contractor agrees to defend every suit of any nature which may be brought against The Connecticut Water Company or any of its respective officers, agents or employees, by reason of, or connected with the work or materials furnished under the Contract and shall pay all costs and expenses of every kind, character, and nature whatsoever (including but not limited to litigation expenses, attorney's fees, and interest), accruing upon or arising out of the Contract. In the event the Contractor fails to reasonably defend such suit or suits as provided above, The Connecticut Water Company may defend said action against itself and all losses, damages, settlements and expenses of every kind (including but not limited to litigation expenses, attorney's fees, and interest) shall be the responsibility of the Contractor who shall indemnify and save harmless The Connecticut Water Company.

C. Contractor further undertakes to reimburse The Connecticut Water Company for damage to property of The Connecticut Water Company caused by the Contractor, or its employees, agents, subcontractors or material suppliers, or by faulty, defective or unsuitable material or equipment used by him or them. It is understood and agreed that this provision shall not apply to damages which are found to have occurred as a result of the sole negligence of The Connecticut Water Company and its respective officers, agents and employees.

Article 11 - Record Drawings

A. Owner will furnish the Contractor with a complete set of prints of all Contract Drawings which shall be used exclusively by the Contractor for incorporating thereon the record drawings of all contract work as the construction progresses. Contractor shall provide, at no additional expense to the Owner, the services of a registered land surveyor and/or engineer under whose direction shall be obtained and recorded all surveys, measurements, and such other data required for the determination of the record drawings of the construction of all Contract work.

ITEM #1301017A
B. One (1) complete set of prints shall be maintained in the Contractor's trailer at all times. Contractor shall be responsible for having clearly, neatly, accurately, and promptly recorded thereon, as the work is performed, the record of the Contract work. Principal dimensions, elevations, measurements, locations and such other data as required shall be recorded for all work.

C. The marked-up prints will be kept up to date and available for inspection by the Owner and shall be corrected immediately if found to be either inaccurate or incomplete.

D. At the completion of the project the entire set of "marked-up' prints shall be submitted to the Owner for review and comment. Contractor shall revise, correct, amplify, and do all the work as may be required by the Owner to complete the record drawings in a manner satisfactory to the Owner.

E. Owner will furnish to the Contractor, at the Contractor's expense, one (1) complete set of the Contract Drawings. Contractor shall be responsible for having transferred and incorporated thereon the complete record of the contract work as recorded on the approved set of black-line prints.

Contractor shall be responsible for doing all work necessary to provide the complete set of drawings with the record of the contract work recorded thereon in a manner as approved by the Owner. This set of completed drawings shall bear the embossed seal of a CT Registered Land Surveyor and/or Registered Professional Engineer engaged by the Contractor under whose direction

**Method of Measurement:** The Temporary Water Main Crossing, being paid for on a lump sum basis, will not be measured for payment.

**Basis of Payment:** The Water Main Support System will be paid for at the contract lump sum price for “Furnishing and Installing Temporary Water Main Crossing”, which price shall include all water main support materials, equipment, tools and labor necessary to provide a complete system accepted by the Engineer, the State and the CWC.

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ITEM #1301017A
ITEM 1301084A – 12” DUCTILE IRON PIPE (WATER MAIN)
ITEM 1301516A – 12” 45 DEGREE MECHANICAL JOINT BEND (WATER MAIN)
ITEM 1301654A – 12” DUCTILE IRON PIPE INSTALLED ON BRIDGE (WATER MAIN)

13.00.01 - Description:

A. The Contractor’s installation responsibility shall be all proposed water main relocation shown on the drawings, including the insulated pipe and fittings supported on the new bridge, the insulated piping, the underground insulated and non-insulated pipe, fittings and all water pipe appurtenances.

B. Work and materials covered under this Section of the specifications shall be in strict compliance with CWC Standards. CWC will furnish all water system pipeline materials, including Ductile Iron Pipe (DIP) and fittings, pre-insulated aboveground and underground pipe, pipe restraints (except thrust blocking), blow-offs, valve boxes, and other water appurtenances.

C. CWC will supervise all water relocation construction performed by the Contractor, water sampling and laboratory testing. The Contractor will perform all water main chlorination, pressure testing and water main dechlorination.

D. Connection to the existing water main system, at the locations indicated on the Contract Drawings, shall be in accordance with the CWC’s requirements and only with the prior approval of, and under the supervision of CWC representatives.

E. All standards, codes, specifications, etc., referred to herein shall be the latest issue.

F. It is not intended that the Contract Drawings shall show every pipe, fitting, valve, or appurtenance, but the Contractor shall obtain from CWC and install, without additional charge, all material necessary to complete the Work in accordance with the best practice and the intent of the Contract Drawings and these specifications.

G. Work and materials required by this section of the Specifications consist of the furnishing of all labor, equipment, tools and materials and performing all operations in connection with the dewatering, control and diversion of water and all other operations necessary to maintain “in the dry” conditions of all excavations and work areas of this Contract. The Contractor shall be responsible for providing, maintaining, operating and removing all dewatering and other facilities, including all pumping and appurtenant equipment required to maintain in a dry condition the areas in which construction of this Contract is to be conducted.

H. Contractor shall be responsible for performing all required dewatering in a manner to prevent injury to persons or public health and damage to existing facilities or public health and damage to existing facilities or the work in progress.

Items #1301084A, #1301516A, #1301654A
I. All dewatering operations shall be conducted in strict compliance with all local, State and Federal environmental permits issued for this Contract.

J. REFERENCES

1. All water system materials shall conform to the current requirements of The Connecticut Water Company’s Standards.

2. The publications listed below form a part of this specification to the extent referenced. The following publications are referred to in the text by the basic designation only.

AMERICAN NATIONAL STANDARDS INSTITUTE, INC. (ANSI)

ANSI A21.4 Cement Mortar Lining for Ductile Iron Pipe and Fittings for Water
ANSI A21.11 Rubber Gasket Joints for Ductile Iron Pipe and Gray-Iron Pressure Pipe and Fittings
ANSI A21.51 Ductile Iron Pipe, Centrifugally Cast in Metal Molds or Sand-Lined Molds, for Water or Other Liquids
ANSI B18.2.2 Square and Hex Nuts
ANSI B18.5 Round Head Bolts

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM A-48 Gray Iron Castings
ASTM A-536 Ductile Iron Castings
ASTM A-563 Carbon and Alloy Steel Nuts

AMERICAN WATER WORKS ASSOCIATION (AWWA)

AWWA C104 Cement Mortar Lining for Ductile Iron Pipe and Fittings for Water
AWWA C110 Ductile Iron and Gray Iron Fittings, 3 in through 48 in. for Water and Other Liquids
AWWA C111 Rubber Gasket Joints for Ductile Iron and Gray Iron Pressure Pipe and Fittings
AWWA C151 Ductile Iron Pipe, Centrifugally Cast in Metal Molds or Sand-Lined Molds, for Water or Other Liquids
AWWA C153 Ductile Iron Compact Fittings (3 in through 12 in), for Water and Other Liquids
AWWA C504 Butterfly Valves
AWWA C600 Installation of Ductile Iron Water Mains and Appurtenances
AWWA C606 Standard for Grooved and Shouldered Type Joints

H. QUALITY ASSURANCE

Items #1301084A, #1301516A, #1301654A
1. Qualifications of the Installer: Only thoroughly trained and experienced personnel who are completely familiar with the requirements for this work shall be involved with the work. Personnel must be capable of carrying out the recommendations of CWC and the manufacturer of the piping, fittings and appurtenances for the proper installation procedures.

2. Comply with State and local controlling authority requirements for materials, installation, fire protection, testing, disinfection and connection to existing water mains.

3. Comply with NFPA 24 for fire protection water main piping materials and installation.

I. SUBMITTALS

1. Since CWC is obtaining and providing to the Contractor all water system components from their standard material suppliers no water system submittals will be required. The Contractor shall submit detailed working drawings for all revised water main relocation work to the CWC and shall coordinate procurement, and delivery of all materials with the CWC. The contractor shall be responsible for picking up and delivering materials to the project site, if necessary.

2. CWC will require that the Contractor also submit the shop drawing submittal for the temporary water main support structure to the CWC for review and comment.

J. DELIVERY, STORAGE AND HANDLING

1. Inspect materials delivered to site for damage. Unload and store with minimum handling. Store materials on site, in enclosures or under protective covering. Store jointing materials and rubber gaskets under cover out of direct sunlight. Do not store materials directly on the ground. Keep inside of pipes and fittings free of dirt and debris.

2. Handle pipe, fittings, and other accessories in a manner to ensure delivery to the site in sound undamaged condition. Take special care to avoid injury to coatings and linings in pipe and fittings and make satisfactory repairs if coatings or linings are damaged. Carry, do not drag, pipe. Store jointing materials and rubber gaskets that are not be installed promptly under cover out of direct sunlight.

K. PROJECT CONDITIONS

1. Perform site survey, research public utility records, and verify existing utility locations. Contact utility locating service in the Project area.

2. Verify that the water main piping may be installed to comply with original design and referenced standards.
3. It is not intended that the drawings shall show every pipe, fitting, valve, etc., but the Contractor shall be required to coordinate with and obtain from CWC, without additional charge, all material necessary to complete the work in accordance with the best practice and intent of drawings and specifications.

L. SEQUENCING AND SCHEDULING

1. Coordinate connection to existing and/or relocated water main with CWC.

2. Coordinate with bridge construction work sequencing.

3. Notify applicable utility companies prior to commencing work. Coordinate with other utility regarding relocation of or impact to other utilities by the proposed work.

13.00.02 – Materials:

A. All materials and workmanship, whether or not specifically described or shown, or whether implied, shall be only first quality new and of a grade satisfactory to the Engineer and CWC. All water system materials shall be directly supplied by CWC and shall conform to the requirements of the current Connecticut Water Company’s Purchasing Standards for Water Works Materials.

B. The Contractor shall be required to coordinate the construction with the ordering and delivery of the water main system materials to be provided by CWC, the Contractor shall confirm all delivery and/or pickup requirements with CWC prior to the start of water main relocation construction.

C. APPROVAL OF MATERIALS: Before starting installation of materials or equipment, the Contractor shall submit to the Engineer/CWC for approval, a detailed installation plan and equipment to be incorporated in the work.

D. Should departures from the Contract Drawings be deemed necessary by the Contractor, details of such departures in materials of construction, including changes in related portions of the Project and the reasons therefore, shall be submitted to CWC and the Engineer for prior approval. Said details shall include accurate layout drawings which clearly illustrate the intended departures from the Contract Drawings.

E. Provide all labor, equipment, pumps, drains, well points, piping, incidental materials, generators, electric services, or any facility necessary for the control, collection and disposal of all surface and subsurface water encountered in the performance of the Contract work.

F. DUCTILE IRON PIPE, JOINTS, FITTINGS AND SPECIALS

1. All underground pipe and fittings shall be CLASS 52 ductile iron with TYTON push-on joints (restrained as required by CWC) conforming to AWWA/ANSI Items #1301084A, #1301516A, #1301654A
C151/A21.51 (latest revision) with a Rated Working Pressure of 250 psig (pipe) with a MINIMUM Factor of Safety of 1.50. All fittings shall conform in all respects to AWWA Standard C110, latest revision. All ductile iron pipe, fittings, or specials shall be clearly marked on the outside surface with the class, thickness class designation and initials of manufacturer, in accordance with AWWA C151.

Underground ductile iron pipe and fittings shall be encased in a polyethylene tube. Polyethylene tubing shall be manufactured of low-density polyethylene film with a nominal thickness of 8 mils. Polyethylene encasement and installation shall conform to the requirements of AWWA C105 latest revision.

2. Underground ductile iron pipe and accessories shall conform to the following additional requirements:

   a. Laying Length: 20 feet
   b. Thickness Class: 52
   c. Joint Type: TYTON push-on
   d. Interior Surface: Cement Lined (Double Thickness)
      Seal Coat (Double Coat)
   e. Exterior Surface: Asphalitic Coating
   f. Joint Restraints: As required including thrust blocks

2. Fittings for underground water mains shall conform in all respects to AWWA Standard C110, latest revision, and to the additional requirements specified herein.

3. All mechanical joint fittings will be installed with EBAA Mega-Lug restraining glands

4. Fittings and accessories shall conform to the following additional requirements specified herein:

   a. Joint Type: Mechanical Joint
   b. Pressure Rating: 350 psi
   c. Type of Iron: Ductile
   d. Interior Surface: Cement Lined (Double Thickness)
      Seal Coat (Double Coat)
   e. Exterior Surface: Asphalitic Coating

5. Cement mortar lining for pipe, fittings, as specified above shall conform in all respects to AWWA Standard C104 (latest revision). Lining thickness shall be twice that specified in Section 4.7.1 of AWWA Standard C104. Seal coat shall be twice that specified in Section 4.11 of AWWA Standard C104.

6. Rubber gasket joints for the water main pipe and fittings, as specified above, shall conform to AWWA Standard C111 (latest revision).
7. Pipe couplings shall be installed where required for connection to existing work and as shown on the Drawings. Pipe couplings shall be mechanical joint (MJ) solid sleeves when connecting to ductile iron or cast iron pipe with an outside diameter within the ductile iron range. When connecting to an oversized diameter pipe, a HYMAX or HYMAX Grip coupling may be used with proper restraint.

8. All pipe, pipe fittings, accessories and appurtenances shall be new and unused.

9. All bolts, nuts, rod, and miscellaneous connecting pieces not provided with an approved factory coating shall be given 2 (two) coats of bitumastic coal-tar after installation.

10. All bolts, nuts, rods, and miscellaneous connecting pieces not provided with an approved factory coating shall be given two (2) coats of bitumastic coal-tar after installation.

11. All insulated pipe and fittings shall be CLASS 53 TR FLEX restrained joint ductile iron pipe conforming to AWWA/ANSI C151/A21.51 (latest revision) with a Rated Working Pressure of 350 psig (pipe). All fittings shall conform in all respects to AWWA Standard C111, latest revision. All ductile iron pipe, fittings, or specials shall be clearly marked on the outside surface with the class, thickness class designation and initials of manufacturer, in accordance with AWWA C150.

12. Insulated ductile iron pipe and accessories shall conform to the following additional requirements:

   a. Minimum Laying Length: 19.5 feet for 12” pipe (plain to bell end)
      Thickness Class: 53
   b. Joint Type: restrained push-on
   c. Interior Surface: Cement Lined (Double Thickness)
      Seal Coat (Double Coat)
   e. Exterior Surface: Asphaltic Coating
   f. Joint Restraints: As required

G. PIPE INSULATION

1. The pipe shall be insulated using the unique U.I.P. factory insulation process, as supplied by Tricon, or approved equal. Above and below grade (where indicated) piping shall be include an HDPE Casing Jacket.

2. The insulation of associated joints, fittings and accessories shall be as per the manufacturer’s recommendations. The product shall be manufactured in accordance with ISO 9001 Standards, or approved equal.

3. The insulation material shall be a rigid polyurethane form, factory applied with a minimum thickness of 2in.

   Items #1301084A, #1301516A, #1301654A
4. **PE Casing Outer Jacket (above grade piping)**
   
a. Shall consist of black HDPE, UV inhibited, factory applied.
   
b. Casing shall be extruded from polyethylene resin (cell class 334360C as defined in ASTM D3350-12).

5. **Outer Jacket on Pipe Insulation (below grade piping)**
   
a. The outer protective jacket shall be HDPE factory applied.

6. **Above Grade Piping Joint Insulation**
   
a. All pipe joints and fittings shall be insulated. Slip joint kits shall consist of preformed polyisocyanurate foam or urethane foam half-shells supplied with HDPE covering, stainless steel bands, plastic tie wraps and self tapping screws.

7. **Below Grade Piping Joint Insulation**
   
a. Installation kits for pipe joints shall use pre-fabricated rigid polyisocyanurate or urethane foam half-shells and sealed with the application of suitable wrap around, adhesive lined, heat shrink sleeves.
   
b. Insulation kits for fittings shall consist of rigid polyisocyanurate or urethane foam half-shells insulation with a fully bonded polymer protective coating on all exterior or interior surfaces, including ends. All insulation kits shall be supplied complete with silicone caulking for seams, stainless steel bands and gear clamps.

8. All pipe shall be insulated until a cover depth of 4-feet is reached.

13.00.03 – **Construction Methods:**

A. **INSTALLATION OF PIPE – GENERAL REQUIREMENTS**
   
1. All methods of installation shall conform to the requirements of The Connecticut Water Company (CWC) and as directed by the CWC representative supervising the water work on site.

2. Pipe, fittings, valves, specials and accessories shall be installed in conformance with AWWA Standard C600 and C606 (latest revision), and the additional requirements specified herein, as indicated on the drawings, and as directed by CWC.

4. All materials found to be defective during the process of the work will be rejected by CWC and the Contractor shall promptly remove such defective material from the job site. All defective material shall be replaced by CWC. The Contractor shall be responsible for the safe storage of all material once it is delivered to the site.

Items #1301084A, #1301516A, #1301654A
5. **DEWATERING:** Install and maintain excavations in a dry condition during underground pipeline construction operations.

6. **EXCAVATION SUPPORT:** Install and maintain sheeting and bracing systems, as necessary to comply with health and safety requirements and to protect workers and the public, prevent injurious caving or erosion, or loss of ground, and to protect adjacent structures.

7. **EXCAVATION AND BACKFILL:** Perform trench excavation and backfill operations as specified elsewhere in these Contract Documents.

8. Excavations for work required under this Contract may be below existing ground water levels.

9. Contractor shall operate and maintain all pumps, drains, well points or any facility necessary for the control, collection and disposal of all surface and subsurface water encountered in the performance of the Contract work. All excavations shall be kept dry at all times and all construction work shall be performed in the dry, unless otherwise authorized or directed by the Owner.

10. Any damage to existing facilities or new work resulting from the failure of the Contractor to maintain the work areas in a dry condition shall be repaired by the Contractor, at no additional expense to the Owner. Pumping shall be continuous where specified or as necessary to protect the work and to maintain satisfactory progress.

11. Contractor’s pumping and dewatering operations shall be carried out in such a manner that no loss of ground will occur. All pipelines or structures not stable against uplift during construction or prior to completion shall be thoroughly braced or otherwise protected against movement or damage.

12. Water being disposed of by the pumping and dewatering operations shall be disposed of in such a manner to avoid pollution of existing water courses and wetlands, injury to persons or public or private property or to the work completed or in progress. All discharges shall be into specially constructed sedimentation facilities approved by the Owner’s Agent. Dewatering shall be accomplished by approved methods which have a background record of successful dewatering of similar excavations and subsurface conditions expected to be encountered in the work.

13. Contractor shall be responsible for providing and maintaining all ditching, grading, sheeting and bracing, pumping and appurtenant work for the temporary diversion of water courses and protection from flooding as necessary to permit the construction of work in the dry.

Items #1301084A, #1301516A, #1301654A
14. Upon completion of the Contract work in each construction area, the Contractor through excavations in which work is underway or has been partially completed. The Contractor shall not restrict or close off the natural flow of water in such a way that ponding or flooding will occur and shall at all times prevent flooding of public and private property. All damages resulting from flooding or restriction of flows shall be the sole responsibility of the Contractor, at no additional expense to the Owner. Contractor’s pumping and dewatering operations shall be carried out in such a manner that the groundwater table is unaffected. Excessive dewatering of the excavation and subsurface is expressly prohibited.

B. INSTALLATION – PIPE, FITTINGS AND ACCESSORIES

1. The top of the water pipe shall be 4’ minimum below grade based on roadway surface when working within the roadway or top of slope, except as otherwise noted or detailed on the plans. Install piping free of sags.

2. Each pipe shall be laid true to line and grade and in such manner as to form a close concentric joint with the adjoining pipe and to prevent sudden offsets in the grade line. No spalls, shims or lumps shall be used to raise the pipe to grade. All pipe shall be maintained accurately to the required line and grade. Any pipe that has the grade or joint disturbed after laying shall be re-laid.

3. Trenches shall be kept free from water so as to prevent flotation of the pipes. Pipelines shall be constructed in dry trenches and shall not be laid when the condition of the trench or the weather is unsuitable for such work. An adjustable, water tight, removable plug shall be provided and placed on the open end of the newly laid pipe when pipe is not being placed. At times when work is not in progress, open ends of pipe and fittings shall be securely closed so that no trench water, earth or other substance will enter the pipe or fittings. Pipes shall not be used as conductors for trench drainage during construction.

4. Jointing of bolted mechanical joints, fittings, valves, and hydrants where required shall be provided in accordance with the printed recommendations of the pipe manufacturer and as specified. The mechanical joint fittings, specials and valves shall be suitable for jointing with the pipe with which they are used and the Contractor shall obtain and install, at no additional expense to the Owner, all necessary adapters for the proper jointing of pipe, pipe fittings, specials and valves. The last eight (8) inches of the outside of the spigot end of pipe and the inside of the bell of the mechanical joint shall be thoroughly cleaned to remove all oil, grit and other foreign matter from the joint. When assembling the joint, the gland shall be brought into place and bolts tightened in a manner to insure the maintaining of the same space between the gland and the face of the flange at all points around the socket. The range of bolt torque in making up joints shall be as recommended by the manufacturer of the mechanical joints.

Items #1301084A, #1301516A, #1301654A
Overstressing of bolts will not be permitted; if effective sealing is not obtained at the recommended maximum bolt torque, the joint shall be disassembled, thoroughly cleaned and reassembled. Bolts shall be checked in the presence of the Engineer/CWC with a torque wrench approved by the Engineer and CWC.

5. All fittings shall be anchored to prevent any movement of the fittings or the adjacent pipe. This anchorage shall be provided by the installation of Portland Cement concrete thrust blocks (where indicated), retainer glands as shown on the Drawings and where and as directed by the Engineer/CWC. The Contractor shall verify extent of anchorage required with Engineer/CWC prior to piping assembly. Hand excavation may be required to excavate for the concrete thrust blocks, the shape and size of which shall be in accordance with contract drawings. The Engineer/CWC may require concrete to be placed at points on the pipeline other than at fittings. All concrete used for thrust restraint shall be exposed for at least sixteen (16) hours before being covered.

6. The Contractor shall install a 1-inch corporation stop as an air vent at the high point on the water main on the bridge. Upon completion of testing and sampling it shall be removed, a 1in. CC plug installed and a section of insulation and the HDPE jacket installed covering the location.

GENERAL REQUIREMENTS FOR WORKING WITH OR AROUND PROPERTY AND FACILITIES OF THE CONNECTICUT WATER COMPANY.

Article 1 – Scope of Work:

A. The State’s Contractor shall furnish all plant, materials (except as specified below), equipment, supplies, labor and other facilities and all other things necessary or proper for or incidental to the work contemplated by the Contract as required by and in strict accordance with the Drawings, Specifications and Addendum (or Addenda), and/or required by and in strict accordance with such changes as are ordered and approved pursuant to this Contract for installation of the water main and appurtenances. Contractor shall further perform all other obligations imposed on him by this Contact. Contractor shall be responsible for all materials (except as specified below) delivered and work performed until completion and final acceptance. Upon completion of the Contract, the Work shall be delivered complete, undamaged and in full, proper operating order.

B. The Connecticut Water Co. (CWC) will furnish all pipeline materials required for the proposed relocation work including the insulated and non-insulated pipe sections, valves, fittings and other water appurtenances shown and detailed on the drawings. The Contractor shall unload all materials delivered to the jobsite as coordinated with CWC’s material supplier.

C. The Contractor shall coordinate with The Connecticut Water Co. for operation of any valves, hydrants, or blow-offs. CWC WILL OPERATE ALL VALVES.

Items #1301084A, #1301516A, #1301654A
Article 2 - Qualifications of Water Main Contractor:

A. The Water Main Installation Contractor shall be experienced in the kind of Work to be performed, shall have the necessary equipment therefore, and shall possess sufficient capital to properly execute the Work within the time allowed and be approved by the CWC. CWC shall evaluate the proposed Contractor’s qualifications in order to confirm that the Contractor for the water main is capable of performing the work in the best interest of CWC. The judgement of the Contractor’s experience, in order for approval of any water main work, shall be at the sole discretion of CWC.

B. To demonstrate qualifications to perform the Work, Contractor shall submit, within 5 days of CWC’s request, written evidence such as financial data, previous experience, references, present commitments, and other such data as may be called for below. Each contractor must provide evidence of Contractor's qualification to do business in Connecticut or covenant to obtain such qualification prior to contract award.

C. The Contractor shall have successfully completed at least five (5) water main projects of similar design meeting the requirements of CWC in the last ten years. Further, the applicant must have been the primary contractor with the work performed by personnel directly employed by the applicant for all of the five (5) projects. The following items must have been included in one or more of the projects referenced:
   o constructed within right-of-way and/or through a road intersection
   o retrofitting of joint restraints on existing piping larger than 6 inches in diameter
   o connections to existing cast iron water mains larger than 6 inches in diameter
   o installation of polyethylene encasement on ductile iron water mains to the manufacturer’s guidelines
   o successful performance of hydrostatic pressure testing of water mains to the satisfaction of the client
   o required traffic diversion/maintenance
   o included the installation of a water main over a bridge crossing
   o coordination and work in conjunction with other existing utilities

C. Contractor Safety / CWC's Qualification Program Submittal: Construction projects can affect the safety of CWC's Contractor's employees, equipment, buildings, and the quality and quantity of the water provided to our customers. So we may assure that the contractors chosen for CWC projects are of the highest quality in both performance and safety, the following process shall be used prior to awarding contracts. The process makes it mandatory that the past safety record of a contractor be considered as part of the qualifying process.

D. The intent of this program is to identify and hire those contractors who can meet the safety requirements as shown below. A contractor should be able to meet the requirements of E.1.a or E.1.b. The Authority may choose to award the contract to a contractor not

Items #1301084A, #1301516A, #1301654A
meeting E.1.a or E.1.b based on review of the information requested under E.1.c or E.1.d at its sole discretion.

1. Safety Requirements:
   a. The most recent Workers Compensation Experience Modification Rating* (EMR) shall be less than or equal to 1.0.
   
   b. The three-year average of the injury and illness rate of the Contractor is less than or equal to the most recent rate as published by the Bureau of Labor Statistics (BLS) Occupational Injury and Illness incidence rate (for the appropriate North American Industrial Classification System Code).
   
   c. Three-year trend showing a decrease in EMR and/or annual number of recordable injuries as shown on the OSHA log. Contractors with less than ten (10) employees who are not required to fill out the OSHA 300A form must still provide the number of injuries for the previous three years.
   
   d. Documented references from two recent previous customers of the Contractor acknowledging appropriate safety performance on the job.

*EMR – The EMR is a percentage modifier that is applied to the basic insurance premium established for a company. A company with an EMR of 0.6 would pay 60% of the base insurance premium, while a company with a poorer accident frequency rate and an EMR of 1.4 would pay 140% of the base insurance premium.

Article 3 - Special Considerations:

A. The Contractor shall provide to CWC prior to the start of construction operations, with a telephone number and location of a place where the Contractor and at least three (3) responsible people, including the superintendent, employed by the Contractor, can be contacted at any time during the duration of the Contract.

B. CWC reserves the right to disqualify any contractor that does not meet the requirements of Article 2.

Article 4 - Work to be Accomplished in Accord with Drawings and Specifications

A. The Work, during its progress and its completion, shall conform to the lines and grades shown on the Drawings and to such specific written directions given by the Owner, subject to such modifications or additions as the Owner may determine to be

   Items #1301084A, #1301516A, #1301654A
necessary during the execution of the Work. In no case will any work be paid for which is in excess of the requirements specifically delineated in the Contract Documents.

B. Any change or delineation in the Work as called for in the Contract Documents, shall have the prior written approval of CWC.

C. It is the intent of these Contract Documents that the Work included under each Section of the Specifications shall cover the manufacture, fabrication, assembly, delivery, and installation and/or erection, with all related and incidental work thereto, unless otherwise noted or specified.

D. The itemization of tasks under the Specification subsection "Work Included" is intended to be general and in no way limits or qualifies the requirements of the Contract.

E. It is the intent of these Contract Documents to provide for a complete, fully functional installation of all portions of the Work. Except where the work, or a portion thereof, is specifically labeled as "Not in Contract" (NIC), it shall be understood that all items, materials, and equipment are to be installed complete, ready for operation and use.

F. Wherever any additional materials and/or details are not shown or specified in the Contract Documents, but are obviously required to complete the Work required by the intent of the Documents, the Contractor shall provide such materials or detailed work as part of the original work and at no additional cost to the Owner.

1.1. **Article 5 - Contractor to Check Dimensions and Schedules**

1.1.1. A. Contractor will be required to check all dimensions and quantities shown on the drawings or schedules, and shall notify the Owner of any and all errors that may exist therein, which the Contractor may discover by examining and checking the same. Contractor shall not take advantage of any error or omission in the Specifications, Drawings, or schedules. Owner will furnish all instructions should such error of omission be discovered, and the Contractor shall carry out such instructions as if originally specified.

**Article 6 - Protection Against High Water and Storms**

A. Contractor shall take all precautions to prevent damage to the work or equipment caused by flooding, high water, or by storms, including hurricanes.

B. Owner may prohibit the carrying out of work at any time when, in his judgment, high waters or storm conditions are not suited for continuing the work, or at any time regardless of weather when proper precautions are not being taken by the Contractor to safeguard his or the Owner's personnel or the completed work or work in progress.

Items #1301084A, #1301516A, #1301654A
C. In case of damage caused by the failure of the Contractor to take adequate precautions, the Contractor shall repair or replace Work or equipment damaged and shall make such repairs or rebuild such parts of the damaged Work, as the Owner may require, at no additional costs of the Owner.

**Article 7 - Competent Help to be Employed:**

A. Contractor shall employ only experienced forepersons, crafters, and other workers competent in the specific work in which they are to be engaged.

**Article 8 - Water**

A. The municipal water system in the Project area is owned by The Connecticut Water Company (CWC).

B. Contractor shall comply with all rules, regulations, and requirements of CWC.

C. Contractor shall make arrangements with CWC for the use of water and shall pay for all water used and any facilities required to convey the water to and about the Work. CWC will provide, WITHOUT CHARGE, all water needed by the Contractor to fill, flush, test and disinfect the water mains to be installed under this Contract. The Contractor is expressly prohibited from opening or using water from any fire hydrants without the express, written, prior authority of CWC.

D. **Article 9 - Defective Materials, Inspection and Testing of Materials Furnished and Sampling**

A. No materials shall be laid or used in the Work which are, in any manner, defective. Notice shall be given to the Owner of any defective of imperfect material. Defective or unfit material found to have been installed shall be removed and replaced by the Contractor with approved quality material, at no additional expense to the Owner.

B. All materials furnished by the Contractor are subject to inspection and testing by the Owner.

C. Contractor shall provide samples of the type and quantity of the various materials used in the work, as determined by these Contract Documents.

**Article 10 - Indemnity of the Owner By Contractor**

A. Contractor shall pay and make good all losses or damages arising out of any cause connected with this Contract and shall indemnify and save harmless The Connecticut Water Company, and its respective officers, agents, and employees from any and all claims and any and all liability or responsibility of every nature and Items #1301084A, #1301516A, #1301654A
kind for any loss, damage or injury which any person or persons may sustain or suffer (including death) or for any property damage occurring by reason of or in any way arising out of the Contract whether or not caused by:

(a) officers, agents and employees of The Connecticut Water Company  
(b) the Contractor, its subcontractors or suppliers, or  
(c) any other persons

B. Contractor agrees to defend every suit of any nature which may be brought against The Connecticut Water Company or any of its respective officers, agents or employees, by reason of, or connected with the work or materials furnished under the Contract and shall pay all costs and expenses of every kind, character, and nature whatsoever (including but not limited to litigation expenses, attorney's fees, and interest), accruing upon or arising out of the Contract. In the event the Contractor fails to reasonably defend such suit or suits as provided above, The Connecticut Water Company may defend said action against itself and all losses, damages, settlements and expenses of every kind (including but not limited to litigation expenses, attorney's fees, and interest) shall be the responsibility of the Contractor who shall indemnify and save harmless The Connecticut Water Company.

C. Contractor further undertakes to reimburse The Connecticut Water Company for damage to property of The Connecticut Water Company caused by the Contractor, or its employees, agents, subcontractors or material suppliers, or by faulty, defective or unsuitable material or equipment used by him or them. It is understood and agreed that this provision shall not apply to damages which are found to have occurred as a result of the sole negligence of The Connecticut Water Company and its respective officers, agents and employees.

Article 11 - Record Drawings

A. Owner will furnish the Contractor with a complete set of prints of all Contract Drawings which shall be used exclusively by the Contractor for incorporating thereon the record drawings of all contract work as the construction progresses. Contractor shall provide, at no additional expense to the Owner, the services of a registered land surveyor and/or engineer under whose direction shall be obtained and recorded all surveys, measurements, and such other data required for the determination of the record drawings of the construction of all Contract work.

B. One (1) complete set of prints shall be maintained in the Contractor's trailer at all times. Contractor shall be responsible for having clearly, neatly, accurately, and promptly recorded thereon, as the work is performed, the record of the Contract work. Principal dimensions, elevations, measurements, locations and such other data as required shall be recorded for all work.

Items #1301084A,  
#1301516A, #1301654A
C. The marked-up prints will be kept up to date and available for inspection by the Owner and shall be corrected immediately if found to be either inaccurate or incomplete.

D. At the completion of the project the entire set of "marked-up' prints shall be submitted to the Owner for review and comment. Contractor shall revise, correct, amplify, and do all the work as may be required by the Owner to complete the record drawings in a manner satisfactory to the Owner.

E. Owner will furnish to the Contractor, at the Contractor's expense, one (1) complete set of the Contract Drawings. Contractor shall be responsible for having transferred and incorporated thereon the complete record of the contract work as recorded on the approved set of black-line prints.

Contractor shall be responsible for doing all work necessary to provide the complete set of drawings with the record of the contract work recorded thereon in a manner as approved by the Owner. This set of completed drawings shall bear the embossed seal of a CT Registered Land Surveyor and/or Registered Professional Engineer engaged by the Contractor under whose direction

13.00.04 – Method of Measurement

A. Work and materials required by this Section of the Specifications will be measured by the linear foot of ductile iron water main, of the size indicated, installed, tested, backfilled and accepted. The linear foot measurement shall include the pipe and line valves, tees, sleeves and fittings installed. Bends will be measured on a per each basis. No compensation will be made for any repairs completed by the Contractor in order to pass the hydrostatic and leakage test.

13.00.05 – Basis of Payment

A. The quantity of relocated insulated ductile iron water main supported on the new bridge and non-insulated ductile iron water main extended to the two (2) connection points to the existing water main, will be paid for by the linear foot of ductile iron water main under Contract Items 1301084A, 1301516A and 1301654A which price and payment shall constitute full compensation for furnishing any water main materials not supplied by CWC and installing all materials, including trench excavation and backfill; furnishing gravel fill; furnishing and installing pipe bedding, underground ductile iron water main and fittings, insulated ductile iron pipe and insulated fittings, joint restraints, pipe marking tape; providing labor, tools, and equipment; air cocks/blow-off valve; air vent, dewatering, control and diversion of water; and the cost of all incidental work and materials not otherwise separately paid. No separate payment will be made for any of these incidental items of work and/or materials that are inherently required

Items #1301084A,
#1301516A, #1301654A
to fulfill the intent of this Contract or required as a result of the Contractor’s construction sequencing to complete the work as specified and as indicated for this Item.

<table>
<thead>
<tr>
<th>Pay Item</th>
<th>Pay Unit</th>
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<tbody>
<tr>
<td>12” Ductile Iron Pipe (Water Main)</td>
<td>LF</td>
</tr>
<tr>
<td>12” Ductile Iron Pipe Installed on Bridge (Water Main)</td>
<td>LS</td>
</tr>
<tr>
<td>12” 45 Degree Mechanical Joint Bend (Water Main)</td>
<td>EA</td>
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</table>

Items #1301084A, #1301516A, #1301654A
ITEM #1301900A – HYDROSTATIC PRESSURE TEST

13.00.01 – Description:

A. Work under this Section covers the furnishing of all plant, labor, equipment, appliances, and materials, and in performing all operations in connection with conducting pressure tests for water main leakage.

B. A 1-inch corporation shall be installed by the Contractor on the bridge water to provide a means for pressure testing, sampling and blowing off of the new water main.

C. REFERENCES:

1. American Water Works Association Standard for Pressure and Leakage Testing for Ductile-Iron Mains and Appurtenances – AWWA C600 (latest revision)

D. SUBMITTAL

1. Submit copies of all necessary permits to the Engineer and CWC.

13.00.02 – Construction Methods:

A. HYDROSTATIC TESTING

1. Tests for water main leakage shall not be conducted until the water main system has been properly disinfected and all water sample testing results have been accepted by CWC. Hydrostatic testing of the water main shall be conducted in accordance with the requirements of CWC. Pressure testing shall be conducted on all portions of completed water pipelines and appurtenances installed by the Contractor, and all methods and procedures for performing the testing of water mains shall be subject to the approval of the Engineer and CWC. Unless otherwise permitted, the testing shall be conducted with partial backfilling over the barrel of any new pipe, between new pipes, pipe fittings, valves and appurtenances of the section before testing.

2. Interiors of all pipes shall be cleaned of all dirt and foreign materials. The water pipelines may be tested in convenient sections as approved by the Engineer and CWC.

3. Pressure and Leakage Testing:

After all piping, including the piping supported on the bridge has been installed and disinfected, the entire system shall be pressure tested. All new sections of water main shall be hydrostatically tested at a pressure of 200 psi for a period of at least two hours. “Pressurization” and “air removal” shall be accomplished as specified in Sections 4.1.2 and 4.1.3 of the latest revisions of ANSI/AWWA C600. After the test pressure is applied, any defective pipe, fitting, valve or hydrant discovered as a consequence of this pressure test
shall be replaced by Contractor. The test shall be performed again until results are achieved to meet these standards satisfactory to the CWC.

A leakage test shall be conducted with the pressure test by the Contractor.

Leakage will be defined as the quantity of water that must be supplied into the newly laid/supported pipe, or any valve section thereof, to maintain pressure within 5 psi of the specified test pressure after the air in the pipeline has been expelled and the pipe has been filled with water.

No pipe installation will be accepted if the leakage is greater than that determined by the following formula:

\[ L = \frac{SD(P)^{\frac{1}{2}}}{133,200} \]

\( L \) = allowable leakage in gallons per hour  
\( S \) = length of the pipe tested, in feet  
\( D \) = the nominal diameter of the pipe in inches  
\( P \) = the average test pressure during the leakage test in 200 psi

When testing against closed metal-seated valves, an additional leakage per closed valve of 0.008 gallons per hour per inch of nominal valve size will be allowed.

When hydrants are in the test section, the test shall be made against the closed hydrant valve (with the auxiliary gate valve open).

If any test of pipe laid discloses leakage greater than that specified above, the Contractor shall locate and repair the defective materials until the leakage is within the specified allowance.

2. Pressure testing of water mains shall be performed by the Contractor and witnessed by the CWC

5. In case the specified maximum rate of leakage for the portion of the pipeline being tested is exceeded, the Contractor shall find and repair the leaks and the pipelines shall be retested, repeatedly, if necessary, by the Contractor, until the required conditions are met, at no additional expense to the Owner. All visible leaks are to be repaired, regardless of the amount of leakage.

6. Piping specialties, which are not intended to be subjected to the test pressures specified, shall be removed and replaced with suitable spool pieces until tests have been completed. Upon completion of tests, the piping specialties, which have been removed, shall be satisfactorily installed in the work.
7. The Contractor shall provide all materials, temporary work including, equipment, labor, instruments, and do all work necessary to satisfactorily complete the testing of pipelines and shall remove all temporary work at no additional expense to the Owner or CWC. Equipment not designed for the system test pressures shall be isolated from the system during testing. Water shall be supplied by the CWC from approved water main locations. All costs for connecting lines, etc., shall be borne by the Contractor.

8. Only CWC personnel shall operate any new or existing valves, air cocks, blow-offs, hydrants and curb stops. The Contractor shall coordinate his Schedule and provide a minimum notice of 48-hours in advance to the CWC to schedule the operation of valves, requests for water or shutdown of service.

13.00.04 – Method of Measurement

Work and materials required for Hydrostatic Testing in this Section of the Specifications will be on a per each basis as required for the temporary and permanent water mains. Only a single test will be paid per main section. Contractor is responsible for any leaks or failures during testing.

13.00.05 – Basis of Payment

A. Payment for Hydrostatic Testing required by this Section of the Specifications will be included in the unit cost for Hydrostatic Pressure Test.

B. Payment for work in this Section shall include all costs related to temporary bulk-heading of the installed water main system, as well as all costs associated with temporary blow-off devices.

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<tr>
<th>Pay Item</th>
<th>Pay Unit</th>
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<tr>
<td>Hydrostatic Pressure Test</td>
<td>EA</td>
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ITEM #1301900A
ITEM #1302051A – RESET VALVE BOX (WATER MAIN)

Description: Work under this item shall include resetting of existing valve boxes or installing new valve boxes on the existing valves within the project limits.

Materials: Unless otherwise specified by the Engineer fittings and appurtenances will be provided by CWC for installation by the State’s Contractor.

Construction Methods: Valve boxes shall be carefully placed to insure the free and proper operation of the valves. The work to be done includes furnishing all labor, tools, plant and equipment required for receiving, inspecting, hauling and distributing materials, removing pavement; excavation and backfill; and resetting or installing valve boxes. As Built installation sketches; all as shown on the drawings, (when available) specified herein or ordered by CWC; complete in every detail, ready for operation.

All valve boxes shall be installed as shown on the plans and to the line and grades as shown on the profiles, if provided.

GENERAL REQUIREMENTS FOR WORKING WITH OR AROUND PROPERTY AND FACILITIES OF THE CONNECTICUT WATER COMPANY.

Article 1 – Scope of Work:

A. The State’s Contractor shall furnish all plant, materials (except as specified below), equipment, supplies, labor and other facilities and all other things necessary or proper for or incidental to the work contemplated by the Contract as required by and in strict accordance with the Drawings, Specifications and Addendum (or Addenda), and/or required by and in strict accordance with such changes as are ordered and approved pursuant to this Contract for installation of the water main and appurtenances. Contractor shall further perform all other obligations imposed on him by this Contact. Contractor shall be responsible for all materials (except as specified below) delivered and work performed until completion and final acceptance. Upon completion of the Contract, the Work shall be delivered complete, undamaged and in full, proper operating order.

B. The Connecticut Water Co. (CWC) will furnish all pipeline materials required for the proposed relocation work including the insulated and non-insulated pipe sections, valves, fittings and other water appurtenances shown and detailed on the drawings. The Contractor shall unload all materials delivered to the jobsite as coordinated with CWC’s material supplier.

C. The Contractor shall coordinate with The Connecticut Water Co. for operation of any
valves, hydrants, or blow-offs. CWC WILL OPERATE ALL VALVES.

Article 2 - Qualifications of Water Main Contractor:

A. The Water Main Installation Contractor shall be experienced in the kind of Work to be performed, shall have the necessary equipment therefore, and shall possess sufficient capital to properly execute the Work within the time allowed and be approved by the CWC. CWC shall evaluate the proposed Contractor's qualifications in order to confirm that the Contractor for the water main is capable of performing the work in the best interest of CWC. The judgement of the Contractor’s experience, in order for approval of any water main work, shall be at the sole discretion of CWC.

B. To demonstrate qualifications to perform the Work, Contractor shall submit, within 5 days of CWC’s request, written evidence such as financial data, previous experience, references, present commitments, and other such data as may be called for below. Each contractor must provide evidence of Contractor's qualification to do business in Connecticut or covenant to obtain such qualification prior to contract award.

C. The Contractor shall have successfully completed at least five (5) water main projects of similar design meeting the requirements of CWC in the last ten years. Further, the applicant must have been the primary contractor with the work performed by personnel directly employed by the applicant for all of the five (5) projects. The following items must have been included in one or more of the projects referenced:
   o constructed within right-of-way and/or through a road intersection
   o retrofitting of joint restraints on existing piping larger than 6 inches in diameter
   o connections to existing cast iron water mains larger than 6 inches in diameter
   o installation of polyethylene encasement on ductile iron water mains to the manufacturer’s guidelines
   o successful performance of hydrostatic pressure testing of water mains to the satisfaction of the client
   o required traffic diversion/maintenance
   o included the installation of a water main over a bridge crossing
   o coordination and work in conjunction with other existing utilities

D. Contractor Safety / CWC’s Qualification Program Submittal: Construction projects can affect the safety of CWC's Contractor's employees, equipment, buildings, and the quality and quantity of the water provided to our customers. So we may assure that the contractors chosen for CWC projects are of the highest quality in both performance and safety, the following process shall be used prior to awarding contracts. The process makes it mandatory that the past safety record of a contractor be considered as part of the qualifying process.

E. The intent of this program is to identify and hire those contractors who can meet the safety requirements as shown below. A contractor should be able to meet the requirements of E.1.a or E.1.b. The Authority may choose to award the contract to a contractor not
meeting E.1.a or E.1.b based on review of the information requested under E.1.c or E.1.d at its sole discretion.

1. Safety Requirements:
   a. The most recent Workers Compensation Experience Modification Rating* (EMR) shall be less than or equal to 1.0.
   b. The three-year average of the injury and illness rate of the Contractor is less than or equal to the most recent rate as published by the Bureau of Labor Statistics (BLS) Occupational Injury and Illness incidence rate (for the appropriate North American Industrial Classification System Code).
   c. Three-year trend showing a decrease in EMR and/or annual number of recordable injuries as shown on the OSHA log. Contractors with less than ten (10) employees who are not required to fill out the OSHA 300A form must still provide the number of injuries for the previous three years.
   d. Documented references from two recent previous customers of the Contractor acknowledging appropriate safety performance on the job.

*EMR – The EMR is a percentage modifier that is applied to the basic insurance premium established for a company. A company with an EMR of 0.6 would pay 60% of the base insurance premium, while a company with a poorer accident frequency rate and an EMR of 1.4 would pay 140% of the base insurance premium.

Article 3 - Special Considerations:

A. The Contractor shall provide to CWC prior to the start of construction operations, with a telephone number and location of a place where the Contractor and at least three (3) responsible people, including the superintendent, employed by the Contractor, can be contacted at any time during the duration of the Contract.

B. CWC reserves the right to disqualify any contractor that does not meet the requirements of Article 2.

Article 4 - Work to be Accomplished in Accord with Drawings and Specifications

A. The Work, during its progress and its completion, shall conform to the lines and grades shown on the Drawings and to such specific written directions given by the Owner, subject to such modifications or additions as the Owner may determine to be
necessary during the execution of the Work. In no case will any work be paid for which is in excess of the requirements specifically delineated in the Contract Documents.

B. Any change or delineation in the Work as called for in the Contract Documents, shall have the prior written approval of CWC.

C. It is the intent of these Contract Documents that the Work included under each Section of the Specifications shall cover the manufacture, fabrication, assembly, delivery, and installation and/or erection, with all related and incidental work thereto, unless otherwise noted or specified.

D. The itemization of tasks under the Specification subsection "Work Included" is intended to be general and in no way limits or qualifies the requirements of the Contract.

E. It is the intent of these Contract Documents to provide for a complete, fully functional installation of all portions of the Work. Except where the work, or a portion thereof, is specifically labeled as "Not in Contract" (NIC), it shall be understood that all items, materials, and equipment are to be installed complete, ready for operation and use.

F. Wherever any additional materials and/or details are not shown or specified in the Contract Documents, but are obviously required to complete the Work required by the intent of the Documents, the Contractor shall provide such materials or detailed work as part of the original work and at no additional cost to the Owner.

**Article 5 - Contractor to Check Dimensions and Schedules**

A. Contractor will be required to check all dimensions and quantities shown on the drawings or schedules, and shall notify the Owner of any and all errors that may exist therein, which the Contractor may discover by examining and checking the same. Contractor shall not take advantage of any error or omission in the Specifications, Drawings, or schedules. Owner will furnish all instructions should such error of omission be discovered, and the Contractor shall carry out such instructions as if originally specified.

**Article 6 - Protection Against High Water and Storms**

A. Contractor shall take all precautions to prevent damage to the work or equipment caused by flooding, high water, or by storms, including hurricanes.

B. Owner may prohibit the carrying out of work at any time when, in his judgment, high waters or storm conditions are not suited for continuing the work, or at any time regardless of weather when proper precautions are not being taken by the Contractor to safeguard his or the Owner's personnel or the completed work or work in progress.
C. In case of damage caused by the failure of the Contractor to take adequate precautions, the Contractor shall repair or replace Work or equipment damaged and shall make such repairs or rebuild such parts of the damaged Work, as the Owner may require, at no additional costs of the Owner.

Article 7 - Competent Help to be Employed:

A. Contractor shall employ only experienced forepersons, crafters, and other workers competent in the specific work in which they are to be engaged.

Article 8 - Water

A. The municipal water system in the Project area is owned by The Connecticut Water Company (CWC).

B. Contractor shall comply with all rules, regulations, and requirements of CWC.

C. Contractor shall make arrangements with CWC for the use of water and shall pay for all water used and any facilities required to convey the water to and about the Work. CWC will provide, WITHOUT CHARGE, all water needed by the Contractor to fill, flush, test and disinfect the water mains to be installed under this Contract. The Contractor is expressly prohibited from opening or using water from any fire hydrants without the express, written, prior authority of CWC.

D. Article 9 - Defective Materials, Inspection and Testing of Materials Furnished and Sampling

A. No materials shall be laid or used in the Work which are, in any manner, defective. Notice shall be given to the Owner of any defective of imperfect material. Defective or unfit material found to have been installed shall be removed and replaced by the Contractor with approved quality material, at no additional expense to the Owner.

B. All materials furnished by the Contractor are subject to inspection and testing by the Owner.

C. Contractor shall provide samples of the type and quantity of the various materials used in the work, as determined by these Contract Documents.

Article 10 - Indemnity of the Owner By Contractor

A. Contractor shall pay and make good all losses or damages arising out of any cause connected with this Contract and shall indemnify and save harmless The Connecticut Water Company, and its respective officers, agents, and employees from any and all claims and any and all liability or responsibility of every nature and kind for any loss, damage or injury which any person or persons...
may sustain or suffer (including death) or for any property damage occurring by reason of or in any way arising out of the Contract whether or not caused by:

(a) officers, agents and employees of The Connecticut Water Company
(b) the Contractor, its subcontractors or suppliers, or
(c) any other persons

B. Contractor agrees to defend every suit of any nature which may be brought against The Connecticut Water Company or any of its respective officers, agents or employees, by reason of, or connected with the work or materials furnished under the Contract and shall pay all costs and expenses of every kind, character, and nature whatsoever (including but not limited to litigation expenses, attorney's fees, and interest), accruing upon or arising out of the Contract. In the event the Contractor fails to reasonably defend such suit or suits as provided above, The Connecticut Water Company may defend said action against itself and all losses, damages, settlements and expenses of every kind (including but not limited to litigation expenses, attorney's fees, and interest) shall be the responsibility of the Contractor who shall indemnify and save harmless The Connecticut Water Company.

C. Contractor further undertakes to reimburse The Connecticut Water Company for damage to property of The Connecticut Water Company caused by the Contractor, or its employees, agents, subcontractors or material suppliers, or by faulty, defective or unsuitable material or equipment used by him or them. It is understood and agreed that this provision shall not apply to damages which are found to have occurred as a result of the sole negligence of The Connecticut Water Company and its respective officers, agents and employees.

Article 11 - Record Drawings

A. Owner will furnish the Contractor with a complete set of prints of all Contract Drawings which shall be used exclusively by the Contractor for incorporating thereon the record drawings of all contract work as the construction progresses. Contractor shall provide, at no additional expense to the Owner, the services of a registered land surveyor and/or engineer under whose direction shall be obtained and recorded all surveys, measurements, and such other data required for the determination of the record drawings of the construction of all Contract work.

B. One (1) complete set of prints shall be maintained in the Contractor's trailer at all times. Contractor shall be responsible for having clearly, neatly, accurately, and promptly recorded thereon, as the work is performed, the record of the Contract work. Principal dimensions, elevations, measurements, locations and such other data as required shall be recorded for all work.
C. The marked-up prints will be kept up to date and available for inspection by the Owner and shall be corrected immediately if found to be either inaccurate or incomplete.

D. At the completion of the project the entire set of "marked-up' prints shall be submitted to the Owner for review and comment. Contractor shall revise, correct, amplify, and do all the work as may be required by the Owner to complete the record drawings in a manner satisfactory to the Owner.

E. Owner will furnish to the Contractor, at the Contractor's expense, one (1) complete set of the Contract Drawings. Contractor shall be responsible for having transferred and incorporated thereon the complete record of the contract work as recorded on the approved set of black-line prints.

Contractor shall be responsible for doing all work necessary to provide the complete set of drawings with the record of the contract work recorded thereon in a manner as approved by the Owner. This set of completed drawings shall bear the embossed seal of a CT Registered Land Surveyor and/or Registered Professional Engineer engaged by the Contractor under whose direction

**Method of Measurement:** The Resetting of Valve Boxes will be measured on a per each basis.

**Basis of Payment:** The Reset of Valve Box (Water Main) will be paid for at the contract per each price for “Reset of Valve Box (Water Main)”, which price shall include all equipment, tools and labor necessary to reset or replace water valve boxes within the project limits accepted by the Engineer, the State and the CWC.

<table>
<thead>
<tr>
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<th>Pay Unit</th>
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<tbody>
<tr>
<td>Reset Valve Box (Water Main)</td>
<td>EA</td>
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</table>

ITEM #1302051A
ITEM #1304065A – REMOVE WATER MAIN

13.04.01 - Description:

A. Work under Item #1304065A, “Remove Water Main”, shall consist of furnishing all labor, tools, materials and equipment necessary to perform the work of cutting, draining, capping and, where called for on the plans, the removal of the existing 8-inch water main and other water appurtenances as shown on the plans and/or as directed by the Engineer. This work will include excavation, trench support, backfill and compaction required to remove the abandoned water main.

B. Existing water mains, not removed by construction or called out for removal on the plans, shall be abandoned-in-place where indicated on the Contract Drawings or as directed by the Engineer.

13.04.02 - Materials:

A. Compacted Gravel Fill for backfilling trenches shall be Bank Run Gravel and it shall conform to the requirements of Form 817, M.02.06, Grading “C”.

13.04.03 - Construction Methods:

A. Abandonment (removal or in place) of the existing 8-inch water main and appurtenances to the limits shown on the drawings is to take place following installation, disinfecting, testing and acceptance of a new 12-inch water main supported on Bridge No. 02708 and connecting to the existing 12-inch water main at the locations shown on the Drawings.

B. The existing water main and all accessories, including the existing temporary water main support system, shall be removed from within the limits shown on the Contract Drawings. Existing steel components that are to remain, if any, shall be properly protected from damage. All material removed under this item shall become the property of the Contractor and shall be properly disposed of off the Project site at an approved facility.

B. Abandoned water mains shall be capped with mechanical joint caps.

13.04.04 - Method of Measurement:

All work and materials required by this Section of the Specifications will be measured by the Contract Lump Sum price as a single abandonment item.

13.04.05 - Basis of Payment:

This work will be paid for at the Contract Lump Sum price bid for 1304065A, “Remove Water Main”, which price and payment shall include payment in full for all materials, equipment, tools, labor and work required to abandon or remove the existing 8-inch water main, including, but not
necessarily limited to, existing hydrants (where called for removal and/or replacement), valves, services, etc., and all water appurtenances, excavation, excavation support, pipe cutting, caps or brick/mortar plugs, backfill and compaction, furnishing granular fill, and the removal and disposal of surplus materials.

<table>
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<tr>
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<tbody>
<tr>
<td>Remove Water Main</td>
<td>LS</td>
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</tbody>
</table>

Item #1304065A
ITEM #1304111A – CLASS “C” CONCRETE (WATER MAIN)

13.00.01 – Description

A. Work of this Section covers the furnishing of all labor, equipment, appliances and materials, and in performing all operations in connection with providing the construction of all plain Portland Cement Concrete work for thrust blocks, pipe cradles, encasements, etc., complete in place and accepted in accordance with the drawings and specifications.

B. The Contractor shall submit a written certification stating that all cast-in-place concrete shall have a compressive strength at the end of 28 days of not less than 3,000 psi. Concrete work for cast-in-place manhole bases shall contain a retarding densifier admixture as an integral part of the design mix. The use of admixture, other than the retarding densifier specified herein, will not be permitted.

C. Portland Cement and aggregates may be tested by the Owner.

D. The Engineer shall have free access at all times to the batching and mixing plant for sampling of all material and inspection of work performed for this Project.

13.00.02 – Materials

A. Portland cement shall conform to ASTM C150, latest revision, for Type I cement. Aggregate for concrete shall conform to ASTM C33, latest revision. Coarse aggregate shall be size No. 67 according to Connecticut Department of Transportation Form 817, Article M.01.01.

13.00.03 – Construction Methods

A. Prior to placing the concrete, the Contractor shall be responsible for checking and maintaining the proper position of all parts to be embedded in Portland Cement Concrete.

B. Placing of concrete shall be such that the concrete for each pour shall be placed in one continuous operation.

C. Water shall be removed from excavations before concrete is deposited. Any flow of water shall be diverted and shall be removed without washing over the freshly deposited concrete.

D. The subgrade for concrete work shall be maintained in an approved, smooth and thoroughly compacted condition in conformity with the required section and grade until the concrete is in place. The subgrade shall be thoroughly moistened, but not muddy, at the time the concrete is deposited. No concrete shall be placed until forms and all work to be built into concrete have been satisfactorily installed and inspected.
E. Concrete shall not be placed when the ambient temperature is below 35 degrees F nor when the concrete, without special protection, is likely to be subjected to freezing temperature before the expiration of the specified curing period. If it is necessary to place concrete under conditions of low temperature, placement shall be approved by the Engineer. The temperature of the concrete, when placed, shall be not less than 50 degrees F or more than 70 degrees F. Heating of the mixing and/or aggregates will be required, as necessary, to maintain the minimum temperature of 50 degrees F, and all methods and equipment for heating shall be satisfactory to the Engineer. Materials shall be free from ice, snow, and frozen lumps before entering the mixer. Suitable covering and other means shall be provided for maintaining the concrete to prevent freezing. Any concrete damaged by freezing shall be removed and replaced by the Contractor at no additional expense to the Owner.

F. Concrete shall be transferred from mixer to transport vehicle to place of final deposit in a continuous manner, as rapidly as practicable, and without segregation or loss of ingredients until the unit of construction is completed. Concrete that has attained its initial set or has contained its mixing water for more than thirty (30) minutes shall not be placed in the work. Placing will not be permitted when, in the opinion of the Engineer, the sun, heat, wind, temperature of limitations of facilities furnished by the Contractor prevent proper finishing and curing of the concrete. Forms shall not be splashed with concrete in advance of pouring. When placing concrete for encasements, precautionary measures shall be taken to prevent the displacement of piping or disturbing of joints of the piping; displaced or disturbed joints shall be corrected by the Contractor in a manner satisfactory to the Engineer, at no additional expense to the Owner. Concrete shall be placed in the forms in uniform layers as nearly as practicable in final position. Immediately after placing, concrete shall be compacted thoroughly in a satisfactory manner. Tapping or other external vibration of forms will not be permitted. Concrete shall not be placed on concrete sufficiently hard to cause formation of seams and planes of weakness within the section. Concrete shall not be allowed to drop freely more than 5 feet. Concrete to receive other construction shall be screeded to the proper level.

G. The ground foundation on which concrete is placed shall be clean, damp and free from frost, ice and standing or running water. Prior to placing concrete, the gravel foundation shall be satisfactorily compacted.

H. Curing shall be accomplished by preventing loss of moisture, rapid temperature change and mechanical injury or injury from rain or flowing water, and kept moist for a period of at least 7 days after placing. During this period, concrete shall be maintained at 70 degrees F for at least four (4) days or above 50 degrees F for at least seven (7) days. All concrete shall be damp-cured in a suitable and approved manner and curing shall be started as soon after placing and finishing as practicable.

13.00.04 – Method of Measurement

A. “Class “C” Concrete (Water Main)”: Concrete for pipe encasements, pipe cradles, cast-in-place pipe sleeves, thrust blocks, and stop collars, will be will be measured by the actual
number of cubic yards of cast-in-place concrete installed to the limits shown on the drawings, complete and accepted by the Engineer.

13.00.05 – Basis of Payment:

A. The quantity of cast-in-place “Class “C” Concrete (Water Main)”, as determined and provided in the preceding paragraphs, will be paid for within the Unit Bid Price price bid for Item 1304111A – “Class “C” Concrete (Water Main)” for thrust blocks, pipe cradles, pipe encasements, pipe sleeves, stop collars, etc.; which prices and payment shall constitute full compensation for all equipment, plant, tools, materials, forms, bracing, mixing, delivering, placing, compacting, furnishing, curing and protection, installing miscellaneous materials to be embedded in concrete and for all labor, and incidentals necessary to complete the items in accordance with the specifications, the drawings and as directed by the Engineer. No payment will be made for concrete until it has been satisfactorily cured.

B. No payment will be made under this section of the Specifications for plain Portland Cement Concrete specified or indicated to be paid for under other items of work.

C. No payment will be made for plain Portland Cement Concrete not shown on the drawings and not ordered by the Engineer.

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Class “C” Concrete (Water Main)</td>
<td>CY</td>
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</tbody>
</table>

ITEM #1304111A
ITEM #1304123A – COMPACTED GRAVEL FILL (WATER MAIN)

13.00.01 – Description:

Conform to the requirements of Section 2.05.01 of Form 817.

A. Work and materials required by this section of the Specifications consists of excavating, backfilling, compacting, as indicated, and refills of unsuitable material, removal of existing pipelines and all other incidental work necessary for the construction of pipelines, structures, pavement and appurtenant work in accordance with the Contract Documents.

B. The Work also includes installing shoring and bracing as the excavation proceeds; providing approved bank-run gravel from off-site sources when directed for backfills of excavations and disposal at locations directed by the Engineer of pavements, surplus and unsuitable materials; protection of existing pipelines, utilities and structures and of new work; compaction of trench bottom, backfills, refills and subgrades; and all other appurtenant work.

13.00.02 – Materials:

A. Compacted Gravel Fill shall be Bank Run Gravel and it shall conform to the requirements of M.02.06, Grading “C”.

B. Earth refill shall be from approved off-site borrow pits, and shall be a well-graded granular material, at least eighty (80%) percent of which must be sand and gravel. It shall be free from peat, organic matter and debris and shall not contain any stones or clay lumps in excess of 4 inches in their greatest dimensions. Any materials of whatever description which are too uniformly graded or saturated and not readily compactable shall not be utilized.

C. Bedding material shall be “Fine Gravel” which shall consist of clean, hard and durable particles or fragments of rock and shall be free from clay, organic matter and other objectionable material. Fine gravel shall conform to the following gradation limits:

<table>
<thead>
<tr>
<th>U.S. Standard Sieve Size</th>
<th>Percentage Passing By Weight</th>
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<tbody>
<tr>
<td>¾ in</td>
<td>100</td>
</tr>
<tr>
<td>3/8 in</td>
<td>50-85</td>
</tr>
<tr>
<td>No. 4</td>
<td>25-70</td>
</tr>
<tr>
<td>No. 10</td>
<td>10-35</td>
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<tr>
<td>No. 40</td>
<td>0-10</td>
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<tr>
<td>No. 100</td>
<td>Less Than 5</td>
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</tbody>
</table>

D. Crushed Stone shall consist of clean, hard durable, crushed rock and shall be satisfactorily free from fine sand, silt or rock flour. Crushed stone shall conform to ASTM Designation D 693 (latest revision), shall be uniformly graded, and shall range in size from 0.75 inches to 1.25 inches.

E. Filter fabric shall be Mirafi 140, Filter-X or equal.

ITEM #1304123A
F. Utility warning/marking tape shall be provided for ALL UTILITIES INSTALLED UNDER THIS CONTRACT.

G. Tape shall be manufactured of poly-plastic 6 inches wide and shall be of a suitable color assigned to the type of facility for surface markings in section 16-345-5(h) of the State of Connecticut General Statutes.

H. Tape shall be of the “DETECTABLE” type and shall be durably imprinted with the name of the specific utility that the tape is above (i.e., “WATER MAIN”). Tape installation and use shall be in accordance with Section 16-345 of the State of Connecticut General Statutes and all other applicable State and/or Federal regulations.

I. Tape shall be installed continuously along the entire length of the underground water main pipe and placed at a point detailed on the Contract Drawings.

13.00.03 – Construction Methods:

Conform to the requirements of Section 2.02.03 and 2.05.03 of Form 817, including the following:

A. EXCAVATION AND DISPOSAL OF UNSUITABLE MATERIAL (WATER MAIN)

1. Unsuitable materials are herein defined as organic material, peat, organic silt or combinations thereof, all having unsuitable in-situ bearing properties and all materials of whatever description which are too loose or saturated for use as backfill or trench bottom to provide satisfactory bearing.

2. The Contractor shall satisfactorily excavate and remove all unsuitable material uncovered within the trench above the bottom of the bedding indicated on the drawings or as directed by the Engineer and shall satisfactorily dispose of such material off the site. Where unsuitable material is found below the bedding bottom, it shall be removed to a depth indicated by the Engineer.

3. All resulting unsuitable excavations outside the pipe bedding and trench limits shall be refilled with compacted bank-run gravel refill.

B. TRENCH EXCAVATION

1. Trench excavation shall include the excavation, removal and satisfactory disposal of all materials of whatever nature encountered from within the limits indicated or specified or as directed in writing, other than rock or ledge.

2. Excavation shall include, but not be limited to, earth materials such as peats, organic or inorganic silts, clay, sand and gravel; pavements; cobbles and boulders less than one (1) cubic yard in volume; soft or disintegrated rock which, in the opinion of the
Engineer, can be removed without blasting or drilling; brick and concrete masonry and all obstructions not specifically included in another Section.

3. All excavation, sheeting, shoring and dewatering operations shall be accomplished to prevent the undermining or disturbing of existing pipelines, utilities and structures or of any completed construction.

4. Portions of the required excavations are below existing ground water levels. All excavations shall be kept dry at all times and all construction work shall be performed in the dry, unless otherwise authorized or directed by the Engineer.

5. Excavation shall be made to the lines and grades shown on the drawings or as modified by the Engineer/CWC. Excavations shall be accurately graded to allow satisfactory construction of the Contract work. Immediately after excavation to the indicated or directed trench bottom, the Contractor shall compact the exposed trench bottom surface with sufficient passes of an approved plate-type vibratory compactor.

6. Bell holes and depressions for joints shall be dug after the trench bottom has been graded and compacted and after gravel bedding, if required, has been placed and compacted. The bottom quadrant of each pipe barrel shall have complete and uniform bearing for the full length of each pipe. The trench bottom shall again be thoroughly compacted just prior to final shaping for bedding and installation of pipe.

7. Excavation operations adjacent to and below existing structures and utilities shall be done manually and in a manner to prevent disturbance of or damage to the existing structures and utilities. Butt bracing of utility poles shall be utilized where necessary.

8. Existing pavements and base courses that are to be removed shall be carefully saw cut and removed to obtain sound, vertical edges to the line indicated.

9. Existing pavements and base courses beyond the indicated lines which are to remain and which have been disturbed or damaged shall be restored or replaced by the Contractor to match existing pavements and base courses, at no additional expense to the Owner. Existing pavements and base courses to remain shall be protected by the Contractor.

10. The Contractor shall be responsible for keeping all excavated and construction material a safe distance back from the edge of excavations to avoid overloading the sides of excavations and to prevent slides or cave-ins.

11. If an excavation is made deeper or wider than that shown on the Drawings, unless directed in writing by the Engineer/CWC, there will be no extra payment for such unauthorized excavation. Backfill and compaction of all unauthorized excavations shall be made by the Contractor with either selected materials from on-site excavations or compacted gravel fill, as directed by the Engineer/CWC and at no expense to the Owner.
12. If a pipe is to be placed in fill or on top of the pipe is within 24 inches of existing ground surface, the fill shall first be placed as specified herein to a height of not less than 24 inches over the top of the pipe and for a width of 5 feet beyond each side of the pipeline. Following placement of such fill, excavation and backfill shall proceed as specified herein.

13. All trench excavations over depths specified by all applicable CWC, Local, State and/or Federal Health and Safety Regulations shall be performed in vertically sheeted or shored trenches. The Contractor may elect to employ a steel trenching box in lieu of the use of sheeting or shoring. The use of a trenching box and the conditions and locations where the same shall be allowed, will be subject to the determination and approval of the Engineer. No shoring or steel trenching box shall be used in areas underlain by soft or unsuitable soils.

14. Shoring shall be adequately braced to prevent cave-ins or loss of ground, and portions of the shoring or bracing shall be left in place as directed by the Engineer to maintain stability as backfilling progresses.

15. No excessive trench widths will be allowed to avoid the use of sheeting. The trench width at and below a level 12 inches above the top of the pipe shall not exceed the payment limit indicated on the drawings for the size pipe being installed, unless otherwise permitted by the Engineer.

16. Where existing subsurface utilities or other facilities adjacent to or crossing through the excavation require temporary support or protection, such temporary support or protection shall be satisfactorily provided by the Contractor, at no additional expense to the Owner. All necessary measures shall be taken by the Contractor to prevent lateral movement or settlement of existing facilities or of work in progress.

17. Grading shall be done as necessary to prevent surface water from flowing into excavations and any water accumulating therein shall be removed by pumping or other approved method. The pipeline shall not, at any time, be used for trench drainage.

18. Steel plate crossings may be required in place of plank crossings to cover excavations, which are temporarily not in use by the Contractor. These excavations shall be bridged with at least 1 inch thick steel plates, which conform to ASTM A36 (latest revision), and weigh not less than 1,000 pounds each. The plates shall extend to a minimum of 24 inches beyond all edges of the excavation. Fastening shall be removable spike, with flush heads, or other suitable means to prevent vibratory movement. Any difference in elevation between top of plate and street surface shall be smoothed over or ramped with bituminous concrete.

19. The Contractor shall adhere to all Federal, State and local regulations regarding safety during the performance of this work, including Occupational and Health

C. BACKFILLING

1. Unless directed otherwise by the Engineer/CWC, excavations shall not be backfilled until all required pipeline tests have been satisfactorily performed and until the work as installed conforms to all requirements specified in these Sections. Each layer of backfill material shall be moistened and compacted in such manner as to permit the proper and desired compaction of the backfill, so that paving of excavated areas can proceed immediately after backfilling is completed.

2. All excavations shall be backfilled as soon as practicable with bank run gravel or approved excavated material, if directed by the Engineer/CWC. If suitable material as approved by the Engineer/CWC is not available from the excavations in the quantities required for proper backfilling of excavations, the Contractor shall provide the necessary bank run gravel for backfilling from off-site sources.

3. All backfill placed in trenches below a level 12 inches above the top of pipe shall consist of pipe bedding or selected backfill, as shown on the plans, placed in layers not exceeding 12 inches in loose depths. Selected backfill shall be select compactable excavated material or bank-run gravel, as applicable, as approved by the Engineer/CWC, sand and/or gravel, not frozen and free from clods of earth, organic matter, stones larger than 2 inches in diameter or unsuitable materials. The material shall be deposited uniformly on both sides of the pipe and shall be thoroughly compacted by tamping under and on each side of the pipe to provide uniform support around the pipe, free from voids. Compaction of each layer shall be ninety-five (95%) percent of maximum dry density as determined by ASTM Test Method D1557 (latest revision).

4. WARNING TAPE: Utility warning tape shall be installed in the trench above the bedding material along the entire length of the pipe.

5. The balance of backfill in trenches shall be bank-run gravel or approved materials obtained from the excavation, if directed and as approved by the Engineer/CWC, not frozen and without any stone larger than 3 inches in their greatest dimension. It shall be spread in layers not exceeding 12 inches in loose depth and each layer shall be compacted by at least four (4) inches of an approved plate-type vibratory compactor. All trench backfilling shall be carefully placed to avoid disturbance of new work and of existing utilities and structures. Each layer shall be compacted to ninety-five (95%) percent of maximum dry density determined by ASTM Test D1557 (latest revision), Method D. The moisture content of backfill shall be such that proper compaction will be obtained. Puddling of backfill with water will not be permitted. During construction periodic tests at the expense of the Owner will be made by personnel of a testing laboratory satisfactory to the Engineer to insure that the required compaction is being obtained.

ITEM #1304123A
6. During filling and backfilling operations, pipelines will be checked by the
Engineer/CWC to determine whether any displacement of the pipe has occurred. If the
inspection of the pipelines shows poor alignment, displaced pipe or any other defects,
the defects designated by the Engineer/CWC shall be remedied in a satisfactory
manner by the Contractor at no additional expense to the Owner.

13.00.04 - Method of Measurement

A. Compacted Bank-Run Gravel required for replacing the unsuitable material removed from
excavation operations, and at such other locations as directed, will be measured by the actual
number of cubic yards of gravel material used to replace the unsuitable material removed.

13.00.05 - Basis of Payment

A. “Compacted Gravel Fill (Water Main)” of unsuitable excavations outside the pipe bedding
and trench limits will be paid at the unit price bid per cubic yard.

<table>
<thead>
<tr>
<th>Pay Item</th>
<th>Pay Unit</th>
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<tbody>
<tr>
<td>Compacted Gravel Fill (Water Main)</td>
<td>CY</td>
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</tbody>
</table>
ITEM #1309301A – DISINFECTION OF WATER MAIN

13.00.01 – Description:

A. Work under this Section covers the furnishing of all plant, labor, equipment, appliances, and materials, and in performing all operations in connection with assisting CWC with the disinfection and sampling of the completed water piping shown on the Contract Drawings, in accordance with this section of the Specifications and as directed by CWC.

B. The Connecticut Water Company (CWC) will be responsible for sampling and water testing, including bacteria testing, as indicated in this Section.

C. The Contractor shall be responsible for disinfection of the water main, the proper removal and neutralization of water and chemicals used for disinfection and testing of water mains. Arrangements for, and all associated costs of, final disposal, including procurement of any necessary discharge permits by State or local regulatory agencies, shall be made by the Contractor.

D. A 1-inch corporation shall be installed by the Contractor on the bridge water to provide a means for sampling and blowing off of the new water main.

E. REFERENCES:


F. SUBMITTAL

1. Submit the plan for neutralization of water and chemicals for review by the Engineer and CWC.

2. Submit copies of all necessary permits to the Engineer and CWC.

13.00.02 – Materials:

A. Chlorine for disinfection shall conform to AWWA Specification B300 (Hypochlorites) and C651 (latest revision).

B. DISINFECTING AND FLUSHING WATER MAINS AND APPURtenances

1. All portions of completed water mains and appurtenances installed by the Contractor are to be disinfected before acceptance for operation.

2. The Contractor shall disinfect the completed water main system in conformance with AWWA Standard C651-14, AWWA Standard for Disinfecting Water Mains, Section 4.4, Continuous-Feed Method of Chlorination (or the latest revision thereof) included.
as Appendix AA. The Contractor is responsible for developing a detailed plan for the disinfection procedure with liquid sodium hypochlorite solution (conforming to ANSI/AWWA B300) and de-chlorination of discharge water for the water main installation. The detailed plan shall be submitted to the Company for approval. This submittal should identify the location of injection and discharge points, the materials (conforming to Company specs) and disinfection and de-chlorination products to be used. This submittal shall also identify any proposed subcontractors for this activity and provide references (3) and list of comparable projects (3) recently completed by them. The contractor shall only proceed with this procedure upon approval of the submittal by the Company. The Company will typically perform the flushing of the water main in preparation for disinfection. As needed the contractor shall support to Company with this effort to meet the following guidelines. The completed line shall be slowly filled with water to eliminate air pockets and flushed to remove particulates. The flushing velocity in the main shall not be less than 3.0 ft/sec (0.91 m/sec). Flushing shall be performed for a sufficient period of time to allow for a minimum of 3 volume changes of water in the main (approximately 16 minutes per 1,000 feet of main at a flow rate that produces 3.0 ft/sec rate). Introduce chlorine to the main at a constant rate from a point not more than 10 ft. downstream from the beginning of the new main, such that the water will have at least 25 mg/L free chlorine. The heavily chlorinated main shall remain at static pressure for no less than 24-hrs. (not to exceed 48-hrs.). Chlorine residual remaining after 24 hours must be at least 10 mg/L. If less than 10/mg/L chlorine is measured after 24 hours, the Contractor shall repeat flushing and disinfection procedures.

### Flushing and Dosing Reference Values
(From AWWA C651 Table 3 and Table 4)

<table>
<thead>
<tr>
<th>Pipe Diameter (in)</th>
<th>Flushing Flow Rate to Produce 3.0 ft./sec (gpm)</th>
<th>1% Chlorine Solution Required to Produce 25 mg/L concentration in 100 feet of pipe (gal)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>120</td>
<td>0.16</td>
</tr>
<tr>
<td>6</td>
<td>260</td>
<td>0.36</td>
</tr>
<tr>
<td>8</td>
<td>470</td>
<td>0.65</td>
</tr>
<tr>
<td>12</td>
<td>1,060</td>
<td>1.44</td>
</tr>
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</table>

The Contractor shall be responsible for the dechlorination of disinfection discharge water. The discharge of heavily chlorinated water (concentrations greater than system residual) to the environment is prohibited. The discharge water must be dechlorinated satisfactory to the Company before released to the environment. Dechlorination will be incidental to the activity. During dechlorination, a neutralizing chemical shall be applied to the water to be wasted to thoroughly neutralize the residual chlorine (see ANSI/AWWA C655 for neutralizing chemicals). Where necessary, federal, state, local, or provincial regulatory agencies should be contacted to determine special provisions for the disposal of heavily chlorinated water. Upon completion of flushing, disinfection, and dechlorinating, a water sample from the section shall be collected by the Company for third-party analysis. No section of main shall be put into service without the approval of the Company, and should the analysis be unsatisfactory, the section shall again be disinfected and re-
tested until an analysis satisfactory to the Company is obtained. All costs for additional disinfection and retesting shall be borne by the Contractor. All temporary taps and discharge points for the disinfection and flushing process shall be permanently abandoned upon successful testing unless approved by the Company to stay in place. Abandonment of temporary taps includes positioning the corporation ‘off’ and installing a Mueller H-15451 coupling and corresponding NPT plug. Abandonment of disinfection taps and blow-offs will be incidental to the activity and shall be coordinated with the Company representative.

3. The Contractor shall be responsible for the satisfactory disposal of all flushing water and chlorinated water at no additional expense to the Owner or the CWC. The Contractor shall be responsible for contacting State and local regulatory agencies to determine special provisions for the disposal of heavily chlorinated water.

4. The CWC will coordinate the sampling and testing of all water quality samples with assistance provided by the Contractor if required. The CWC will coordinate the delivery/pickup of the water samples with the testing laboratory and be responsible for the testing costs.

5. The Contractor’s workers who are responsible for the water main work should be aware of the potential health hazards with chlorine and should be trained to observe carefully the prescribed construction practices and disinfection procedures. The effectiveness of disinfection depends in large measure on maintaining clean pipes and avoiding major contamination during construction.

6. An adequate amount of reducing agent should be applied by the Contractor to water being disposed of in order to neutralize thoroughly the chlorine residual remaining in the water before final disposal. Arrangements for, and all associated costs of, final disposal, including procurement of any necessary discharge permits by State or local regulatory agencies, shall be made by the Contractor.

7. In order to take samples after the disinfection of the new main, the Contractor shall install one 1-inch blow-off in the bridge piping, composed of a corporation stop, flared fitting, shutoff valve and pipe of the length and at the locations ordered by the CWC to allow the chloride residual to reach normal.

8. Disinfection procedure to follow at connections to existing water mains: The interior of pipe and fittings, used in making the connection, shall be swabbed or sprayed with a 1% hypochlorite solution before they are installed.

C. REQUIRED WATER QUALITY TESTS

1. The CWC will collect all water quality samples, with the assistance of the Contractor. The Contractor shall not be responsible for payment of laboratory fees.
associated with testing of water quality samples required by this section of the specification.

a. Total Coliform
b. Standard Plate Count
c. Volatile Organic Compounds
d. Synthetic Organic Compounds

13.00.04 – Method of Measurement

Work and materials required for Disinfection and Flushing will be measured on a per each basis as required.

13.00.05 – Basis of Payment

A. Payment for Disinfection and Flushing will be paid once per each section. It shall include the development of the disinfection plan, all labor, materials and equipment required to provide and install temporary chlorination taps and blow-offs as identified in the disinfection plan. Work to include all excavation, backfill, chlorination, flushing, de-chlorination and abandonment of temporary taps and blow-offs. Re-chlorination and testing due to a failed test will be the responsibility of the Contractor.

B. Payment for work in this Section shall include all costs related to temporary bulk-heading of the installed water main system, as well as all costs associated with temporary blow-off devices.

<table>
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<tr>
<th>Pay Item</th>
<th>Pay Unit</th>
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<tbody>
<tr>
<td>Disinfection of Water Main</td>
<td>LS</td>
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</table>
PERMITS AND/OR REQUIRED PROVISIONS:

The following Permits and/or Required Provisions follow this page are hereby made part of this Contract.

- **PERMITS AND/OR PERMIT APPLICATIONS**
  - Flood Management Certification: August 21, 2019
  - Structures, dredging, Fill, Tidal Wetlands & 401 Permit: pending
  - Pre-Construction Notification (PCN): pending

- **Construction Contracts - Required Contract Provisions (State Funded Only Contracts)**
Date: August 21, 2019

Connecticut Department of Transportation
Kimberly Lesay
2800 Berlin Turnpike, Newington, CT 06131

SUBJECT: DEEP License #: 201903582-FM
Bridge No. 02708, Route 154 over Plum Bank Creek, Old Saybrook, CT 06475

Dear Mrs. Lesay:

Please find attached a copy of your subject license and relevant enclosures which are being issued pursuant to your application of March 5, 2019. Your attention is directed to the conditions of the license. All work must conform to that which is specifically authorized.

Any work in regulated areas of the State which has not been authorized by a valid license is a violation of state law and subject to enforcement action by the Department of Energy & Environmental Protection and the Office of the Attorney General.

Your initiation of authorized activities will be relied upon as your agreement to comply with the terms and conditions of the license.

If you have not already done so, you should contact your local Planning and Zoning Office and the U. S. Army Corps of Engineers to determine local and federal permit requirements on your project, if any. Write the Corps’ New England District, Regulatory Branch, 696 Virginia Road, Concord, MA 01742-2751; http://www.nae.usace.army.mil/ or call 1-800-343-4789.

If you should have any questions or concerns, please contact me at (860)424-3407, or alexander.curry@ct.gov.

Sincerely,

Alexander Curry; Engineer Intern
Land & Water Resources Division
Bureau of Water Protection & Land Reuse

Encl(s): License # 201903582-FM

cc: File 201903582-FM
cc (via email): Kimberly Lesay, CT DOT; kimberly.lesay@ct.gov
Ryan Martin, CT DOT; ryan.martin@ct.gov
Carl Fortuna, Old Saybrook CEO; cf Fortuna@town.old-saybrook.ct.us
Scott Mitchell, Old Saybrook Harbor Master; osharbornmaster@hotmail.com
Richard Esty, Old Saybrook Conservation Commission; rfish@town.old-saybrook.ct.us
<table>
<thead>
<tr>
<th><strong>Licensee(s):</strong></th>
<th>Connecticut Department of Transportation</th>
</tr>
</thead>
</table>
| **Licensee Address(s):** | 2800 Berlin Turnpike  
Newington, CT 06131 |
| **License Number(s):** | 201903582-FM |
| **Municipality:** | Old Saybrook |
| **Project Description:** | CT DOT Project 105-215, Replacement of Bridge No. 02708 carrying Route 154 over Plum Bank Creek. |
| **Project Address/Location:** | Route 154 over Plum Bank Creek |
| **Waters:** | Plum Bank Creek |
| **Authorizing CT Statute(s) and/or Federal Law:** | CGS Section 25-68b to h |
| **Applicable Regulations of CT State Agencies:** | 25-68h-1 to 3 |
| **Agency Contact:** | Land & Water Resources Division, Bureau of Water Protection & Land Reuse, 860-424-3019 |
| **License Expiration:** | Five (5) years from the date of issuance of this license. |
| **Project Site Plan Set:** | “Replacement of Bridge No. 02708, Route 154 Over Plum Bank Creek”, Prepared by CT DOT, checked by Ryan Martin, dated 2/6/2019. |
| **License Enclosures:** | LWRD General Conditions, Compliance Certification Form |

*Connecticut’s Uniform Administrative Procedure Act defines License to include, “the whole or part of any agency permit, certificate, approval, registration, charter or similar form of permission required by law . . .”*
Authorized Activities:

The Licensee is hereby authorized to conduct the following work as described in application # 201903582-FM and as depicted on any site plan sheets / sets cited herein:

1. Remove the existing superstructure, abutments, and wingwalls above elevation 2.0 feet (NAVD88);
2. Install new abutments and wingwalls approximately 12 feet behind the existing abutments;
3. Install a new superstructure with a span length of approximately 40.5 feet;
4. Install permanent sheet piling around the new abutments with a top elevation of -0.75 feet (NAVD88);
5. Install 3.0 foot deep concrete block revetments between the existing and new abutments;
6. Temporarily relocate the existing 8 inch diameter water main on site and replace it with a 12 inch diameter main.

Failure to comply with the terms and conditions of this license shall subject the Licensee and / or the Licensee’s contractor(s) to enforcement actions and penalties as provided by law.

This license is subject to the following Terms and Conditions:

1. License Enclosure(s) and Conditions. The Licensee shall comply with all applicable terms and conditions as may be stipulated within the License Enclosure(s) listed above.
2. Time of Year Restriction: All construction activity authorized herein is prohibited between May 1st and August 31st, inclusive, of any year in order to protect nesting of the saltmarsh sharp-tailed sparrow.

Issued under the authority of the Commissioner of Energy and Environmental Protection on:

August 21, 2019

Brian P. Thompson
Division Director
Land & Water Resources Division
General Conditions for Land & Water Resources Division Licenses

1. Land Record Filing (for Structures Dredging & Fill, Tidal Wetlands, Certificate of Permission, and Long Island Sound General Permit Licenses only). The Licensee shall file the Land Record Filing on the land records of the municipality in which the subject property is located not later than thirty (30) days after license issuance pursuant to Connecticut General Statutes (CGS) Section 22a-363g. A copy of the Notice with a stamp or other such proof of filing with the municipality shall be submitted to the Commissioner no later than sixty (60) days after license issuance. If a Land Record Filing form is not enclosed and the work site is not associated with an upland property, no filing is required.

2. Contractor Notification. The Licensee shall give a copy of the license and its attachments to the contractor(s) who will be carrying out the authorized activities prior to the start of construction and shall receive a written receipt for such copy, signed and dated by such contractor(s). The Licensee’s contractor(s) shall conduct all operations at the site in full compliance with the license and, to the extent provided by law, may be held liable for any violation of the terms and conditions of the license. At the work site, the contractor(s) shall, whenever work is being performed, have on site and make available for inspection a copy of the license and the authorized plans.

3. Work Commencement¹. Not later than two (2) weeks prior to the commencement of any work authorized herein, the Licensee shall submit to the Commissioner, on the Work Commencement Form attached hereto, the name(s) and address(es) of all contractor(s) employed to conduct such work and the expected date for commencement and completion of such work, if any.
   - For water diversion activities authorized pursuant to 22a-377(e)-1 of the Regulations of Connecticut State Agencies, the Licensee shall also notify the Commissioner in writing two weeks prior to initiating the authorized diversion.
   - For emergency activities authorized pursuant Connecticut General Statutes Section 22a-6k, the Licensee shall notify the Commissioner, in writing, of activity commencement at least one (1) day prior to construction and of activity completion no later than five (5) days after conclusion.

4. For Coastal Licenses Only - License Notice. The Licensee shall post the first page of the License in a conspicuous place at the work area while the work authorized therein is undertaken.

5. Unauthorized Activities. Except as specifically authorized, no equipment or material, including but not limited to, fill, construction materials, excavated material or debris, shall be

¹ The Work Commencement condition and the need for a Work Commencement Form is not applicable to Flood Management Certification approvals.

Revised: October, 2017
deposited, placed or stored in any wetland or watercourse on or off-site. The Licensee may not conduct work within wetlands or watercourses other than as specifically authorized, unless otherwise authorized in writing by the Commissioner. Tidal wetlands means “wetland” as defined by section 22a-29 and “freshwater wetlands and watercourses” means “wetlands” and “watercourses” as defined by section 22a-38.

6. Unconfined Instream Work. Unless otherwise noted in a condition of the license, the following conditions apply to projects in non-coastal waters:
   - Unconfined instream work is limited to the period June 1 through September 30.
   - Confinement of a work area by cofferdam techniques using sand bag placement, sheet pile installation (vibratory method only), portadam, or similar confinement devices is allowed any time of the year. The removal of such confinement devices is allowed any time of the year.
   - Once a work area has been confined, in-water work within the confined area is allowed any time of the year.
   - The confinement technique used shall completely isolate and protect the confined area from all flowing water. The use of silt boom/curtain or similar technique as a means for confinement is prohibited.

7. For State Actions Only - Material or Equipment Storage in the Floodplain. Unless approved by a Flood Management Exemption, the storage of any materials at the site which are buoyant, hazardous, flammable, explosive, soluble, expansive, radioactive, or which could in the event of a flood be injurious to human, animal or plant life, below the elevation of the five-hundred (500) year flood is prohibited. Any other material or equipment stored at the site below said elevation by the Licensee or the Licensee’s contractor must be firmly anchored, restrained or enclosed to prevent flotation. The quantity of fuel stored below such elevation for equipment used at the site shall not exceed the quantity of fuel that is expected to be used by such equipment in one day. In accordance with the licensee’s Flood Contingency Plan, the Licensee shall remove equipment and materials from the floodplain during periods when flood warnings have been issued or are anticipated by a responsible federal, state or local agency. It shall be the Licensee’s responsibility to obtain such warnings when flooding is anticipated.

8. Temporary Hydraulic Facilities for Water Handling. If not reviewed and approved as a part of the license application, temporary hydraulic facilities shall be designed by a qualified professional and in accordance with the Connecticut Guidelines for Soil Erosion and Sediment Control, the 2004 Connecticut Stormwater Quality Manual, or the Department of Transportation’s ConnDOT Drainage Manual, as applicable. Temporary hydraulic facilities may include channels, culverts or bridges which are required for haul roads, channel relocations, culvert installations, bridge construction, temporary roads, or detours.

9. Excavated Materials. Unless otherwise authorized, all excavated material shall be staged and managed in a manner which prevents additional impacts to wetlands and watercourses.

10. Best Management Practices. The Licensee shall not cause or allow pollution of any wetlands or watercourses, including pollution resulting from sedimentation and erosion. In constructing
or maintaining any authorized structure or facility or conducting any authorized activity, or in removing any such structure or facility, the Licensee shall employ best management practices to control storm water discharges, to prevent erosion and sedimentation, and to otherwise prevent pollution of wetlands and other waters of the State. For purposes of the license, "pollution" means "pollution" as that term is defined by CGS section 22a-423. Best Management Practices include, but are not limited, to practices identified in the Connecticut Guidelines for Soil Erosion and Sediment Control as revised, 2004 Connecticut Stormwater Quality Manual, Department of Transportation’s ConnDOT Drainage Manual as revised, and the Department of Transportation Standard Specifications as revised.

11. Work Site Restoration. Upon completion of any authorized work, the Licensee shall restore all areas impacted by construction, or used as a staging area or accessway in connection with such work, to their condition prior to the commencement of such work.

12. Inspection. The Licensee shall allow any representative of the Commissioner to inspect the project location at reasonable times to ensure that work is being or has been conducted in accordance with the terms and conditions of this license.

13. Change of Use. (Applies only if a use is specified within the License "Project Description")
   a. The work specified in the license is authorized solely for the purpose set forth in the license. No change in purpose or use of the authorized work or facilities as set forth in the license may occur without the prior written approval of the Commissioner. The Licensee shall, prior to undertaking or allowing any change in use or purpose from that which is authorized by this license, request permission from the Commissioner for such change. Said request shall be in writing and shall describe the proposed change and the reason for the change.

   b. A change in the form of ownership of any structure authorized herein from a rental/lease commercial marina to a wholly-owned common interest community or dockominium may constitute a change in purpose as specified in paragraph (a) above.

14. De Minimis Alteration. The Licensee shall not deviate from the authorized activity without prior written approval from the Commissioner. The Licensee may request a de minimis change to any authorized structure, facility, or activity. A de minimis alteration means a change in the authorized design, construction or operation that individually and cumulatively has minimal additional environmental impact and does not substantively alter the project as authorized.
   - For diversion activities authorized pursuant to 22a-377(c)-2 of the Regulations of Connecticut State Agencies, a de minimis alteration means an alteration which does not significantly increase the quantity of water diverted or significantly change the capacity to divert water.

15. Extension Request. The Licensee may request an extension of the license expiration date. Such request shall be in writing and shall be submitted to the Commissioner at least thirty (30) days prior to the license expiration. Such request shall describe the work done to date, what work still needs to be completed, and the reason for such extension. It shall be the
Commissioner’s sole discretion to grant or deny such request.

16. **Compliance Certification.** Not later than 90 days after completion of the authorized work, the Licensee shall prepare and submit to the Commissioner the attached Compliance Certification Form. Such Compliance Certification shall be completed, signed, and sealed by the Licensee and a Connecticut Licensed Design Professional. If non-compliance is indicated on the form, or the Commissioner has reason to believe the activities and/or structures were conducted in non-compliance with the license, the Commissioner may require the Licensee to submit as-built plans as a condition of this license.

17. **Maintenance.** The Licensee shall maintain all authorized structures or work in optimal condition or shall remove such structures or facility and restore the affected waters to their pre-work condition. Any such maintenance or removal activity shall be conducted in accordance with applicable law and any additional approvals required by law.

18. **No Work After License Expiration.** Work conducted after the license expiration date is a violation of the license and may subject the licensee to enforcement action, including penalties, as provided by law.

19. **License Transfer.** The license is not transferable without prior written authorization of the Commissioner. A request to transfer a license shall be submitted in writing and shall describe the proposed transfer and the reason for such transfer. The Licensee’s obligations under the license shall not be affected by the passage of title to the license site to any other person or municipality until such time as a transfer is approved by the Commissioner.

20. **Document Submission.** Any document required to be submitted to the Commissioner under the license or any contact required to be made with the Commissioner shall, unless otherwise specified in writing by the Commissioner, be directed to:

   Regulatory Section
   Land & Water Resources Division
   Department of Energy and Environmental Protection
   79 Elm Street
   Hartford, Connecticut 06106-5127
   860-424-3019

21. **Date of Document Submission.** The date of submission to the Commissioner of any document required by the license shall be the date such document is received by the Commissioner. The date of any notice by the Commissioner under the license, including but not limited to notice of approval or disapproval of any document or other action, shall be the date such notice is personally delivered or the date three (3) days after it is mailed by the Commissioner, whichever is earlier. Except as otherwise specified in the license, the word “day” as used in the license means calendar day. Any document or action which is required by the license to be submitted or performed by a date which falls on a Saturday, Sunday or a Connecticut or federal holiday shall be submitted or performed on or before the next day which is not a Saturday, Sunday, or a Connecticut or federal holiday.

22. **Certification of Documents.** Any document, including but not limited to any notice, which
is required to be submitted to the Commissioner under the license shall be signed by the Licensee and by the individual or individuals responsible for actually preparing such document, each of whom shall certify in writing as follows: "I have personally examined and am familiar with the information submitted in this document and all attachments and certify that based on reasonable investigation, including my inquiry of those individuals responsible for obtaining the information, the submitted information is true, accurate and complete to the best of my knowledge and belief, and I understand that any false statement made in this document or its attachments may be punishable as a criminal offense."

23. Accuracy of Documentation. In evaluating the application for the license, the Commissioner has relied on information and data provided by the Licensee and on the Licensee’s representations concerning site conditions, design specifications and the proposed work, including but not limited to representations concerning the commercial, public or private nature of the work or structures, the water-dependency of said work or structures, its availability for access by the general public, and the ownership of regulated structures or filled areas. If such information proves to be false, deceptive, incomplete or inaccurate, the license may be modified, suspended or revoked, and any unauthorized activities may be subject to enforcement action.

24. Limits of Liability. In granting the license, the Commissioner has relied on all representations of the Licensee, including information and data provided in support of the Licensee’s application. Neither the Licensee’s representations nor the issuance of the license shall constitute an assurance by the Commissioner as to the structural integrity, the engineering feasibility or the efficacy of such design.

25. Reporting of Violations. In the event that the Licensee becomes aware that they did not or may not comply, or did not or may not comply on time, with any provision of this license or of any document incorporated into the license, the Licensee shall immediately notify the agency contact specified within the license and shall take all reasonable steps to ensure that any noncompliance or delay is avoided or, if unavoidable, is minimized to the greatest extent possible. In so notifying the agency contact, the Licensee shall provide, for the agency’s review and written approval, a report including the following information:

a. the provision(s) of the license that has been violated;
b. the date and time the violation(s) was first observed and by whom;
c. the cause of the violation(s), if known;
d. if the violation(s) has ceased, the duration of the violation(s) and the exact date(s) and times(s) it was corrected;
e. if the violation(s) has not ceased, the anticipated date when it will be corrected;
f. steps taken and steps planned to prevent a recurrence of the violation(s) and the date(s) such steps were implemented or will be implemented; and
g. the signatures of the Licensee and of the individual(s) responsible for actually preparing such report.

If the violation occurs outside of normal business hours, the Licensee shall contact the
General Conditions for LWRD Licenses

Department of Energy and Environmental Protection Emergency Dispatch at 860-424-3333. The Licensee shall comply with any dates which may be approved in writing by the Commissioner.

26. Revocation/Suspension/Modification. The license may be revoked, suspended, or modified in accordance with applicable law.

27. Other Required Approvals. License issuance does not relieve the Licensee of their obligations to obtain any other approvals required by applicable federal, state and local law.

28. Rights. The license is subject to and does not derogate any present or future property rights or powers of the State of Connecticut, and conveys no property rights in real estate or material nor any exclusive privileges, and is further subject to any and all public and private rights and to any federal, state or local laws or regulations pertinent to the property or activity affected hereby.

29. Condition Conflicts. In the case where a project specific special condition listed on the license differs from, or conflicts with, one of the general conditions listed herein, the project specific special condition language shall prevail. It is the licensee’s responsibility to contact the agency contact person listed on the license for clarification if needed prior to conducting any further regulated activities.
Compliance Certification Form

The following certification must be signed by the licensee working in consultation with a Connecticut-licensed design professional and must be submitted to the address indicated at the end of this form within ninety (90) days of completion of the authorized work.

1. Licensee Name: ____________________________
   License Number(s): __________________________
   Site Address: ________________________________

2. Check one:
   (a) □ “I certify that the final site conditions and / or structures are in general conformance with the approved site plans”. Identify and describe any deviations and attach to this form.
   (b) □ “The final site conditions and / or structures are not in general conformance with the approved site plans. The enclosed “as-built” plans note the modifications”.

3. “I understand that any false statement in this certification is punishable as a criminal offence under section 53a-157b of the General Statutes and under any other applicable law.”

   Signature of Licensee ____________________________ Date

   Name of Licensee (print or type) ____________________________

   Signature of CT-Licensed Design Professional ____________________________ Date

   Name of CT-Licensed Design Professional (print or type) ____________________________

   Professional License Number (if applicable) ____________________________ Affix Stamp Here

- As-built plans shall include: elevations or tidal datums, as applicable, and structures, including any proposed elevation views and cross sections included in the approved license plans. Such as-built plans shall be the original ones and be signed and sealed by an engineer, surveyor or architect, as applicable, who is licensed in the State of Connecticut.
- The Licensee will be notified by staff of the Land and Water Resources Division (LWRD) if further compliance review is necessary. Lack of response by LWRD staff does not imply compliance.

Submit this completed form to:
Regulatory Section
Department of Energy and Environmental Protection
Land & Water Resources Division
79 Elm Street
Hartford, CT 06106-5127
IN THE TOWN OF OLD SAYBROOK
ROUTE 154 OVER PLUM BANK CREEK
REPLACEMENT OF BRIDGE NO. 02708
STATE PROJECT NO. 105-215
ENVIRONMENTAL PERMIT PLANS

CONNECTICUT DEPARTMENT OF TRANSPORTATION
**Subject:** State DOT Project No. 105-209  
Replacement of Br. No. 02708 carrying Route 154 over Plum Bank Creek  
Old Saybrook, CT

Attached are an original copy of the Flood Management Certification Permit and a CD with supporting hydraulic data associated with the above referenced project. The hydraulic analysis for the project has been performed by the Departments Hydraulics & Drainage Unit.

Any questions pertaining to this application may be directed to Mr. Andrew H. Davis, Transportation Supervising Planner of my staff, at 860-594-2157.

Attachments

Ryan D. Martin/rdm
bcc: Kimberley C. Lesay
    Andrew H. Davis – Amanda M. Saul
    Theodore H. Nezames – Mary E. Baker – Bryan H. Reed – Ryan D. Martin
    Robert E. Obey – Eileen M. Ego
Connecticut Department of Energy & Environmental Protection

Permit Application Transmittal Form

Please complete this transmittal form in accordance with the instructions in order to ensure the proper handling of your application(s) and the associated fee(s). Print legibly or type.

Part I: Applicant Information:

- If an applicant is a corporation, limited liability company, limited partnership, limited liability partnership, or a statutory trust, it must be registered with the Secretary of State. If applicable, applicant's name shall be stated exactly as it is registered with the Secretary of State.
- If an applicant is an individual, provide the legal name (include suffix) in the following format: First Name; Middle Initial; Last Name; Suffix (Jr, Sr., II, III, etc.).

Applicant: Connecticut Department of Transportation
Mailing Address: 2800 Berlin Turnpike
City/Town: Newington
Business Phone: 860-594-2931
Contact Person: Kimberly C. Lesay
E-Mail: kimberly.lesay@ct.gov
State: CT Zip Code: 06131
Phone: 860-594-2931 ext.

Applicant (check one): ☐ individual ☐ *business entity ☐ federal agency ☑ state agency ☐ municipality ☐ tribal
*If a business entity, list type (e.g., corporation, limited partnership, etc.):
☐ Check if any co-applicants. If so, attach additional sheet(s) with the required information as supplied above.

Please provide the following information to be used for billing purposes only, if different:
Company/Individual Name:
Mailing Address:
City/Town:
State: Zip Code:
Contact Person:
Phone: ext.

Part II: Project Information

Brief Description of Project: (Example: Development of a 50 slip marina on Long Island Sound)

CTDOT Project 105-215, Replacement of Bridge No. 02708, Route 154 over Plum Bank Creek

Location (City/Town): Old Saybrook

Other Project Related Permits (not included with this form):

<table>
<thead>
<tr>
<th>Permit Description</th>
<th>Issuing Authority</th>
<th>Submittal Date</th>
<th>Issuance Date</th>
<th>Denial Date</th>
<th>Permit #</th>
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### Part III: Individual Permit Application and Fee Information

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<th>New, Mod. or Renew</th>
<th>Individual Permit Applications</th>
<th>Initial Fees</th>
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<th>Total Initial Fees</th>
<th>Original + Required Copies</th>
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<td>To Groundwater</td>
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<td>Dam Safety</td>
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<td>Aquatic Pesticide Application</td>
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<td>CGS Section 22a-454 Waste Facilities</td>
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<td>Disruption of a Solid Waste Disposal Area</td>
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**Subtotal**  
1  
$0.00

**GENERAL PERMITS and AUTHORIZATIONS**  
Subtotals Page 3 & 4  
0  
$0.00

Enter subtotals from Part IV, pages 3 - 6 of this form  
Subtotals Page 5  
0  
$0.00

Subtotals Page 6  
0  
$0.00

**TOTAL**  
1  
$0.00

Select ☐ Indicate whether municipal discount or state waiver applies.  
Less Applicable Discount  

**AMOUNT REMITTED**  
$0.00

Check #  

See fee schedule on individual application.
### Part IV: General Permit Registrations and Requests for Other Authorizations

#### Application and Fee Information

<table>
<thead>
<tr>
<th>General Permits and Other Authorizations</th>
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<tbody>
<tr>
<td><strong>AIR EMISSIONS</strong></td>
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<td>Limit Potential to Emit from Major Stationary Sources of Air Pollution</td>
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<td>Diagnostic and Therapeutic X-Ray Devices (Medical X-Ray) Registration</td>
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<td>Radioactive Materials and Industrial Device Registration (Ionizing Radiation)</td>
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<td>Emergency/Temporary Authorization</td>
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<td>★★</td>
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<td>License Revocation Request</td>
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<td>★★</td>
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<tr>
<td>Other, (please specify):</td>
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</tbody>
</table>

| **WATER DISCHARGES**                      |              |                           |                    |                           |
| Categorical Industry User to a POTW      |              |                           |                    |                           |
| Discharges ≥ 10,000 gpd                  | $6250.00 | 1 + 0                     |                    |                           |
| Discharges < 10,000 gpd                  | $3125.00 | 1 + 0                     |                    |                           |
| Comprehensive Discharges to Surface Water and Groundwater | | | | |
| Registration Only                        | $625.00 | 1 + 0                     |                    |                           |
| Approval of Registration by DEEP         | $1250.00 | 1 + 0                     |                    |                           |
| Domestic Sewage                          | $625.00 | 1 + 0                     |                    |                           |
| Food Service Establishment Wastewater    | No Registration |                     |                    |                           |
| Groundwater Remediation Wastewater       |              |                           |                    |                           |
| Registration Only                        | $625.00 | 1 + 0                     |                    |                           |
| Approval of Registration by DEEP         | $1250.00 | 1 + 0                     |                    |                           |
| Miscellaneous Discharges of Sewer Compatible Wastewater | | | | |
| Registration Only                        | $500.00 | 1 + 0                     |                    |                           |
| Approval of Registration by DEEP         | $1000.00 | 1 + 0                     |                    |                           |
| Nitrogen Discharges                      | No Registration |                     |                    |                           |
| Point Source Discharges from Application of Pesticides | $200.00 | 1 + 0                     |                    |                           |
| Stormwater Associated with Commercial Activities | $300.00 | 1 + 0                     |                    |                           |
| Stormwater Associated with Industrial Activities | | | | |
| No Exposure Certification               | $250.00 | 1 + 0                     |                    |                           |
| <50 employees--see general permit for additional requirements | $500.00 | 1 + 0                     |                    |                           |
| >50 employees--see general permit for additional requirements | $1000.00 | 1 + 0                     |                    |                           |
| Stormwater & Dewatering Wastewaters-Construction Activities | ★ | 1 + 0 |                    |                           |
| Stormwater from Small Municipal Separate Storm Sewer Systems (MS4) | $625.00 | 1 + 0 |                    |                           |
| Stormwater from DOT Separate Storm Sewer Systems (DOT MS4) | $0 | 1 + 0 |                    |                           |
| Subsurface Sewage Disposal Systems Serving Existing Facilities | ★★ | 1 + 0 |                    |                           |
| Swimming Pool Wastewater - Public Pools and Contractors | $500.00 | 1 + 0 |                    |                           |
| Vehicle Maintenance Wastewater           |              |                           |                    |                           |
| Registration Only                        | $625.00 | 1 + 0                     |                    |                           |
| Approval of Registration by DEEP         | $1250.00 | 1 + 0                     |                    |                           |
| Emergency/Temporary Authorization - Discharge to POTW | $1500.00 | 1 + 0 |                    |                           |
| Emergency/Temporary Authorization - Discharge to Surface Water | $1500.00 | 1 + 0 |                    |                           |
| Emergency/Temporary Authorization - Discharge to Groundwater | $1500.00 | 1 + 0 |                    |                           |
| Other, (please specify):                  |              |                           |                    |                           |

Note: Carry subtotals over to Part III, page 2 of this form. Subtotal: 0 | $0.00

★★ See fee schedule on registration/application. ★★ Contact the specific permit program for this information.

(Contact numbers are provided in the instructions)
<table>
<thead>
<tr>
<th>General Permits and Other Authorizations</th>
<th>Initial Fees</th>
<th>No. of Permits</th>
<th>Total Initial Fee</th>
<th>Original + Required Copies</th>
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<td><strong>AQUIFER PROTECTION PROGRAM</strong></td>
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<td>Registration for Regulated Activities</td>
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<td><strong>WATER PLANNING AND MANAGEMENT</strong></td>
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<td>Dam Safety Repair and Alteration: Non Filing</td>
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<td><strong>LAND AND WATER RESOURCES</strong></td>
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<td></td>
</tr>
<tr>
<td>Marina and Mooring Field Reconfiguration</td>
<td>$700.00</td>
<td></td>
<td></td>
<td>1 + 1</td>
</tr>
<tr>
<td>Minor Seawall Repair</td>
<td>No Registration</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Placement of Culvert</td>
<td>No Registration</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reconstruction of Legally Existing Structure/Obstruction/Encroachment</td>
<td>$300.00</td>
<td></td>
<td></td>
<td>1 + 1</td>
</tr>
<tr>
<td>Removal of Derelict Structures</td>
<td>No Registration</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Residential Flood Hazard Mitigation</td>
<td>$100.00</td>
<td></td>
<td></td>
<td>1 + 1</td>
</tr>
<tr>
<td>Temporary Access of Construction Vehicles/Equipment</td>
<td>No Registration</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Programmatic General Permit</td>
<td>★</td>
<td></td>
<td></td>
<td>1 + 1</td>
</tr>
<tr>
<td>Emergency/Temporary Authorization</td>
<td>★★</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other, (please specify):</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: Carry subtotals over to Part III, page 2 of this form. Subtotal = $0.00

★ See fee schedule on registration/application. ★★ Contact the specific permit program for this information. (Contact numbers are provided in the instructions)
Part IV: General Permit Registrations and Requests for Other Authorizations (continued)

<table>
<thead>
<tr>
<th>✓ General Permits and Other Authorizations</th>
<th>Initial Fees</th>
<th>No. of Permits Applied For</th>
<th>Total Initial Fee</th>
<th>Original + Required Copies</th>
</tr>
</thead>
<tbody>
<tr>
<td>WASTE MANAGEMENT</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>□ Addition of Grass Clippings at Registered Leaf Composting Facilities</td>
<td>$500.00</td>
<td></td>
<td>1 + 0</td>
<td></td>
</tr>
<tr>
<td>□ Beneficial Use Determination</td>
<td>★</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>□ Collection and Storage of Post Consumer Paint</td>
<td>$0</td>
<td></td>
<td>1 + 0</td>
<td></td>
</tr>
<tr>
<td>□ Connecticut Solid Waste Demonstration Project</td>
<td>$1000.00</td>
<td></td>
<td>1 + 0</td>
<td></td>
</tr>
<tr>
<td>□ Construct and Operate a Commercial Facility for the Management of Recyclable Materials and Certain Solid Wastes (Commercial GP)</td>
<td>Initial/Mod Fee</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>□ Asbestos Containing Materials</td>
<td>$1,250.00/50$25</td>
<td></td>
<td>1 + 0</td>
<td></td>
</tr>
<tr>
<td>□ Ash Residue</td>
<td>$1,250.00/50$25</td>
<td></td>
<td>1 + 0</td>
<td></td>
</tr>
<tr>
<td>□ Clean Wood: Tier III</td>
<td>$500.00/50$25</td>
<td></td>
<td>1 + 0</td>
<td></td>
</tr>
<tr>
<td>□ Clean Wood: Tier II</td>
<td>$250.00/50$125</td>
<td></td>
<td>1 + 0</td>
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</tr>
<tr>
<td>□ Construction and Demolition Waste: Tier III</td>
<td>$1,250.00/50$25</td>
<td></td>
<td>1 + 0</td>
<td></td>
</tr>
<tr>
<td>□ Construction and Demolition Waste: Tier II</td>
<td>$500.00/50$25</td>
<td></td>
<td>1 + 0</td>
<td></td>
</tr>
<tr>
<td>□ Non-RCRA Hazardous Waste/Compatible Solid Wastes</td>
<td>$1,250.00/50$25</td>
<td></td>
<td>1 + 0</td>
<td></td>
</tr>
<tr>
<td>□ Recyclables</td>
<td>$500.00/50$25</td>
<td></td>
<td>1 + 0</td>
<td></td>
</tr>
<tr>
<td>□ Universal Wastes/Compatible Solid Wastes</td>
<td>$1,250.00/50$25</td>
<td></td>
<td>1 + 0</td>
<td></td>
</tr>
<tr>
<td>Contaminated Soil and/or Staging Management (Staging/Transfer)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>□ New Registrations</td>
<td>$250.00</td>
<td></td>
<td>1 + 0</td>
<td></td>
</tr>
<tr>
<td>□ New Approval of Registrations</td>
<td>$1500.00</td>
<td></td>
<td>1 + 0</td>
<td></td>
</tr>
<tr>
<td>□ Renewal of Registrations</td>
<td>$250.00</td>
<td></td>
<td>1 + 0</td>
<td></td>
</tr>
<tr>
<td>□ Renewal of Approval of Registrations</td>
<td>$750.00</td>
<td></td>
<td>1 + 0</td>
<td></td>
</tr>
<tr>
<td>□ Disassembling Used Electronics</td>
<td>$2000.00</td>
<td></td>
<td>1 + 0</td>
<td></td>
</tr>
<tr>
<td>□ Leaf Composting Facility</td>
<td>$0</td>
<td></td>
<td>1 + 1</td>
<td></td>
</tr>
<tr>
<td>□ Municipal Transfer Station</td>
<td>$800.00</td>
<td></td>
<td>1 + 1</td>
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</tr>
<tr>
<td>□ One Day Collection of Certain Wastes and Household Hazardous Waste</td>
<td>$1000.00</td>
<td></td>
<td>1 + 0</td>
<td></td>
</tr>
<tr>
<td>□ Sheet Leaf Composting Notification</td>
<td>$0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Special Waste Authorization</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>□ Landfill or RRF Disposal</td>
<td>$600.00</td>
<td></td>
<td>1 + 0</td>
<td></td>
</tr>
<tr>
<td>□ Asbestos Disposal</td>
<td>$300.00</td>
<td></td>
<td>1 + 0</td>
<td></td>
</tr>
<tr>
<td>□ homeowner</td>
<td>$0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>□ Storage and Processing of Asphalt Roofing Shingle Waste</td>
<td>$2500.00</td>
<td></td>
<td>1 + 0</td>
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</tr>
<tr>
<td>□ Storage and Processing of Scrap Tires for Beneficial Use</td>
<td>$1250.00</td>
<td></td>
<td>1 + 0</td>
<td></td>
</tr>
<tr>
<td>□ Emergency/Temporary Authorization</td>
<td>★</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>□ Other, (please specify):</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>REMEDIATION</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>□ In Situ Groundwater Remediation: Enhance Aerobic Biodegradation</td>
<td>★</td>
<td></td>
<td>1 + 2</td>
<td></td>
</tr>
<tr>
<td>□ In Situ Groundwater Remediation: Chemical Oxidation</td>
<td>$500.00</td>
<td></td>
<td>1 + 0</td>
<td></td>
</tr>
<tr>
<td>□ Emergency/Temporary Authorization</td>
<td>★</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: Carry subtotals over to Part III, page 2 of this form.

Subtotal: 0 $0.00

★ See fee schedule on registration/application. ★★ Contact the specific permit program for this information.

(Contact numbers are provided in the instructions)

Affirmative Action, Equal Employment Opportunity and Americans with Disabilities

The Connecticut Department of Energy and Environmental Protection is an Affirmative Action/Equal Opportunity Employer that is committed to complying with the requirements of the Americans with Disabilities Act (ADA). Please contact us at (860) 418-5910 or deep.accommodations@ct.gov if you: have a disability and need a communication aid or service; have limited proficiency in English and may need information in another language; or if you wish to file an ADA or Title VI discrimination complaint.
Permit Application for Programs Administered by the Inland Water Resources Division

Please complete this application form in accordance with the instructions (DEP-IWRD-INST-100) in order to ensure the proper handling of your application. Print or type unless otherwise noted. You must submit the Permit Application Transmittal Form (DEP-APP-001) and the initial fee along with this form.

Part I: Application Type

Check the appropriate box identifying the application type.

This application is for (check one):

☒ A new application
☐ A renewal of an existing permit
☐ A modification of an existing permit

Please identify any previous or existing permit/authorization/registration number in the space provided.

Existing permit/authorization/registration number:

Expiration Date:

Part II: Permit Type and Fee Information

Please note: effective August 21, 2003, the application fees for the programs administered by the Inland Water Resources Division have increased as listed in the following table. The fee for municipalities is 50% of the listed rates.

<table>
<thead>
<tr>
<th>Type of Permit (check all that apply):</th>
<th>Fee to submit with application:</th>
</tr>
</thead>
<tbody>
<tr>
<td>☐ Inland Wetlands &amp; Watercourses CGS Sec. 22a-36 et seq.</td>
<td>none</td>
</tr>
<tr>
<td>☐ Dam Construction CGS Sec. 22a-403</td>
<td>none</td>
</tr>
<tr>
<td>☐ 401 Water Quality Certificate 33 U.S.C. 1341</td>
<td>none</td>
</tr>
<tr>
<td>☒ Flood Management Certification CGS Sec. 25-68(b) - (h)</td>
<td>none</td>
</tr>
<tr>
<td>Stream Channel Encroachment CGS Sec. 22a-342</td>
<td></td>
</tr>
<tr>
<td>☐ No change in grade and no construction of above-ground structures</td>
<td>$470.00</td>
</tr>
<tr>
<td>☐ A change in grade and no construction of above-ground structures</td>
<td>$940.00</td>
</tr>
<tr>
<td>☐ A change in grade and above-ground structures or buildings</td>
<td>$4,000.00</td>
</tr>
<tr>
<td>Water Diversion: Consumptive Use CGS Sec. 22a-372(e)</td>
<td></td>
</tr>
<tr>
<td>☐ Withdrawal &gt; 0.05 and &lt; 0.5 mgd</td>
<td>$2,050.00</td>
</tr>
<tr>
<td>☐ Withdrawal &gt; 0.5 and &lt; 2.0 mgd</td>
<td>$4,000.00</td>
</tr>
<tr>
<td>☐ Withdrawal ≥ 2.0 mgd</td>
<td>$6,250.00</td>
</tr>
<tr>
<td>Water Diversion: Nonconsumptive Use CGS Sec. 22a-372(e)</td>
<td></td>
</tr>
<tr>
<td>☐ Watershed &lt; 0.5 sq mi</td>
<td>$2,050.00</td>
</tr>
<tr>
<td>☐ Watershed &gt; 0.5 sq mi and &lt; 2.0 sq mi</td>
<td>$4,000.00</td>
</tr>
<tr>
<td>☐ Watershed ≥ 2.0 sq mi</td>
<td>$6,250.00</td>
</tr>
</tbody>
</table>
# Part III: Applicant Information

1. Fill in the name of the applicant(s) as indicated on the Permit Application Transmittal Form (DEP-APP-001):

   **Applicant:** Connecticut Department of Transportation

   **Phone:** 860-594-2931 ext.  
   **Fax:** 860-594-3028

   □ Check here if there are co-applicants. If so, label and attach additional sheet(s) with the required information to this sheet.

2. Applicant's interest in property at which the proposed activity is to be located:

   - [x] site owner
   - [ ] option holder
   - [ ] lessee
   - [ ] easement holder
   - [ ] operator
   - [ ] other (specify):

3. List primary contact for departmental correspondence and inquiries, if different than the applicant.

   **Name:** Connecticut Department of Transportation

   **Mailing Address:** 2800 Berlin Turnpike

   **City/Town:** Newington  
   **State:** CT  
   **Zip Code:** 06131

   **Business Phone:** 860-594-2931 ext.  
   **Fax:** 860-594-3028

   **Contact Person:** Kimberly C. Lesay  
   **Title:** Transp. Asst. Planning Director

4. List attorney or other representative, if applicable:

   **Firm Name:**

   **Mailing Address:**

   **City/Town:**

   **State:**  
   **Zip Code:**

   **Business Phone:**

   **ext:**  
   **Fax:**

   **Attorney:**

5. Facility or Property Owner, if different than the applicant:

   **Name:**

   **Mailing Address:**

   **City/Town:**

   **State:**  
   **Zip Code:**

   **Business Phone:**

   **ext:**  
   **Fax:**

   **Contact Person:**

   **Title:**

   **Home address of owner (for Inland Wetlands applications only):**

   **Mailing Address:**

   **City/Town:**

   **State:**  
   **Zip Code:**

   **Home Phone:**
Part III: Applicant Information (continued)

6. List any engineer(s) or other consultant(s) employed or retained to assist in preparing the application or in designing or constructing the activity. □ Check here if additional sheets are necessary, and label and attach them to this sheet.

Name: Connecticut Department of Transportation
Mailing Address: 2800 Berlin Turnpike
City/Town: Newington State: CT Zip Code: 06131
Business Phone: 860-594-3205 ext. Fax: 860-594-3218
Contact Person: Ryan D. Martin Title: Project Engineer
Service Provided: Project Engineer

Part IV: Site Information

1. Site Location:
   a. Name of facility, if applicable: Bridge No. 02708
      Street Address or Description of Location: Route 154 bridge over Plum Bank Creek
      City/Town: Old Saybrook State: CT Zip Code: 06475
      Project No., if applicable: 105-215

   b. Tax Assessor’s Reference: Map Block Lot
      (Assessor’s reference is not required if requester is an agency of the State of Connecticut.)

   c. Latitude and Longitude of the approximate “center of the site” in degrees, minutes, and seconds:
      Latitude: 41°16′18.9″ Longitude: 72°23′36.5″
      Method of determination (check one):
      □ GPS □ USGS Map □ Other (please specify): Google Earth
      If a USGS Map was used, provide the quadrangle name:

   d. Drainage Basin number(s) wherein the proposed activity will take place: 5000-02

   e. Flood Insurance Rate Map Panel Number: 09007C0344J
      Date of the map referenced: 2/6/2013

   f. If applying for a SCCL permit, identify the property wherein the proposed activity will take place by indicating the following:
      SCCL Map number(s):
      Property Identifier:
      Date of the map referenced:

2. COASTAL BOUNDARY: Is the activity which is the subject of this application located within the coastal boundary as delineated on DEP approved coastal boundary maps? □ Yes □ No
   If yes, and this application is for a new permit or for a modification of an existing permit, you must submit a Coastal Consistency Review Form (DEP-APP-004) with your application as Attachment P.
   Information on the coastal boundary is available at the local town hall or on the “Coastal Boundary Map” available at DEP Maps and Publications (860-424-3555).
Part IV: Site Information (continued)

3. **ENDANGERED OR THREATENED SPECIES:** Is the project site located within an area identified as a habitat for endangered, threatened or special concern species as identified on the "State and Federal Listed Species and Natural Communities Map"? ☑ Yes ☐ No Date of Map: December 2017

   If yes, complete and submit a *Connecticut Natural Diversity Data Base (CT NNDB) Review Request Form* (DEP-APP-007) to the address specified on the form. Please note NNDB review generally takes 4 to 6 weeks and may require additional documentation from the applicant. DEP strongly recommends that applicants complete this process before submitting the subject application.

   When submitting this application form, include copies of any correspondence to and from the NNDB, including copies of the completed *CT NNDB Review Request Form*, as Attachment K (Environmental Report) or in Attachment Q if no environmental report is required.

   For more information visit the DEP website at www.ct.gov/dep/endangeredspecies (Review/Data Requests) or call the NNDB at 860-424-3011.

4. **AQUIFER PROTECTION AREAS:** Is the site located within a town required to establish Aquifer Protection Areas, as defined in section 22a-354a through 354bb of the General Statutes (CGS)?

   ☐ Yes ☑ No

   If yes, is the site within an area identified on a Level A or Level B map? ☐ Yes ☑ No

   To view the applicable list of towns and maps visit the DEP website at www.ct.gov/dep/aquiferprotection.

   To speak with someone about the Aquifer Protection Areas, call 860-424-3020.

5. **CONSERVATION OR PRESERVATION RESTRICTION:** Is the property subject to a conservation or preservation restriction? ☐ Yes ☑ No

   If Yes, proof of written notice of this application to the holder of such restriction or a letter from the holder of such restriction verifying that this application is in compliance with the terms of the restriction, must be submitted as Attachment Q.

6. **Other Permits:** List any previous federal, state or local permits or certificates that have already been issued for the site or for the proposed activity:

<table>
<thead>
<tr>
<th>Type of Permit</th>
<th>Permit No.</th>
<th>Issuing Authority</th>
<th>Date Issued</th>
<th>Expiration Date</th>
<th>Permittee Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Place riprap</td>
<td>CT-FCWPC</td>
<td></td>
<td>10/19/1953</td>
<td>10/19/1955</td>
<td>State Highway Dept</td>
</tr>
</tbody>
</table>

Part V: Supporting Documents

Please check the attachments submitted as verification that all applicable attachments have been submitted with this application form. When submitting any supporting documents, please label the documents as indicated in this part (e.g., Attachment A, etc.) and be sure to include the applicant's name as indicated on the Permit Application Transmittal Form. The specific information required in each attachment is described in the Instructions for Completing A Permit Application for Inland Water Resources Division Activities (DEP-IWRD-INST-100).

☑ Attachment A: Executive Summary

☑ Attachment B: An 8 1/2" x 11" copy of a United States Geological Survey (USGS) Topographic Quadrangle Map (scale: 1:24,000) with the regulated activity or project site outlined or pinpointed, as appropriate.

☐ Attachment C: Documentation Form for: Inland Wetlands and Watercourses Permit, Stream Channel Encroachment Line Permit, and 401 Water Quality Certification (DEP-IWRD-APP-101)
Part V: Supporting Documents (continued)

☐ Attachment D: Documentation Form for Water Diversion Permit (DEP-IWRD-APP-102)

☐ Attachment E: Documentation Form for a Dam Construction Permit (DEP-IWRD-APP-103)

☒ Attachment F: Documentation Form for Flood Management Certification (DEP-IWRD-APP-104) (State Agencies Only)

☒ Attachment G: Plan Sheets and Drawings

☒ Attachment H: Engineering Documentation
  Part 1: Engineering Report Checklist (DEP-IWRD-APP-105A) and an Engineering Report
  Part 2: Hydrologic and Hydraulic Consistency Worksheet (DEP-IWRD-APP-105B)
    Section I: Floodplain Management
    Section II: Stormwater Management
    For state agencies only:
    Section III: State Grants and Loans
    Section IV: Disposal of State Land

☒ Attachment I: Flood Contingency Plan

☐ Attachment J: Soil Scientist Report (not required for Flood Management Certification)

☐ Attachment K: Environmental Report (not required for Flood Management Certification)

☐ Attachment L: Mitigation Report - wetlands and watercourses, fish and wildlife (not required for Flood Management Certification)

☐ Attachment M: Alternatives Assessment (not required for Flood Management Certification)

☐ Attachment N: Applicant Compliance Information Form (DEP-APP-002) (not required for Flood Management Certification or 401 Water Quality Certification Approvals)

☐ Attachment O: Applicant Background Information Form (DEP-APP-008) (not required for Flood Management Certification)

☒ Attachment P: Coastal Consistency Review Form (DEP-APP-004) (if applicable)

☒ Attachment Q: Other Information: any other information the applicant deems relevant or is required by DEP.

Number of Copies of Application:
Submit one original of all application forms, certifications, reports and supporting documents and the number of photocopies of all such materials as noted on the Permit Application Transmittal Form. When applying for more than one permit, you should submit the original and no more than six copies.
Part VI: Application Certification

The applicant and all individuals responsible for actually preparing the application or supporting documentation must sign this part. An application will be considered insufficient unless all required signatures are provided. You must include signatures of any person preparing any report or parts thereof filed in support of this application (i.e., professional engineers, surveyors, soil scientists, biologists, environmental and other consultants, etc.).

"I have personally examined and am familiar with the information submitted in this document and all attachments thereto, and I certify that based on reasonable investigation, including my inquiry of the individuals responsible for obtaining the information, the submitted information is true, accurate and complete to the best of my knowledge and belief.

I understand that a false statement in the submitted information may be punishable as a criminal offense, in accordance with Section 22a-6 of the General Statutes, pursuant to Section 53a-157b of the General Statutes, and in accordance with any other applicable statute.

I certify that this application is on complete and accurate forms as prescribed by the commissioner without alteration of the text.

I certify that I will comply with all notice requirements as listed in Section 22a-6g of the General Statutes."

Signature of Applicant

Date

3-4-2019

Thomas J. Maziarz

Name of Applicant (print or type)

Date

3/1/19

Signature of Preparer (if different than above)

Bureau Chief, Policy & Planning

Title (if applicable)

Ryan D. Martin

Name of Preparer (print or type)

Project Engineer

Title (if applicable)

☐ Check here if additional signatures are required.

If so, please reproduce this sheet and attach signed copies to this sheet.

Reminder: After submitting this application to DEP, except in the case of a Flood Management Certification, you must publish a notice of the application immediately and submit a certified copy of this published notice to DEP. See "Notice of Permit Application" section in the instructions (DEP-IWRD-INST-100).

List the name of the newspaper the Notice of Permit Application will be published in: The Hartford Courant

Note: Please submit the Permit Application Transmittal Form, Application Form, Fee, and all Supporting Documents to:

CENTRAL PERMIT PROCESSING UNIT
DEPARTMENT OF ENVIRONMENTAL PROTECTION
79 ELM STREET
HARTFORD, CT 06106-5127
Attachment A: Executive Summary

PROJECT 105-215
RT. 154 OVER PLUM BANK CREEK
OLD SAYBROOK
BRIDGE NO. 02708

Bridge No. 02708 carries US Route 154 over Plum Bank Creek in the Town of Old Saybrook. The bridge is located approximately 0.75 miles from Old Boston Post Road. It was built in 1935 and carries an average 4600 vehicles per day. Bridge 02708 is a single span concrete slab. It is approximately 19’ long with a 30’ curb to curb width. The abutments and wingwalls are in water and are comprised of concrete with timber facing. Concrete struts connect the abutments beneath the channel. The open concrete parapets have metal beam rails installed on each approach along each side of the roadway that are continuous across the bridge.

Bridge No. 02708 is evaluated as “Serious” and is currently on an increased inspection frequency due to deterioration to the superstructure. The abutments and wingwalls have large cracks and spalls and their footings are exposed due to scour. Due to the extent of deterioration the structure must be replaced.

The proposed project consists of replacing the bridge with a single span structure comprised of prestressed concrete box beams integral with concrete abutments, wingwalls, and deck. The existing abutments and wingwalls will be partially removed down to Elev. 2.0 feet and the new abutments will be placed behind them. For scour protection, the project proposes permanent sheet piling around the new abutments and wingwalls. Concrete block revetments will be placed between the new and existing abutments. Standard riprap will be placed adjacent to the new structure’s wingwalls but not within the channel. The approach roadways will be raised to meet the vertical profiles of the new bridge. Snow shelves and guiderail barriers will be incorporated into the approaches. Construction will require a Spring-time detour of approximately 12 weeks, which is scheduled to occur in Spring of 2020.

The bridge will be built behind the existing abutments in order to minimize adverse impacts to adjacent property and coastal wetlands, simplify water handling, and reduce the duration of construction. The elevation of the current structure’s low chord, which is approximately 5.0 feet, will be maintained. The 100-year frequency coastal storm event can be anticipated to produce a storm surge and wave activity that will be 8-9 feet above the Route 154 roadway elevation. Providing a hydraulically adequate structure is not feasible due to the adjacent properties and coastal wetlands that would be severely impacted. Instead, the new structure will provide long term serviceability and be able to withstand the forces and the flooding conditions generated during the 100-year frequency storm event; remaining serviceable following the subsidence of the flooding events.
This project has been presented to DEEP and USACE and their comments have been incorporated into the project documents. Coordination with DEEP Fisheries and NDDB has been completed. There will be temporary and permanent wetland impacts totaling 1,680 square feet. Permits will be obtained from DEEP and ACOE prior to start of construction.

Existing utility poles owned by Eversource carry 13.8kV electric lines and communications lines overhead along the west edge of the roadway. Utility poles near the bridge will be temporary relocated further west in order to allow safe usage of construction equipment. After bridge construction is complete, the utility poles will be relocated adjacent to the roadway edge. Electric lines will be at least 20 feet above the bottom of the bridge and the communications lines will be at least 10 feet above the bottom of the bridge in both the temporary and final conditions. The structure also carries an 8" diameter water main, which is owned by The Connecticut Water Company, at its west fascia. The water main will be temporarily relocated east of the structure, on a temporary support, during construction then moved to its final location at the east fascia of the structure. The temporary support will be then be removed. The Connecticut Water Company will upgrade the water main to 12" diameter.
Attachment F: Documentation Form for Flood Management Certification

1. Applicant Name: Connecticut Department of Transportation (as indicated on the Permit Application Transmittal Form)

2. Name of Subject Facility or Project/Project Number:
   Bridge No. 02708, State Project 0105-0215

3. Name of floodplain and watercourse:
   Plum Bank Creek

4. This Certification is submitted for the Commissioner's approval pursuant to Section 25-68d of the General Statutes. I hereby certify that based on my reasonable investigation, including my inquiry of those individuals responsible for obtaining the information, the proposed activity described in this application is consistent with all applicable standards and criteria established in Sections 25-68d(b) of the General Statutes and Sections 25-68h-1 through 25-68h-3, inclusive, of the Regulations of Connecticut State Agencies.

[Signature]
Signature of the head of the certifying State agency or his/her designated agent

3-4-2019
Date

Thomas J. Maziarz
Name of the head of the certifying State agency or his/her designated agent (print or type)

Bureau Chief, Policy & Planning
Title (if applicable)
Appendix G: Plan Sheets and Drawings
ENVIRONMENTAL PERMIT PLANS
STATE PROJECT NO. 105-215
REPLACEMENT OF BRIDGE NO. 02708
ROUTE 154 OVER PLUM BANK CREEK
IN THE TOWN OF OLD SAYBROOK

GENERAL NOTES:
1. THESE PLANS ARE INTENDED ONLY FOR ENVIRONMENTAL PERMITTING PURPOSES. THEY DO NOT CONSTITUTE AUTHORITY FOR ALL ACTIVITIES CONDUCIBLE TO THE REGULATED AREA. FOR DETAILS, DIMENSIONS, INFORMATION AND SPECIFICATIONS REFER TO THE APPLICABLE CONTRACT DOCUMENTS.
2. THE DEPARTMENT OF TRANSPORTATION WILL ONLY SUBMIT REVISIONS TO THIS PLAN TO ADDRESS THE DESIGN THAT WILL AFFECT REGULATED AREAS.
3. FOR A DESCRIPTION OF THE BARTOLOTTA'S, OLD SAYBROOK AND WATERTOWN MILLS, THE PROJECTS DEFINED IN THE PERMIT APPLICATION.
4. 493 FOOT GRADE BASED ON CONNECTICUT COORDINATE SYSTEM N.A.D. 1983 VERTICAL DATUM BASED ON NAVD 08 OF 2009.
5. ALL CONSTRUCTION ACTIVITIES WILL BE CONDUCTED IN ACCORDANCE WITH THE DEPARTMENT'S STANDARDS. SPECIFICATIONS FOR ROADS, BRIDGES AND INFRASTRUCTURE CONSTRUCTION. THIS PROJECT'S SPECIFICATIONS, ARE SYMMETRIC TO THE CONNECTICUT DEPARTMENT OF ENVIRONMENTAL PROTECTION AND THE 2019 ENVIRONMENTAL PERMIT MANUAL.

ENVIRONMENTAL PERMIT PLANS
PLAN DATE: JANUARY 22, 2019

STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION
OFFICE OF ENGINEERING
REPLACEMENT OF BRIDGE NO. 02708, ROUTE 154 OVER PLUM BANK CREEK
OLD SAYBROOK
STAGE 1
SUGGESTED SEQUENCE OF CONSTRUCTION
1. CLEARING AND CHANGING AND INSTALLATION OF DESIGNATION CONTROL SYSTEM (DSS).
2. INSTALL TEMPORARY EARTH RETAINING SYSTEM (LESS 21.6) AND CO-DEVELOPMENT TEMPORARY WATER MAIN CONTROL VALVE INSTALLATION (LESS 6.5). INSTALL TEMPORARY WATER MAIN DISTRIBUTION PIPE AND DRAINAGE PIPE INSTALLATION (LESS 6.5). INSTALL TEMPORARY WATER MAIN RELOCATION.
3. TEMPORARILY RELocate WATER MAIN AND CORRESPONDING UTILITY FOMPANIES TO TEMPORARILY RELocate WATER MAIN AND CORRESPONDING UTILITY DISTRIBUTION PIPE AND DRAINAGE PIPE INSTALLATION (LESS 6.5). INSTALL TEMPORARY WATER MAIN DISTRIBUTION PIPE AND DRAINAGE PIPE INSTALLATION (LESS 6.5). INSTALL TEMPORARY WATER MAIN RELOCATION.
4. CLOSE ROAD AND DETOUR TRAFFIC.
5. REMOVE EXISTING SUPERSTRUCTURE USING FLOATING ONGS SHIELD (LESS 6.5). INSTALL SHEET PILE FOR FLOAT DETAIL). COLLECT AND MOVE DEBRIS FOR SITE WORK REMOVAL.

LEGEND
THE DEPARTMENT OF TRANSPORTATION WILL ONLY SUBMIT BIDDER'S SUBMITTAL TO THE CONTRACTING AUTHORITY IN THE PROGRAM.

NOTE: ENTIRE PROJECT LIMITS FALL WITHIN THE MAPLE TREE 100-YEAR FLOOD ZONE (FC-41-44).

STAGE 2
SUGGESTED SEQUENCE OF CONSTRUCTION
1. CLEAN AND CHANGING AND INSTALLATION OF DESIGNATION CONTROL SYSTEM (DSS).
2. INSTALL TEMPORARY EARTH RETAINING SYSTEM (LESS 21.6) AND CO-DEVELOPMENT TEMPORARY WATER MAIN CONTROL VALVE INSTALLATION (LESS 6.5). INSTALL TEMPORARY WATER MAIN DISTRIBUTION PIPE AND DRAINAGE PIPE INSTALLATION (LESS 6.5). INSTALL TEMPORARY WATER MAIN RELOCATION.
3. TEMPORARILY RELocate WATER MAIN AND CORRESPONDING UTILITY FOMPANIES TO TEMPORARILY RELocate WATER MAIN AND CORRESPONDING UTILITY DISTRIBUTION PIPE AND DRAINAGE PIPE INSTALLATION (LESS 6.5). INSTALL TEMPORARY WATER MAIN DISTRIBUTION PIPE AND DRAINAGE PIPE INSTALLATION (LESS 6.5). INSTALL TEMPORARY WATER MAIN RELOCATION.
4. CLOSE ROAD AND DETOUR TRAFFIC.
5. REMOVE EXISTING SUPERSTRUCTURE USING FLOATING ONGS SHIELD (LESS 6.5). INSTALL SHEET PILE FOR FLOAT DETAIL). COLLECT AND MOVE DEBRIS FOR SITE WORK REMOVAL.

STAGE 3
SUGGESTED SEQUENCE OF CONSTRUCTION
1. CLEAN AND CHANGING AND INSTALLATION OF DESIGNATION CONTROL SYSTEM (DSS).
2. INSTALL TEMPORARY EARTH RETAINING SYSTEM (LESS 21.6) AND CO-DEVELOPMENT TEMPORARY WATER MAIN CONTROL VALVE INSTALLATION (LESS 6.5). INSTALL TEMPORARY WATER MAIN DISTRIBUTION PIPE AND DRAINAGE PIPE INSTALLATION (LESS 6.5). INSTALL TEMPORARY WATER MAIN RELOCATION.
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4. CLOSE ROAD AND DETOUR TRAFFIC.
5. REMOVE EXISTING SUPERSTRUCTURE USING FLOATING ONGS SHIELD (LESS 6.5). INSTALL SHEET PILE FOR FLOAT DETAIL). COLLECT AND MOVE DEBRIS FOR SITE WORK REMOVAL.
6. TEMPORARILY RELocate WATER MAIN AND CORRESPONDING UTILITY FOMPANIES TO TEMPORARILY RELocate WATER MAIN AND CORRESPONDING UTILITY DISTRIBUTION PIPE AND DRAINAGE PIPE INSTALLATION (LESS 6.5). INSTALL TEMPORARY WATER MAIN DISTRIBUTION PIPE AND DRAINAGE PIPE INSTALLATION (LESS 6.5). INSTALL TEMPORARY WATER MAIN RELOCATION.
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ENVELOPMENTAL PERMIT PLANS
PLAN DATE: FEBRUARY 6, 2019
**Attachment H: Engineering Documentation**

**Part 1: Engineering Report Checklist**

The following is a checklist of requirements that need to be completed, included and submitted as part of the Engineering Report. Please complete this checklist by identifying where each requirement listed is addressed in the Engineering Report (report title and page numbers). If an item is not applicable, place "NA" in the box. Attach the completed checklist as the cover sheet to engineering reports, as applicable, which fully describe the design of the proposed facilities or other actions and the hydraulic and hydrologic effects thereof. The application instructions (DEP-IWRD-INST-100) should be consulted for a complete description of each item listed. This checklist is required to be signed and sealed by a professional engineer licensed in the State of Connecticut.

**Stormwater Management**

<table>
<thead>
<tr>
<th>Location of Item</th>
<th>Item Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>NA</td>
<td>Description of the design storm frequency intensity, volume and duration</td>
</tr>
<tr>
<td>NA</td>
<td>Watershed maps, existing and proposed</td>
</tr>
<tr>
<td>NA</td>
<td>Computations for Tc</td>
</tr>
<tr>
<td>NA</td>
<td>Imperviousness calculations</td>
</tr>
<tr>
<td>NA</td>
<td>NRCS runoff curve numbers, volumetric runoff coefficients</td>
</tr>
<tr>
<td>NA</td>
<td>Computations used to determine peak runoff rates, and velocities for each watershed area (24-hour storm):</td>
</tr>
<tr>
<td></td>
<td>- Stream Channel Protection: 2-year frequency (&quot;over-control&quot; of 2-year storm)</td>
</tr>
<tr>
<td></td>
<td>- Conveyance Protection: 10-year frequency</td>
</tr>
<tr>
<td></td>
<td>- Peak Runoff Attenuation: 2-year, 10-year, and 100-year frequency</td>
</tr>
<tr>
<td></td>
<td>- Emergency Outlet Sizing: safely pass the 100-year frequency or larger storm</td>
</tr>
<tr>
<td>NA</td>
<td>Hydrograph routing calculations</td>
</tr>
<tr>
<td>NA</td>
<td>Description, schematics, and calculations for drainage and stormwater management systems, bridges and culverts</td>
</tr>
<tr>
<td>NA</td>
<td>Infiltration rates</td>
</tr>
<tr>
<td>NA</td>
<td>Documentation of sources</td>
</tr>
<tr>
<td>NA</td>
<td>Computer disk containing input and output data and the associated program for all computer models used in the analyses</td>
</tr>
<tr>
<td>NA</td>
<td>Hard copy of input and output data including input/output tables</td>
</tr>
<tr>
<td>NA</td>
<td>Detention basin analysis including timing and duration of expected outflow, stream stability analysis and hydrograph summation</td>
</tr>
</tbody>
</table>
## Flood Plain Assessment

<table>
<thead>
<tr>
<th>Location of Item</th>
<th>Item Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hydraulic Design Report</strong></td>
<td>Description or simulation of existing and proposed conditions upstream and downstream of the proposed activity</td>
</tr>
<tr>
<td>NA</td>
<td>(For SCEL applications only) A determination of the effect of the proposed activity on flooding and flood hazards together with an equivalent encroachment on the opposite bank for the flood event establishing the encroachment lines</td>
</tr>
<tr>
<td>NA</td>
<td>For any bridge or culvert placement or replacement with a drainage area of 100 acres or more, plan sheets showing the existing and proposed inundation area for the 2, 10, 25, 50, and 100 year discharges, carried to convergence</td>
</tr>
<tr>
<td>NA</td>
<td>A description and analysis of the floodplain modifications required to restore any flood conveyance and flood storage capacity</td>
</tr>
<tr>
<td>NA</td>
<td>Demonstration that backwater from the proposed activity will not impact an existing dam, dike, or similar structure</td>
</tr>
<tr>
<td><strong>Hydraulic Design Report</strong></td>
<td>Backup data and complete hydraulic analysis for proposed modifications to the floodplain including location plan and plot for sections, profile sheet, summary sheet</td>
</tr>
</tbody>
</table>

## Dams, Dikes, Diversion Channels, Similar Structures

<table>
<thead>
<tr>
<th>Location of Item</th>
<th>Item Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>NA</td>
<td>Primary and emergency spillway and outlet structure erosion protection</td>
</tr>
<tr>
<td>NA</td>
<td>Dam breach analysis</td>
</tr>
<tr>
<td>NA</td>
<td>Geotechnical evaluation</td>
</tr>
<tr>
<td>NA</td>
<td>Construction Specifications for foundation preparation, embankment material, outlet structure, and construction inspection</td>
</tr>
</tbody>
</table>

## Soil Erosion and Sediment Control Plan

<table>
<thead>
<tr>
<th>Location of Item</th>
<th>Item Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>NA</td>
<td>Narrative</td>
</tr>
<tr>
<td>NA</td>
<td>Drawings</td>
</tr>
<tr>
<td>NA</td>
<td>Details</td>
</tr>
<tr>
<td>NA</td>
<td>Calculations for Engineered Measures</td>
</tr>
</tbody>
</table>
**Professional Certification**

For any Engineering Report submitted as part of the IWRD permit application, the following certification must be signed and sealed by a professional engineer licensed to practice in Connecticut and submitted with the Engineering Report Checklist and Report.

> "I certify that in my professional judgement, each requirement listed in the Engineering Report Checklist has been addressed in the Engineering Report submitted as part of the IWRD permit application as Attachment H, Part 1 and that the information is true, accurate and complete to the best of my knowledge and belief.

This certification is based on my review of the Engineering Report.

I understand that a false statement made in the submitted information may, pursuant to Section 22a-6 of the General Statutes, be punishable as a criminal offense under Section 53a-157b of the General Statutes, and may also be punishable under Section 22a-438 of the General Statutes."

<table>
<thead>
<tr>
<th>Signature of Applicant</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thomas J. Maziarz</td>
<td>3-4-2019</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Name of Applicant (print or type)</th>
<th>Title (if applicable)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thomas J. Maziarz</td>
<td>Bureau Chief, Policy &amp; Planning</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Signature of Professional Engineer</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ryan D. Martin</td>
<td>3/1/19</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Name of Professional Engineer (print or type)</th>
<th>P.E. Number (if applicable)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ryan D. Martin</td>
<td></td>
</tr>
</tbody>
</table>

Affix P.E. Stamp Here (if applicable)
Attachment H: Engineering Documentation

Part 2: Hydrologic and Hydraulic Consistency Worksheet

Inland Water Resources Division Permit Activities

This worksheet has four sections; only complete the section(s) applicable to the proposed project. Where a question requires a "Yes" or "No" answer, select the appropriate response and explain your response, if required, in the space provided.

Section I: Floodplain Management (if the proposed project involves a structure, obstruction, encroachment or work in a watercourse, floodplain, or coastal high hazard area)

Section II: Stormwater Management (if the proposed project involves stormwater drainage or stormwater runoff)

Sections III: State Grants and Loans and Section IV: Disposal of State Land (only if the applicant is a state agency seeking flood management certification approval for state grants and loans or disposal of state land)

Contents:

Section I: Floodplain Management

1. General Criteria
   a. Critical Activity .......................................................... 3
   b. Nonintensive Floodplain Uses ........................................ 3
   c. National Flood Insurance Program (NFIP) .................. 3
   d. Municipal Regulations .................................................. 3

2. Flooding and Flood Hazards
   a. Flooding ................................................................. 4
   b. Flood Velocities ...................................................... 4
   c. Flood Storage .......................................................... 4
   d. Degrading or Aggrading Stream Beds ......................... 4
   e. Ice Jams ................................................................. 4
   f. Storage of Materials & Equipment .............................. 5
   g. Floodwater Loads ..................................................... 5

3. Standards for Structures in Floodplains or Coastal High Hazard Areas
   a. Structures in Coastal High Hazard Areas ............... 5
   b. Structures in Floodplain Areas ................................. 6
   c. Residential Structures ............................................. 6
   d. Non-residential Structures .................................. 6
   e. Utilities ................................................................. 6
   f. Water Supply Systems ........................................... 6
   g. Sanitary Sewage Systems ..................................... 6
   h. Foundation Drains .................................................. 6
4. Topography Changes within Floodplains
   a. No Regulatory Floodway ........................................... 7
   b. Floodway Encroachments ....................................... 7
   c. Coastal Areas .................................................. 7

5. Alterations of Watercourses
   a. Topography Change .............................................. 7
   b. Hydraulic Capacity ............................................ 7
   c. Aquatic Habitat ................................................ 8

6. Culverts and Bridges
   a. Fish Passage .................................................... 9
   b. Depressed Structural Floors .................................. 9
   c. Multiple Openings ............................................. 9
   d. Sag Vertical Curves ......................................... 9
   e. Debris Blockage ............................................... 9
   f. Topography Change .......................................... 9
   g. State Highways ............................................. 10
   h. Local Roads & Driveways ................................... 11
   i. Downstream Peak Flows ................................... 12

7. Temporary Hydraulic Facilities ...................... 12

Section II: Stormwater Management

1. Stormwater Runoff ............................................. 13

2. Stormwater Detention Facilities ..................... 14

3. Storm Drainage Systems
   a. DOT Standards ............................................... 15
   b. Design Storm ............................................... 15
   c. Future Development ....................................... 15
   d. Outlet Protection .......................................... 16
   e. Overland Flow ............................................ 16
   f. Vegetated Filter Strips .................................. 16
   g. Stormwater Treatment .................................. 16
   h. E & S Control Plan ........................................ 16

Section III: State Grants and Loans .................. 17

Section IV: Disposal of State Land ................... 18

Definitions of terms used in these worksheets are found in Section 25-68b of the Connecticut General Statutes and Section 25-68h-1 of the Regulations of Connecticut State Agencies and in the National Flood Insurance Program Regulations (44 CFR, Chapter 1, Subchapter B, Part 59.1).

Section I: Floodplain Management
Section I: Floodplain Management

Name of Applicant: Connecticut Department of Transportation
Name of Proposed Project: Project 0105-0215

1. General Criteria

a. Critical Activity - Does the proposed project involve the treatment, storage and disposal of hazardous waste or the siting of hospitals, housing for the elderly, schools or residences, in the 0.2 per cent [500 year] floodplain?  ☑ Yes  ☒ No

If yes, the base flood for the critical activity shall have a recurrence interval equal to the 500 year flood event; if no, the base flood for the activity shall have a recurrence interval equal to the 100 year flood event.

b. Nonintensive Floodplain Uses - Will the proposed project promote development in floodplains or will utilities servicing the project be located so as to enable floodplain development?

☑ Yes  ☒ No

Explain:

c. National Flood Insurance Program (NFIP) - Will the proposed project be located within an area of special flood hazard designated by the Federal Emergency Management Agency (FEMA)?

☒ Yes  ☐ No  If yes, list the FEMA flood zone(s):

Zone VE

Does the proposed project meet the NFIP minimum standards established in 44 CFR, Chapter 1, Subchapter B, Part 60.3, floodplain management criteria for flood-prone areas?

☒ Yes  ☐ No

d. Municipal Regulations - Has the municipality in which the proposed project is to be located adopted floodplain regulations containing requirements that are more restrictive than the NFIP floodplain management criteria for flood-prone areas?  ☒ Yes  ☐ No

If yes, describe the more restrictive requirements:

Chapter 128 of the Old Saybrook Town Code, Flood Plain Management, Article V Provisions For Flood Hazard Reduction, Section 128-18, (N) Equal Conveyance and (O) Compensatory Storage. However, there are exceptions to these requirements for floodplains that are tidally influenced and therefore these provisions do not apply to this project.

Does the proposed project comply with the more restrictive standards of the municipality?

☒ Yes  ☐ No
Section I: Floodplain Management (continued)

2. Flooding and Flood Hazards

a. Flooding - Will the proposed project pose any hazard to human life, health or property in the event of a base flood? ☐ Yes ☒ No

If yes, explain:

b. Flood Velocities - Will the proposed project cause an increase in flow velocity or depth during the base flood discharge? ☐ Yes ☒ No

If yes, the increase in velocity is: fps 
and/or the increase in depth is: ft.

Will such increase in velocity or depth cause channel erosion or pose any hazard to human life, health or property? ☐ Yes ☐ No

Explain:

c. Flood Storage - Will the proposed project affect the flood storage capacity or flood control value of the floodplain? ☐ Yes ☒ No

If yes, describe the effects:

d. Degrading or Aggrading Stream Beds - Is the streambed currently degrading or aggrading?

☐ Degrading ☐ Aggrading ☒ Neither

Has the project design addressed degrading or aggrading streambed conditions?

☐ Yes ☐ No

e. Ice Jams - Is the watercourse prone to ice jams or floods due to ice? ☐ Yes ☒ No

Has the project design considered ice jams or floods due to ice? ☐ Yes ☐ No
Section I: Floodplain Management (continued)

f. **Storage of Materials & Equipment** - Will the construction or use of the proposed project involve the storage of materials below the 500 year flood elevation that are buoyant, hazardous, flammable, explosive, soluble, expansive or radioactive, or the storage of any other materials which could be injurious to human, animal or plant life in the event of a flood?

☐ Yes ☒ No

If yes, describe the materials and how such materials will be protected from flood damage, secured or removed from the floodplain to prevent pollution and hazards to life and property.

Storage of materials that could be injurious to human health or the environment in the event of flooding is prohibited below the elevation of the 500 year flood. Other material or equipment may be stored below the 500 year flood elevation provided that such material or equipment is not subject to major damage by floods, and provided that such material or equipment is firmly anchored, restrained or enclosed to prevent it from floating away or that such material or equipment can be removed prior to flooding.

g. **Floodwater Loads** - Will structures, facilities and stored materials be anchored or otherwise designed to prevent flotation, collapse, or lateral movement resulting from hydrodynamic and hydrostatic loads, including the effects of buoyancy? ☒ Yes ☐ No

3. **Standards for Structures in Floodplains or Coastal High Hazard Areas**

Does the proposed project involve a new or substantially improved structure or facility located within a floodplain or coastal high hazard area? ☐ Yes ☒ No

If yes, complete this subsection; if no, skip to subsection 4 (Topography Changes within Floodplain).

a. **Structures in Coastal High Hazard Areas** - Will the structure or facility be located within an NFIP coastal high hazard area?

☐ Yes ☒ No

If no, skip to paragraph 3(b); if yes:

1. Will the structure or facility be located landward of the reach of mean high tide?

☐ Yes ☐ No

2. Will a new structure or facility be located on an undeveloped coastal barrier beach designated by FEMA? ☐ Yes ☐ No

3. If the structure or facility is/are located within a coastal high hazard area, the structure or facility must be elevated on pilings or columns so that the bottom of the lowest horizontal structural member of the lowest floor (excluding the pilings or columns) is elevated to at least one foot above the base flood level and the pile or column foundation and structure attached thereto must be anchored to resist flotation, collapse and lateral movement due to the effects of wind, velocity waters, hurricane wave wash, and base flood water loads acting simultaneously on all building components.

Does the proposed structure or facility meet these standards? ☐ Yes ☐ No

The base flood elevation is: ft. (Datum: )

The elevation of the lowest horizontal structural member is: ft. (Datum: )
Section I: Floodplain Management (continued)

4. Will the space below the lowest floor be either free of obstruction or constructed with non-supporting breakaway walls?  
   - Yes  
   - No

5. Will fill be used for structural support of any buildings within coastal high hazard areas?  
   - Yes  
   - No

b. Structures in Floodplain Areas - Are the structures residential or nonresidential?  
   - Residential  
   - Nonresidential  
   If nonresidential, skip to paragraph 3(d) below.

c. Residential Structures - If the structure or facility is for human habitation will the lowest floor of such structure or facility, including its basement, be elevated one foot above the level of the 500 year flood?  
   - Yes  
   - No
   The 500 year flood elevation is: ft.  (Datum: )  
   The elevation of the lowest floor, including basement, is: ft.  (Datum: )

d. Non-residential Structures - If the structure or facility is not intended for residential uses, will the lowest floor of such structure or facility, including its basement, be elevated to or above the 100 year flood height or be floodproofed to that height, or in the case of a critical activity, the 500 year flood height?  
   - Yes  
   - No
   If yes, the structure will be:  
     - Elevated  
     - Floodproofed
   The base flood elevation is: ft.  (Datum: )  
   The elevation of the lowest floor, including basement, is: ft.  (Datum: )  
   The structure is floodproofed to: ft.  (Datum: )
   Note: for insurance purposes nonresidential structures must be floodproofed to at least one foot above the base flood elevation. DEP strongly encourages that the height of floodproofing incorporate one foot of freeboard.

e. Utilities - Will service facilities such as electrical, heating, ventilation, plumbing, and air conditioning equipment be constructed at or above the elevation of the base flood or floodproofed with a passive system?  
   - Yes  
   - No

f. Water Supply Systems - Does the proposed project include a new or replacement water supply system?  
   - Yes  
   - No
   If yes, is the water supply system designed to prevent floodwaters from entering and contaminating the system during the base flood?  
   - Yes  
   - No

g. Sanitary Sewage Systems - Does the proposed project include a new or replacement sanitary sewage or collection system?  
   - Yes  
   - No
   If yes, is the sanitary sewage system designed to minimize or eliminate the infiltration of flood waters into the systems and discharges from the systems into flood waters during the base flood?  
   - Yes  
   - No

h. Foundation Drains - Are foundation drains of buildings designed to prevent backflow from the 100 year frequency flood into the building?  
   - Yes  
   - No  
   - No foundation drains
Section I: Floodplain Management (continued)

4. Activity within Floodplain

Does the proposed project involve activity in a floodplain including but not limited to filling, dumping, construction, excavating, or grading?

☑ Yes ☐ No If no, skip to subsection 5 (Alterations of Watercourses).

If yes, does the proposed project include encroachments, including fill, new construction, substantial improvements, or other development within a NFIP adopted regulatory floodway?

☐ Yes ☑ No If yes, skip to paragraph 4(b) below.

a. No Regulatory Floodway - The NFIP requires that until a regulatory floodway is designated, that no new construction, substantial improvements, or other development (including fill) shall be permitted within Zones A1-30 and AE unless it is demonstrated that the cumulative effect of the proposed development, when combined with all other existing and anticipated development, will not increase the water surface elevation of the base flood more than one foot at any point. (If no regulatory floodway has been adopted, project impacts may be evaluated by considering an equivalent conveyance loss on the opposite side of the river from the proposed project.)

Is the proposed project consistent with this requirement? ☑ Yes ☐ No

b. Floodway Encroachments - Will the proposed encroachment into the floodway result in any increase in flood levels during either the 100 year or 10 year discharges?

100 year: ☐ Yes; the increase is: (in 1/100ths of a foot) ☐ No

If yes, has the applicant received approval of such increase in accordance with 44 CFR, Chapter 1, Subchapter B, Part 65.12? ☐ Yes ☐ No

10 year: ☐ Yes; the increase is: (in 1/100ths of a foot) ☐ No

c. Coastal Areas - Flood hazard potential in coastal areas shall be evaluated considering surface profiles of the combined occurrence of tides, storm surges, and peak runoff. The starting water surface elevation for the base flood in watersheds with time of concentrations of over 6 hours shall be the 10 year frequency tidal surge level.

If the proposed project is in a coastal area, have the hydraulic analyses incorporated these criteria?

☑ Yes ☐ No ☐ Not in Coastal Area

5. Alterations of Watercourses

Does the proposed project include the construction or alteration to a natural perennial watercourse or man-made channel?

☐ Yes ☑ No If no, skip to subsection 6 (Culverts and Bridges); if yes, complete the following subsection:

a. Topography Change - Is the watercourse or channel located within a regulatory floodway or Zone A1-30 or AE as designated by the NFIP? ☐ Yes ☐ No

b. Hydraulic Capacity - Does the channel have a minimum flow capacity of a flood equal to at least the 25 year frequency flood? ☐ Yes ☐ No

The channel capacity is designed for the: year flood.

Does the channel have an inner channel with a capacity of a 2 year frequency flood? ☐ Yes ☐ No
Section I: Floodplain Management (continued)

c. Aquatic Habitat - Channel alterations should be designed to create aquatic habitats suitable for fisheries, including suitable habitat for maintaining fish populations and to enable fish passage, and to maintain or improve water quality, aesthetics, and recreation.

Has the applicant had any pre-application meetings or correspondence with DEP Fisheries?
☐ Yes ☐ No

Check each of the following criteria that have been incorporated into the project design:
☐ 1. artificial channel linings have been avoided;
☐ 2. the channel will encourage ecological productivity and diversity;
☐ 3. the channel and its banks will be compatible with their surroundings;
☐ 4. the channel will vary in its width, depth, invert elevations, and side slopes to provide diverse aquatic habitat;
☐ 5. straightening existing channels and thereby decreasing their length has been avoided;
☐ 6. the channel will not create barriers to upstream and downstream fish passage;
☐ 7. the channel will contain pools and riffles and a low flow channel to concentrate seasonal low water flows;
☐ 8. the channel will contain flow deflectors, boulders and low check dams to enhance aquatic habitat;
☐ 9. stream bank vegetation will be preserved where feasible and disturbed stream bank areas will be replanted with suitable vegetation;
☐ 10. clean natural stream bed materials of a suitable size will be incorporated in the new channel; and
☐ 11. construction of the proposed project will be scheduled to minimize conflicts with spawning, stocking, and recreational fishing seasons.

Describe how the above aquatic habitat design criteria have been incorporated into the project design:
Section I: Floodplain Management (continued)

6. Culverts and Bridges

Does the proposed project involve the repair or new construction of a culvert or bridge?

☒ Yes ☐ No  If no, go to subsection 7 (Temporary Hydraulic Facilities).

If yes, complete this subsection:

a. Fish Passage - Does the culvert design allow for the passage of fish?    ☒ Yes ☐ No

If yes, describe the specific design provisions for fish passage:

b. Depressed Structural Floors - Is the rigid structural floor of the culvert or bridge depressed below the normal stream bed to allow a natural stream bed to form over the floor?

☐ Yes ☐ No  ☒ No rigid structural floor

c. Multiple Openings - The use of a single large culvert or bridge opening is preferred over the use of multiple small openings. Has the design minimized the use of multiple small openings?

☒ Yes ☐ No

If no, explain:

d. Sag Vertical Curves - Does the design utilize solid parapet walls in the sag part of a vertical curve?

☐ Yes ☐ No  ☒ Not located in a sag vertical curve

e. Debris Blockage - Is the culvert or bridge prone to blockage by debris?    ☐ Yes ☒ No

If yes, has the project design incorporated measures to minimize the potential for debris blockage?

☐ Yes ☐ No

f. Topography Change - Is the culvert or bridge located within a regulatory floodway or Zone A1-30 or AE as designated by the NFIP?    ☒ Yes ☐ No
Section I: Floodplain Management (continued)

g. State Highways - Does the watercourse pass under a state roadway?
   ☑ Yes  ☐ No  If no, skip to paragraph 6(g)(2).

If yes, culverts and bridges for state highways shall be designed in accordance with the Connecticut Department of Transportation (DOT) Drainage Manual and all applicants should refer to it for specific design criteria. In general, however, the Drainage Manual requires the following:

(Place a check mark for all applicable criteria utilized)

☐ Minor Structures - Minor structures have a drainage area of less than one square mile in which there is no established watercourse. They shall be designed to pass the 25 year frequency discharge.

☐ Small Structures - Small structures have a drainage area of less than one square mile in which there is an established watercourse. They shall be designed to pass the 50 year frequency discharge.

☐ Intermediate Structures - Intermediate structures have a drainage area greater than one square mile and less than 10 square miles. They shall be designed to pass the 100 year frequency discharge with reasonable underclearance.

☐ Large Structures - Large structures have a drainage area greater than 10 square miles and less than 1000 square miles. They shall be designed to pass the 100 year frequency discharge with an underclearance not less than two feet.

☐ Monumental Structures - Monumental structures have a drainage area greater than 1000 square miles. They shall be designed to meet the requirements of the Connecticut Department of Environmental Protection, U.S. Army Corps of Engineers, and the U.S. Coast Guard.

☒ Tidal Structures - Tidal structures are subject to tidal action and shall be classified as minor, small, intermediate, etc. depending on their drainage area. These structures shall be designed in accordance with the previously listed classifications. However if the highway is subject to frequent tidal flooding, the design storm may be made consistent with the frequency of flooding by tidal action. The proposed culvert or bridge is classified as:

☐ Tidal, minor
☐ Tidal, small
☒ Tidal, intermediate
☐ Tidal, large
☐ Tidal, monumental

1. Has the structure been designed in accordance with the criteria established in the DOT Drainage Manual?  ☐ Yes  ☑ No

If no, describe the lower design standards and the reasons for not complying with the DOT Drainage Manual:

Bridge No. 02708 will adequately convey the 100-year riverine flow under normal tide conditions. However, a 100-year frequency coastal storm event can be anticipated to produce a storm surge and wave activity that will be over 6 feet above the bridge deck elevation. See Hydraulic Report for details. Consequently, per Section 9.3.9 of the Drainage Manual, the design criteria regarding freeboard and roadway overtopping has been waived for the project.
Section I: Floodplain Management (continued)

2. Will the proposed culvert or bridge increase upstream water surface elevations in the event of a base flood above that which would have been obtained in the natural channel if the highway embankment were not constructed?  □ Yes  □ No

If yes, is the increase in elevation more than one foot? Describe:

Given the complex tidally controlled flow conditions within the Plum Bank Marsh area, a "Natural Condition" analysis was not considered applicable for this site and was therefore not performed.

3. Will the proposed culvert or bridge be designed so that flooding during the design discharge does not endanger the roadway or cause damage to upstream developed property? (NOTE: The design discharge for culverts and bridges on state highways should be that which was determined by FEMA. If the applicant judges that the FEMA discharge is inappropriate, the project should be analyzed for both the applicant's computed flow and the FEMA discharge. The project, however, must still meet the standards of the NFIP.)  □ Yes  □ No

Explain:

Based on the analyses performed for the project (see Hydraulic Report for details), the proposed bridge replacement will not pose or exacerbate any hazard to human life, health or property in the event of a base flood, nor affect the regulatory base flood elevations established by the FEMA FIS and as shown on the FIRM. The proposed project is consistent with the minimum National Flood Insurance Program (NFIP) standards.

h. Local Roads & Driveways - Local roads (not state highways) and driveways may be designed for flood frequencies and underclearances less stringent than those specified in the DOT Drainage Manual when (check all that have been incorporated into the project design):

 □ 1. the road is at or close to the floodplain grade

 □ 2. water surface elevations are not increased by more than one foot nor cause damage to upstream properties

 □ 3. provisions are made to barricade the road when overtopped

 □ 4. the road or driveway is posted as being subject to flooding

 □ 5. the road or driveway has low traffic volume

 □ 6. alternate routes are available

The culvert or bridge has been designed to pass the: year frequency discharge with an underclearance of: feet.

Utilizing the DOT Drainage Manual classifications listed under paragraph 6(g) above, the culvert or bridge is classified as a: structure.
Section I: Floodplain Management (continued)

h. If the culvert or bridge is designed to standards lower than which is stipulated in the DOT Drainage Manual, list such standards and the reasons for the lower design standards:

i. **Downstream Peak Flows** - Will the proposed culvert or bridge increase downstream peak flows by decreasing existing headwater depths during flooding events?  
   - [ ] Yes  
   - [X] No

   If yes, describe the selected design criteria and the impacts to downstream properties:

7. **Temporary Hydraulic Facilities**

   Temporary hydraulic facilities include all channels, culverts or bridges which are required for haul roads, channel relocations, culvert installations, bridge construction, temporary roads, or detours. They are to be designed with the same care which is used for the primary facility.

   If the proposed activity involves a temporary hydraulic facility(s), has such facility been designed in accordance with Chapter 6, Appendix F, "Temporary Hydraulic Facilities," of the DOT Drainage Manual?
   
   - [ ] Yes  
   - [ ] No  
   - [X] No temporary hydraulic facilities

   If yes, the design flood frequency is the: ______ year flood.

   Describe the temporary facilities:
Section II: Stormwater Management

Name of Applicant: Connecticut Department of Transportation
Name of Proposed Project: Project No. 105-0215

1. Stormwater Runoff

The proposed project will (check all that apply):

☐ Increase the area of impervious surfaces
☐ Increase runoff coefficients
☐ Alter existing drainage patterns
☐ Alter time of concentrations
☐ Change the timing of runoff in relation to adjacent watersheds

Will the proposed project impact downstream areas by increasing peak flow rates, the timing of runoff, or the volume of runoff? ☐ Yes ☒ No

If yes, describe the downstream impacts for the 2, 10 and 100 year frequency discharges:

The pre and post development peak flow rates at the downstream design point are as follows:

<table>
<thead>
<tr>
<th>Return Frequency (Year)</th>
<th>Peak Discharges (CFS)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pre-Development</td>
</tr>
<tr>
<td>2</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
</tr>
<tr>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

The above peak discharges were computed utilizing the: hour duration storm. This duration storm was selected because:
Section II: Stormwater Management (continued)

Describe the location of the design point and why this location was chosen:

2. Stormwater Detention Facilities

Does the proposed project include the construction of any stormwater detention facilities?

☐ Yes ☑ No If no, skip to subsection 3 (Storm Drainage Systems).

If yes, has the DEP determined whether a dam construction permit is required? ☐ Yes ☐ No

The pre and post development peak flow rates at the downstream design point are as follows:

<table>
<thead>
<tr>
<th>Return Frequency (Year)</th>
<th>Peak Discharges (CFS)</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pre-Development</td>
<td>Post-Development (without detention)</td>
<td>Post-Development (with detention)</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>100</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The above peak discharges were computed utilizing the: hour duration storm. This duration storm was selected because:

Describe the location of the design point and why this location was chosen:
Section II: Stormwater Management (continued)

If the proposed project increases peak flow rates for the 2, 10 or 100 year frequency discharges, describe the impacts to downstream areas:

Will the detention facility aggravate erosion along the downstream channel? □ Yes □ No

In certain situations, detention of stormwater aggravates downstream flooding. This occurs when the discharge from a subwatershed is delayed by a detention facility so that it adds to the peak discharge from another subwatershed. Adding the hydrographs of the two subwatersheds results in a higher peak discharge over that which would occur if detention were not present.

Is the location of the detention facility within the watershed suitable for detention? □ Yes □ No

Explain:

3. Storm Drainage Systems

Does the proposed project include the construction of subsurface storm drainage systems?
□ Yes □ No If no, you have completed Section II of the worksheets.

If yes, complete this subsection:

a. DOT Standards - Is the proposed storm drainage system designed in accordance with the Connecticut Department of Transportation's (DOT) Drainage Manual? □ Yes □ No

If no, describe the lower design standards and the reasons for not complying with the Drainage Manual:

b. Design Storm - Is the storm drainage system designed for a ten year frequency storm without closing the use of the facility? □ Yes □ No

c. Future Development - Has the design of the system considered future development of adjacent properties? □ Yes □ No
Section II: Stormwater Management (continued)

d. **Outlet Protection** - Have the outlets from the system been designed to minimize the potential for downstream erosion?  
   ☐ Yes  ☐ No

e. **Overland Flow** - Has the use of curbing been minimized to encourage overland dispersed flow through stable vegetated areas?  
   ☐ Yes  ☐ No

f. **Vegetated Filter Strips** - Has the design incorporated the use of vegetated filter strips or grass swales to improve the quality of water outletting from the storm drainage system?  
   ☐ Yes  ☐ No

g. **Stormwater Treatment** - Describe features of the stormwater collection system intended to improve the quality of stormwater runoff prior to its discharge to surface waters.

h. **E & S Control Plan** - Has the design and installation of the storm drainage system been coordinated with the soil erosion and sediment control plan prepared in accordance with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control?  
   ☐ Yes  ☐ No

   Explain:
Section III: State Grants and Loans

Name of Applicant:
Name of Proposed Project:

1. This Flood Management Certification concerns a:  □ grant  □ loan

2. Total amount of grant or loan: $

3. The recipient of the grant or loan will be:
   Name:
   Mailing Address:
   City/Town:  State:  Zip Code:
   Phone:  ext.  Fax:
   Recipient Contact person:
   Name:
   Mailing Address:
   City/Town:  State:  Zip Code:
   Phone:  ext.  Fax:

4. The recipient will use the grant or loan to (check all that apply):
   □ construct a structure, obstruction or encroachment or conduct other work within a floodplain or coastal high hazard area.
   □ construct a facility or develop a site affecting drainage and stormwater runoff.
   □ conduct a study or prepare a report concerning land use or land use planning affecting a floodplain, drainage or stormwater runoff.

5. If the grant or loan is for a study or report, describe the anticipated effects on floodplains, drainage or stormwater runoff if the recommendations are implemented:

6. Will the proposed project promote development in floodplains or will utilities servicing the project be located so as to enable floodplain development?  □ Yes  □ No
   Explain:

If the grant or loan is for construction of a structure, obstruction or encroachment or other work within a floodplain, or if it is for construction of a facility or development of a site that will affect drainage and stormwater runoff, Sections I and/or II of this Worksheet must be completed and the engineering report (Attachment H) and plans (Attachment G) must be provided as part of this application.
Section IV: Disposal of State Land

Name of Applicant:
Name of Proposed Project:

1. The grantee will be:
   Name:
   Mailing Address:
   City/Town: State: Zip Code:
   Phone: ext. Fax:

2. Describe the current state of development and use of the land to be disposed.

3. Why is the agency disposing of the land?

4. Describe the grantee's intended use of the land.

5. Will the disposal of the land promote development in floodplains? □ Yes □ No
   Explain:

6. Will the grantee's use of the land be consistent with the state's flood management statutes and regulations?
   □ Yes □ No   Explain:
Attachment I

Flood Contingency Plan

October 9, 2018

APPLICANT: State of Connecticut, Department of Transportation

PROJECT NUMBER: 105-215, Replacement of Bridge No. 02708, Route 154 over Plum Bank Creek

TOWN: Old Saybrook, Connecticut

There is no construction activity proposed for the project that would pose a hazard to human life, health, or property during significant precipitation events. The Contractor will be prohibited from storing any equipment and materials (other than water handling equipment/materials) within the coastal wetland area.

The Contractor will submit to the Engineer for approval a written Flood Contingency Plan prior to commencement of any construction. The plan will include the following:

- A description of the means by which the Contractor will remove from within the watercourse, all material, equipment and personnel prior to a predicted major storm. A major storm shall be defined as a storm predicted by the NOAA Weather Service with warning of flooding, severe thunderstorms or similarly severe weather conditions or effects.
- Provisions for notifying workers engaged in work on or near the project of an impending storm.
- Provisions for securing work in progress prior to a major storm.

The Contractor shall submit the Flood Contingency Plan for approval at the preconstruction meeting.

No long-term storage of construction equipment and/or material will occur within the 500 year flood boundary unless such equipment or material is not subject to major flood damage; or is anchored, restrained; or enclosed to prevent it from floating away or is removed prior to flooding.

Work within or adjacent to watercourses will be conducted during periods of low flow, whenever possible. The Engineer will remain aware of flow conditions during the conduct of such work and will direct the Contractor to stop this work if flow conditions threaten to cause excessive erosion, siltation, or turbidity.

During construction, the Contractor will be bound by the conditions set forth in the Department’s “Standard Specifications for Roads, Bridge and Incidental Construction”, Form 817, Section 1.10, Environmental Compliance, Best Management Practices, which address the need for the Contractor to maintain a stable work area. The Department will have District inspection personnel assigned to the project to ensure compliance with the provisions of the Standard Specifications. In addition, the Office of Environmental Planning will assign personnel to oversee the Contractor for the duration of the contract as necessary to ensure compliance with all environmental requirements.

The Department is responsible for maintaining the integrity of the facility after completion of the project. The 100-year frequency coastal storm event can be anticipated to produce a storm surge and wave activity
that will be 8-9 feet above the Route 154 roadway elevation. The structure will provide long term serviceability and be able to withstand the forces and the flooding conditions generated during the 100-year frequency storm event; remaining serviceable following the subsidence of the flooding events. Therefore, the need for a special flood operation plan upon completion of the project is not foreseen. Any deficiencies will be noted and corrected in a timely manner.

**Contact Information:**

**During Construction:**
Robert Obey, District II Engineer
(860) 823-3204

**Post Construction:**
Douglas Harris, District II Maintenance
(860) 823-3222
Attachment P: Coastal Consistency Statement

PROJECT 105-215
RT. 154 OVER PLUM BANK CREEK
OLD SAYBROOK
BRIDGE NO. 02708

No Coastal Consistency Review Form (DEEP-APP-004) is provided with this permit. The project will be submitting for a Structures, Dredging and Fill, and Tidal Wetlands Permit. Submittal of the TWSDF Permit to follow submission of the FMC.
Appendix Q: Other Information

- FEMA Map Landscape
- Interagency Coordination Notes
- NDDB Information
- Site Photographs
- Fisheries Signoff
INTERAGENCY COORDINATION MEETING NOTES
January 18, 2018
Room 3130

Project 0105-0209 Bridges 01386 & 02708, Route 154 over Back River & Plum Bank Creek, Old Saybrook

01/18/2018 – The project involves the replacement of Bridges 02708 and 01386. The bridges will be completed in consecutive years as they are near each other and are both connected to the Plum Bank Marsh. These are coastal bridges in a low lying area with beaches, residential uses, and coastal resources nearby. The proposed structures are designed for overtopping conditions. Permanent sheet piling protections will be employed to protect the proposed bridges and approach slabs and allow the majority of the work to be completed in the dry. In-water work will be needed to remove portions of existing abutments and provide scour protections. The majority of the work is proposed outside of the busy “beach” season. Roadway profiles will be raised 8”-15” and road shoulder widths will be increased to address the raised road profile and current guiderail/safety standards. 2:1 vegetated slopes are proposed.

Project Impacts: Bridge 02708: Impact below HTL=2,014 sq.ft.; Impact below CIL=1,617 sq.ft. Bridge 01386: Impact below HTL=2,327 sq.ft.; Impact below CIL=1,658 sq.ft. Total of 4300+/- sq.ft. of tidal vegetation impacted. Mitigation TBD.

Permitting Requirements: Not under Coast Guard Jurisdiction. Flood management certification. CTDEEP Structures Dredging and Fill and Tidal Wetlands. USACE PCN (GP-19). (2) Permits/applications will be needed but mitigation will be proposed under one package. Subsequent to the meeting it was confirmed that an Application to the ACOE will be required for the PCN. Fisheries sign-off required (no recommendations in fisheries comments of 08/21/2017). Project is within an NDDB area and a determination is needed. OEP staff has pre-screened the project for NDDB protected species and does not anticipate additional restrictions based on the current NDDB data.

Agency Comments: CTDEEP Land & Water Resources staff noted that they had contacted DEEP internal personnel to discuss options for nearby mitigation sites. CTDEEP fisheries staff confirmed that no time of year restrictions are necessary from a fisheries perspective. CTDEEP Land & Water Resources staff commented that the public could petition for additional hearings and noted that the public information meetings held by CTDOT were a benefit to informing the public and incorporating public feedback. He also requested that the proposed water main shelf be minimized to discourage public access. It was also requested that any proposed rip rap be minimized. CTDOT design staff confirmed that they had minimized rip rap placement. USACE staff requested and received confirmation that temporary utility locations would not cause additional wetland impacts. USACE staff noted that the temporary aerial utility crossings, if over the water, will be included in the permit under Section 10 and that the temporary crossings would need to meet minimum elevations across the waterway as specified in 33 CFR 322.5(i)(2).

Action Items: Design staff should minimize water main shelf to discourage public access. Design and OEP should continue to coordinate with CTDEEP to pursue mitigation options, including discussing options with the Town of Old Saybrook.
Interagency Meeting Notes
October 18, 2018
Room 3130

Project 82-312, Bridge 00524, Arrigoni Bridge - Route 66 over the Connecticut River, Middletown/Portland
10/18/2018 – The project consists of superstructure steel repairs/strengthening, spot painting of the superstructure, steel and concrete substructure repairs, approach span deck replacement, and replacement of deteriorated electrical components. The entire bridge will be upgraded to state of good repair. Initial rehab work was done six years ago. For access they plan to use the same method - a platform system that will hang just below the low chord of the structure – there will not be in water work and no work done on the piers. A protective fence will be installed during construction. Three year construction timeframe.

Project Impacts: Currently no impacts. NDDB shows Falcon/Eagle; specifications will be included in project. There was discussion of a nest on pier 19, but not of these species.

Permitting Requirements: Flood Management General, Coastal Maintenance General Permit (to be completed by OEP). Coordination with the Coast Guard will be required.

Agency Comments: USACE staff commented that if there will be fill in the wetland, then an Army Corps permit would be needed. Mike Hogan (H&D) asked about work occurring in the floodplain (is the access road/lay down area in the floodplain?). As currently shown, the floodplain impacts would qualify for an FM General. There is one area between the two rail lines on the Middletown side that needs to be checked for wetlands. DEEP confirmed the project is eligible for a coastal general permit. The Designer mentioned the potential for "jetting" of the drainage structure at Pier 8 and DEEP questioned whether or not the waters would be captured prior to discharge to the Connecticut River.

Action Items: Consultant is finalizing wetlands assessment to determine if there will be any impacts due to the proposed access road.

Project 96-201, Bridges 01218 & 04180, I-84 over Housatonic River in Newtown/Southbury.
10/18/2018 - This Project previously attended the Interagency Meeting on 5/18/2017. This project consists of the rehabilitation of Bridges 01218 and 04180 that carry I-84 east and westbound over the Housatonic River. Bridge 01218 and 04180 are both 4-span continuous steel two girder floor system structures. On Bridge 01218, there is rust on the steel girders and the deck needs extensive repair. On Bridge 04180 there are cracks in the cantilevered floorbeam and map cracking on the underside of the deck. The proposed work is to replace the superstructure on both structures; lengths/widths match existing. The demolition of the existing superstructure will be done with cranes from a work trestle and barges. The work trestle platform would be above the 100-year flood elevation. There will be new pier caps on all piers on both bridges. Cofferdams and dewatering are required around Pier 3 on Bridge 04180. Proposed low chord elevations will be greater than current low chord. They are proposing to make repairs to south embankment on Bridge 01218 as existing riprap has eroded. The work trestle would be located in Spans 3 and 4, with waterway in that area closed to boat traffic. Barges could be used in Span 1; however, a work trestle could also be used in that area. Span 2 would remain open to boat traffic during the duration of construction. There will be a period of several days that the channel will be completely closed to boat traffic. The Lake Zoar public boat launch has been proposed to be used to launch safety boats and work crews.
Environmental Compliance. Pending coordination with DEEP Remediation, the 401 permitting needs will need to re-evaluated.

Boating: Coordination documents for DEEP boating need to be submitted to OEP.

USACE: Army Corps would like to see elevation views of work being done around Pier 3. The elevation views will need to show excavation and fill limits below OHW.

Project 113-107/108, Bridges 02931 & 02932, Route 2A over Poquetanuck Cove & Dickerman’s Brook, Preston
10/18/2018 – This Project previously attended the Interagency Coordination Meeting on 5/18/2017. This project involves the rehabilitation of Bridge 02931 (project 113-107) and Bridge 02932 (project 113-108). The proposed work on both bridges includes superstructure replacement and repairs to abutments and wingwalls. Low chords will be raised 6” and 12” respectively. Drainage areas are 0.046 sq. mi. and 0.79 sq. mi. respectively. NDDB indicates several species concerns in this area including saltmarsh bulrush, tufted hairgrass, and liliaeopsis. There is also an archaeologically sensitive area in the vicinity of Project 113-107. These projects require mitigation. The mitigation site has been determined and includes an area of 4,200 sq feet of phragmites treatment, restoration of the treated area with a native tidal planting plan, as well as improvements to the Stoddard Hill boat launch. Consultant will submit a plan for fisheries sign-off once permit plans are developed.

**Project Impacts:** The temporary wetland impacts are 14,400 sq feet and permanent 17,100 sq feet – the consultant provided rough estimates of 400 cy cut and 330 cy fill in the floodplain – but expressed these provided numbers need to be updated.

**Permitting Requirements:** OLSIP Tidal Wetlands, Structures, Dredging and Fill, FM General and USACE PCN.

**Agency Comments:** Mike Grzywinski from DEEP commented that the mitigation site will be permitted as part of the Tidal Wetlands, Structures, Dredging and Fill and 401 permit, not under the Coastal Maintenance GP, as identified in the presentation. Army Corps commented that a mitigation checklist following the tidal wetland module will need to be prepared as part of the PCN application and the consultant should refer to the USACE mitigation guidance for the planting plan. Army Corps also commented plans should include elevation of temporarily located utilities to show the clearance at the bridge, and add high tide lines to all plans. It was also mentioned there is Coast Guard coordination for this project. A comment was made that an herbicide application permit/license was required for the mitigation site. DOT said there has been communication with Roger Wolfe from DEEP Wildlife Division, WHAMM Unit, and his program will be conducting the phragmites removal at the mitigation site and is aware of all permitting requirements.

**Action Items:** Make required changes to plans as requested by Army Corps (see comments above). Provide OEP with an updated mitigation plan to facilitate coordination with DEEP Parks and Boating Divisions.

Project 141-154, Bridge 06793 & 06794, I-395 over Little Mountain Brook & Unnamed Brook, Thompson
10/18/2018—This Project attended the Interagency Meeting on 4/21/2016. Both structures are single 72” asphalt-coated corrugated metal pipes in very poor condition under as much as 50’ of fill. The proposed rehabilitations will
replace existing drainage roadway pipes to allow for 2-year flow and to bypass pump Folly Brook through that structure.

**Project Impacts:** No NDDB concerns. FEMA mapping depicts the 100-year floodplain and floodway through the pipe.

<table>
<thead>
<tr>
<th>Impacts sq. ft</th>
<th>Wetland</th>
<th>Watercourse</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temporary</td>
<td>100</td>
<td>600</td>
<td>700</td>
</tr>
<tr>
<td>Permanent</td>
<td>0</td>
<td>5,200</td>
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</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>5,800</td>
<td>5,900</td>
</tr>
</tbody>
</table>

**Permitting Requirements:** DEEP FMC, DEEP GP Addendum, DEEP IW General, USACE PCN

**Agency Comments:** Two baffle-style alternatives were presented with perpendicular baffles being acceptable to DEEP Fisheries. Fisheries staff will need to know water depths during low flow conditions and the water depth within the baffles. DEEP IW staff want to see a detailed planting plan. OEP staff noted a previous project, which used a by-pass pipe to lift flow up to another culvert.

**Action Items:** OEP will send designer the project number where this water handling technique was done. Designer to determine water depths at low-flow with the baffles installed.

**Project 59-164, US Route 1 & CT Route 22, Guilford**

10/18/2018 – The proposed project will construct a modern 3-legged roundabout to replace the existing T-intersection. Construction of the roundabout will improve safety and efficiency for all modes of traffic. There is a potential historic property in the northwest quadrant of the project location (a historical well). Wetland/watercourse impacts are proposed at an existing drainage outlet and channel that goes into Kneuer Pond. This area falls within 100-year floodplain in one small area (zone A) but the drainage area to that point is less than one square mile. There are no Fisheries concerns or NDDB concerns.

**Project Impacts:**

<table>
<thead>
<tr>
<th>Impacts sq. ft</th>
<th>Wetland</th>
<th>Watercourse</th>
<th>Total</th>
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<tbody>
<tr>
<td>Temporary</td>
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<td>187</td>
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<tr>
<td>Permanent</td>
<td>278</td>
<td>147</td>
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<td>991</td>
<td>334</td>
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<th>FEMA impacts C.Y.</th>
<th>cut</th>
<th>fill</th>
<th>net</th>
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<tr>
<td>floodway</td>
<td></td>
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</tr>
<tr>
<td>floodplain</td>
<td>86</td>
<td>36</td>
<td>-50</td>
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</table>

**Permitting Requirements:** USACE SV, DEEP IW General, Stormwater Permit.
DEEP/USACE/EPA/DOT
Interagency Coordination Meeting
Project Meeting Agenda – 10/18/2018

abutments, wingwalls, and decks. To protect the bridges from scour the project proposes permanent sheet piling around the new piles. Most of the conversation centered around the proposed mitigation. The projects are going to be separated into different construction contracts so they will have separate permits. Bridge 02708 is going to construction first, Bridge 01386 is under further review by a coastal engineer to address concerns from nearby Homeowners Association (following the coastal engineering assessment, the bridge design may be revisited, and the span could increase, thereby increasing proposed impacts). Current mitigation proposal is acquisition of 1-acre parcel at the mouth of Ragged Rock Creek. This mitigation proposal is for both bridges. The parcel is surrounded by ~250 acres of preserved land (comprised of state, The Nature Conservancy, and Old Saybrook Land Trust). DOT would like to ultimately transfer the 1 acre parcel to DEEP or the Land Trust to be maintained in perpetuity. The mitigation parcel provides a mitigation ratio of approximately 15.9:1 on the impacts for both bridges combined.

Project 105-209 Impacts:

<table>
<thead>
<tr>
<th>Bridge 02708</th>
<th>Permanent</th>
<th>Temporary</th>
<th>Total</th>
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</thead>
<tbody>
<tr>
<td>Impacts below HTL</td>
<td>1,225</td>
<td>615</td>
<td>1,840</td>
</tr>
<tr>
<td>Impacts below MHW</td>
<td>70</td>
<td>20</td>
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</tr>
<tr>
<td>Total</td>
<td>1,295</td>
<td>635</td>
<td>1,930</td>
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<table>
<thead>
<tr>
<th>Bridge 01386</th>
<th>Permanent</th>
<th>Temporary</th>
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</thead>
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<tr>
<td>Impacts below HTL</td>
<td>1,360</td>
<td>615</td>
<td>1,975</td>
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<tr>
<td>Impacts below MHW</td>
<td>70</td>
<td>20</td>
<td>90</td>
</tr>
<tr>
<td>Total</td>
<td>1,430</td>
<td>635</td>
<td>2,065</td>
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</table>

Total permanent impacts below HTL: 2,585 sq feet
Total permanent impact below MHW: 140 sq feet
Total temporary: 1,270 sq feet

Permitting Requirements: Separately for each bridge - USACE PCN, OLISP Tidal Structures, Dredging and Fill
Agency Comments: USACE asked to clarify if this could be an in-lieu fee project – DOT commented that in-lieu fee would meet the USACE mitigation requirements but that DEEP would not accept in-lieu fee as suitable mitigation for this project and therefore DOT is seeking a single mitigation measure to meet both agency needs. It is DEEP’s position that the mitigation proposal is suitable for impacts as they have been calculated to date for both bridges. It is also their position that if a change in span length on Bridge 01386 causes an increase in impacts, that no additional mitigation would be required. EPA was supportive of the mitigation proposal because the parcel will be able to be managed in the future if acquired, which it will not be if left in private hands. DEEP Fisheries indicated that Ragged Rock Creek Wildlife Area is a state designated waterfowl hunting area, and that preservation of the parcel would allow additional access to marsh for hunters, given its position at the mouth of Ragged Rock Creek. Bob Gilmore was also supportive of the mitigation. There was a discussion regarding the future “development threat” pressure on the
Ms. Amanda Saul  
CT Department of Transportation  
PO BOX 317546  
2800 Berlin Turnpike  
Newington, CT 06111  
amanda.saul@ct.gov

Project: CTDOT Project No. 105-209, Replacement of Bridge No. 02708, Route 154 over Plum Bank Creek in Old Saybrook, Connecticut  
NDDB Determination No.: 201900702

Dear Amanda Saul,

I have reviewed Natural Diversity Data Base maps and files regarding the area delineated on the map provided for CTDOT Project No. 105-209, Replacement of Bridge No. 02708, Route 154 over Plum Bank Creek in Old Saybrook, Connecticut.

Thank you for pre-screening NDDB species information. I concur with your findings regarding the State Special Concern Malaclemys terrapin terrapin (diamondback terrapin) that are known to occur from Harveys Beach (which is 800 feet from the bridge project site). I do not anticipate any adverse impacts to this turtle since the project area is not ideal habitat and the only in water work involves a float which will not disturb the diamondback terrapins. We also have extant known populations of saltmarsh sharp-tailed sparrow (Ammodramus caudacutus) from this area but I do not anticipate adverse impacts to this bird species since project activities will take place in fall, winter and spring, which is outside the nesting time for these birds.

This determination is good for two years. Please re-submit an NDDB Request for Review if the scope of work changes or if work has not begun on this project by February 6, 2021.

Natural Diversity Data Base information includes all information regarding critical biological resources available to us at the time of the request. This information is a compilation of data collected over the years by the Department of Energy and Environmental Protection’s Natural History Survey and cooperating units of DEEP, private conservation groups and the scientific community. This information is not necessarily the result of comprehensive or site-specific field investigations. Consultations with the Data Base should not be substitutes for on-site surveys required for environmental assessments. Current research projects and new contributors continue to identify additional populations of species and locations of habitats of concern, as well as, enhance existing data. Such new information is incorporated into the Data Base as it becomes available. The result of this review does not preclude the possibility that listed species may be encountered on site and that additional action may be necessary to remain in compliance with certain state permits.

Please contact me if you have further questions at (860) 424-3592, or dawn.mckay@ct.gov. Thank you for consulting the Natural Diversity Data Base.

Sincerely,

Dawn M. McKay  
Environmental Analyst 3

February 6, 2019
Photographs: Bridge No. 02708, Route 154 over Plum Bank Creek

West elevation (log direction).

Photo Number: 4

Photo Taken: 01/10/2018

East elevation (log direction).

Photo Number: 5

Photo Taken: 01/10/2018
Upper Left: Upstream facing north
Upper Right: Downstream facing south
Center Left: Downstream facing northwest
Center Right: Looking north across downstream face of bridge
Bottom Left: Upstream facing east

Photos: 8/23/2018
Subject: State Project No. 105-215
Replacement of Br. No. 02708, Route 154 over Plum Bank Creek
Town of Old Saybrook

Attached are an original and two copies of the Tidal Wetlands, Structures, Dredge and Fill permit for the above referenced project. A permit for Flood Management Certification has been previously submitted to the CTDEEP.

Notices of the Application have been sent to the Abutters, the Harbor and Shellfish Commissions and the First Selectman; Copies of the application have been sent to the Municipal CEO, the Shellfish Commission and the Conservation Commission; copies of the letters are included.

Any questions pertaining to this application may be directed to Mr. Andrew H. Davis, Transportation Supervising Planner at 860-594-2157.

Attachments
Amanda M. Saul/ams
bcc: Andrew H. Davis – Amanda M. Saul
     Mary E. Baker – Bao Chuong – Raymond I. Basar
     Robert E. Obey – District 2
June 25, 2019

Honorable Carl P. Fortuna, Jr.
First Selectman, Town of Old Saybrook
302 Main Street
Old Saybrook, CT 06475

Subject: State Project No. 105-215
Replacement of Bridge No. 02708
Route 154 over Plum Bank Creek
Town of Old Saybrook
Notice of Permit Application

Dear Mr. Fortuna,

The State of Connecticut Department of Transportation (the Department) is applying for a Structures, Dredge, and Fill and Tidal Wetlands permit pursuant to Connecticut General Statute 22a-32 and 22a-361 from the Connecticut Department of Energy and Environmental Protection.

The project proposes to replace a Bridge No. 02708 which carries Route 154 over Plum Bank Creek in Old Saybrook and provide minor roadway improvements. The proposed activity will take place at Route 154 at Plum Bank Creek. The proposed activity will potentially affect: Coastal resources; Plum Bank Creek; tidal wetlands.

In accordance with Section 22a-6g of the Connecticut General Statutes, as revised, the Department hereby gives notice of the filing with the Connecticut Department of Energy and Environmental Protection for regulated activities to be conducted in conjunction with the subject project. A copy of said notice is attached. If you have any questions or require additional information, please contact Mr. Andrew H. Davis, of my staff, at (860) 594-2157.

Very truly yours,

Kimberly C. Lesay
Transportation Assistant Planning Director
Bureau of Policy and Planning

Enclosure
Connecticut Department of Energy & Environmental Protection

Certification of Notice Form - Notice of Application

I, [Name of Applicant], certify that

the attached notice represents a true copy of the notice that appeared in [Name of Newspaper] on [Date].

I also certify that I have provided a copy of said notice to the chief elected municipal official listed below as required by section 22a-6g CGS.

<table>
<thead>
<tr>
<th>Carl Fortuna</th>
<th>First Selectman</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name of Official</td>
<td>Title of Official</td>
</tr>
<tr>
<td>302 Main Street</td>
<td></td>
</tr>
<tr>
<td>Address</td>
<td></td>
</tr>
<tr>
<td>Old Saybrook</td>
<td>CT 06475</td>
</tr>
<tr>
<td>City/Town</td>
<td>State Zip Code</td>
</tr>
</tbody>
</table>

Signature of Applicant: [Signature] Date: [Date]

Name of Applicant (print or type): Kimberly C. Lesay
Title (if applicable): Trans. Assistant Planning Director

Rev. 08/08/11
Affidavit of Publication

State of Connecticut
County of Fairfield

I, Chris Censur, a billing representative of Graystone Group Advertising, 2710 North Avenue, Suite 200, Bridgeport, CT 06604, do solemnly swear that on:

Date: March 8, 2019
Ad Title: CT DOT - Notice of Permit Application
Town: Old Saybrook

Appeared in: Hartford Courant
publication and the newspaper extracts hereto annexed were clipped from the above named issue of said newspaper.

Subscribed and sworn to this 12 day of March, 2019 before me.

KATHLEEN VITKO
Notary Public
State of Connecticut
My Commission Expires July 31, 2022

[Signature]

Project No. 0105-0215 373
Connecticut Department of Energy & Environmental Protection
Land & Water Resources Division
79 Elm Street
Hartford, CT 06106

Subject: State Project No. 105-215
Replacement of Bridge No. 02708
Route 154 over Plum Bank Creek
Town of Old Saybrook
Certification of Abutter Notices

To Whom It May Concern:

The State of Connecticut Department of Transportation (the Department) is applying for a Structures, Dredge, and Fill permit pursuant to Connecticut General Statute 22a-32 and 22a-361 from the Connecticut Department of Energy and Environmental Protection.

In accordance with Section 22a-6g of the Connecticut General Statutes, this letter serves as certification that all abutting property owners within 500 feet of the project limits have been provided a copy of the legal notice which appeared in the Hartford Courant on March 8, 2019. A copy of the letter sent to the Abutters is enclosed. A list of the abutting property owners can be found in Attachment K of the Tidal Wetlands, Structures, Dredge and Fill permit for the subject project. If you have any questions or require additional information, please contact Mr. Andrew H. Davis, of my staff, at (860) 594-2157.

Very truly yours,

Kimberly C. Leduc
Transportation Assistant Planning Director
Bureau of Policy and Planning

Enclosure
Subject: State Project No. 105-215
   Replacement of Bridge No. 02708
   Route 154 over Plum Bank Creek
   Town of Old Saybrook
   Notice of Permit Application

To Whom It May Concern:

You have received a copy of this notice previously. We apologize for an oversight where we inadvertently listed the Town where the project is being conducted as “Branford” when in fact, the project is being conducted in Old Saybrook. This letter is being provided to correct that error for the record.

The State of Connecticut Department of Transportation (the Department) is applying for a Structures, Dredge, and Fill permit pursuant to Connecticut General Statute 22a-32 and 22a-361 from the Connecticut Department of Energy and Environmental Protection.

The project proposes to replace a Bridge No. 02708 which carries Route 154 over Plum Bank Creek in Old Saybrook and provide minor roadway improvements. The proposed activity will take place at Route 154 at Plum Bank Creek. The proposed activity will potentially affect: Coastal resources; Plum Bank Creek; tidal wetlands.

In accordance with Section 22a-6g of the Connecticut General Statutes, as revised, the Department hereby gives notice of the filing with the Connecticut Department of Energy and Environmental Protection for regulated activities to be conducted in conjunction with the subject project. A copy of the notice is attached. If you have any questions or require additional information, please contact Mr. Andrew H. Davis, of my staff, at (860) 594-2157.

Very truly yours,

Kimberly C. Lasay
Transportation Assistant-Planning Director
Bureau of Policy and Planning

Enclosure
cc: CTDEEP LWRD
STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION

2800 BERLIN TURNPIKE, P.O. BOX 317546
NEWINGTON, CONNECTICUT 06111-7546
Phone: (860) 594-2931

April 17, 2019

Subject: State Project No. 105-215
Replacement of Bridge No. 02708
Route 154 over Plum Bank Creek
Town of Branford
Notice of Permit Application

To Whom It May Concern:

The State of Connecticut Department of Transportation (the Department) is
applying for a Structures, Dredge, and Fill permit pursuant to Connecticut General Statute
22a-32 and 22a-361 from the Connecticut Department of Energy and Environmental
Protection.

The project proposes to replace a Bridge No. 02708 which carries Route 154
over Plum Bank Creek in Old Saybrook and provide minor roadway improvements. The
proposed activity will take place at Route 154 at Plum Bank Creek. The proposed activity
will potentially affect: Coastal resources; Plum Bank Creek; tidal wetlands.

In accordance with Section 22a-6g of the Connecticut General Statutes, as
revised, the Department hereby gives notice of the filing with the Connecticut Department
of Energy and Environmental Protection for regulated activities to be conducted in
conjunction with the subject project. A copy of the notice is attached. If you have any
questions or require additional information, please contact Mr. Andrew H. Davis, of my
staff, at (860) 594-2157.

Very truly yours,

[Signature]
Kimberly C. Lesay
Transportation Assistant Planning Director
Bureau of Policy and Planning

Enclosure
cc: CTDEEP LWRD

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This e-Sheet confirms that the ad appeared in The Hartford Courant on the date and page indicated. You may not create derivative works, or in any way exploit or repurpose any content displayed or contained on the e-Sheet.
Notice of Permit Application

Town: Old Saybrook

Notice is hereby given that the Connecticut Department of Transportation (the "applicant") of 2800 Berlin Turnpike, Newington, CT 06111 will submit to the Department of Energy and Environmental Protection an application under Sections 22a-32 for a permit to conduct regulated activities in tidal wetlands, Section 22a-361 to conduct work in tidal coastal or navigable waters of the state, and 33 U.S.C. 1341 (401 Water Quality Certificate) to conduct an activity which may result in a discharge to certain waters of the state.

Specifically, the applicant proposes to replace a Bridge No. 02708 which carries Route 154 over Plum Bank Creek in Old Saybrook and provide minor roadway improvements. The proposed activity will take place at Route 154 at Plum Bank Creek. The proposed activity will potentially affect: Coastal resources; Plum Bank Creek; tidal wetlands.

Interested persons may obtain copies of the application from Ryan Martin, Project Engineer, 2800 Berlin Turnpike, Newington, CT 06111 telephone (860) 594-3205.

The application will be available for inspection at the Office of the Department of Energy and Environmental Protection, Office of Long Island Sound Programs, 79 Elm Street, Hartford, CT 06106-5127 telephone 860-424-3034 from 8:30 to 4:30 Monday through Friday. Please call in advance to schedule review of the application.
June 25, 2019

Old Saybrook Waterfront Commission
Town Hall
302 Main Street
Old Saybrook, CT 06475

Subject: State Project No. 105-215
Replacement of Bridge No. 02708
Route 154 over Plum Bank Creek
Town of Old Saybrook
Notice of Permit Application

To Whom It May Concern:

The State of Connecticut Department of Transportation (the Department) is applying for a Structures, Dredge, and Fill and Tidal Wetlands permit pursuant to Connecticut General Statute 22a-32 and 22a-361 from the Connecticut Department of Energy and Environmental Protection.

The project proposes to replace a Bridge No. 02708 which carries Route 154 over Plum Bank Creek in Old Saybrook and provide minor roadway improvements. The proposed activity will take place at Route 154 at Plum Bank Creek. The proposed activity will potentially affect Coastal resources; Plum Bank Creek; tidal wetlands.

In accordance with Section 22a-6g of the Connecticut General Statutes, as revised, the Department hereby gives notice of the filing with the Connecticut Department of Energy and Environmental Protection for regulated activities to be conducted in conjunction with the subject project. A copy of the notice is attached. If you have any questions or require additional information, please contact Mr. Andrew H. Davis, of my staff, at (860) 594-2157.

Very truly yours,

Kimberly C. Lesay
Transportation Assistant Planning Director
Bureau of Policy and Planning

Enclosure
cc: CTDEEP LWRD
June 25, 2019

Old Saybrook Shellfish Commission
Town Hall
302 Main Street
Old Saybrook, CT 06475

Subject: State Project No. 105-215
Replacement of Bridge No. 02708
Route 154 over Plum Bank Creek
Town of Old Saybrook
Notice of Permit Application

To Whom It May Concern:

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Very truly yours,

[Signature]
Kimberly C. Lesaw
Transportation Assistant Planning Director
Bureau of Policy and Planning

Enclosure
STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION

2800 BERLIN TURNPIKE, P.O. BOX 317546
NEWINGTON, CONNECTICUT 06131-7546
Phone: (860) 594-2931

June 26, 2019

Honorable Carl P. Fortuna, Jr.
First Selectman, Town of Old Saybrook
302 Main Street
Old Saybrook, CT 06475

Subject: State Project No. 105-215
Replacement of Bridge No. 02708
Route 154 over Plum Bank Creek
Town of Old Saybrook
Notice of Permit Application

Dear Mr. Fortuna,

The State of Connecticut Department of Transportation (the Department) is applying for a Structures, Dredge, and Fill and Tidal Wetlands permit pursuant to Connecticut General Statute 22a-32 and 22a-361 from the Connecticut Department of Energy and Environmental Protection.

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Per the requirements of the permit application, please find attached a copy of the Structures, Dredge and Fill and Tidal Wetlands permit application for your use. If you have any questions or require additional information, please contact Mr. Andrew H. Davis, of my staff, at (860) 594-2157.

Very truly yours,

[Signature]
Kimberly C. Lesay
Transportation Assistant Planning Director
Bureau of Policy and Planning

Enclosure

cc: CTDEEP LWRD
June 26, 2019

Honorable Carl P. Fortuna, Jr.
First Selectman, Town of Old Saybrook
302 Main Street
Old Saybrook, CT 06475

Subject: State Project No. 105-215
   Replacement of Bridge No. 02708
   Route 154 over Plum Bank Creek
   Town of Old Saybrook
   Notice of Permit Application

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Very truly yours,

Kimberly C. Lessay
Transportation Assistant Planning Director
Bureau of Policy and Planning

Enclosure
cc: CTDEEP LWRD
June 26, 2019

Old Saybrook Conservation Commission
Town Hall
302 Main Street
Old Saybrook, CT 06475

Subject: State Project No. 105-215
Replacement of Bridge No. 02708
Route 154 over Plum Bank Creek
Town of Old Saybrook
Notice of Permit Application

To Whom It May Concern:

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Per the requirements of the permit application, please find attached a copy of the Structures, Dredge and Fill and Tidal Wetlands permit application for your use. If you have any questions or require additional information, please contact Mr. Andrew H. Davis, of my staff, at (860) 594-2157.

Very truly yours,

[Signature]
Kimberly C. Lessay
Transportation Assistant Planning Director
Bureau of Policy and Planning

Enclosure
cc: CTDEEP LWRD
June 26, 2019

Old Saybrook Shellfish Commission
Town Hall
302 Main Street
Old Saybrook, CT 06475

Subject: State Project No. 105-215
Replacement of Bridge No. 02708
Route 154 over Plum Bank Creek
Town of Old Saybrook
Notice of Permit Application

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Per the requirements of the permit application, please find attached a copy of the Structures, Dredge and Fill and Tidal Wetlands permit application for your use. If you have any questions or require additional information, please contact Mr. Andrew H. Davis, of my staff, at (860) 594-2157.

Very truly yours,

[Signature]
Kimberly C. Lesay
Transportation Assistant Planning Director
Bureau of Policy and Planning

Enclosure
cc: CTDEEP LWRD

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Permit Application Transmittal Form

Please complete this transmittal form in accordance with the instructions in order to ensure the proper handling of your application(s) and the associated fee(s). Print legibly or type.

Part I: Applicant Information:
- *If an applicant is a corporation, limited liability company, limited partnership, limited liability partnership, or a statutory trust, it must be registered with the Secretary of State. If applicable, applicant’s name shall be stated exactly as it is registered with the Secretary of State.
- If an applicant is an individual, provide the legal name (include suffix) in the following format: First Name; Middle Initial; Last Name; Suffix (Jr, Sr, Il, Iii, etc.).

Applicant: Connecticut Department of Transportation
Mailing Address: 2800 Berlin Turnpike
City/Town: Newington
Business Phone: 860-594-2931 ext:
Contact Person: Kimberly C. Lesay
E-Mail: kimberly.lesay@ct.gov

Applicant (check one): ☐ individual ☐ *business entity ☐ federal agency ☐ state agency ☐ municipality ☐ tribal
*If a business entity, list type (e.g., corporation, limited partnership, etc.):
☐ Check if any co-applicants. If so, attach additional sheet(s) with the required information as supplied above.

Please provide the following information to be used for billing purposes only, if different:
Company/Individual Name:
Mailing Address:
City/Town:
Contact Person:

State: CT Zip Code: 06131
Phone: 860-594-2931 ext.

Part II: Project Information

Brief Description of Project: (Example: Development of a 50 slip marine on Long Island Sound)
CTDOT Project 105-215, Replacement of Bridge No. 02708, Route 154 over Plum Bank Creek

Location (City/Town): Old Saybrook

Other Project Related Permits (not included with this form):

<table>
<thead>
<tr>
<th>Permit Description</th>
<th>Issuing Authority</th>
<th>Submittal Date</th>
<th>Issuance Date</th>
<th>Denial Date</th>
<th>Permit #</th>
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Project No. 0105-0215
### Part III: Individual Permit Application and Fee Information

<table>
<thead>
<tr>
<th>New, Mod. or Renew</th>
<th>Individual Permit Applications</th>
<th>Initial Fees</th>
<th>No. of Permits Applied For</th>
<th>Total Initial Fees</th>
<th>Original + Required Copies</th>
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<td>Title V Operating Permits</td>
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<td>Title IV</td>
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<td>Clean Air Interstate Rule (CAIR)</td>
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<td>To Groundwater</td>
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<td>Inland Wetlands and Watercourses (State Agencies Only)</td>
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<td>Inland 401 Water Quality Certification</td>
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<td>FERC- Hydropower Projects- 401 Water Quality Certification</td>
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<td>Aquatic Pesticide Application</td>
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<td>Waste Transportation</td>
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Subtotal ➔ 2 $660.00

GENERAL PERMITS and AUTHORIZATIONS

Enter subtotals from Part IV, pages 3 - 6 of this form

**TOTAL** ➔ 2 $660.00

Check # ➔

**AMOUNT REMITTED** ➔ $660.00

See fee schedule on individual application.
**Part IV: General Permit Registrations and Requests for Other Authorizations**

**Application and Fee Information**

<table>
<thead>
<tr>
<th>General Permits and Other Authorizations</th>
<th>Initial Fees</th>
<th>No. of Permits Applied For</th>
<th>Total Initial Fees</th>
<th>Original + Required Copies</th>
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<tbody>
<tr>
<td>AIR EMISSIONS</td>
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<tr>
<td>□ Limit Potential to Emit from Major Stationary Sources of Air Pollution</td>
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<td>□ Diagnostic and Therapeutic X-Ray Devices (Medical X-Ray) Registration</td>
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<td>□ Radioactive Materials and Industrial Device Registration (ionizing Radiation)</td>
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<td>□ Emergency/Temporary Authorization</td>
<td>★★</td>
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<td>★★</td>
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<tr>
<td>□ License Revocation Request</td>
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<td>★★</td>
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<tr>
<td>□ Other, (please specify):</td>
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<tr>
<td>WATER DISCHARGES</td>
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<tr>
<td>□ Categorical Industry User to a POTW</td>
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<tr>
<td>□ Discharges &gt; 10,000 gpd</td>
<td>$6250.00</td>
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<td>□ Discharges &lt; 10,000 gpd</td>
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<td>□ Comprehensive Discharges to Surface Water and Groundwater Registration Only</td>
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<td>□ Approval of Registration by DEEP</td>
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<tr>
<td>□ Domestic Sewage</td>
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<td>□ Food Service Establishment Wastewater</td>
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<tr>
<td>□ Groundwater Remediation Wastewater Registration Only</td>
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<td>□ Approval of Registration by DEEP</td>
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<td>□ Miscellaneous Discharges of Sewer Compatible Wastewater Registration Only</td>
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<td>□ Approval of Registration by DEEP</td>
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<td>□ Nitrogen Discharges</td>
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<tr>
<td>□ Point Source Discharges from Application of Pesticides</td>
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<td>□ Stormwater Associated with Commercial Activities</td>
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<td>□ Stormwater Associated with Industrial Activities</td>
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<td>□ No Exposure Certification</td>
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<tr>
<td>□ &lt;50 employees—see general permit for additional requirements</td>
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<tr>
<td>□ &gt;50 employees—see general permit for additional requirements</td>
<td>$1000.00</td>
<td></td>
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<td>1 + 0</td>
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<td>□ Stormwater &amp; Dewatering Wastewaters-Construction Activities</td>
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<td>□ Stormwater from Small Municipal Separate Storm Sewer Systems (MS4)</td>
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<td>□ Stormwater from DOT Separate Storm Sewer Systems (DOT MS4)</td>
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<td>□ Subsurface Sewage Disposal Systems Serving Existing Facilities</td>
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<td>□ Swimming Pool Wastewater - Public Pools and Contractors</td>
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<tr>
<td>□ Vehicle Maintenance Wastewater Registration Only</td>
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<tr>
<td>□ Approval of Registration by DEEP</td>
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<td>1 + 0</td>
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<tr>
<td>□ Emergency/Temporary Authorization - Discharge to POTW</td>
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<tr>
<td>□ Emergency/Temporary Authorization - Discharge to Surface Water</td>
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<td>□ Emergency/Temporary Authorization - Discharge to Groundwater</td>
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<td>□ Other, (please specify):</td>
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Note: Carry subtotals over to Part III, page 2 of this form.

Subtotal → 0 $0.00

★ See fee schedule on registration/application. ★★ Contact the specific permit program for this information.

(Contact numbers are provided in the instructions)
Part IV: General Permit Registrations and Requests for Other Authorizations (continued)

<table>
<thead>
<tr>
<th>General Permits and Other Authorizations</th>
<th>Initial Fees</th>
<th>No. of Permits Applied For</th>
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<tr>
<td>AQUIFER PROTECTION PROGRAM</td>
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<td>☐ Registration for Regulated Activities</td>
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<td>☐ Permit Application to Add a Regulated Activity</td>
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| WATER PLANNING AND MANAGEMENT            |              |                           |                   |                            |
| ☐ Dam Safety Repair and Alteration: Non Filing | No Registration |                   |                   |                            |
| ☐ Dam Safety Repair and Alteration: Filing – No PE | $100.00 |                           |                   | 1 + 0                      |
| ☐ Dam Safety Repair and Alteration: Filing – PE | $200.00 |                           |                   | 1 + 0                      |
| ☐ Dam Safety Repair and Alteration: Approval of Filing | $250.00 |                           |                   | 1 + 0                      |
| ☐ Diversion of Remediation Groundwater    | No Registration |                   |                   |                            |
| ☐ Diversion of Water for Consumptive Use: Reauthorization Categories | $2500.00 |                           |                   | 1 + 0                      |
| ☐ Diversion of Water for Consumptive Use: Authorization Required | $2500.00 |                           |                   | 1 + 4                      |
| ☐ Diversion of Water for Consumptive Use: Filing Only | $1500.00 |                           |                   | 1 + 1                      |
| ☐ Water Resource Construction Activities  | ★★           |                           |                   |                            |
| ☐ Emergency/Temporary Authorization       | ★★           |                           |                   |                            |
| ☐ Notice of High Hazard Dam or a Significant Hazard Dam | $0 |                           |                   | 1 + 0                      |
| ☐ Other, (please specify):                |              |                           |                   |                            |

| LAND AND WATER RESOURCES                |              |                           |                   |                            |
| ☐ Minor Coastal Structures              |              |                           |                   |                            |
| ☐ 4/40 Docks/Access Stairs              | $700.00      |                           |                   | 1 + 1                      |
| ☐ Beach Grading                         | No Registration |                   |                   |                            |
| ☐ Buoys or Markers                      | No Registration |                   |                   |                            |
| ☐ Experimental Activities/Scientific Monitoring Devices | No Registration |                   |                   |                            |
| ☐ Harbor Moorings                       | No Registration |                   |                   |                            |
| ☐ Non-harbor Moorings                   | $250.00      |                           |                   | 1 + 1                      |
| ☐ Osprey Platforms and Perch Poles       | No Registration |                   |                   |                            |
| ☐ Pump-out Facilities                   | No Registration |                   |                   |                            |
| ☐ Swim Floats                           | No Registration |                   |                   |                            |
| ☐ Coastal Maintenance                   |              |                           |                   |                            |
| ☐ Backflow Prevention Structure          | No Registration |                   |                   |                            |
| ☐ Beach Grading/Raking                  | No Registration |                   |                   |                            |
| ☐ Catch Basin Cleaning                   | No Registration |                   |                   |                            |
| ☐ Coastal Remedial Activities Required by Order | $700.00 |                           |                   | 1 + 1                      |
| ☐ Coastal Restoration                   | No Registration |                   |                   |                            |
| ☐ DEEP Boat Launch Infrastructures      | No Registration |                   |                   |                            |
| ☐ DOT Infrastructures                   | No Registration |                   |                   |                            |
| ☐ Marina and Mooring Field Reconfiguration | $700.00 |                           |                   | 1 + 1                      |
| ☐ Minor Seawall Repair                  | No Registration |                   |                   |                            |
| ☐ Placement of Cuiitch                   | No Registration |                   |                   |                            |
| ☐ Reconstruction of Legally Existing Structure/Obstruction/Encroachment | $300.00 |                           |                   | 1 + 1                      |
| ☐ Removal of Derelict Structures        | No Registration |                   |                   |                            |
| ☐ Residential Flood Hazard Mitigation   | $100.00      |                           |                   | 1 + 1                      |
| ☐ Temporary Access of Construction Vehicles/Equipment | No Registration |                   |                   |                            |
| ☐ Programmatic General Permit           | ★★           |                           |                   |                            |
| ☐ Emergency/Temporary Authorization      | ★★           |                           |                   |                            |
| ☐ Other, (please specify):              |              |                           |                   |                            |

Subtotal: $0.00

Note: Carry subtotals over to Part III, page 2 of this form.

★ See fee schedule on registration/application.
★★ Contact the specific permit program for this information.
(Contact numbers are provided in the instructions)
Part IV: General Permit Registrations and Requests for Other Authorizations (continued)

<table>
<thead>
<tr>
<th>General Permits and Other Authorizations</th>
<th>Initial Fees</th>
<th>No. of Permits Applied For</th>
<th>Total Initial Fee</th>
<th>Original + Required Copies</th>
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<tbody>
<tr>
<td><strong>WASTE MANAGEMENT</strong></td>
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<td>Addition of Grass Clippings at Registered Leaf Composting Facilities</td>
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<td>Beneficial Use Determination</td>
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<td>Collection and Storage of Post Consumer Paint</td>
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<tr>
<td>Connecticut Solid Waste Demonstration Project</td>
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<td>Construct and Operate a Commercial Facility for the Management of Recyclable Materials and Certain Solid Wastes (Commercial GP)</td>
<td>Initial/Mod Fee</td>
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<td>Asbestos Containing Materials</td>
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<td>Ash Residue</td>
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<td>Clean Wood: Tier III</td>
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<td>Clean Wood: Tier II</td>
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<tr>
<td>Construction and Demolition Waste: Tier III</td>
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<tr>
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<td>Non-RCRA Hazardous Waste/Compatible Solid Wastes</td>
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<td>Recyclables</td>
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<td>Universal Wastes/Compatible Solid Wastes</td>
<td>$1,250.00</td>
<td>1 + 0</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Contaminated Soil and/or Staging Management (Staging/Transfer)</strong></td>
<td>$250.00</td>
<td>1 + 0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>New Registrations</td>
<td>$250.00</td>
<td>1 + 0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>New Approval of Registrations</td>
<td>$1500.00</td>
<td>1 + 0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Renewal of Registrations</td>
<td>$250.00</td>
<td>1 + 0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Renewal of Approval of Registrations</td>
<td>$750.00</td>
<td>1 + 0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Disassembling Used Electronics</td>
<td>$2000.00</td>
<td>1 + 0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leaf Composting Facility</td>
<td>$0</td>
<td>1 + 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Municipal Transfer Station</td>
<td>$800.00</td>
<td>1 + 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>One Day Collection of Certain Wastes and Household Hazardous Waste</td>
<td>$1000.00</td>
<td>1 + 0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sheet Leaf Composting Notification</td>
<td>$0</td>
<td>1 + 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Special Waste Authorization</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Landfill or RRF Disposal</td>
<td>$660.00</td>
<td>1 + 0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asbestos Disposal</td>
<td>$300.00</td>
<td>1 + 0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>homeowner</td>
<td>$0</td>
<td>1 + 0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Storage and Processing of Asphalt Roofing Shingle Waste</td>
<td>$2500.00</td>
<td>1 + 0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Storage and Processing of Scrap Tires for Beneficial Use</td>
<td>$1250.00</td>
<td>1 + 0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Emergency/Temporary Authorization</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Other, (please specify):                 |              |                           |                  |                           |

**REMEDIATION**

| In Situ Groundwater Remediation: Enhance Aerobic Biodegradation | 1 + 2 | |
| In Situ Groundwater Remediation: Chemical Oxidation | $500.00 | 1 + 0 | |
| Emergency/Temporary Authorization | 1 + 0 | |

| Note: Carry subtotals over to Part III, page 2 of this form. | Subtotal | 0 | $0.00 |

★See fee schedule on registration/application. ★★ Contact the specific permit program for this information.

(Contact numbers are provided in the instructions)

Affirmative Action, Equal Employment Opportunity and Americans with Disabilities

The Connecticut Department of Energy and Environmental Protection is an Affirmative Action/Equal Opportunity Employer that is committed to complying with the requirements of the Americans with Disabilities Act (ADA). Please contact us at (860) 418-5910 or deep.accommodations@ct.gov if you: have a disability and need a communication aid or service; have limited proficiency in English and may need information in another language; or if you wish to file an ADA or Title VI discrimination complaint.
Connecticut Department of
Energy & Environmental Protection
Bureau of Water Protection & Land Reuse
Office of Long Island Sound Programs

Permit Application for Programs Administered by the Office of Long Island Sound Programs

IMPORTANT - Please refer to the instructions (DEEP-OLISP-INST-100) for completing this application form to ensure that all required information is provided. Print or type all information within the form, providing additional pages as necessary.

Part I: Permit Type and Fee Information

Check only one of the boxes below identifying the applicable state permit program(s). You must submit the initial fee indicated below and a copy of the published notice of permit application and the completed Certification of Notice Form with this application.

<table>
<thead>
<tr>
<th>Type of Permit</th>
<th>Initial Fee</th>
</tr>
</thead>
<tbody>
<tr>
<td>Structures, Dredging &amp; Fill CGS sec. 22a-361 (#1085)</td>
<td>$660.00</td>
</tr>
<tr>
<td>Structures, Dredging &amp; Fill and 401 Water Quality Certificate (#1632)</td>
<td>$660.00</td>
</tr>
<tr>
<td>Structures, Dredging &amp; Fill, and Tidal Wetlands CGS sec. 22a-361 &amp; sec. 22a-32 (#438)</td>
<td>$660.00</td>
</tr>
<tr>
<td>Structures, Dredging &amp; Fill, and Tidal Wetlands and 401 Water Quality Certificate (#417)</td>
<td>$660.00</td>
</tr>
<tr>
<td>401 Water Quality Certificate 33 U.S.C. 1341 (For Federal Use Only) (#1195)</td>
<td>None</td>
</tr>
</tbody>
</table>

Note: The fee for municipalities is 50% of the above listed rates. Additional fees based on the water area occupied by the project will be invoiced. The application will not be processed without the initial fee. The fee shall be non-refundable and shall be paid by check or money order to the Department of Energy and Environmental Protection.

Town where site is located: Old Saybrook

Brief Description of Project: Replacement of Bridge No. 02708 carrying Route 154 over Plum Bank Creek

The public notice of application must be published prior to submitting an application, as required in CGS section 22a-6g. A copy of the published notice of application and the completed Certification of Notice Form must be included as Attachment AA to this application. Your application will not be processed if Attachment AA is not included.

Date of Publication: March 8, 2019

☐ Check here, in addition to one of the boxes above, if your application is being submitted pursuant to CGS sec. 22a-361(a)(2)(d) to address a violation.
Part II: Applicant Information

- If an applicant is a corporation, limited liability company, limited partnership, limited liability partnership, or a statutory trust, it must be registered with the Secretary of State. If applicable, registrant's name shall be stated exactly as it is registered with the Secretary of State. Please note, for those entities registered with the Secretary of State, the registered name will be the name used by DEEP. This information can be accessed at the Secretary of State's database (CONCORD). (www.concord-sots.ct.gov/CONCORD/index.jsp)

- If an applicant is an individual, provide the legal name (include suffix) in the following format: First Name; Middle Initial; Last Name; Suffix (Jr, Sr., II, III, etc.).

- If there are any changes or corrections to your company/facility or individual mailing or billing address or contact information, please complete and submit the Request to Change Company/Individual Information to the address indicated on the form. If there is a change in name of the entity holding a DEEP license or a change in ownership, contact the Office of Planning and Program Development (OPPD) at 860-424-3003. For any other changes you must contact the specific program from which you hold a current DEEP license.

1. Applicant Name: Connecticut Department of Transportation
   Mailing Address: 2800 Berlin Turnpike
   City/Town: Newington
   Business Phone: 860-594-2931
   Contact Person: Kimberly C. Lesay
   *E-mail: kimberly.lesay@ct.gov

   *By providing this e-mail address you are agreeing to receive official correspondence from DEEP, at this electronic address, concerning the subject application. Please remember to check your security settings to be sure you can receive e-mails from "ct.gov" addresses. Also, please notify DEEP if your e-mail address changes.

   a) Applicant Type (check one):
      □ individual □ federal agency □ state agency □ municipality □ tribal
      □ *business entity (*if a business entity complete i through iii):
        i) check type: □ corporation □ limited liability company □ limited partnership
        □ limited liability partnership □ statutory trust □ Other: ______________________
        ii) provide Secretary of the State business ID #: ____________________ This information can be accessed at database (CONCORD). (www.concord-sots.ct.gov/CONCORD/index.jsp)
        iii) □ Check here if your business is NOT registered with the Secretary of State's office.

   b) Applicant's interest in property at which the proposed activity is to be located:
      □ site owner □ option holder □ lessee
      □ easement holder □ operator □ other (specify): _____________________________

      □ Check if any co-applicants. If so, attach additional sheet(s) with the required information as requested above.

   Note: If the applicant is not the owner, submit written permission from the owner as Attachment B.

2. List billing contact, if different than the applicant.
   Name:
   Mailing Address:
   City/Town: ____________________________ State: __________ Zip Code: ________
   Business Phone: ______________________ ext.
   Contact Person: ________________________ Title: ____________________________
Part II: Applicant Information (continued)

3. List primary contact for departmental correspondence and inquiries if different than applicant.
   Name: 
   Mailing Address: 
   City/Town: State: Zip Code: 
   Business Phone: ext. 
   Contact Person: Title: 
   *E-mail: 

4. List Site Owner, if different than applicant:
   Name: 
   Mailing Address: 
   City/Town: State: Zip Code: 
   Business Phone: ext. 
   Contact Person: Title: 
   E-mail: 

5. List Facility Owner, if different than applicant:
   Name: 
   Mailing Address: 
   City/Town: State: Zip Code: 
   Business Phone: ext. 
   Contact Person: Title: 
   E-mail: 

6. List attorney or other representative, if applicable.
   Firm Name: 
   Mailing Address: 
   City/Town: State: Zip Code: 
   Business Phone: ext. 
   Attorney: Title: 
   E-mail: 

7. List all engineer(s), surveyor(s) and/or other consultant(s) employed or retained to assist in preparing the application and designing or constructing the activity.
   Name: Connecticut Department of Transportation 
   Mailing Address: 2800 Berlin Turnpike 
   City/Town: Newington State: CT Zip Code: 06111 
   Business Phone: 860-594-3313 ext. 
   Contact Person: Raymond I. Basar Title: Project Engineer 
   E-mail: raymond.basar@ct.gov 
   Service Provided: Project Engineer & Permit Preparation 
   ☐ Check if additional Applicant Information sheets are included, and label and attach them to this sheet. 

8. A pre-application meeting with Office of Long Island Sound Program (OLISP) staff is strongly recommended prior to application submission. Please note the meeting date and OLISP staff person's name:
   Staff Name: Meeting Date: 
Part III: Project Information

1. Describe the proposed regulated work and activities in a detailed narrative, including the number and dimensions of structures. Refer to both the instructions and Appendix A of the instructions (Activity Specific Instructions).

   Regulated work in the project includes the construction of new abutments, behind the existing abutments, placement of riprap at the four quadrants of the bridge (majority of which is within the existing riprap footprints, and fill associated with the slight raise in the roadway profile and installation of new guiderail which necessitates slight increase in roadway embankment fill slopes on the approaches to the bridge. Existing bridge will be replaced with a single span bridge constructed of prestressed concrete box beams on integral abutments. The new structure will be 47' long and have an out-to-out width of 36'. Existing abutments will be cut down in-place to an elevation of 2.0ft. Concrete block revetments will be installed between the old and new abutments. The existing low-chord of the bridge will be maintained in the final condition. Native plantings will be installed within all disturbed areas. Existing utility poles will be temporarily relocated and will meet USACE vertical clearance requirements. The existing watermain will be temporarily relocated upstream of the bridge and placed on the bridge in the final condition.

2. a. Describe the construction activities involved for the project in detail, including methods, sequencing, equipment, and any alternative construction methods that might be employed.

   The bridge will be closed to traffic during its construction. Temporary earth retaining systems (TERS) will be installed at both western corners of the bridge at Elev. 6.0' to temporarily relocate utility poles. Temporary piles and support beam will be installed east of the bridge to carry a temporary water main during construction. The water main will be moved to the proposed structure toward the end of construction and the temporary piles and support will be removed. The minimum elevation of the temporary support is 7.0'. The existing structure will be demolished to the mudline (approximately 2.0' elevation). Debris will be collected by a debris shield float. Both the debris and float will be stored away from the watercourse when not in use. Permanent sheet piling will be driven in place behind the existing bridge abutments, enclosing the the locations of the proposed abutments and wingwalls. Excavation will occur within the enclosed sheeting using typical excavation equipment to elevation -4.5'. Water within the sheeting will be pumped to dewatering basins prior to discharge into Plum Bank Creek. The pump will remain in-place during construction of piles, abutment and wingwall pile caps, and bracing for the sheeting. The pumps will be removed prior to backfilling within the enclosed sheeting. The permanent sheet piling will be reduced to elevation -0.75'. The bridge box beams will be placed using cranes. A reinforced concrete deck will be constructed on the beams. All formwork will be removed off-site once installation is complete. Roadway construction and embankment regrading will utilize typical excavation and compaction equipment including excavators, dump trucks, pavers, and graders. Concrete block revetments and riprap will be placed with similar equipment. The temporary utility poles and TERS will be removed and replanting will occur.
b. Describe any erosion and sedimentation or turbidity control installation and maintenance schedule and plans in detail.

Sediment control systems will be installed along the roadway embankments at the edges of the project limits, outside of the wetlands where possible. Permanent sheet piling will be installed around the abutments in order to protect the structure from scour. Dewatering basins will be utilized for treatment of any infiltrated water. The dewatering basins will be inspected daily throughout use and will be cleaned when sediment reaches half the height of the basin. A concrete revetment will be installed between each new abutment and the remaining portion of each existing abutment for stability and scour protection. Standard riprap will be installed adjacent to the wingwalls for scour protection. Turbidity curtains will be installed at each existing wingwall when the existing substructure is reduced to the mudline and when riprap is installed.

c. Indicate the length of time needed to complete the project and identify any anticipated time period restrictions.

The proposed bridge replacement is anticipated to last from March 2020 through May 2020. Bridge 02708 is one of two bridges allowing vehicle and pedestrian access to the Island community. It must remain open between Memorial Day and Labor Day to allow beach-goers easy access to Harvey's Beach during the summer season.
Part III: Project Information (continued)

3. Describe the purpose of, the need for, and intended use of the proposed activities. (For example, private recreational boating, marina, erosion protection, public infrastructure, etc.)

   Bridge 02708 is one of only two means for wheeled vehicles to access an island community and the public beaches located on the island and are therefore necessary to preserve the island’s economy, utilities, and recreation facilities. The bridge is in "serious" condition, according to the most recent inspection report, and must be replaced in order to meet the primary transportation needs in the coastal area. The bridge replacement is designed and will be constructed so as to minimize adverse impacts to the coastal region.

4. Identify and describe all coastal or aquatic resources on the site by checking the appropriate box and describe the expected impact on these resources. You may add addenda as necessary as Attachment M.

<table>
<thead>
<tr>
<th>Coastal/Aquatic Resources</th>
<th>On-site</th>
<th>Adjacent</th>
<th>Describe Expected Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coastal bluffs and escarpments</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rocky Shoresfront</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Beaches and Dunes</td>
<td></td>
<td></td>
<td>Beaches and dunes will not be impacted because work only occurs within the existing Highway Right-of-Way. Any impacts due to accommodate the new structure and roadway alignment will be minor.</td>
</tr>
<tr>
<td>Intertidal Flats</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tidal Wetlands</td>
<td></td>
<td></td>
<td>Intertidal wetlands will be permanently impacted by the addition of rip rap for scour protection and by the additional fill necessary to accommodate the vertical alignment of the new structures. 1095 SF (perm) and 585SF (temp) of tidal wetlands will be impacted. Native plantings will be included in impacted areas where riprap is not being installed.</td>
</tr>
<tr>
<td>Fresh Water Wetlands and Watercourses</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Estuarine Embayments</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coastal Hazard Areas</td>
<td></td>
<td></td>
<td>The entire project site is located within a mapped FEMA 100-year Zone (VE-EL-14) floodplain, however no adverse impacts are anticipated. The proposed structure may provide a slight improvement over existing conditions by providing a larger hydraulic opening. Flood Management Certification will be sought from CTDEEP IWRD.</td>
</tr>
<tr>
<td>Developed Shorefront</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Islands</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Near shore Waters</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Offshore Waters</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shorelands</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shellfish Concentration Areas</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wildlife Resources and Habitat</td>
<td>☐</td>
<td>☒</td>
<td>Wildlife Resources and Habitat will not be impacted due to efforts described in Section 2, above, to minimize impacts, working only within the highway right-of-way, and because the timing of construction avoids the breeding season of most species.</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>---</td>
<td>---</td>
<td>--------------------------------------------------</td>
</tr>
<tr>
<td>Benthic (bottom) Habitat</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>Indigenous aquatic life, including shellfish and finfish</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
<tr>
<td>Submerged Aquatic Vegetation</td>
<td>☐</td>
<td>☐</td>
<td></td>
</tr>
</tbody>
</table>
Part III: Project Information (continued)

5. Identify whether the proposed activities will impact the following categories. If so, describe the expected impact, adding addenda as necessary as Attachment M.

<table>
<thead>
<tr>
<th>Categories</th>
<th>Yes</th>
<th>No</th>
<th>Describe Expected Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prevention or alleviation of shoreline erosion and coastal flooding</td>
<td>☑</td>
<td>□</td>
<td>Shoreline erosion will be prevented where riprap is placed adjacent to the bridge. Flooding on Route 154 will be slightly reduced in the project locations due to increasing the vertical alignment of the roadway.</td>
</tr>
<tr>
<td>Use and development of adjoining uplands</td>
<td>□</td>
<td>☑</td>
<td></td>
</tr>
<tr>
<td>Use and development of adjacent lands and properties</td>
<td>□</td>
<td>☑</td>
<td></td>
</tr>
<tr>
<td>Improvement of coastal and inland navigation for all vessels, including small craft for recreational purposes</td>
<td>☑</td>
<td>□</td>
<td>Construction will temporarily reduce the navigable waterway when the existing structure is demolished and debris is collected, during in-water work at the existing abutments, and during superstructure placement. There are no permanent impacts to navigation.</td>
</tr>
<tr>
<td>Pollution control</td>
<td>☑</td>
<td>□</td>
<td>Proper erosion and sediment controls and water handling during construction will be utilized to minimize impacts. Pumps within the enclosed sheet piling will drain to dewatering basins prior to draining into Plum Bank Creek.</td>
</tr>
<tr>
<td>Water quality</td>
<td>☑</td>
<td>□</td>
<td>Proper erosion and sediment controls and water handling during construction will be utilized to minimize impacts. Pumps within the enclosed sheet piling will drain to dewatering basins prior to draining into Plum Bank Creek.</td>
</tr>
<tr>
<td>Water circulation and drainage</td>
<td>□</td>
<td>☑</td>
<td></td>
</tr>
<tr>
<td>Recreational use of public water</td>
<td>☑</td>
<td>□</td>
<td>Construction will temporarily reduce the navigable waterway when the existing structure is demolished and debris is collected, during in-water work at the existing abutments, and during superstructure placement. There are no permanent impacts to navigation.</td>
</tr>
<tr>
<td>Management of coastal resources</td>
<td>☑</td>
<td>□</td>
<td>Tidal Wetlands will be impacted by the addition of riprap for scour protection and additional fill to accomodate the increased vertical alignment of the roadway. Native plantings are being provided to replace vegetation in impacted areas where riprap will not be installed.</td>
</tr>
<tr>
<td>Public health and welfare</td>
<td>☑</td>
<td>□</td>
<td>The detour route during construction is 4.5 miles. Public safety will be improved by replacing the deteriorated bridge.</td>
</tr>
<tr>
<td>The protection of life and property from flood, hurricane and other natural disasters</td>
<td>☑</td>
<td>□</td>
<td>The proposed permanent sheet piling will protect the bridge during natural disasters, allowing emergency vehicles to access the island community after the event.</td>
</tr>
</tbody>
</table>
6. Identify and evaluate any potential beneficial and adverse impacts to:

   a. navigation: (include federal and local navigation channels and distance to nearby docks)

      During construction, navigation will be restricted when the existing structure is demolished
      and debris is collected and during in-water work, which will be required to remove the tops of the
      existing abutments and wingwalls, temporarily reducing the navigable waterway. There will also be
      short duration restrictions during superstructure placement. There are no permanent impacts to
      navigation. The low chord of the proposed structure will be at 5.0 ft. elevation, minimum, which is
      the approximate low chord of the current bridge.

      The nearest boat docks are approximately 70 feet from the bridge.

   b. public access to, and public use of, public trust lands and waters waterward of mean high water:

      There are no adverse impacts.
Part III: Project Information (continued)

7. Describe how the proposed work will be a water-dependent use(s) of the property or will physically support water-dependent use(s) of the property, such as marinas, recreational and commercial fishing, boating facilities, shipyards and boat building facilities. Please do not include private recreation docks in this category. Include how upland facilities, such as sanitary facilities, designated parking, boat repair and sales, winter storage, etc., will support water-dependent uses on-site.

Construction will temporarily restrict the watercourse’s recreational use and navigability when the existing structure is demolished and debris is collected, during in-water partial concrete abutment removal, and during placement of the proposed bridge superstructure. The project will not cause any permanent adverse impacts for water-dependent uses.

8. Identify and evaluate the potential adverse impacts of the proposed work upon future water-dependent development opportunities and activities.

There are no adverse impacts.

9. Discuss the alternatives to the proposed project which were considered and indicate why they were rejected.

The bridge is designed for overtopping conditions. The alternative to raise the roadway profile above storm-related events would require raising the profile of Route 154 to a degree that would cause an unreasonable amount of wetland impacts and disruption to local roadway and private driveways.

The alternative to move the abutments beyond critical scour zones was rejected because it would result in a multi-span structure and an unreasonable amount of wetland impacts and disruption to local roadway and private driveways.

The alternative to reduce the underclearance of the bridge in order to reduce the roadway vertical alignment changes was rejected because it would restrict boat use under the bridges.

The alternative to use long retaining walls instead of roadway embankment grading was rejected because the retaining wall embankments would require additional scour protection measures and an unreasonable amount of wetland impacts.
Part III: Project Information (continued)

10. After all measures to eliminate or minimize adverse impacts have been incorporated in the proposed project, describe why any adverse impacts that remain should be deemed acceptable by OLISP.

The project's regulated areas of impact are necessary for the long-term protection of the bridge structure and for the safety of the traveling public. The impact of the installation of scour protection measures is required for embankment stability adjacent to the bridge and for the safety of the public. Replanting of native species will be provided at other impacted areas.

11. a. Is any portion of the work for which authorization is being sought now complete or under construction?

☐ Yes  ☒ No  If No, skip to question #12.

b. Specify what parts of the proposed work have been completed or are under construction.

c. Indicate when such work was undertaken or completed. Identify completed portions on the plans submitted.

d. When did you acquire interest in this property?

e. Were you responsible for the unauthorized activity as a result of actions taken before the acquisition of the property?  ☐ Yes  ☐ No  If Yes, explain.
Part III: Project Information (continued)

f. Did you know or have reason to know of the unauthorized activity?  □ Yes □ No  If Yes, explain.

g. Is this application associated with an enforcement action pending with DEEP?  □ Yes □ No  If Yes, explain:

12. Is there or will there be any federal and/or state funding of this project?  ☑ Yes □ No  If Yes, explain.

The preliminary engineering phase of this project is 80% Federal and 20% State funded. The construction phase is 100% State funded.

☐ Check here if additional Project Information sheets are necessary, and label and attach them to this sheet.

Part IV: Site and Resource Information

1. SITE NAME AND LOCATION

Name of Site: Bridge No. 02708
Street Address or Location Description: Route 154 bridge over Plum Bank Creek
City/Town: Old Saybrook  State: CT  Zip Code: 06475
Tax Assessor's Reference: Map  Block  Lot
Latitude and longitude of the exact location of the proposed activity in degrees, minutes, and seconds or in decimal degrees:
Latitude: N 41°16'18.9"  Longitude: W 72°23'36.5"
Method of determination (check one):
☐ GPS  ☐ USGS Map  ☑ Other (please specify):
If a USGS Map was used, provide the quadrangle name: Google Earth

2. INDIAN LANDS: Will the activity which is the subject of this application be located on federally recognized Indian lands?  □ Yes □ No

3. COASTAL AREA: Is the project site located in a municipality within the coastal area? (check town list in the instructions)  ☑ Yes □ No

4. ENDANGERED OR THREATENED SPECIES: According to the most current "State and Federal Listed Species and Natural Communities Map", will the activity which is the subject of this application, including all impacted areas, be located within an area identified as a habitat for endangered, threatened or special concern species?  ☑ Yes □ No  Date of Map: December 2017
Part IV: Site Information (continued)

If yes, complete and submit a Request for NDDB State Listed Species Review Form (DEEP-APP-007) to the address specified on the form, prior to submitting this application. Please note NDDB review generally takes 4 to 6 weeks and may require additional documentation from the applicant. A copy of the completed Request for NDDB State Listed Species Review Form and the CT NDDB response must be submitted with this completed application as Attachment C.

For more information visit the DEEP website at www.ct.gov/deep/nddbrequest or call the NDDB at 860-424-3011.

5. AQUIFER PROTECTION AREAS: Is the site located within a mapped Level A or Level B Aquifer Protection Area, as defined in CGS section 22a-354a through 22a-354bb?

☐ Yes  ☒ No  If yes, check one:  ☐ Level A  or  ☐ Level B

If Level A, are any of the regulated activities, as defined in RCSA section 22a-354i-1(34), conducted on this site?  ☐ Yes  ☐ No

If yes, and your business is not already registered with the Aquifer Protection Program, contact the local aquifer protection agent or DEEP to take appropriate actions.

For more information on the Aquifer Protection Area Program visit the DEEP website at www.ct.gov/deep/aquiferprotection or contact the program at 860-424-3020.

6. SHELLFISH COMMISSION: Does your town have a shellfish commission?  ☒ Yes  ☐ No

If yes, you must submit a completed Shellfish Commission Consultation Form (DEEP-OLISP-APP-101D) with this application as Attachment D.

7. HARBOR MANAGEMENT COMMISSION: Does your town have a Harbor Management Commission?

☒ Yes  ☐ No

If yes, you must submit a completed Harbor Management Commission Consultation Form (DEEP-OLISP-APP-101E) with this application as Attachment E.

8. DEPARTMENT OF AGRICULTURE/BUREAU OF AQUACULTURE: If the subject site is located in a specific area as explained in Part IV, Item 8 of the application instructions (DEEP-OLISP-INST-100), you must submit a completed Department of Agriculture/Bureau of Aquaculture Consultation Form (DEEP-OLIS-APP-101F) as Attachment F.

9. CONSERVATION OR PRESERVATION RESTRICTION: Will the activity which is the subject of this application be located within a conservation or preservation restriction area?  ☐ Yes  ☒ No

If Yes, proof of written notice of this application to the holder of such restriction or a letter from the holder of such restriction verifying that this application is in compliance with the terms of the restriction, must be submitted as Attachment G.

10. Indicate the number and date of issuance of any previous state coastal permits or certificates issued by DEEP authorizing work at the site and the names to whom they were issued.

<table>
<thead>
<tr>
<th>Permit/COP Number</th>
<th>Date Issued</th>
<th>Name of Permittee/Certificate Holder</th>
</tr>
</thead>
<tbody>
<tr>
<td>N/A</td>
<td>10/19/1953</td>
<td>State Highway Department</td>
</tr>
</tbody>
</table>
Part IV: Site Information (continued)

11. Identify any changes in conditions of the site (including ownership, development, use, or natural resources) since the issuance of the most recent state permit or certificate authorizing work at the site.

   The existing bridge was built in 1934. Since its construction, the bridge has been owned and operated by the Department of Transportation and continually in service without change.

12. a. Identify and describe the existing municipal zoning classification of the site.

   Residence A District (Single family homes and home businesses allowed)

b. Identify and describe the existing land use(s) on and adjacent to the site.

   The northeast, northwest, and southeast approaches are undeveloped. The southwest approach is residential with boat docks just west of the closest residential property.

13. Provide the name of the waterbody at the site of proposed work: Plum Bank Creek

14. Provide the elevation of the applicable regulatory limit for your project referenced to NAVD88. Refer to the instructions for more information.

   ☑ Tidal Wetlands Limit = 3.9 ft  ☐ Coastal Jurisdiction Limit = 2.9 ft

15. How was the regulatory limit identified above determined? Please check one of the following:

   ☑ DEEP-calculated elevation

   ☐ Self-calculated elevation (If a self-calculated elevation is used, please provide the additional information and calculations per the instructions.)

   ☐ Mean High Water elevation (use only if project is upstream of a tide gate, dam or weir)

   (If a MHW elevation is used, provide a discussion of the location of the tide gate, dam or weir.)

   If other than a DEEP calculated elevation was used to calculate the C JL, please provide the additional information and calculations per the instructions and label and attach them as Attachment M.

16. Provide the elevations of the mean high water and mean low water at the site and the reference datum used. Refer to the instructions regarding elevation datum.

   MHW = 1.3 ft  MLW = 2.3 ft  Datum = NAVD 88

   ☐ Check here if NAVD88 is not referenced, and provide an orthometric conversion table in Attachment M.
Part V: Supporting Documents

The supporting documents listed below must be submitted with the application and labeled as indicated. The specific information required in each attachment is described in the Instructions for Completing a Permit Application for Programs Administered by the Office of Long Island Sound Programs (DEEP-OLIS-INST-100). Check the box by the attachments listed to indicate that they have been submitted.

| Attachment AA: | A copy of the published notice of permit application, as described in the instructions, attached to a completed *Certification of Notice Form* (DEEP-APP-005A) |
| Attachment A: | Executive Summary; summarize the information contained in the complete application which must include a description of the proposed regulated activities and a synopsis of the environmental and engineering analyses of the impact of such activities. Include a list of the titles of all plans, drawings, reports, studies, appendices, or other documentation which are attached as part of the application. |
| Attachment B: | If the applicant is not the owner, submit written permission from the owner as Attachment B. |
| Attachment C: | Copy of the completed *Request for NDDB State Listed Species Review Form* (DEEP-APP-007) and the NDDB response, if applicable. |
| Attachment D: | *Shellfish Commission Consultation Form* (DEEP-OLIS-APP-101D), if applicable. |
| Attachment E: | *Harbor Management Commission Consultation Form* (DEEP-OLIS-APP-101E), if applicable. |
| Attachment F: | *Department of Agriculture/Bureau of Aquaculture Consultation Form* (DEEP-OLIS-APP-101F), if applicable. |
| Attachment G: | Conservation or Preservation Restriction Information, if applicable. |
| Attachment H: | *Applicant Compliance Information Form* (DEEP-APP-002). |
| Attachment I: | Provide plans of the project as Attachment I. They must be 8 1/2” x 11” scaled plans of the site and proposed work, with the datum of the measurements noted, including: |
| | a. A Vicinity Map; |
| | b. A Tax Assessor’s Map showing the Map, Block and Lot #, subject property and immediately adjacent properties; |
| | c. Plan Views showing existing and proposed conditions, including vessel berthing arrangement, based on a site survey prepared by a licensed surveyor; and |
| | d. An Elevation or Cross-Section View showing existing and proposed conditions, including vessel berthing arrangement, based on a site survey prepared by a licensed surveyor. Please refer to Attachment I of the instructions for identification and discussion of required plan components. |
| Attachment J: | Photographs showing existing conditions of the site. |
| Attachment K: | Land owner information, including names and mailing addresses, for all land owners of record for any property located five hundred feet (500) or less from the property lines of the subject property. Certification that a copy of the Notice of Application was sent to each identified property owner and names and addresses of any known claimants of water rights adjacent to the project and owners or lessees of shellfish grounds or franchises within the area which work is proposed. |
| Attachment L: | *Applicant Background Information Form* (DEEP-APP-008) (if applicable). |
| Attachment M: | Other Information: Any other information the applicant deems relevant or is required by DEEP. |
| Attachment N: | *US. Army Corps of Engineers Consultation Form* (DEEP-OLISP-APP-101N). |
Part VI: Applicant Certification

The applicant(s) and the individual(s) responsible for actually preparing the application must sign this part. An application will be considered insufficient unless all required signatures are provided.

"I have personally examined and am familiar with the information submitted in this document and all attachments thereto, and I certify that based on reasonable investigation, including my inquiry of the individuals responsible for obtaining the information, the submitted information is true, accurate and complete to the best of my knowledge and belief.

I understand that a false statement in the submitted information may be punishable as a criminal offense, in accordance with section 22a-6 of the General Statutes, pursuant to section 53a-157b of the General Statutes, and in accordance with any other applicable statute.

I certify that this application is on complete and accurate forms as prescribed by the commissioner without alteration of the text.

I certify that I have complied with all notice requirements as listed in section 22a-6g of the General Statutes."

Signature of Applicant

[Signature]

6/27/2019

Date

Thomas J. Maziarz

Name of Applicant (print or type)

[Signature]

6/29/19

Date

Raymond I. Basar

Name of Preparer (if different than above)

[Signature]

Bureau Chief, Policy & Planning

Title (if applicable)

Project Engineer

Title (if applicable)

☐ Check here if additional signatures are required. If so, please reproduce this sheet and attach signed copies to this sheet. You must include signatures of any person preparing any report or parts thereof required in this application (i.e., professional engineers, surveyors, soil scientists, consultants, etc.)

Note: Please submit the completed Application Form, Fee, and all Supporting Documents to:

CENTRAL PERMIT PROCESSING UNIT
DEPARTMENT OF ENERGY AND ENVIRONMENTAL PROTECTION
79 ELM STREET
HARTFORD, CT 06106-5127

Please remember to publish notice of the permit application prior to submitting your completed application to DEEP. Send a copy of the published notice to the chief elected official of the municipality in which the regulated activity is proposed and provide DEEP with a copy of the published notice, as described in the instructions, attached to a completed Certification of Notice Form (DEEP-APP-005A) as Attachment AA to this application.

Also send a copy of the notice to the Chairman of the Shellfish Commission and to the Chairman of the Harbor Management Commission in the municipality in which the regulated activity is proposed, where applicable. Refer to the Shellfish Commission and Harbor Management Commission lists for contact information.

Submit one complete application copy to the U.S. Army Corps of Engineers, Regulatory Division, 696 Virginia Road, Concord, MA, 01742.

If you are submitting a tidal wetlands application, mail complete application copies to the municipal CEO, Shellfish Commission and Conservation Commission.
Attachment A: Executive Summary

PROJECT 105-215
RT. 154 PLUM BANK CREEK
OLD SAYBROOK
BRIDGE NO. 02708

TABLE OF CONTENTS

| Permit Application for Office of Long Island Sound Programs | 16 pages |
| Published Notice of Permit Application – Attachment AA | 2 pages |
| Executive Summary – Attachment A | 2 pages |
| Request for NDDB State Listed Species Review Form – Attachment C | 1 page |
| Shellfish Commission Consultation Form – Attachment D | 16 pages |
| Harbor Management Commission Consultation Form – Attachment E | 3 pages |
| DA/BA Consultation Form – Attachment F | 3 pages |
| Project Plans – Attachment I | 9 pages |
| Photographs – Attachment J | 1 page |
| Land Owner Information – Attachment K | 3 pages |
| Attachment M – Other Information | 53 pages |
| U.S. Army Corps of Engineers Consultation Form – Attachment N | 3 pages |

EXECUTIVE SUMMARY

Bridge No. 02708 carries US Route 154 over Plum Bank Creek in the Town of Old Saybrook. The bridge is located approximately 0.75 miles from Old Boston Post Road. It was built in 1935 and carries an average 4600 vehicles per day. Bridge 02708 is a single span concrete slab. It is approximately 19’ long with a 30’ curb to curb width. The abutments and wingwalls are in water and are comprised of concrete with timber facing. Concrete struts connect the abutments beneath the channel. The open concrete parapets have metal beam rails installed on each approach along each side of the roadway that are continuous across the bridge.

Bridge No. 02708 is evaluated as “Serious” and is currently on an increased inspection frequency due to deterioration to the superstructure. The abutments and wingwalls have large cracks and spalls and their footings are exposed due to scour. Due to the extent of deterioration the structure must be replaced.

The proposed project consists of replacing the bridge with a single span structure comprised of prestressed concrete box beams integral with concrete abutments, wingwalls, and deck. The existing abutments and wingwalls will be partially removed down to Elev. 2.0 feet and the new abutments will be placed behind them. For scour protection, the project proposes permanent sheet piling around the new abutments and wingwalls. Concrete block revetments will be placed between the new and existing abutments. Standard riprap will be placed adjacent to the new...
structure’s wingwalls but not within the channel. The approach roadways will be raised to meet
the vertical profiles of the new bridge. Snow shelves and guiderail barriers will be incorporated
into the approaches. Construction will require a Spring-time detour of approximately 12 weeks,
which is scheduled to occur in Spring of 2020.

The bridge will be built behind the existing abutments in order to minimize adverse impacts to
adjacent property and coastal wetlands, simplify water handling, and reduce the duration of
construction. The elevation of the current structure’s low chord, which is approximately 5.0 feet,
will be maintained. The 100-year frequency coastal storm event can be anticipated to produce a
storm surge and wave activity that will be 8-9 feet above the Route 154 roadway elevation.
Providing a hydraulically adequate structure is not feasible due to the adjacent properties and
coastal wetlands that would be severely impacted. Instead, the new structure will provide long
term serviceability and be able to withstand the forces and the flooding conditions generated
during the 100-year frequency storm event; remaining serviceable following the subsidence of
the flooding events.

This project has been presented to DEEP and USACE and their comments have been
incorporated into the project documents. Coordination with DEEP Fisheries and NDDB has
been completed. There will be temporary and permanent wetland impacts totaling 1,680 square
feet. Permits will be obtained from DEEP and ACOE prior to start of construction.

Existing utility poles owned by Eversource carry 13.8kV electric lines and communications lines
overhead along the west edge of the roadway. Utility poles near the bridge will be temporary
relocated further west in order to allow safe usage of construction equipment. After bridge
construction is complete, the utility poles will be relocated adjacent to the roadway edge. Electric
lines will be at least 20 feet above the bottom of the bridge and the communications lines will be
at least 10 feet above the bottom of the bridge in both the temporary and final conditions. The
structure also carries an 8” diameter water main, which is owned by The Connecticut Water
Company, at its west fasciae. The water main will be temporarily relocated east of the structure,
on a temporary support, during construction then moved to its final location at the east fascia of
the structure. The temporary support will be then be removed. The Connecticut Water
Company will upgrade the water main to 12” diameter.
Attachment C: NDDB
Ms. Amanda Saul  
CT Department of Transportation  
PO Box 317546  
2800 Berlin Turnpike  
Newington, CT 06111  
amanda.saul@ct.gov

Project: CTDOT Project No. 105-209, Replacement of Bridge No. 02708, Route 154 over Plum Bank Creek in Old Saybrook, Connecticut  
NDDDB Determination No.: 201900702

Dear Amanda Saul,

I have reviewed Natural Diversity Data Base maps and files regarding the area delineated on the map provided for CTDOT Project No. 105-209, Replacement of Bridge No. 02708, Route 154 over Plum Bank Creek in Old Saybrook, Connecticut.

Thank you for pre-screening NDDDB species information. I concur with your findings regarding the State Special Concern Maiaclenus terrapin terrapin (diamondback terrapin) that are known to occur from Harveys Beach (which is 800 feet from the bridge project site). I do not anticipate any adverse impacts to this turtle since the project area is not ideal habitat and the only in water work involves a float which will not disturb the diamondback terrapins. We also have extant known populations of saltmarsh sharp-tailed sparrow (Ammodramus caudacutus) from this area but I do not anticipate adverse impacts to this bird species since project activities will take place in full, winter and spring, which is outside the nesting time for these birds.

This determination is good for two years. Please re-submit an NDDDB Request for Review if the scope of work changes or if work has not begun on this project by February 6, 2021.

Natural Diversity Data Base information includes all information regarding critical biological resources available to us at the time of the request. This information is a compilation of data collected over the years by the Department of Energy and Environmental Protection's Natural History Survey and cooperating units of DEEP, private conservation groups and the scientific community. This information is not necessarily the result of comprehensive or site-specific field investigations. Consultations with the Data Base should not be substitutes for on-site surveys required for environmental assessments. Current research projects and new contributors continue to identify additional populations of species and locations of habitats of concern, as well as, enhance existing data. Such new information is incorporated into the Data Base as it becomes available. The result of this review does not preclude the possibility that listed species may be encountered on site and that additional action may be necessary to remain in compliance with certain state permits.

Please contact me if you have further questions at (860) 424-3592, or dawne.mckay@ct.gov. Thank you for consulting the Natural Diversity Data Base.

Sincerely,

Dawn M. McKay  
Environmental Analyst 3

February 6, 2019
ATTACHMENT D: SHELLFISH COMMISSION

DEEP PERMIT CONSULTATION FORM

You need to complete and submit this form only if your town has a Shellfish Commission.

To the applicant: Prior to the submission of your permit application to the Connecticut Department of Energy and Environmental Protection- Office of Long Island Sound Programs (DEEP-OLISP), please complete Part I and submit this form to your local shellfish commission (contact the town for the appropriate contact person) with a location map of your site and project plans. Once the commission returns the completed form to you, please submit it along with your permit application to the DEEP.

Part I: To be completed by APPLICANT

1. List applicant information.
   Name: Connecticut Department of Transportation
   Mailing Address: 2800 Berlin Turnpike
   City/Town: Newington
   Business Phone: 860.594.2931
   Contact Person: Kimberly C. Lesay
   Email: kimberly.lesay@ct.gov
   State: CT Zip Code: 06131
   Ext.
   Fax: 860.594.3028
   Title: Transp. Assistant Planning Director

2. List engineer/surveyor/agent information.
   Name: Ryan D. Martin
   Mailing Address: 2800 Berlin Turnpike
   City/Town: Newington
   Business Phone: 860.594.3205
   Contact Person:
   Service Provided: Engineering & Permitting
   State: CT Zip Code: 06131
   Ext.
   Fax: 860.594.3218
   Title:

3. Site Location:
   Street Address or Location Description: Engineering & Permitting
   City/Town: Old Saybrook
   Tax Assessor's Reference: Map
   State: CT Zip Code: Block Lot

4. Are plans attached? ☑ Yes ☐ No If Yes, provide date of plans: 1/22/2019

5. Provide or attach a brief, but thorough description of the project: CTDOT Project 105-215 proposes the replacement of Bridge No. 02708 which carries Route 164 over Plum Bank Creek. See attached for further project description.
Part II: To be completed by SHELLFISH COMMISSION

This consultation form is required to be submitted as part of an application for a Structures, Dredging & Fill permit (section 22a-361 of the Connecticut General Statutes (CGS)) and/or Tidal Wetlands permit (CGS section 22a-32) to the DEEP-OLISP. The application has not yet been submitted to the DEEP. Please review the enclosed materials and determine whether the project will adversely impact shellfish beds. You may also provide comments or recommendations regarding the proposal. Should you have any questions regarding this process, please call DEEP-OLISP at (860) 424-3034 to speak with the analyst assigned to the town in which the work is proposed. Please return the completed form to the applicant.

SHELLFISH COMMISSION DETERMINATION:

Project located on (check one): □ natural bed  □ state bed  □ local bed  □ none

□ other, please specify:

If project is located upon a franchised or leased shellfish bed, please provide the owner or lessee’s contact information below.

Check one of the following:

□ I have determined that the work described in Part I of this form and attachments WILL NOT adversely impact a shellfish area.

□ I have determined that the work described in Part I of this form and attachments WILL adversely impact a shellfish area. A summary of the Shellfish Commission’s project-specific concerns/comments is described below or attached.

COMMENTS/RECOMMENDATIONS (check the box if attached: □):

Signature of Commission Representative

Date

Print Name of Commission Representative

Title
Good morning Amanda. Please see below. Have a great day! Mike -

Micheal P. Grzywinski
Senior Environmental Analyst
Land & Water Resources Division
Regulatory Section - Southeast
Bureau of Water Protection & Land Reuse
Connecticut Department of Energy & Environmental Protection
79 Elm Street, Hartford, CT 06106-5127
Direct: 860.424.3674 | Email: micheal.grzywinski@ct.gov
Office Hours: Monday-Thursday, 7:30am - 4:45pm

Connecticut Department of
ENERGY &
ENVIRONMENTAL
PROTECTION

www.ct.gov/deep
Conserving, improving and protecting our natural resources and environment;
Ensuring a clean, affordable, reliable, and sustainable energy supply.

Agreed have DOT submit the application. The application should include copies of any correspondence that shows attempts to coordinate with Shellfish Commission.
"No matter what people tell you, words and ideas can change the world." - Robin Williams

Jeffrey P. Caiola, Assistant Director
Land & Water Resources Division
Bureau of Water Protection and Land Re-Use
Connecticut Department of Energy and Environmental Protection
79 Elm Street, Hartford, CT 06106-5127
P: 860.424.4162 | E: jeff.caiola@ct.gov

Connecticut Department of
ENERGY &
ENVIRONMENTAL
PROTECTION

www.ct.gov/deep

Conserving, improving and protecting our natural resources and environment;
Ensuring a clean, affordable, reliable, and sustainable energy supply.

From: Grzywinski, Micheal
Sent: Tuesday, June 25, 2019 6:46 AM
To: Golembiewski, Brian <Brian.Golembiewski@ct.gov>; Caiola, Jeff <Jeff.Caiola@ct.gov>
Subject: FW: CTDOT 105-215 Route 154 o/Plum Bank Creek - Shellfish Consult
Importance: High

Good morning Brian and Jeff. I’ve forwarded you an email from Amanda Saul, CT DOT regarding multiple attempts to obtain a signed consultation form from the Old Saybrook Shellfish Commission. Amanda has included a timeline of discussions with Mr. Bonin, Shellfish Chairman and her efforts to contact him. The application is ready to be submitted with only the consultation form outstanding. In an effort to keep the proposed schedule on track, can I inform Amanda to submit the application without a signed form given the DOT’s (Amanda’s) efforts to work with the Old Saybrook Shellfish Commission?

Mike -

Micheal P. Grzywinski
Senior Environmental Analyst
Land & Water Resources Division
Regulatory Section - Southeast
Bureau of Water Protection & Land Reuse
Connecticut Department of Energy & Environmental Protection
79 Elm Street, Hartford, CT 06106-5127
Direct: 860.424.3674 | Email: Micheal.Grzywinski@ct.gov
Office Hours: Monday-Thursday, 7:30am - 4:45pm
From: Saul, Amanda M
Sent: Monday, June 24, 2019 11:43 AM
To: Grzywinski, Micheal <Micheal.Grzywinski@ct.gov>
Subject: FW: CTDOT 105-215 Route 154 o/Plum Bank Creek - Shellfish Consult

Hi Mike,

I still have not heard back from Mr. Bonin.

Could you please advise on whether or not we can submit the permit, having done our best to solicit comments?

Thanks,

Amanda

From: Saul, Amanda M
Sent: Thursday, June 06, 2019 2:35 PM
To: Grzywinski, Micheal <Micheal.Grzywinski@ct.gov>
Cc: Davis, Andrew H <Andrew.H.Davis@ct.gov>
Subject: CTDOT 105-215 Route 154 o/Plum Bank Creek - Shellfish Consult

Hi Mike,

Per our conversation this morning, please find attached a summary of our attempts to solicit pre-application comments from the Old Saybrook Shellfish Commission (Mr. Lary Bonin, Chairman). We have been trying to obtain their comments since February 25, 2019. This consultation package is the last thing that we need in order to be able to submit our TWSDF & ACOE permits. Because we have not yet received it, I have also held back on sending the copy of the public notice to the Shellfish Commission and the First Selectman.

I left another message for Mr. Bonin today.

If you could advise on how we should proceed, I would appreciate it.

Thanks,

Amanda

Amanda M. Saul
Transportation Planner 2
CTDOT 105-215 Shellfish Commission Consultation – Contact Log

2/25/2019 – Initial consultation package sent (form, project description, plans)

4/1/2019 – PC Town Planner re: no response from Commission, asked if she had any recommendations, she asked me to send her the consultation package and she would pass along to the Shellfish Commission.

4/10/2019 – PC Larry Bonin, Shellfish Chair. Mr. Bonin expressed concerns over impact to shellfish beds, indicated readiness to sign-off on consultation letter but would request load of oyster shells (culch). I further explained the proposed project and explained that there were no impacts to the shellfish, and no physical impacts below MHW (existing abutments to be cut down in place, new abutments to be built behind), and that only a work float would be used. Told Mr. Bonin that if he did want to request that we provide culch that we would need specific details on the culch. He indicated that he would go back to the commission and get back to DOT.

4/17/2019 – Attempt to call Mr. Bonin at DPW Office, no answer. Contacted Town Planner for Alternate Phone number and was given First Selectman’s Office; left message for Mr. Bonin with the Selectman’s Office.

4/23/2019 – Left message for Mr. Bonin with the Selectman’s Office.

5/10/2019 – PC Town Planner asking for assistance with coordination with Shellfish Commission, but she was unable to help, suggested leaving him an additional message. Left additional message for Mr. Bonin on the DPW phone line.

5/14/2019 – PC Mr. Bonin, he indicated that he had inspected the bridge site and had observed a shellfish bed beneath the bridge. I explained again that the project did not propose any impacts below the MHW and any use of the work float would not be allowed to impact the river bed. He indicated that he would like to return to the site at low tide to have another look and then would get back to the Commission. I asked if there was a scheduled Commission meeting in the near future. I expressed our desire to receive their comments so that we can submit the permit. He indicated that, if necessary, he could call a special meeting of the Commission.

5/22/2019 – Sent Mr. Bonin an email through the Town’s “contact staff” email system. Inquired whether or not he had the opportunity to re-visit the site and whether or not a special meeting of the Commission had been scheduled. Also indicated that the consultation form was the only thing needed before we could submit the permit. Left my phone number and email address.

5/29/2019 – Left message for Mr. Bonin on the DPW phone line; again expressing our desire to receive the Commissions comments, and indicating that the comments were the only item outstanding in our permit package.

6/6/2019 – Left message for Mr. Bonin on the DPW phone line inquiring as to the status of field review and whether or not he has had a chance to review with the Commission so that we could have the consultation form returned with their comments.
February 25, 2019

Old Saybrook Waterfront Commission
Town Hall
302 Main Street
Old Saybrook, CT 06475

Subject: State Project No. 105-215
Replacement of Br. 02708
Route 154 over Plum Bank Creek
Old Saybrook, CT
DEEP Permit Consultation Form

To Whom It May Concern:

The State of Connecticut Department of Transportation (the Department) is applying for a Tidal Wetlands, Structures, Dredge, and Fill permit pursuant to Connecticut General Statute 22a-32 and 22a-361 from the Connecticut Department of Energy and Environmental Protection (CTDEEP).

The project proposes to replace the existing 190 ft span bridge which carries Route 154 over Plum Bank Creek with a 400 ft concrete box beam bridge supported on integral abutments which will be built behind the existing abutments. Mitigation for the impacts to tidal wetlands will be provided through the preservation of a 1-acre parcel of undeveloped land at the mouth of Ragged Rock Creek along the Connecticut River. The parcel of land will be transferred from the Department to CTDEEP in the future to include in their landholdings within the Ragged Rock Creek Marsh, a system comprised of over 250 acres of preserved lands (map of mitigation parcel attached). This mitigation will satisfy the requirements of CTDEEP. Additionally, the Department will be paying into the Army Corps of Engineers In-Lieu Fee program to compensate for unavoidable impacts to resources within the Corps’ jurisdiction.

Per the requirements of the above-mentioned permit, we request your review of the proposed activities. Please find enclosed the CTDEEP Consultation Form, a location map, project description and project plans for your review and comment. If you have any questions or require additional information, please contact Mr. Andrew H. Davis, of my staff, at (860) 594-2157.

Very truly yours,

Kimberly C. Lesay
Transportation Assistant Planning Director
Bureau of Policy and Planning

Encl.
cc: CTDEEP LWRD

An Equal Opportunity Employer
Printed on Recycled or Recovered Paper
SITE LOCATION
BRIDGE 02708 & MITIGATION

Project No. 105-215
Town of Old Saybrook
GENERAL NOTES:

1. THESE PLANS ARE INTENDED ONLY FOR ENVIRONMENTAL PERMITTING PURPOSES. THESE PLANS HOLD AUTHORITY FOR ALL ACTIVITIES CONCERNING THE IMPACTED AREA FOR DETAILED ENGINEERING DESIGN AND ARE REFERRED TO THE APPLICABLE CONTRACT DOCUMENT.

2. THE DEPARTMENT OF TRANSPORTATION WILL ONLY SUBMIT REVISIONS TO DEER AND WISE FOR CHANGES TO THE BORDERS THAT WILL AFFECT IMPACTED AREAS.

3. FOR A DESCRIPTION OF THE WATERSHED, WATERSHED AND WATERSHED TOOLS SEE ATTACHED SECTIONS OF THE PERMIT APPLICATION.


5. ALL CONSTRUCTION ACTIVITIES WILL BE CONDUCTED IN ACCORDANCE WITH THE EARTHWORKS STANDARDS SPECIFIED FOR HIGHWAY, BRIDGE, AND INCIDENCE CONSTRUCTION FOR AND MHD 1127 AND WILL ALSO FOLLOW RECOMMENDED BEST MANAGEMENT PRACTICES AND VENAND MINNISATION (CONTINUOUS) MEASURINGS IN ACCORDANCE WITH THE D2D SECTION & D2D IMPLEMENTATION CONTROL GUIDELINES AND THE 2018 INFORMATION QUALITY MANUAL.
ATTACHMENT E: HARBOR MANAGEMENT COMMISSION

DEEP PERMIT CONSULTATION FORM

You need to complete and submit this form only if your town has a Harbor Management Commission.

To the applicant- Prior to the submission of your permit application to the Connecticut Department of Energy and Environmental Protection-Office of Long Island Sound Programs (DEEP-OLISP), please complete Part I and submit this form to your local harbor management commission (contact the town for the appropriate contact person) with a location map of your site and project plans. Once the commission returns the completed form to you, please submit it along with your permit application to the DEEP.

Part I: To be completed by APPLICANT

1. List applicant information.
   Name: Connecticut Department of Transportation
   Mailing Address: 2800 Berlin Turnpike
   City/Town: Newington
   Business Phone: 860-594-2931
   Contact Person: Kimberly C. Lesay
   E-mail: Kimberly.Lesay@ct.gov
   State: CT Zip Code: 06131
   ext. Fax: 860-594-3028
   Title: Trans. Asst. Planning Director

2. List engineer/surveyor/agent information.
   Name: Connecticut Department of Transportation
   Mailing Address: 2800 Berlin Turnpike
   City/Town: Newington
   Business Phone: 860-594-3205
   Contact Person: Ryan D. Martin
   Service Provided: Project Engineer
   State: CT Zip Code: 06111
   ext. Fax:
   Title: Project Engineer

3. Site Location:
   Street Address or Location Description: Route 154 bridge at Plum Bank Creek
   City/Town: Old Saybrook
   State: CT Zip Code: 06475
   Tax Assessor's Reference: Map
   Block Lot

4. Are plans attached? ☑ Yes ☐ No If Yes, provide date of plans: January 22, 2019

5. Provide or attach a brief, but thorough description of the project:
   Please see the attached sheets.
Part II: To be completed by HARBOR MANAGEMENT COMMISSION

This consultation form is required to be submitted as part of an application for a Structure, Dredging & Fill permit (section 22a-361 of the Connecticut General Statutes (CGS)) and/or Tidal Wetlands permit (CGS section 22a-32) to the DEEP-OLISP. The application has not yet been submitted to the DEEP. Please review the enclosed materials and determine whether the project is consistent or inconsistent with your local Harbor Management Plan. You may also provide comments or recommendations regarding the proposal. The Harbor Management Commission may still provide written comments to the Commissioner during the Department's public notice comment period. Should you have any questions regarding this process, please call DEEP-OLISP at (860) 424-3034 to speak with the analyst assigned to the town in which the work is proposed. Please return the completed form to the applicant.

HARBOR MANAGEMENT COMMISSION DETERMINATION:

Check one of the following:

☐ The Commission has determined that the work as described in Part I of this form and attachments is CONSISTENT with the harbor management plan.

☐ The Commission has determined that the work as described in Part I of this form and attachments is INCONSISTENT with the following section of the harbor management plan:

COMMENTS/RECOMMENDATIONS (or check here if attached: ☐):

Signature of Commission Representative

Robert Murphy

Print Name of Commission Representative

3/11/19

Date

CHAIRMAN OSMC

Title
Old Saybrook Waterfront Commission
Town Hall
302 Main Street
Old Saybrook, CT 06475

Subject: State Project No. 105-215
Replacement of Br. 02708
Route 154 o/Plum Bank Creek
Old Saybrook, CT
DEEP Permit Consultation Form

To Whom It May Concern:

The State of Connecticut Department of Transportation (the Department) is applying for a Tidal Wetlands, Structures, Dredge, and Fill permit pursuant to Connecticut General Statute 22a-32 and 22a-361 from the Connecticut Department of Energy and Environmental Protection (CTDEEP).

The project proposes to replace the existing 19ft span bridge which carries Route 154 over Plum Bank Creek with a 40.5ft concrete box beam bridge supported on integral abutments which will be built behind the existing abutments. Mitigation for the impacts to tidal wetlands will be provided through the preservation of a 1-acre parcel of undeveloped land at the mouth of Ragged Rock Creek along the Connecticut River. The parcel of land will be transferred from the Department to CTDEEP in the future to include in their landholdings within the Ragged Rock Creek Marsh, a system comprised of over 250ac of preserved lands (map of mitigation parcel attached). This mitigation will satisfy the requirements of CTDEEP. Additionally, the Department will be paying into the Army Corps of Engineers In-Lieu Fee program to compensate for unavoidable impacts to resources within the Corps’ jurisdiction.

Per the requirements of the above-mentioned permit, we request your review of the proposed activities. Please find enclosed the CTDEEP Consultation Form, a location map, project description and project plans for your review and comment. If you have any questions or require additional information, please contact Mr. Andrew H. Davis, of my staff, at (860) 594-2157.

Very truly yours,

[Signature]
Kimberly C. Lesay
Transportation Assistant Planning Director
Bureau of Policy and Planning

Enclosure
cc: CTDEEP LWRD
ATTACHMENT F: DEPARTMENT OF AGRICULTURE / BUREAU OF AQUACULTURE

DEEP PERMIT CONSULTATION FORM

You need to complete and submit this form only if the subject site is located along the coastal area or in the municipalities as follows: south of Lyme or Essex on the Connecticut River; south of Orange and Derby/Ansonia on the Housatonic River; south of Norwich and Preston on the Thames River; or Lyme, Essex, Orange, Derby/Ansonia, Norwich or Preston and the activity includes dredging.

To the applicant- Prior to the submission of your permit application to the Connecticut Department of Energy and Environmental Protection- Office of Long Island Sound Programs (DEEP-OLISP), please complete Part I and submit this form to the Department of Agriculture, Bureau of Aquaculture ("DOA/BOA") (P.O. Box 97, Milford, CT 06460 or by facsimile at 203-783-9976) with a location map of your site and project plans. Once the DOA/BOA returns the completed form to you, please submit it along with your permit application to the DEEP.

Part I: To be completed by APPLICANT

<table>
<thead>
<tr>
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<tr>
<td>Contact Person: Kimberly C. Lesay</td>
<td>Title: Transp. Asst. Planning Director</td>
</tr>
<tr>
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<td>E-mail: <a href="mailto:ryan.martin@ct.gov">ryan.martin@ct.gov</a></td>
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<td>Service Provided: Project Engineer</td>
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| 4. Are plans attached? | ☒ Yes ☐ No | If Yes, provide date of plans: January 22, 2019 |  |
Part II: To be completed by DEPARTMENT OF AGRICULTURE/BUREAU OF AQUACULTURE

This consultation form is required to be submitted as part of an application for a Structures, Dredging & Fill permit (section 22a-361 CGS) and/or Tidal Wetlands permit (section 22a-32 CGS) to the DEP-OLISP. The application has not yet been submitted to the DEP. Please review the enclosed materials and determine whether the project will significantly impact shellfish beds. You may also provide comments or recommendations regarding the proposal. Should you have any questions regarding this process, please call DEP-OLISP at (860) 424-3034 to speak with the analyst assigned to the town in which the work is proposed. Please return the completed form to the applicant.

Section 22a-361(b) CGS requires that the Commissioner of the DEP shall hold a public hearing on permit applications submitted pursuant to section 22a-361 CGS provided that a petition requesting such hearing signed by 25 or more persons is received and if the project will significantly impact any shellfish area, as determined by the Director of the Bureau of Aquaculture at the Department of Agriculture.

DEPARTMENT OF AGRICULTURE/BUREAU OF AQUACULTURE DETERMINATION:

Project located on (check one):  □ natural bed  □ state bed  □ local bed  □ none
□ other, please specify:

If project is located upon a franchised or leased shellfish bed, please provide the owner or lessee's contact information below.

Check one of the following:

☒ I have determined that the work described in Part I of this form and attachments WILL NOT significantly impact any shellfish area.

☐ I have determined that the work described in Part I of this form and attachments WILL significantly impact any shellfish area and that a public hearing must be held if the DEP issues a public notice for the project as currently designed and a qualified petition is received.

COMMENTS/RECOMMENDATIONS (or check here if attached:  □ ):
Town code of Project Location: 106  Applicant Name: CT Department Transportation
Address of Project: RTE 164 over Plum Bank Creek, Old Saybrook  Date of Plans: 1/22/2019
Analyst Reviewing Project and Date: DHC 03/01/19

The following permit conditions are recommended to minimize impacts:

Project is located in a "Prohibited" Shellfish area. There is no known commercial shellfish activity in this part of the river or Long Island Sound. Upon completion of the project native shellfish will recolonize the area if disturbed bottom land and river banks returned to preconstruction condition.

DA/BA recommends no additional conditions required.

[Signature]  3/01/19
Date

Print Name of Commission Representative

DEP-OLISP-APP-101F
Project No. 0105-0215
Page 2 of 2  Rev. 10/07/06
February 25, 2019

David Carey
State of Connecticut Department of Agriculture/Bureau of Aquaculture
190 Rogers Avenue
PO Box 97
Milford, CT 06460

Subject: State Project No. 105-215
Replacement of Br. 02708
Route 154 o/Plum Bank Creek
Old Saybrook, CT
DEEP Permit Consultation Form

Dear Mr. Carey,

The State of Connecticut Department of Transportation (the Department) is applying for a Tidal Wetlands, Structures, Dredge, and Fill permit pursuant to Connecticut General Statute 22a-32 and 22a-361 from the Connecticut Department of Energy and Environmental Protection (CTDEEP).

The project proposes to replace the existing 19ft span bridge which carries Route 154 over Plum Bank Creek with a 40.5ft concrete box beam bridge supported on integral abutments which will be built behind the existing abutments. Mitigation for the impacts to tidal wetlands will be provided through the preservation of a 1-acre parcel of undeveloped land at the mouth of Ragged Rock Creek along the Connecticut River. The parcel of land will be transferred from the Department to CTDEEP in the future to include in their landholdings within the Ragged Rock Creek Marsh, a system comprised of over 250ac of preserved lands (map of mitigation parcel attached). This mitigation will satisfy the requirements of CTDEEP. Additionally, the Department will be paying into the Army Corps of Engineers In-Lieu Fee program to compensate for unavoidable impacts to resources within the Corps' jurisdiction.

Per the requirements of the above-mentioned permit, we request your review of the proposed activities. Please find enclosed the CTDEEP Consultation Form, a location map, project description and project plans for your review and comment. If you have any questions or require additional information, please contact Mr. Andrew H. Davis, of my staff, at (860) 594-2157.

Very truly yours,

[Signature]

Kimberly C. Lesay
Transportation Assistant Planning Director
Bureau of Policy and Planning

Enclosures
cc: CTDEEP LWRD
Attachment I: Project Plans

- Vicinity Map
- Tax Map
- Project Permit Plans
CONNECTICUT DEPARTMENT OF TRANSPORTATION

ENVIRONMENTAL PERMIT PLANS
STATE PROJECT NO. 105-215
REPLACEMENT OF BRIDGE NO. 02708
ROUTE 154 OVER PLUM BANK CREEK
IN THE TOWN OF OLD SAYBROOK

LOCATION PLAN

5" = 200'

ENVIRONMENTAL PERMIT PLANS
PLAN DATE: MAY 3, 2019

GENERAL NOTES:

1. THESE PLANS ARE INTENDED ONLY FOR ENVIRONMENTAL PERMITTING.
   PLOTTED: THESE PLANS HOLD AUTHORITY FOR ALL ACTIVITIES CONCERNING
   THE ULTRASTRUCTURAL AREA FOR EXISTING OR PROPOSED PROJECTS.
   PLANNING: ALL PLANS ARE INTENDED FOR ENVIRONMENTAL PERMITTING
   PURPOSES.

2. THE DEPARTMENT OF TRANSPORTATION WILL ONLY SUBMIT DRAWINGS TO
   THE BOOTHS FOR CONCERN'S TO THE DESIGN THAT WILL AFFECT
   REGULATORY AREAS.

3. FOR A DESCRIPTION OF THE WATERCOURSES, WETLANDS AND INLAND SOILS
   SEE REMARKS SECTIONS OF THE PERMIT APPLICATION.

4. AND DATA GATHERED ON CONNECTICUT COORDINATE SYSTEM 1983.
   VERTICAL DATUM BASED ON HGS-1988.

5. ALL CONSTRUCTION ACTIVITIES WILL BE CONDUCTED IN ACCORDANCE WITH
   THE DEPARTMENT'S STANDARD SPECIFICATIONS FOR ROAD, BRIDGE,
   AND
   ROADWAY CONSTRUCTION. DRAW SECTIONS: 1:200 AND WELL ALSO FOLLOW
   REQUIREMENTS FOR MANAGEMENT PLANNING (NMP) AND GROUND AND GREENS
   CONTROL MEASURES IN ACCORDANCE WITH THE DEPARTMENT'S REGULATIONS
   GUIDELINES AND THE 2009 STANDARDS QUALITY MANUAL.

436
STAGE 1
SUGGESTED SEQUENCE OF CONSTRUCTION
1. Clearing and grubbing and installation of segmentation control system (SCS).
2. Install temporary water Main and water Main lateral from temporary water Main location, detail per SCS.
3. Temporarily locate temporary water Main and coordinated with High Tide Level to temporarily locate temporary lateral utilization.
4. Close road and detour traffic.
5. Remove existing infrastructure using floating cranes with chariot lift along with critical lift for short-term stability. Collect and remove debris for offshore removal.

LEGEND
The presentation of transportation will only remain effective to the extent for changes and the design will not be affected by these recommendations.

- SCS: Segmentation Control System
- Limits of Coastal Jurisdiction
- High Tide Level
- Mean High Water
- Mean Low Water
- Coastal Jurisdiction Line
- Turbidity Curtain

NOTE: Entire Project Limits Rail within the Map Extent. Drainage Area Zone (DZA).

ENVIRONMENTAL PERMIT PLANS
PLAN DATE: MAY 3, 2019

Project No: 0105-0215

STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION
OFFICE OF ENGINEERING

REPLACEMENT OF BRIDGE NO.
03706, ROUTE 154 OVER
PLUM BANK CREEK

CURRENT CONSTRUCTION SEQUENCE

OLD SAYBROOK
Appendix J: Photographs

Photographs: Bridge No. 02708, Route 154 over Plum Bank Creek

Photo Number: 4  Photo Taken: 01/10/2018
West elevation [log direction].

Photo Number: 5  Photo Taken: 01/10/2018
East elevation [log direction].
Attachment K

State Project No. 105-215, Bridge 02708

William H & Laurie J Paetzold
72 Stockade Road
South Glastonbury, CT 06073

Mary M Frost
PO Box 2155
Riverside, CA 92516

Town of Old Saybrook
302 Main Street
Old Saybrook, CT 06452

Edward Michael Devaney etal
25 Plum Bank Road
Old Saybrook, CT 06475

George Besonni Sr Est & Raymond Snarks
222 Old Boston Road
Old Saybrook, CT 06475

Sandra G & Marc B Friedman Trustees
2 Avery Road
Bloomfield, CT 06002

Dana G Taylor Trustee
PO Box 1568
Port Salerno, FL 34992

Linda R Kesselman
57 Winterset Lane
Simsbury, CT 06070

David A & Kristine Tomey etal
5 Nassau Drive
Winchester, MA 01890

Russell A & Karen A Settipane
1170 Carrs Pond Road
East Greenwich, RI 02818

Aaron M & Christina P Deems
23 Carleton Avenue
Briarcliffe Manor, NY 10510
Stella & Jerzy Jedrychowski Trustees
12 Essex Court
Farmington, CT 06032

Robert Settipane
7 White Avenue
Riverside, RI 02915

Charles J Fitzgerald Jr
5 Toms Road
Old Saybrook, CT 06475-2021

David J McFarlin Trustee
6 Toms Road
Old Saybrook, CT 06475

John D & Andreae T Waanders
8 Toms Road
Old Saybrook, CT 06475

Donald, Christopher & Ann Marie Griggs
241 Asylum Street
Hartford, CT 06103

Henry V & Eileen M Kensing
60 Orchard Road
Mount Kisco, NY 10549-1204

Evelyn P Credidio
524 Antelope Trail
Huntington, CT 06484

Mekrut Family LTD Partnership
4 Fair Oaks Drive
Lincoln, RI 02865

Robert W Matchett
PO Box 2155
Riverside, CA 92516

Melvin F JR & Douglas R Evarts
15690 Millie Lane
Reno, NV 89511

Sandra S & Jerald K Rome Trustees
63 Lovelace Drive
West Hartford, CT 06117
Attachment M: Additional Information

PROJECT 105-215
RT. 154 OVER PLUM BANK CREEK
OLD SAYBROOK
BRIDGE NO. 02708

- Interagency Meeting Minutes
- Fisheries Signoff
- Environmental Report
INTERAGENCY COORDINATION MEETING NOTES

January 18, 2018
Room 3130

Meeting Notes:
The meeting notes for December were raised for discussion. No comments were made and the notes are accepted.

Project 0083-0263 Bridge 06755, Route 162 over Turtle Creek, Milford

01/18/2018 – The project proposes to replace Bridge 06755 (existing as three arch culvert CMP’s) with twin 8’x4’ precast concrete box culverts sunken 1’. The project was presented at an Interagency Meeting in October 2014, but the design process was impacted by the construction of a new sanitary sewer line nearby. Existing pipe slopes are nearly flat (water is always sitting.) Additional drainage system improvements are proposed adjacent to the culvert to address a change in road grade. The change in road grade is proposed, in part, because a portion of the roadway is below CIL. The site is all within the 100-year flood plain. Approximately 630’ of Turtle Creek upstream of this Bridge is in a 42”x70” CMP.

Project Impacts: 4,300 sq.ft. of impact below CIL, which includes impacts to 400 sq.ft. of tidal vegetation. 1010 sq.ft. of mitigation area is proposed adjacent to the inlet. Rip rap with natural material cover is proposed at the inlet and outlet. The project is planned for one construction season without a road closure.

Permitting Requirements: Flood Management Certification, USACE PCN, CTDEEP Structures Dredging and Fill and Tidal Wetlands. Subsequent to the meeting it was confirmed that an application to the ACOE will be required for the PCN. Fisheries coordination was initiated in 2013 and no further review was warranted at that time. Fisheries coordination will be continued to obtain final sign-off. The project is within an NDDB area and comments were received by design staff in May 2013.

Agency Comments: CTDEEP Land & Water Resources staff requested that all proposed rip rap be minimized (not on bottom) and noted that the designer described limited scour potential at the bridge. CTDOT Office of Environmental Planning staff noted that the mitigation plan specified bayberry at elevation 3’+/− and that was not a suitable plant for that tidal wetland soil elevation. If needed, OEP is available for assistance with vegetation selection for the design of the mitigation area. CTDEEP Land & Water Resources staff requested that elevation datum information be shown to reflect NGVD ‘29 and NGVD ‘88 conversions so coastal jurisdiction elevation would be clear.

Action Items: Designer should: Revise mitigation planting. Note elevation datum conversion. Review proposed rip-rap to verify it is minimized. An updated NDDB review form should be submitted to OEP. When plans are revised, they should be submitted to OEP to obtain DEEP fisheries sign-off.

Project 0105-0209 Bridges 01386 & 02708, Route 154 over Back River & Plum Bank Creek, Old Saybrook

01/18/2018 – The project involves the replacement of Bridges 02708 and 01386. The bridges will be completed in consecutive years as they are near each other and are both connected to the Plum Bank Marsh. The project will be administered with 1 contract. These are coastal bridges in a low lying area with beaches, residential uses, and coastal resources nearby. The proposed structures are designed for overtopping conditions. Permanent sheet piling will be employed to protect the proposed bridges and
Interagency Coordination Meeting 01/18/2018
Meeting Notes

approach slabs and allow the majority of the work to be completed in the dry. In-water work will be needed to remove portions of existing abutments and provide scour protections. The majority of the work is proposed outside of the busy “beach” season. Roadway profiles will be raised 8”-15” and road shoulder widths will be increased to address the raised road profile and current guiderail/safety standards. 2:1 vegetated slopes are proposed.

**Project Impacts:**
- Bridge 02708: Impact below HTL=2,014 sq.ft.; Impact below CIL=1,617 sq.ft.
- Bridge 01386: Impact below HTL=2,327 sq.ft.; Impact below CIL=1,658 sq.ft.
- Total of 4,300+/- sq.ft. of tidal vegetation impacted. Mitigation TBD.

**Permitting Requirements:** Not under Coast Guard Jurisdiction. The project will have a Flood Management Certification, CTDIEMY Structures Dredging and Fill and Tidal Wetlands, and USACE PCN (GP-19). Two permit applications for SD&F will be needed (separated for each bridge.) Other permits and mitigation will be proposed under one package. Subsequent to the meeting it was confirmed that an Application to the USACE will be required for the PCN. Fisheries sign-off required (no recommendations in Fisheries comments of 08/21/2017). Project is within an NDDB area and a determination is needed. OEP staff has pre-screened the project for NDDB protected species and does not anticipate additional restrictions based on the current NDDB data.

**Agency Comments:** Micheal G. of CTDIEMY Land & Water Resources noted that they had contacted DEEP internal personnel to discuss options for nearby mitigation sites (no opportunity exists within the project area). CTDIEMY Fisheries staff confirmed that no time of year restrictions are necessary from a fisheries perspective. CTDIEMY Land & Water Resources staff commented that the public could petition for additional hearings and noted that the public information meetings held by CTDOT were a benefit to informing the public and incorporating public feedback. He also requested that the proposed water main shelf be minimized to discourage public access. It was also requested that any proposed rip rap be minimized. CTDOT design staff confirmed that they had minimized rip rap placement. USACE staff requested and received confirmation that temporary utility locations would not cause additional wetland impacts. USACE staff noted that the temporary aerial utility crossings, if over the water, will be included in the permit under Section 10 and that the temporary crossings would need to meet minimum elevations across the waterway (per 33 CFR 322.51(2)).

**Action Items:** Design staff should minimize water main shelf to discourage public access. Design and OEP should continue to coordinate with CTDIEMY to pursue mitigation options, including discussing options with the Town of Old Saybrook.

**Project 0302-0014 Merritt 7 Railroad Station Improvements, Norwalk**

01/18/2018 – The project proposes Railroad station improvements including a new station, high-level platform, pedestrian overpass, new parking, and drainage system improvements that will impact a mapped stream. The project also proposes full depth reconstruction of 1900’ of Glover Avenue and a slight realignment (6-7’ horizontal.) Schaab Creek runs easterly under Glover Avenue (the project area) until it reaches the Norwalk River. It is contained in an open channel, into a 2’x4’ stone culvert, and then a 30’ RCP. The proposed drainage improvements include replacing a portion of the stone culvert under and adjacent to Glover avenue with 48” RCP, drainage manholes, and a concrete endwall. One section of 36” RCP is proposed at the inlet to replicate existing hydraulic capacity until all downstream sections of culvert can be replaced with the 48” pipe. Some existing adjacent storm drainage will also be connected to the proposed manholes.

**Project Impacts:** Estimated from preliminary wetland locations: 510 sq.ft. permanent /70 sq.ft. temporary watercourse impact and 50 sq.ft. permanent/120 sq.ft. temporary wetland impact.

**Permitting Requirements:** USACE SV (GP-19), FM General, IW-General, and Stormwater Permit
Interagency Coordination Meeting 01/18/2018
Meeting Notes

**Agency Comments:** CTDOT Staff requested verification that the pipe downstream of the proposed repairs/improvements was functioning. CTDOT design staff and the consultant stated that the engineering study was done by the City of Norwalk and indicated that the drainage within Glover Avenue was compromised but there was no indication that it was compromised downstream of Glover Avenue. DEEP Fisheries indicated no concerns with the project given that the watercourse runs intermittently.

**Action Items:** Submission of plans to DEEP Fisheries for final sign-off should be coordinated with OEP.

**Project 0148-0208  Hall Avenue Pedestrian Improvement Project, Wallingford**

01/18/2018 – The project proposes pedestrian improvements along Hall Avenue, Washington Street, and Oak Street that will include pedestrian lighting, street trees, ADA compliance modifications, and bicycle signage. The vast majority of these proposed improvements are outside of the travel way with the exception of pedestrian crossing striping upgrades. The project also includes a multi-use trail extending to the senior center with an overlook spur at Community Lake. The primary reason for being at the Interagency Meeting is to discuss the proposed relocation of an existing culvert outfall. The existing outfall is a concrete channel that outlets in a vegetated area and shows signs of significant erosion and sedimentation. The existing outfall is above an intermittent watercourse. The proposed outlet will include a more stable outfall (scour hole) and plantings, and be downstream from the existing location. 48” HDPEP is proposed for the new drainage. The concrete in the channel at the old outfall will be removed. An “overflow” at the plunge pool would be used to continue some hydric connectivity between the proposed outlet and the existing outlet location to maintain some of the existing wetland functions and values in this area.

**Project Impacts:**
At proposed outlet: Permanent wetland impact= 4,075 sq.ft.; Temp. wetland impact= 1,225 Sq.ft.
At existing outlet: Permanent wetland impact= 900 sq.ft.; Temp. wetland impact= 300 Sq.ft.

**Permitting Requirements:** FM-MOU, USACE PCN (GP-18), Local Inland Wetlands (received), CT Addendum, NDDB Determination (received).

**Agency Comments:** OEP Staff noted that DEEP Fisheries had reviewed this project with a proposed pipe extension at the current outfall and not the currently proposed outlet location. DEEP Fisheries stated that this was an intermittent watercourse and they had no concerns. CTDEEP Land & Water Resources staff inquired about the location of cuts and fills within the floodplain. The town representative responded that cuts and fills within the floodplain are nearly balanced but there is a net cut within the floodplain. The fill locations along the multi-use trail were highlighted on the plans. USACE staff inquired about the quality of wetlands at the new outfall location and an image was shown showing the sedimentation and erosion in that area. USACE staff requested and received verification that total wetland impacts for the project are greater than 5,000 sq.ft.

**Action Items:** Updated plans need to be submitted to OEP for review and submittal to DEEP Fisheries for sign-off.
Interagency Meeting Notes
October 18, 2018
Room 3130

Project 82-312, Bridge 00524, Arrigoni Bridge - Route 66 over the Connecticut River, Middletown/Portland
10/18/2018 - The project consists of superstructure steel repairs/strengthening, spot painting of the superstructure, steel and concrete substructure repairs, approach span deck replacement, and replacement of deteriorated electrical components. The entire bridge will be upgraded to state of good repair. Initial rehab work was done six years ago. For access they plan to use the same method - a platform system that will hang just below the low chord of the structure - there will not be in water work and no work done on the piers. A protective fence will be installed during construction. Three year construction timeframe.

Project Impacts: Currently no impacts. NDDB shows Falcon/Eagle; specifications will be included in project. There was discussion of a nest on pier 19, but not of these species.
Permitting Requirements: Flood Management General, Coastal Maintenance General Permit (to be completed by OEP). Coordination with the Coast Guard will be required.
Agency Comments: USACE staff commented that if there will be fill in the wetland, then an Army Corps permit would be needed. Mike Hogan (H&D) asked about work occurring in the floodplain (is the access road/lay down area in the floodplain?). As currently shown, the floodplain impacts would qualify for an FM General. There is one area between the two rail lines on the Middletown side that needs to be checked for wetlands. DEEP confirmed the project is eligible for a coastal general permit. The Designer mentioned the potential for “jetting” of the drainage structure at Pier 8 and DEEP questioned whether or not the waters would be captured prior to discharge to the Connecticut River.
Action Items: Consultant is finalizing wetlands assessment to determine if there will be any impacts due to the proposed access road.

Project 96-201, Bridges 01218 & 04180, I-84 over Housatonic River in Newtown/Southbury.
10/18/2018 - This Project previously attended the Interagency Meeting on 5/18/2017. This project consists of the rehabilitation of Bridges 01218 and 04180 that carry I-84 east and westbound over the Housatonic River. Bridge 01218 and 04180 are both 4-span continuous steel two girder floor system structures. On Bridge 01218, there is rust on the steel girders and the deck needs extensive repair. On Bridge 04180 there are cracks in the cantilevered floorbeam and map cracking on the underside of the deck. The proposed work is to replace the superstructure on both structures; lengths/widths match existing. The demolition of the existing superstructure will be done with cranes from a work trestle and barges. The work trestle platform would be above the 100-year flood elevation. There will be new pier caps on all piers on both bridges. Cofferdams and dewatering are required around Pier 3 on Bridge 04180. Proposed low chord elevations will be greater than current low chord. They are proposing to make repairs to south embankment on Bridge 01218 as existing riprap has eroded. The work trestle would be located in Spans 3 and 4, with waterway in that area closed to boat traffic. Barges could be used in Span 1; however, a work trestle could also be used in that area. Span 2 would remain open to boat traffic during the duration of construction. There will be a period of several days that the channel will be completely closed to boat traffic. The Lake Zoar public boat launch has been proposed to be used to launch safety boats and work crews.
DEEP/USACE/EPA/DOT
Interagency Coordination Meeting
Project Meeting Agenda – 10/18/2018

Project Impacts:
NDDB indicates Eastern Box Turtle and Bald Eagle.

<table>
<thead>
<tr>
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<th>Wetland</th>
<th>Watercourse</th>
<th>Total</th>
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<tbody>
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</tr>
<tr>
<td>floodplain</td>
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</table>

Permitting Requirements: USACE SV, DEEP FMC, Stormwater General Permit. 401 permitting is TBD (potentially Individual 401 from DEEP, see notes below). Project will also require First Light coordination, Coast Guard coordination, and coordination with DEEP Boating.

Agency Comments:
Boating/channel use: Fisheries commented that DEEP Boating will need to be notified / coordinated with regarding the complete closure of boat traffic for certain days during construction. DEEP Fisheries mentioned these days would have to be scheduled well in advance. Fisheries also inquired whether public use of the DEEP boat launch would be compromised – the consultant responded it would still be open for public use as the launch would only be used for safety boats and work crews. District 1 Construction commented that this is a highly recreational area and it is important to minimize the days the channel will be completely closed to recreational boat traffic.
Riprap/haul roads: DEEP asked if placement of rip rap or haul roads would have wetland impacts and designer confirmed that these areas would be outside wetland limits.
USACE/Pier 3/Trestle Piles: The Army Corps asked for clarification on what work is being done at Pier 3. Army Corps requested more information / an elevation view of Pier 3 to show what is happening in terms of excavation and fill. Though it will likely still be an SV, Army Corps requested to see limits of excavation and fill (concrete) and elevation views. Army Corps also commented that the temporary pile supported trestle would not be considered impact – it is a temporary pile supported structure in a non-navigational channel (Non-Section 10 waters). If piles are to be cut and left in-place, this would be considered a permanent impact under Army Corps jurisdiction. There was discussion on whether piles would be cut and buried or completely pulled out (TBD.) On other piers where there will be jacking towers, the temporary structures would not be considered impact under Army Corps jurisdiction. Designer said most permanent impacts are from the piles for the trestle (217 piles).
Soils: DEEP said data from soil testing should be submitted to Remediation Division at DEEP for review as there is a concern for the resuspension of PCBs (if present) from the sediments into the water column when the temporary trestle piles and sheeting for cofferdams are pulled. This information will help determine what type of 401 permit is required.

Action Items:
Soils: Information from soil testing should be submitted to DEEP Remediation Division through
Environmental Compliance. Pending coordination with DEEP Remediation, the 401 permitting needs will need to be re-evaluated.

Boating: Coordination documents for DEEP boating need to be submitted to OEP.

USACE: Army Corps would like to see elevation views of work being done around Pier 3. The elevation views will need to show excavation and fill limits below OHW.

Project 113-107/108, Bridges 02931 & 02932, Route 2A over Poquetanuck Cove & Dickerman’s Brook, Preston
10/18/2018 — This Project previously attended the Interagency Coordination Meeting on 5/18/2017. This project involves the rehabilitation of Bridge 02931 (project 113-107) and Bridge 02932 (project 113-108). The proposed work on both bridges includes superstructure replacement and repairs to abutments and wingwalls. Low chords will be raised 6” and 12” respectively. Drainage areas are 0.046 sq. mi. and 0.79 sq. mi. respectively. NDBB indicates several species concerns in this area including saltmarsh bulrush, tufted hairgrass, and lilaecopsis. There is also an archaeologically sensitive area in the vicinity of Project 113-107. These projects require mitigation. The mitigation site has been determined and includes an area of 4,200 sq feet of phragmites treatment, restoration of the treated area with a native tidal planting plan, as well as improvements to the Stoddard Hill boat launch. Consultant will submit a plan for fisheries sign-off once permit plans are developed.

**Project Impacts:** The temporary wetland impacts are 14,400 sq feet and permanent 17,100 sq feet — the consultant provided rough estimates of 400 cy cut and 330 cy fill in the floodplain — but expressed these provided numbers need to be updated.

**Permitting Requirements:** OLSIP Tidal Wetlands, Structures, Dredging and Fill, FM General and USACE PCN.

**Agency Comments:** Mike Grzywinski from DEEP commented that the mitigation site will be permitted as part of the Tidal Wetlands, Structures, Dredging and Fill and 401 permit, not under the Coastal Maintenance GP, as identified in the presentation. Army Corps commented that a mitigation checklist following the tidal wetland module will need to be prepared as part of the PCN application and the consultant should refer to the USACE mitigation guidance for the planting plan. Army Corps also commented plans should include elevation of temporarily located utilities to show the clearance at the bridge, and add high tide lines to all plans. It was also mentioned there is Coast Guard coordination for this project. A comment was made that an herbicide application permit/license was required for the mitigation site. DOT said there has been communication with Roger Wolfe from DEEP Wildlife Division, WHAMM Unit, and his program will be conducting the phragmites removal at the mitigation site and is aware of all permitting requirements.

**Action Items:** Make required changes to plans as requested by Army Corps (see comments above). Provide OEP with an updated mitigation plan to facilitate coordination with DEEP Parks and Boating Divisions.

Project 141-154, Bridge 06793 & 06794, I-395 over Little Mountain Brook & Unnamed Brook, Thompson
10/18/2018 — This Project attended the Interagency Meeting on 4/21/2016. Both structures are single 72” asphalt-coated corrugated metal pipes in very poor condition under as much as 50’ of fill. The proposed rehabilitations will
utilize a 60" internally corrugated HDPE slip lining for repair. Bridge 06794 currently has no endwalls, which will be installed.
This project was sent to Fisheries and received comments in February 2016 reporting the project has negligible effects on Fisheries resources.

### Project Impacts:
For Bridge 06793

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For Bridge 06794

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<td>6,771</td>
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**Permitting Requirements:** Permits will be submitted separately for each bridge: DEEP IW General, DEEP PGP Addendum, USACE PCN

**Agency Comments:** In regards to a proposed swale and pipe underneath one of the access roads, DOT staff questioned if providing a traversable swale across the access road made more sense than installing a pipe - the swale being a better option for maintenance purposes. EPA said in-lieu fee would be required for permanent impacts associated with the upstream permanent access road for Bridge 06794 (1,342 sq feet). DEEP commented to provide plans for the restoration areas.

**Action Items:** The in-lieu fee worksheet and calculation will need to be included in the permit application, as well as a plans for planting/restoration of disturbed areas.

### Project 76-222, Bridge 06650, I-384 over Folly Brook, Manchester

**10/18/2018** – This Project previously attended the Interagency Meeting on 1/18/2018. The existing structure is a 10-foot diameter asphalt-coated corrugated metal pipe under 25 feet of fill. The pipe conveys Folly Brook into Hop Brook a short distance away. The structure is hydraulically adequate but its invert has numerous perforations and there is settlement of the upstream collar. The pipe will be rehabilitated by installing a cast-in-place concrete invert in the bottom quarter of the pipe. New concrete wingwalls will be constructed at the inlet and outlet. The pipe length will be reduced from 362 feet to 288 feet; shortening the pipe at the outlet provides 50’ of new watercourse channel and can possibly improve the angle that Folly Brook enters Hop Brook. Baffles will be installed within the rehabilitated culvert per request from Fisheries. Design is considering open cutting I-384 to
replace existing drainage roadway pipes to allow for 2-year flow and to bypass pump Folly Brook through that structure.

**Project Impacts:** No NDDB concerns. FEMA mapping depicts the 100-year floodplain and floodway through the pipe.

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<tr>
<th>Impacts sq. ft</th>
<th>Wetland</th>
<th>Watercourse</th>
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**Permitting Requirements:** DEEP FMC, DEEP GP Addendum, DEEP IW General, USACE PCN

**Agency Comments:** Two baffle-style alternatives were presented with perpendicular baffles being acceptable to DEEP Fisheries. Fisheries staff will need to know water depths during low flow conditions and the water depth within the baffles. DEEP IW staff want to see a detailed planting plan. OEP staff noted a previous project, which used a by-pass pipe to lift flow up to another culvert.

**Action Items:** OEP will send designer the project number where this water handling technique was done. Designer to determine water depths at low-flow with the baffles installed.

**Project 59-164, US Route 1 & CT Route 22, Guilford**

10/18/2018 – The proposed project will construct a modern 3-legged roundabout to replace the existing T-intersection. Construction of the roundabout will improve safety and efficiency for all modes of traffic. There is a potential historic property in the northwest quadrant of the project location (a historical well). Wetland/watercourse impacts are proposed at an existing drainage outlet and channel that goes into Kneuer Pond. This area falls within 100-year floodplain in one small area (zone A) but the drainage area to that point is less than one square mile. There are no Fisheries concerns or NDDB concerns.

**Project Impacts:**

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<tr>
<td>floodplain</td>
<td>86</td>
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<td>-50</td>
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**Permitting Requirements:** USACE SV, DEEP IW General, Stormwater Permit.
Agency Comments: DEEP H&D commented the drainage area is less than 1 sq mile so no Flood Management permit is needed. USACE stated that the historic resources are outside their agency’s jurisdictional area, therefore, this project is eligible for an USACE SV even if there are impacts to the historical property.

Action Items: No action items identified.

Project 53-190, Putnam Bridge Trail Connections, Wethersfield/Glastonbury
10/18/2018 – The project attended the Interagency Meeting on 12/21/2017. The project proposes a new 4,750-foot long shared use path connecting the Putnam Bridge walkway between Great Meadow Road in Wethersfield and Niantic Avenue in Glastonbury. In Wethersfield the path starts at the intersection of I-91 exit 25 off-ramp and Great Meadows Road and utilizes the existing walkway on the Putnam Bridge over the river. This project is presented again because the hydraulic analysis has been completed and designers wanted to present the final project design to DEEP.

Project Impacts: This project has 590 sq feet of Federal wetland impact (USACE), and 15,700 sq feet of State wetland impact (DEEP).

Permitting Requirements: USACE SV GP 19, Individual IW Permit (because of state wetland impacts on Glastonbury side), Individual FMC. At a previous meeting, DEEP agreed there was no need for an Exemption, as long as the Town provides written support.

Agency Comments: Some Fiberglass panels on the Putnam Bridge walkway are damaged; Mike Grzywinski said that if a previous permit that included fiberglass panel work is good for 5 years, he can process the extension request for that permit. Bob asked if state wetlands were non-hydric floodplain soils, OEP confirmed. Susan (USACE) and Susan (DEEP) both inquired about elevation over Keeney Cove / how this area will be handled. Mike Hogan from H&D has prepared a hydraulic analysis which indicates that there is no adverse effect due to the loss of flood storage. Municipal Floodplain regulations were discussed briefly. Typically a project requires a Flood Management Exemption if it does not meet town zoning regulation requirements for compensatory flood storage/conveyance. DEEP may not require an exemption if the town provides a letter supporting that the project will not have an adverse impact. DEEP makes the final decision on if an exemption will be required in association with the submitted Individual FMC. Based on the proposed impacts the project would not be eligible for an IWGP and would require an Individual Inland Wetlands and Watercourses permit. DEEP indicated that no mitigation will be required for the state-only wetland impacts.

Action Items: Coordinate extension request from OLISP (permit is still good until 2020). Designer to obtain support letter from Town regarding Town Flood Management requirement for DEEP to alleviate the need for an exemption.

Project 105-209, Bridge 02708 & 01386, Route 154 over Plum Bank Creek & Back River, Old Saybrook
10/18/2018 - The project attended the Interagency Meeting on 1/18/2018. The project proposes to replace the existing bridges with a single span structures comprised of pre-stressed concrete box beams integral with concrete
abutments, wingwalls, and decks. To protect the bridges from scour the project proposes permanent sheet piling around the new piles. Most of the conversation centered around the proposed mitigation. The projects are going to be separated into different construction contracts so they will have separate permits. Bridge 02708 is going to construction first, Bridge 01386 is under further review by a coastal engineer to address concerns from nearby Homeowners Association (following the coastal engineering assessment, the bridge design may be revisited, and the span could increase, thereby increasing proposed impacts). Current mitigation proposal is acquisition of 1-acre parcel at the mouth of Ragged Rock Creek. This mitigation proposal is for both bridges. The parcel is surrounded by ~250 acres of preserved land (comprised of state, The Nature Conservancy, and Old Saybrook Land Trust). DOT would like to ultimately transfer the 1 acre parcel to DEEP or the Land Trust to be maintained in perpetuity. The mitigation parcel provides a mitigation ratio of approximately 15.9:1 on the impacts for both bridges combined.

### Project 105-209 Impacts:

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<td>Impacts below MHW</td>
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<tr>
<td>Total</td>
<td>1,430</td>
<td>635</td>
<td>2,065</td>
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Total permanent impacts below HTL: 2,585 sq feet
Total permanent impact below MHW: 140 sq feet
Total temporary: 1,270 sq feet

### Permitting Requirements: Separately for each bridge - USACE PCN, OLISP Tidal Structures, Dredging and Fill

### Agency Comments: USACE asked to clarify if this could be an in-lieu fee project – DOT commented that in-lieu fee would meet the USACE mitigation requirements but that DEEP would not accept in-lieu fee as suitable mitigation for this project and therefore DOT is seeking a single mitigation measure to meet both agency needs. It is DEER’s position that the mitigation proposal is suitable for impacts as they have been calculated to date for both bridges. It is also their position that if a change in span length on Bridge 01386 causes an increase in impacts, that no additional mitigation would be required. EPA was supportive of the mitigation proposal because the parcel will be able to be managed in the future if acquired, which it will not be if left in private hands. DEEP Fisheries indicated that Ragged Rock Creek Wildlife Area is a state designated waterfowl hunting area, and that preservation of the parcel would allow additional access to marsh for hunters, given its position at the mouth of Ragged Rock Creek. Bob Gilmore was also supportive of the mitigation. There was a discussion regarding the future “development threat” pressure on the
mitigation parcel (or the lack thereof). Bob Gilmore indicated that in-lieu fee monies are being awarded to other projects which the proposed preserve lands are not under development pressure. **Action Items:** DOT to return to the Interagency Meeting for Bridge 01386 to report if, at the conclusion of the coastal engineering assessment, the design will be changed and if there are any additional wetland impacts.
TO: Amanda M. Saul, Transportation Planner 2, DOT

FROM: David Ellis, DEEP - Fisheries Division

DATE: June 9, 2017

SUBJECT: Fisheries Review – DOT Project 0105-0209

Type of Permit:
- ☑ 1. DOT Culvert/Bridge Projects Project #: 0105-0209 Bridge #: 02708
- □ 2. Diversion
- □ 3. PGP/Inland Wetland
- □ 4. Water Quality Certification

Applicant: Connecticut Department of Transportation

State P.E. Project #: N.A. Town: Old Saybrook

Waters: Plum Creek Sub Regional Basin #: 5000

Project Scope: Bridge No. 02708 consisting of a concrete slab atop concrete abutments currently carries a portion of Route 154 over Plum Bank Creek. Abutment stems and wing walls are in water. The superstructure is in serious condition (rating 3), the abutments stems and channel scour are in fair condition (rating 5), while the remaining components of the structure are in satisfactory condition (rating 6) or better. Enclosed are my preliminary comments.

Fisheries Resources: Plum Bank Creek is likely host to a number of tidal marsh species, including Mummichog, Atlantic Silverside, Stickleback, Killifish and Sheepshead Minnow. This area also supports a recreational Blue Crab fishery during the summer months.

Comments/Recommendations:
The project will not adversely affect fish habitat or species of fish within. Seasonal restrictions would not be recommended for this project as there are no known anadromous fish runs or Winter Flounder present in this area.

Fisheries supports a plan of full bridge replacement with hydraulically acceptable structures.
ENVIRONMENTAL REPORT
STATE PROJECT 105-215
Replacement of Bridge 02780, Route 154 over Plum Bank Creek
Old Saybrook, CT

Introduction

This project involves the replacement of Bridge 02780 which carries Route 154 over Plum Bank Creek in the Town of Old Saybrook. The existing bridge is a single span concrete slab on concrete abutments with timber clad wingwalls upstream and downstream of the structure. Concrete struts connect the structures’ abutments at/near the mudline. The existing structure has a span length of approximately 19’ and 30’ curb to curb width. The bridge was built in 1934. The proposed structure consists of single span, pre-stressed concrete box beam superstructure with integral abutments. The proposed abutments will be built behind the existing. A slight raise in the roadway profile at the bridge will necessitate roadway improvements at the approaches to the bridge. The project limits extend from approximately 250’ south of the bridge to approximately 275’ north of the bridge.

General Site Characteristics

The project site is located on Route 154 as it crosses through Plum Bank Marsh. With the exception of areas of residential development next to the roadway, Route 154 is essentially a causeway across Plum Bank Marsh running in a north-south direction. Plum Bank Creek is tidal and flows from the Sound into Plum Bank Marsh. Approximately 1/2mi upstream, the creek meets the confluence of the Back River which flows to the north of the project site. These two watercourses create the island community between the subject bridge and the bridge to the north. The southwest quadrant of the bridge has a small residential beach community. The northwest, northeast, and southeast quadrants of the bridge are undeveloped areas dominated by saltmarsh at the base of the roadway embankment.

The project is located within the South Central Shoreline subregional drainage basin (Basin No. 5000). Route 154 through this section has no formal drainage system and all runoff drains via sheetflow down the roadway embankments which are elevated above the marsh. The site is located within mapped FEMA 100-year floodplain designated as Zone VE (elev. 14). Groundwater quality for the site is mapped as GA. The soils of the site are a mix of Udorthents soils within the ROW (right-of-way) and Westbrook mucky peat comprises the marsh substrate. (Soils are further described in the soils report appended to this document).

The entrance to Toms Road is located on the western side of the road near the south approach roadway. Toms Road services approximately one dozen residences in a beach community. There are no other roadway intersections or driveway entrances within the project limits. Overhead utilities are located on the western side of the roadway and cross over the water just to the west of the fascia of the bridge. The poles carry 13.8kV electric lines and communication lines. A water main is located on the downstream fascia of the bridge.
Habitat Assessment

There are slight differences in the vegetative community downstream and upstream of the bridge due to the presence of vast open marsh upstream of the bridge. The roadway and bridge are elevated above the marsh surface through the project limits and as such there are slight roadway embankments formed of fill at the edge of the roadway. For the most part, tidal wetlands exist at the base of the embankment with tidal wetland vegetation being present up to the CJL elevation and extending slightly above the CJL/HTL making the ultimate limit of Coastal Jurisdiction for purposes of DEEP permitting CJL +1B (elevation 3.9 NAVD 88). Mean High Water (MHW) is identified at elevation 1.3 and Mean Low Water (MLW) is identified at elevation -2.3. The High Tide Line (used for ACOE permitting) has been determined to be elevation 3.2 (NGVD 88). The only locations where tidal wetland vegetation does not extend above the CJL is directly proximate to the bridge where existing areas of riprap have been placed for slope stabilization. Those are not capable of supporting tidal wetland vegetation due to the presence of the riprap. Mapping of the tidal wetland vegetation is depicted on an existing conditions plan appended to this report.

The marsh and creek provide excellent wildlife habitat for a myriad of species. There are no osprey platforms (natural or manmade) within 500’ of the structure but osprey can be seen hunting the creek and the Sound to the west. Other wading birds such as great blue heron, little egrets, snowy egrets and various shorebirds, waterfowl, and gulls work the marsh and creek edges foraging for crabs and fish. The site is mapped in the NDDDB for Saltmarsh sparrow. While the Creek is expected to support typical tidal and brackish fish species, it is expected to function as forage and refugia for juvenile life stages. The creek is mapped as a restricted relay shellfish area. There are no known mapped shellfish beds in proximity to the project (CTDEEP GIS). Diamondback Terrapin are known from the vicinity of Harvey’s Beach, to the north of the project site. No impact is expected to the species due to the minimization of impacts and lack of in-water disturbance.

Vegetative Community Downstream

The vegetation at the toe of the embankment on the downstream side of the bridge (the northwest and southwest quadrants) is dominated by high tide bush (Iva frutescens) and groundsel tree (Baccharis halimifolia). Within the marsh proper, the vegetation is dominated by saltwater cordgrass (Spartina alterniflora) and salt meadow cordgrass (Spartina patens) in the high marsh. Additional tidal vegetation just above the jurisdictional limits are scattered occurrences of beach plum (Prunus maritima) and seaside goldenrod (Solidago sempervirens), and bayberry (Myrica pensylvanica) in this area. Areas of common reed* (Phragmites australis) straddle the marsh edge and lower roadway embankment. Beyond the roadway embankment the marsh areas are vast and healthy with little evidence of disturbance. There is a portion of maintained “lawn” area beyond the southwest quadrant of the bridge. This area received tidal inundation, and though not part of the marsh proper does support tidal wetland species, namely blackgrass (Juncus gerardii).

The uplands of the embankment are a mixture of shrubs and herbaceous species. The dominant shrub is winged sumac (Rhus copallinum). There are occurrences of autumn olive (Blaeagnus unbellata), smooth sumac (Rhus glabra), and cedar (Juniperus virginiana). The herbaceous layer is dominated by little bluestem (Schizachyrium scoparium) and bittersweet* (Celastrus orbiculatus). Additional species

* Denotes a species known to be invasive in Connecticut
include spotted knapweed* (*Centaurea stoebe*), poison ivy (*Toxicodendron radicans*) and assorted grasses.

**Vegetative Community Upstream**

While similar in composition the vegetation upstream of the bridge (on the northeast and southeast quadrants) is structurally different. The southeast quadrant of the bridge is dominated by shrubs along the embankment, primarily bayberry, smooth sumac, and cedars. The northeast quadrant has only a few small shrubs of autumn olive and cedar. The uplands are mostly dominated by a patch of Japanese knotweed* (*Fallopia japonica*). Additional shrubs on the upstream side of the roadway include winged sumac, Japanese honeysuckle* (*Lonicera japonica*) and rugose rose* (*Rosa rugosa*). Herbaceous species include little bluestem, spotted knapweed, evening primrose (*Onothera biennis*), and poison ivy.

Tidal wetland vegetation within the regulatory limits include similar species as the downstream wetlands, being dominated by saltwater cordgrass. The fringes have high tide bush and marsh elder, as well as seaside goldenrod.

**Proposed Conditions**

The proposed replacement bridge will have abutments built behind the existing abutments. The existing abutments will be cut down and left in place. The proposed bridge is a single 40'6" span structure of concrete box beams with integral abutments. To protect the bridge from future scour in critical storms (100-year storm) the new abutments will be enclosed in permanent sheet pile. This will allow the bridge to resist a record storm without failure. A concrete block revetment will be placed between the existing abutments and the new abutments to stabilize the shoreline above the waterline. The existing wingwalls will be used, and additional riprap will be placed at the four corners of the bridge to stabilize the shoreline around the abutments. The proposed low chord of the bridge will match the existing at elevation 5ft. There will be temporary relocation of the aerial utility poles during construction. The utility pole relocations will be accomplished via the installation of temporary earth retaining systems along the western slope to allow for the installation of the temporary poles. Minimum clearances in accordance with CFR 322.5 will be maintained during the temporary aerial utility relocations. An existing watermain will be replaced on the east fascia of the bridge. The existing watermain will be temporarily relocated upstream during construction on temporary supports. The bottom chord of the temporary watermain structure will match the existing bridge. As the new bridge will be a slightly deeper structure there will be a slight increase in the vertical alignment of the roadway at the bridge, necessitating some roadway reconstruction of the approaches which includes reforming the roadway embankments to accommodate current standard guardrail. A work float is proposed to be used in the water during the removal of the bridge superstructure as a debris control system and to facilitate work when the abutments are being cut down. The work float will have a waterproof membrane to prevent any debris or slurry from discharging from the float to the waterway. The work float will not be stored in the waterway when not in use, and at no time will it be allowed to 'bottom-out' on the riverbed. When not in use, it will be stored within the disturbed project limits. It will not be stored in undisturbed marsh areas.

**Impact Assessment**

The wetland impacts for the proposed bridge replacement are relatively minor and mostly restricted to the fringes of wetland at the base of the roadway embankment and are mostly due to the roadway reconstruction and guardrail installation. There is some impact associated with refreshing the riprap at the four corners of the abutments. Total impacts below the CIL amount to 1680sf (1095sf Perm, 585sf Temp). Of the total impacts below CIL only 20sf are below the MHW. Total impacts below the HTL
amount to 930 sf (625 sf Perm, 305 sf Temp), of which again, only 20 sf are below the MIFW. In total most of the wetland impacts are to the fringe wetlands at the base of the roadway embankment and not to the large intact marsh system which is beyond the bridge and roadway toe. Measures have been taken to minimize impacts to the extent practical. Areas which are temporarily disturbed will be restored with native plantings.

There are no anticipated impacts to fish or wildlife species from the proposed activity. Because the existing abutments will be used for water handling, there will be no impacts to fish passage through the structure during construction. The impacts to vegetation along the roadway is minor, and there are areas of invasive species that will benefit from treatment and replacement by native vegetation. Though the marsh is mapped as Saltmarsh Sparrow habitat, the timing of the construction is such that it should not affect breeding of the sparrows in the marsh. The NDDP response letter is appended to the Application which shows no negative effects are expected to species from the project.

Mitigation and Minimization

The Department is proposing preservation as a means to mitigate the permanent impacts resulting from the bridge replacement to satisfy DEEP mitigation requirements. The Department underwent an exhaustive search for on-the-ground mitigation sites to either restore or create within the surrounding area. Because the impacts of the project are so limited, it also means that limited mitigation would be required, even at a ratio of 3:1. Given that ratio the Department was seeking an area of approximately 5000 sf, or 0.1 acres. The adjacent marsh is one of the larger intact marshes within Old Saybrook and little opportunity exists to find an accessible isolated 0.1 acre patch that is degraded and in need of restoration. While there are areas of Phragmites incursions, we were unable to find any that were isolated enough where the success of the restoration was probable, let alone reliably predictable. The Department also involved the Old Saybrook Planning Department, Old Saybrook Land Trust, and the DEEP WHAMM unit in an attempt to identify a suitable restoration area.

The Old Saybrook Land Trust was able to identify a parcel for acquisition within the Ragged Rock Creek Marsh area. The parcel is located at the mouth of Ragged Rock Creek adjacent to the Connecticut River. The parcel is approximately 1 acre in size and is currently undeveloped. The parcel is surrounded by approximately 250 acres of adjacent preserved land owned by the DEEP, the Nature Conservancy, the Old Saybrook Land Trust and the Town of Old Saybrook. It is the last remaining unpreserved parcel in this portion of the marsh. It is the intention of the Department to acquire the parcel (currently in process with our Rights-of-Way division) and then turn over the ownership to DEEP to incorporate into their management of existing preserved lands. The parcel is currently identified by the Town of Old Saybrook Assessors Map as MBL 049/036-0000, Account Number 00533000.

Ragged Rock Creek Marsh has long been deemed a valuable resource of the lower Connecticut River valley. In 1990 Congress sponsored a study the “Northeast Coastal Areas Study of Significant Coastal Habitats” for the U.S. Fish & Wildlife service to identify areas in Southern New England and Long Island in need of protection for fish & wildlife habitat and to preserve natural diversity. Ragged Rock marsh was called out as part of the Connecticut River and Tidal Wetlands complex worthy of protection. An article from the Hartford Courant in 1995 lauded the donation of land from private ownership to the Nature Conservancy within the marsh. DEEP sponsored an extensive vegetation study in 2009 documenting the diverse vegetation of the marsh. The mouth of the Connecticut River has been designated by the Audubon Society as a Landscape-scale Important Bird Area (IBA) of which Ragged Rock Creek Wildlife Management Area is specifically called out. Ragged Rock Creek marsh was also identified in the Plan for Implementing the Silvio O. Conte National Wildlife Refuge as a target area for conservation in the 2015 FEIS (Final Environmental Impact Statement).

Because the parcel is approximately 1 acre, and in excess of what would be required for preservation for this bridge, the Department, in consultation with CTDEEP at the November 2018 monthly Intergency Coordination Meeting, has proposed that the parcel not only serve as mitigation for the replacement of Br.
02708, but also serve as mitigation for the replacement of Br. 01386, which is located just north of the subject bridge. Br. 01386 is currently under design for replacement, and was to be contract bid at the same time as Br. 02708 however the design schedule has fallen behind. We expect the construction of Br. 01386 to follow the year after the construction of the subject bridge. As such, we are proposing to provide State mitigation for both projects by the acquisition of the single parcel. As discussed at the Interagency Coordination Meeting, the impacts for Br. 01386, as known at that time, would be mitigated for by the acquisition parcel. It was CTDEEP’s position that the acquisition parcel would be sufficient for both bridges, as it is expected that any increase in impacts at Br. 01386 would be the result of increasing the bridge opening, which they found to an activity that would provide mitigation via increased flushing of the tidal marsh, so that nothing further would be required to satisfy the CTDEEPs mitigation requirements. Location maps for the mitigation site are provided in the Appendix to this report. In order to satisfy the mitigation requirements for the ACOE, a payment will be made to the CT In-Lieu Fee program to compensate for the unavoidable permanent impacts to wetlands and waters within the ACOE jurisdiction.

In addition to the off-site mitigation mentioned above, all temporarily disturbed areas will be stabilized and re-vegetated with native vegetation tolerant of coastal conditions. Invasive species identified in the Habitat Characteristics section above will be treated within the project limits utilizing the Department’s Control and Removal of Invasive Vegetation Specification. These areas will also be re-planted with native vegetation. The Contractor will adhere to the Department’s Form 817, Standard Specifications for Roads, Bridges, facilities and Incidental Construction which guides BMP’s for the protection of water quality during construction. The work float that will be utilized in the removal of the superstructure and the cutting down of the abutments will be watertight to ensure that no debris enters the waterway from work float and other debris control measures will be used during abutment and superstructure removal to contain debris. Turbidity curtains will be utilized in the water at the four corners of the bridge during the placement of the riprap to control any turbidity which may be produced from the activity. The riprap limits do not extend below the MHW line, so work should be able to be accomplished during low tidal ranges. Silt fence and sandbag cofferdams are not suitable along the wingwalls due to the steep side slopes of the waterway in and around the bridge and the short duration of the riprap placement, however silt fence will be used along the roadway for the reconstruction work. The Specification for the work float will prohibit the Contractor from allowing the work float to ground out on the riverbed at any time.

**Summary**

The project represents the efforts to minimize impacts to the salt marsh habitat surrounding the bridge. Keeping the existing abutments in place allows for no impacts to the waterway from the full structure replacement. Best Management Practices for the construction and use of the work float will prevent discharges to the waterway. The riprap placement has been minimized to that which is necessary to protect the existing wingwalls at the four corners of the bridge. Impacts to wildlife will be avoided by the timing of the construction in later winter and early spring prior to the breeding season for most species. The proposed mitigation is a unique opportunity to preserve the last parcel of privately held land surrounded by 250ac of adjacent preserved land in the valuable Ragged Rock Creek wildlife area and in addition will contribute to the Connecticut In-Lieu Fee mitigation fund.
Site Photographs
&
Vegetation Mapping
Upper Left: Upstream facing north
Upper Right: Downstream facing south
Center Left: Downstream facing northwest
Center Right: Looking north across downstream face of bridge
Bottom Left: Upstream facing east

Photos: 8/23/2018
Soils Information
### MAP LEGEND

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<td>Aerial Photography</td>
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### MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: State of Connecticut
Survey Area Data: Version 18, Dec 6, 2018

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Dec 31, 2009—Sep 6, 2017

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.
Map Unit Legend

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<tr>
<th>Map Unit Symbol</th>
<th>Map Unit Name</th>
<th>Acres in AOI</th>
<th>Percent of AOI</th>
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</thead>
<tbody>
<tr>
<td>99</td>
<td>Westbrook mucky peat, 0 to 2 percent slopes, very frequently flooded</td>
<td>0.1</td>
<td>33.1%</td>
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<tr>
<td>306</td>
<td>Udorthents-Urban land complex</td>
<td>0.1</td>
<td>23.7%</td>
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<tr>
<td>311</td>
<td>Udorthents-Urban land complex, coastal, rarely flooded</td>
<td>0.1</td>
<td>15.0%</td>
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<tr>
<td>W</td>
<td>Water</td>
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<td>28.2%</td>
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<td><strong>Totals for Area of Interest</strong></td>
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<td><strong>0.3</strong></td>
<td><strong>100.0%</strong></td>
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</table>
Map Unit Description

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions in this report, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named, soils that are similar to the named components, and some minor components that differ in use and management from the major soils.

Most of the soils similar to the major components have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Some minor components, however, have properties and behavior characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.
Soils that have profiles that are almost alike make up a soil series. All the soils of a series have major horizons that are similar in composition, thickness, and arrangement. Soils of a given series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into soil phases. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silty loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A complex consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An association is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An undifferentiated group is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include miscellaneous areas. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Additional information about the map units described in this report is available in other soil reports, which give properties of the soils and the limitations, capabilities, and potentials for many uses. Also, the narratives that accompany the soil reports define some of the properties included in the map unit descriptions.

Report—Map Unit Description

State of Connecticut

98—Westbrook mucky peat, 0 to 2 percent slopes, very frequently flooded

Map Unit Setting
National map unit symbol: 2tyqf
Elevation: 0 to 10 feet  
Mean annual precipitation: 36 to 71 inches  
Mean annual air temperature: 39 to 55 degrees F  
Frost-free period: 140 to 250 days  
Farmland classification: Not prime farmland

Map Unit Composition
Westbrook and similar soils: 90 percent  
Minor components: 10 percent  
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Westbrook

Setting
Landform: Tidal marshes  
Landform position (three-dimensional): Dip  
Down-slope shape: Linear  
Across-slope shape: Linear  
Parent material: Partly-decomposed herbaceous organic material over loamy mineral material

Typical profile
Oe - 0 to 19 inches: mucky peat  
Cg - 19 to 59 inches: silt loam

Properties and qualities
Slope: 0 to 2 percent  
Depth to restrictive feature: More than 80 inches  
Natural drainage class: Very poorly drained  
Runoff class: Negligible  
Capacity of the most limiting layer to transmit water (Ksat): Very low to high (0.00 to 14.17 in/hr)  
Depth to water table: About 0 inches  
Frequency of flooding: Very frequent  
Frequency of ponding: None  
Calcium carbonate, maximum in profile: 5 percent  
Salinity, maximum in profile: Nonsaline to strongly saline (0.7 to 111.6 mmhos/cm)  
Sodium adsorption ratio, maximum in profile: 33.0  
Available water storage in profile: High (about 9.1 inches)

Interpretive groups
Land capability classification (irrigated): None specified  
Land capability classification (nonirrigated): 8w  
Hydrologic Soil Group: B/D  
Ecological site: Tidal Salt Low Marsh mesic very frequently flooded (R144AY001CT), Tidal Salt High Marsh mesic very frequently flooded (R144AY002CT)  
Hydric soil rating: Yes
Minor Components

Pawcatuck
Percent of map unit: 5 percent
Landform: Tidal marshes
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Tidal Salt Low Marsh mesic very frequently flooded
(R144AY001CT), Tidal Salt High Marsh mesic very frequently flooded
(R144AY002CT)
Hydric soil rating: Yes

Ipswich
Percent of map unit: 5 percent
Landform: Tidal marshes
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Tidal Salt Low Marsh mesic very frequently flooded
(R144AY001CT), Tidal Salt High Marsh mesic very frequently flooded
(R144AY002CT)
Hydric soil rating: Yes

306—Udorthents-Urban land complex

Map Unit Setting
National map unit symbol: 91mg
Elevation: 0 to 2,000 feet
Mean annual precipitation: 43 to 56 inches
Mean annual air temperature: 45 to 55 degrees F
Frost-free period: 120 to 185 days
Farmland classification: Not prime farmland

Map Unit Composition
Udorthents and similar soils: 50 percent
Urban land: 35 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the map unit.

Description of Udorthents

Setting
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Drift

Typical profile
A - 0 to 5 inches: loam
C1 - 5 to 21 inches: gravelly loam
C2 - 21 to 80 inches: very gravelly sandy loam
Properties and qualities
Slope: 0 to 25 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Very low to high (0.00 to 1.98 in/hr)
Depth to water table: About 54 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Moderate (about 6.8 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Hydric soil rating: No

Description of Urban Land

Typical profile
H - 0 to 6 inches: material

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8
Hydrologic Soil Group: D
Hydric soil rating: Unranked

Minor Components

Unnamed, undisturbed soils
- Percent of map unit: 8 percent
  Hydric soil rating: No

Udorthents, wet substratum
Percent of map unit: 5 percent
Down-slope shape: Convex
Across-slope shape: Linear
Hydric soil rating: No

Rock outcrop
Percent of map unit: 2 percent
Hydric soil rating: No

311—Udorthents-Urban land complex, coastal, rarely flooded

Map Unit Setting
National map unit symbol: 2x1kg
Elevation: 0 to 10 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition
- Udorthents, coastal, and similar soils: 50 percent
- Urban land, coastal: 35 percent
- Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Udorthents, Coastal

Setting
- Landform: Tidal marshes
- Landform position (three-dimensional): Tread
- Down-slope shape: Linear
- Across-slope shape: Linear
- Parent material: Loamy human-transported material

Typical profile
- A: 0 to 5 inches: loam
- C1: 0.5 to 21 inches: gravelly sandy loam
- C2: 21 to 79 inches: very gravelly sandy loam

Properties and qualities
- Slope: 0 to 3 percent
- Depth to restrictive feature: More than 80 inches
- Natural drainage class: Moderately well drained
- Runoff class: Medium
- Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.01 to 1.42 in/hr)
- Depth to water table: About 24 to 54 inches
- Frequency of flooding: Rare
- Frequency of ponding: None
- Salinity, maximum in profile: Nonsaline (0.0 to 1.9 mmhos/cm)
- Available water storage in profile: Low (about 5.8 inches)

Interpretive groups
- Land capability classification (irrigated): None specified
- Land capability classification (nonirrigated): 8
- Hydrologic Soil Group: C
- Hydric soil rating: No

Description of Urban Land, Coastal

Setting
- Landform: Dunes
- Down-slope shape: Linear
- Across-slope shape: Linear

Typical profile
- M: 0 to 10 inches: cemented material

Properties and qualities
- Slope: 0 to 8 percent
Depth to restrictive feature: 0 inches to manufactured layer
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Frequency of flooding: Rare
Available water storage in profile: Very low (about 0.0 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8
Hydrologic Soil Group: D
Hydrick soil rating: Unranked

Minor Components
Verrazano
Percent of map unit: 6 percent
Landform: Dunes
Landform position (three-dimensional): Tread
Down-slope shape: Linear, convex
Across-slope shape: Linear, convex
Hydrick soil rating: No

Bigapple
Percent of map unit: 6 percent
Landform: Tidal marshes
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Hydrick soil rating: No

Hooksan
Percent of map unit: 3 percent
Landform: Dunes
Landform position (two-dimensional): Backslope, shoulder, foottslope
Landform position (three-dimensional): Crest, base slope, side slope
Down-slope shape: Convex
Across-slope shape: Convex
Hydrick soil rating: No

W—Water

Map Unit Composition
Water: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Data Source Information

Soil Survey Area: State of Connecticut
Survey Area Data: Version 18, Dec 6, 2018
Mitigation Site Information
RIVER MEADOW DISTRICT

Location: RIVER MEADOW DISTRICT

Acct#: 00533000

Owner: LIBMAN MICHAEL

Assessment: $7,000

Appraisal: $10,000

PID: 5419

Building Count: 1

Current Value

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<tr>
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<tr>
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Owner of Record

Owner: LIBMAN MICHAEL

Co-Owner: C/O RICHARD CASE ESQ

Address: 16 TOWER LANE
          AVON, CT 06001

Sale Price: $500

Certificate

Book & Page: 0451/0520

Sale Date: 11/25/2003

Ownership History

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Building Information

Building 1: Section 1

Year Built: 0

Living Area: Building Attributes

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<tr>
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<tr>
<td>Style</td>
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<tr>
<td>Model</td>
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<td>Occupancy</td>
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### Exterior Wall 1

<table>
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<th>Details</th>
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<tbody>
<tr>
<td>Roof Structure</td>
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<tr>
<td>Roof Cover</td>
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</tr>
<tr>
<td>Interior Wall 1</td>
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<tr>
<td>Interior Wall 2</td>
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<tr>
<td>Interior Ffr 1</td>
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<td>Bath Style</td>
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<td>Kitchen Style</td>
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### Building Layout

No Image Available

### Building Sub-Areas (sq ft) Legend

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### Extra Features

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### Land

#### Land Use

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#### Land Line Valuation

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### Valuation History

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Project No. 0105-0215


3/6/2019
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CERTIFICATE OF CONDEMNATION

THIS IS TO CERTIFY that, the State of Connecticut, acting herein by its Commissioner of Transportation, Joseph J. Giulietti, pursuant to the provisions of Section 13a-73(b) of the General Statutes of Connecticut, as revised, has taken by filing an Assessment of Damages and Notice of Condemnation on March 4, 2019, with the Clerk of the Superior Court in the Judicial District of Middlesex, the following described premises owned by Heirs of Michael Libman, c/o Richard Case, Esq., 10 Tower Lane, Avon, Connecticut 06001, and in which the following persons or corporations have an interest of record:

Stephen Libman aka Stephen Hanafi
14912 106 Ave Northeast
Bothell, Washington 98011

Town of Old Saybrook
Barry E. Maynard, Tax Collector
302 Main Street
Old Saybrook, Connecticut 06475 (Tax Lien)

Department of Revenue Services
Scott D. Jackson
DRS Commissioner
450 Columbus Blvd., Ste 1
Hartford, CT 06103 (Duplicate Notice)

DESCRIPTION OF PREMISES

That certain parcel of land with all improvements thereon and appurtenances thereto, situated in the Town of Old Saybrook, County of Middlesex and State of Connecticut, located easterly of Present Rivers Ridge Road, containing one acre, more or less, and being more particularly bounded and described on SCHEDULE A attached hereto and made part hereof, Town No. 105, Project No. 105-209, Serial No. 001.

The above-described premises are taken subject to such easements and rights as appear of record.

The above-described premises are taken subject to any and all provisions of any ordinance, municipal regulation, or public or private law.
Heirs of Michael Libman
105-209-001

The premises taken herein are the same premises contained in a Warranty Deed
dated November 25, 2003, and recorded in Volume 451 at Page 520 of the Town of Old
Seabrook Land Records.

This is a total take.

Dated at Newington, Connecticut, this 25 day of February A.D., 2019.

Joseph J. Giulietti
Commissioner of Transportation
State of Connecticut

By ________________ (L.S.)

Terrence J. Obey
Director of Rights of Way
Bureau of Engineering and Construction
Duly Authorized
Heirs of Michael Libman
105-209-001

SCHEDULE A

Northeast by Flagged Rock Creek,
East by Personage Creek,
South by land now or formerly of G. Robert and Charlotte P. Saunders, and
West by land of the State of Connecticut.

Received for Record at Old Saybrook, Ct.
On 03/04/2010 At 11:14:30 am

3 of 3
ATTACHMENT N: U.S. ARMY CORPS OF ENGINEERS
DEEP PERMIT CONSULTATION FORM

To the applicant- Prior to the submission of your permit application to the Connecticut Department of Energy and Environmental Protection - Office of Long Island Sound Programs (DEEP- OLISP), please complete Part I and submit this form to the U.S. Army Corps of Engineers (USACE), Regulatory Division, Attn: Diane M. Ray, 696 Virginia Road, Concord, MA 01742, with a location map of your site and project plans. Once they return the completed form to you, please submit it along with your permit application to the DEEP.

Part I: Applicant Information
To be completed by applicant.

1. List applicant information:
   Name: Connecticut Department of Transportation
   Mailing Address: 2800 Berlin Turnpike
   City/Town: Newington State: CT Zip Code: 06131
   Business Phone: 860-594-2931 ext. Fax: 860-594-3028
   Contact Person: Kimberly C. Lesay Title: Transportation Asst. Planning Director
   E-mail: kimberly.lesay@ct.gov

2. List engineer, surveyor or agent information:
   Name: Connecticut Department of Transportation
   Mailing Address: 2800 Berlin Turnpike
   City/Town: Newington State: CT Zip Code: 06111
   Business Phone: 860-594-3205 ext. Fax:
   Contact Person: Ryan D. Martin Title: Project Engineer
   E-mail: ryan.martin@ct.gov
   Service provided: Project Engineer

3. Site location:
   Name of site: Bridge No. 02708
   Street Address or Location Description: Route 154 Bridge at Plum Bank Creek
   City/Town: Old Saybrook State: CT Zip Code: 06475
   Tax Assessor's Reference: Map Block Lot

4. Are plans attached? ☑ Yes ☐ No If yes, provide date of plans: January 22, 2019
Part I: Applicant Information (continued)

5. Provide or attach a brief, but thorough description of the project:
   CTDOT - Replace Bridge 02708 over Plum Bank Creek, Old Saybrook

Part II: To be Completed by US Army Corps of Engineers

This consultation form is required to be submitted as part of an application for a Structures, Dredging & Fill permit (section 22a-361 of the Connecticut general Statutes (CGS)) and/or Tidal Wetlands permit (CGS section 22a-32) to the DEEP-OLISP. The application has not yet been submitted to the DEEP. Please review the enclosed materials with regard to the U.S. Army Corp of Engineers review process pursuant to Section 10 of the Rivers and Harbors Act of 1899 and Section 404 of the Clean Water Act; and provide any comments or recommendations you may have with regard to this proposal. Please call DEEP-OLISP at 860-424-3034 to speak with the analyst assigned to the town in which the work is proposed if you have any questions. Please return the completed form to the applicant.

COMMENTS/RECOMMENDATIONS:
see attached

USACE Application number: NAE-2019-00547

LEE.SUSAN.K.12285

34940


Signature of Project Manager: Susan Lee

Printed Name of Project Manager: Susan Lee

03/08/2019

Date

03/08/2019 15:00:08 -05'00'

DEEP-OLISP-APP-101
Project No. 0105-0215

2 of 2

Rev. 08/29/11
Corps File # NAE-2019-00547  Pre-application Comments

Applicant: CTDOT

Project: Replacement of Bridge 02708 over Plum Bank Creek (State Project 105-215)

1. The activity (fill/riprap/grading and work/structures) affecting waters of the U.S., as proposed and shown on Drawings PMT-01 through PMT-07 (dates January 22, 2019 and February 6, 2019), requires Section 404 and Section 10 permits from the Corps. The project activity appears eligible for general permit review under the current CT GPs (PCN application).

2. Coordination with NOAA-NMFS will be required regarding potential adverse effects on EFH and ESA species. Application materials should include specific information on construction activities directly affecting Plum Bank Creek and adjacent tidal wetlands, and those BMP measures to avoid/minimize impacts on ESA species, and on EFH and fishery resources dependent on EFH areas. The Corps acknowledges that CTDOT has initiated consultation with NOAA. The NOAA determinations should be included in application materials, or when available.

3. Plans:
   a. Drawing PMT-05: The length of the temporary water line and temporary electric/communications lines spanning between MHW limits should be identified. It appears that the temporary poles supporting the temporary aerial electric lines will be within Corps jurisdictional limits. Information on the proposed construction method for installation of the temporary poles should be included. The application materials need to include appropriate utility drawings (plan and elevation/section views, as appropriate) that clearly show temporary structures relative to Corps jurisdictional limits. The temporary electric/communication lines crossing over navigable waters of the United States need to meet the minimum additional clearances as specified under 33 CFR 322.5 (i) (2) and (3). See 33 CFR 322.5 (i) appended below.
   b. Drawing PMT-04: Bridge section B-B - Minimum elevations are shown for the final and temporary condition of the aerial electric and communication lines shown at bridge section B-B. Need to show reference point/datum from which minimum vertical clearance is measured.

4. Mitigation: This project was previously reviewed in pre-application discussions. The Corps recommends compensatory mitigation for permanent impacts on tidal wetlands resources. The Corps and CTDOT have agreed on compensatory mitigation in the form of an ILF payment to the CT ILF Program.
February 25, 2019

Ms. Susan K. Lee
USACE – New England District
Regulatory Division
696 Virginia Road
Concord, MA 01742

Subject: State Project No. 105-215
Replacement of Br. 02708
Route 154 over Plum Bank Creek
Old Saybrook, CT
DEEP Permit Consultation Form

Dear Ms. Lee,

The State of Connecticut Department of Transportation (the Department) is applying for a Tidal Wetlands, Structures, Dredge, and Fill permit pursuant to Connecticut General Statute 22a-32 and 22a-361 from the Connecticut Department of Energy and Environmental Protection (CTDEEP).

The project proposes to replace the existing 19ft span bridge which carries Route 154 over Plum Bank Creek with a 40.5ft concrete box beam bridge supported on integral abutments which will be built behind the existing abutments. Mitigation for the impacts to tidal wetlands will be provided through the preservation of a 1-acre parcel of undeveloped land at the mouth of Ragged Rock Creek along the Connecticut River. The parcel of land will be transferred from the Department to CTDEEP in the future to include in their landholdings within the Ragged Rock Creek Marsh, a system comprised of over 250ac of preserved lands (map of mitigation parcel attached). This mitigation will satisfy the requirements of CTDEEP. Additionally, the Department will be paying into the Army Corps of Engineers In-Lieu Fee program to compensate for unavoidable impacts to resources within the Corps’ jurisdiction.

Per the requirements of the above-mentioned permit, we request your review of the proposed activities. Please find enclosed the CTDEEP Consultation Form, a location map, project description and project plans for your review and comment. If you have any questions or require additional information, please contact Mr. Andrew H. Davis, of my staff, at (860) 594-2157.

Very truly yours,

[Signature]
Kimberly C. Lesay
Transportation Assistant Planning Director
Bureau of Policy and Planning

Enclosures
cc: CTDEEP LWRD
June 26, 2019

Ms. Susan Lee
U.S. Army Corps of Engineers
New England District
696 Virginia Road
Concord, MA 01742-2751

Subject: State Project No. 105-215
Replacement of Br. No. 02708, Route 154 over Plum Bank Creek
Town of Old Saybrook

Dear Ms. Lee:

Enclosed please find the Section 404 permit application for your review and approval. The Department is submitting this PCN permit application under GP 19 (Stream, River & Brook Crossings). An application for a Tidal Wetlands, Structures, Dredge and Fill Permit from CTDEEP has been submitted concurrently.

The project has received funding from FHWA, and as such has been submitted to the USFWS under the Final 4(d) rule for the Federally Threatened Northern Long-eared Bat. There are no documented hibernacula within Old Saybrook or in the vicinity of the project. Consultation with NOAA NMFS has been completed for both ESA and EFH and are included in the application. The Department will be contributing the Connecticut In-Lieu Fee program to compensate for unavoidable impacts to wetlands and waters. The In-Lieu Fee calculation is $6318.75 and the worksheet is included with this submission.

Any questions pertaining to this application may be directed to Mr. Andrew H. Davis, Transportation Supervising Planner at 860-594-2157.

Very truly yours,

Kimberly C. Lesay
Transportation Assistant Planning Director
Bureau of Policy and Planning

Attachments
Amanda M. Saul/ams
cc: Nathan Margason – USEPA

An Equal Opportunity Employer
Printed on Recycled or Recovered Paper

Project No. 0105-0215

499
bcc: Andrew H. Davis – Amanda M. Saul
Mary E. Baker – Bao Chuong – Raymond I. Basar
Robert E. Obey – District 2
# CONNECTICUT IN-LIEU FEE (ILF) PROJECT IMPACT WORKSHEET

1. Date:  __April 10, 2019__
2. Corps file number:  **NAE-**
3. Corps project manager:  **Susan K. Lee**
4. Applicant(s):  **Connecticut Department of Transportation**
5. ILF amount:  **$ 6318.75**
6. Project address:  **Route 154 over Plum Bank Creek, Bridge #02708 State Project 105-215.**
7. Service area:  **Connecticut River**
8. Lat/long of impact1:  **-72.393478 41.271919**
9. 8-Digit Hydrologic Unit Code:  **01100004**
10. Impact area subject to compensation (in SF or LF):  **625 SF (100% of Permanent impacts to wetlands and waters)**
11. Resources impacted:

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<th>Resource Type (list all that apply)</th>
<th>Functions (for wetland impacts - by resource type)</th>
<th>Type of Impact (by resource type)</th>
<th>SF of Aquatic Resources Impacted (by resource type)</th>
<th>Linear Feet of Streams Impacted</th>
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<tr>
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<td>Fill</td>
<td>605sf (Wetland)</td>
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<td>20sf (Waterway)</td>
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</table>

**Total Impacts:** 625 625

- **Resource Type:** Wetlands by NWI type (PFO, PSS, PEM, M1, M2, E2, etc.), vernal pool (VP), VP critical terrestrial habitat (CTH), and/or river, stream, or brook (R).
- **Wetland Functions:** Groundwater recharge/discharge (GWR); floodflow alteration (FF); fish & shellfish habitat (FSH); sediment toxicant retention (STR); nutrient removal (NR); production export (PE); sediment/shoreline stabilization (SS); wildlife habitat (WH).
- **Type of impact:** May include one or more of the following: fill, conversion (e.g., forested to shrub/scrub), excavation with associated discharge, etc.

---

1 If the project is linear, choose the midpoint within each service area.
**U.S. Army Corps of Engineers (USACE)**

**APPLICATION FOR DEPARTMENT OF THE ARMY PERMIT**
33 CFR 325. The proponent agency is CECW-CO-R.

The public reporting burden for this collection of information, OMB Control Number 0710-0003, is estimated to average 11 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate or burden reduction suggestions to the Department of Defense, Washington Headquarters Services, at whs.mco.alex.ead.mbx.of-dod-information-collections@mail.mil. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.

**PRIVACY ACT STATEMENT**

Authorities: Rivers and Harbors Act, Section 10, 33 USC 403; Clean Water Act, Section 404, 33 USC 1344; Marine Protection, Research, and Sanctuaries Act, Section 103, 33 USC 1413; Regulatory Programs of the Corps of Engineers; Final Rule 33 CFR 320-332. Principal Purpose: Information provided on this form will be used in evaluating the application for a permit. Routine Uses: This information may be shared with the Department of Justice and other federal, state, and local government agencies, and the public and may be made available as part of a public notice as required by Federal law. Submission of requested information is voluntary, however, if information is not provided the permit application cannot be evaluated nor can a permit be issued. One set of original drawings or good reproducible copies which show the location and character of the proposed activity must be attached to this application (see sample drawings and/or instructions) and be submitted to the District Engineer having jurisdiction over the location of the proposed activity. An application that is not completed in full will be returned. System of Record Notice (SORN). The information received is entered into our permit tracking database and a SORN has been completed (SORN #A1145b) and may be accessed at the following website: [http://dpcold.defense.gov/Privacy/SORNsIndex/DOD-wide-SORN Article-View/Article/570115/a1145b-ce.aspx](http://dpcold.defense.gov/Privacy/SORNsIndex/DOD-wide-SORN Article-View/Article/570115/a1145b-ce.aspx)

**(ITEMS 1 THRU 4 TO BE FILLED BY THE CORPS)**

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<th>4. DATE APPLICATION COMPLETE</th>
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**(ITEMS BELOW TO BE FILLED BY APPLICANT)**

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<td>First -</td>
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<td>Middle - C</td>
<td>Middle -</td>
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<td>Last - Lesay</td>
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<tr>
<td>Company -</td>
<td>Company -</td>
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<td>Connecticut Department of Transportation</td>
<td>E-mail Address - <a href="mailto:kimberly.lesay@ct.gov">kimberly.lesay@ct.gov</a></td>
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<th>7. APPLICANT'S PHONE NOs, w/AREA Code</th>
<th>10. AGENTS PHONE NOs, w/AREA Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Residence</td>
<td>a. Residence</td>
</tr>
<tr>
<td>b. Business</td>
<td>b. Business</td>
</tr>
<tr>
<td>c. Fax</td>
<td>c. Fax</td>
</tr>
<tr>
<td>869-594-2931</td>
<td>860-594-3028</td>
</tr>
</tbody>
</table>

**STATEMENT OF AUTHORIZATION**

11. I hereby authorize, [Signature], to act in my behalf as my agent in the processing of this application and to furnish, upon request, supplemental information in support of this permit application.

<table>
<thead>
<tr>
<th>SIGNATURE OF APPLICANT</th>
<th>DATE</th>
</tr>
</thead>
</table>

**NAME, LOCATION, AND DESCRIPTION OF PROJECT OR ACTIVITY**

12. PROJECT NAME OR TITLE (see instructions)
Replacement of Bridge No. 02708 carrying Route 154 over Plum Bank Creek in the Town of Old Saybrook

<table>
<thead>
<tr>
<th>13. NAME OF WATERBODY, IF KNOWN (if applicable)</th>
<th>14. PROJECT STREET ADDRESS (if applicable)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plum Bank Creek</td>
<td>Address Route 154</td>
</tr>
</tbody>
</table>

15. LOCATION OF PROJECT

<table>
<thead>
<tr>
<th>Latitude: N 41°16'18.9&quot;</th>
<th>Longitude: W 72°23'36.5&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>City - Old Saybrook</td>
<td></td>
</tr>
<tr>
<td>State - CT</td>
<td>Zip - 06475</td>
</tr>
</tbody>
</table>

16. OTHER LOCATION DESCRIPTIONS, IF KNOWN (see instructions)

<table>
<thead>
<tr>
<th>State Tax Parcel ID</th>
<th>Municipality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Section -</td>
<td>Township -</td>
</tr>
<tr>
<td></td>
<td>Range -</td>
</tr>
</tbody>
</table>

**ENG FORM 4345, SEP 2017**

**PREVIOUS EDITIONS ARE OBSOLETE.**

Page 1 of 3

Project No. 0105-0215 502
17. DIRECTIONS TO THE SITE
From the New England Army Corps of Engineers Office, take Interstate-95 Southbound (SB) to Connecticut Exit 67 toward Elm Street. Turn left onto Elm Street/Inham Hill Road. After 400 feet, turn right onto Inham Hill Road. After 0.8 miles turn left onto US-1 N/Boston Post Road. After 0.1 miles, turn right onto Old Boston Post Road. After 500 feet turn right onto CT-154 E. Follow CT-154 E for 1.1 miles to the bridge carrying Route 154 over Plum Bank Creek.

18. Nature of Activity (Description of project, include all features)
Please see attached sheets and executive summary.

19. Project Purpose (Describe the reason or purpose of the project, see instructions)
The purpose of the project is to address safety concerns associated with the deterioration of the bridge that carries Route 154 over Plum Bank Creek. Based on the most recent bridge inspection report the bridge is considered to be in serious condition. The bridge is assessed to be beyond repair and must be replaced. The bridge is one of only two means for wheeled vehicles and foot traffic to access an island community and the public beaches located on the island and are therefore necessary to preserve the island’s economy, utilities, and recreation facilities. It serves approximately 4600 vehicles per day. Construction is anticipated to occur from March through May of 2020.

USE BLOCKS 20-23 IF DREDGED AND/OR FILL MATERIAL IS TO BE DISCHARGED

20. Reason(s) for Discharge
Permanent impacts to the wetlands and watercourse are the result of grading along Route 154 to support the roadway and due to rip-rap placement adjacent to the bridges to protect the structure's embankments from scour. The bridge site is assessed to have a high potential for deep scouring. Temporary impacts in the wetlands are required to temporarily relocate a water main and utility poles in order to safely construct the bridges and maintain services to the community during construction.

21. Type(s) of Material Being Discharged and the Amount of Each Type in Cubic Yards:

<table>
<thead>
<tr>
<th>Type</th>
<th>Amount in Cubic Yards</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard Riprap</td>
<td>105 CY</td>
</tr>
<tr>
<td>Granular fill</td>
<td>10 CY</td>
</tr>
<tr>
<td>Fill</td>
<td>125 CY</td>
</tr>
</tbody>
</table>

22. Surface Area in Acres of Wetlands or Other Waters Filled (see instructions)

- Wetland: 0.021 ac
- Watercourse: 0.001 ac

23. Description of Avoidance, Minimization, and Compensation (see instructions)
The project will not raise the roadway profile above the 100-year frequency storm event as that would cause an unreasonable amount of wetland impacts and disruption to local roadways and private driveways. Instead, the bridge is designed to withstand the forces and flooding generated by the 100-year frequency storm event; remaining serviceable following the subsidence of the flooding events. Riprap placement has been limited to the wingwalls. Proper dewatering practices will be employed. Replanting of native species will be provided at impact areas other than where riprap is installed. Sediment control systems will be installed along the project limits during construction. In-lieu fee is being utilized to mitigate for unavoidable impacts.

ENG FORM 4345, SEP 2017

Project No. 0105-0215

503
24. Is Any Portion of the Work Already Complete? □ Yes □ No IF YES, DESCRIBE THE COMPLETED WORK

25. Address of Adjoining Property Owners, Lessees, Etc., Whose Property Adjoins the Waterbody (if more than can be entered here, please attach a supplemental list).

a. Address: State of Connecticut - PO Box 341441
   City - Hartford  State - CT  Zip - 06134

b. Address: Robert J. Settipane - 7 White Ave
   City - Riverside  State - RI  Zip - 02915

c. Address: Mary M. Frost - PO Box 2155
   City - Riverside  State - CA  Zip - 92516

d. Address:
   City -  State -  Zip -

e. Address:
   City -  State -  Zip -

26. List of Other Certificates or Approvals/Denials received from other Federal, State, or Local Agencies for Work Described in this Application.

<table>
<thead>
<tr>
<th>AGENCY</th>
<th>TYPE APPROVAL*</th>
<th>IDENTIFICATION NUMBER</th>
<th>DATE APPLIED</th>
<th>DATE APPROVED</th>
<th>DATE DENIED</th>
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</thead>
<tbody>
<tr>
<td>CTDEEP</td>
<td>Flood Mgmt Indiv</td>
<td></td>
<td>2019-03-07</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CTDEEP</td>
<td>TWSDF/401</td>
<td></td>
<td>Concurrently</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Would include but is not restricted to zoning, building, and flood plain permits

27. Application is hereby made for permit or permits to authorize the work described in this application. I certify that this information in this application is complete and accurate. I further certify that I possess the authority to undertake the work described herein or am acting as the duly authorized agent of the applicant.

[Signature]

The Application must be signed by the person who desires to undertake the proposed activity (applicant) or it may be signed by a duly authorized agent if the statement in block 11 has been filled out and signed.

18 U.S.C. Section 1001 provides that: Whoever, in any manner within the jurisdiction of any department or agency of the United States knowingly and willfully falsifies, conceals, or covers up any trick, scheme, or disguises a material fact or makes any false, fictitious or fraudulent statements or representations or makes or uses any false writing or document knowing same to contain any false, fictitious or fraudulent statements or entry, shall be fined not more than $10,000 or imprisoned not more than five years or both.
Block 18: Executive Summary

Application for Department of the Army Permit

Applicant: State of Connecticut, Department of Transportation
Project No. 0105-0215 – Replacement of Bridge No. 02708 Carrying Route 154 over Plum Bank Creek
Old Saybrook, CT

PROJECT 105-215
RT. 154 OVER PLUM BANK CREEK
OLD SAYBROOK
BRIDGE NO. 02708

Bridge No. 02708 carries US Route 154 over Plum Bank Creek in the Town of Old Saybrook. The bridge is located approximately 0.75 miles from Old Boston Post Road. It was built in 1935 and carries an average 4600 vehicles per day. Bridge 02708 is a single span concrete slab. It is approximately 19’ long with a 30’ curb to curb width. The abutments and wingwalls are in water and are comprised of concrete with timber facing. Concrete struts connect the abutments beneath the channel. The open concrete parapets have metal beam rails installed on each approach along each side of the roadway that are continuous across the bridge.

Bridge No. 02708 is evaluated as “Serious” and is currently on an increased inspection frequency due to deterioration to the superstructure. The abutments and wingwalls have large cracks and spalls and their footings are exposed due to scour. Due to the extent of deterioration the structure must be replaced.

The proposed project consists of replacing the bridge with a single span structure comprised of prestressed concrete box beams integral with concrete abutments, wingwalls, and deck. The existing abutments and wingwalls will be partially removed down to Elev. 2.0 feet and the new abutments will be placed behind them. For scour protection, the project proposes permanent sheet piling around the new abutments and wingwalls. Concrete block revetments will be placed between the new and existing abutments. Standard riprap will be placed adjacent to the new structure’s wingwalls but not within the channel. The approach roadways will be raised to meet the vertical profiles of the new bridge. Snow shelves and guiderail barriers will be incorporated into the approaches. Construction will require a Spring-time detour of approximately 12 weeks, which is scheduled to occur in Spring of 2020.

The bridge will be built behind the existing abutments in order to minimize adverse impacts to adjacent property and coastal wetlands, simplify water handling, and reduce the duration of construction. The elevation of the current structure’s low chord, which is approximately 5.0 feet, will be maintained. The 100-year frequency coastal storm event can be anticipated to produce a storm surge and wave activity that will be 8-9 feet above the Route 154 roadway elevation.
Providing a hydraulically adequate structure is not feasible due to the adjacent properties and coastal wetlands that would be severely impacted. Instead, the new structure will provide long term serviceability and be able to withstand the forces and the flooding conditions generated during the 100-year frequency storm event; remaining serviceable following the subsidence of the flooding events.

This project has been presented to DEEP and USACE and their comments have been incorporated into the project documents. Coordination with DEEP Fisheries and NDDB has been completed. There will be temporary and permanent wetland impacts totaling 1,680 square feet. Permits will be obtained from DEEP and ACOE prior to start of construction.

Existing utility poles owned by Eversource carry 13.8kV electric lines and communications lines overhead along the west edge of the roadway. Utility poles near the bridge will be temporary relocated further west in order to allow safe usage of construction equipment. After bridge construction is complete, the utility poles will be relocated adjacent to the roadway edge. Electric lines will be at least 20 feet above the bottom of the bridge and the communications lines will be at least 10 feet above the bottom of the bridge in both the temporary and final conditions. The structure also carries an 8” diameter water main, which is owned by The Connecticut Water Company, at its west fascia. The water main will be temporarily relocated east of the structure, on a temporary support, during construction then moved to its final location at the east fascia of the structure. The temporary support will be then be removed. The Connecticut Water Company will upgrade the water main to 12” diameter.
ENVIROMENTAL PERMIT PLANS
STATE PROJECT NO. 105-215
REPLACEMENT OF BRIDGE NO. 02708
ROUTE 154 OVER PLUM BANK CREEK
IN THE TOWN OF OLD SAYBROOK

GENERAL NOTES:
1. THESE PLANS ARE INTENDED ONLY FOR ENVIRONMENTAL PERMITTING PURPOSES. THESE PLANS DO NOT AUTHORITY FOR ALL ACTIVITIES OR WORKS AS SPECIFIED IN THE PROJECT SPECIFICATIONS. FOR DETAILS, CONSULT THE PROJECT SPECIFICATIONS AND PREFERENCE TO THE APPPLICANT'S CONTRACT DOCUMENTS.
2. THE DEPARTMENT OF TRANSPORTATION WILL ONLY SUBMIT REVISIONS TO THE APPPLICANT'S DIGITAL FILE OR PROJECT PLAN CHANGES TO THE DESIGN THAT WILL AFFECT THE ENVIRONMENTAL REMARKS AND SPECECIFICATIONS.
3. FOR A DESCRIPTION OF THE WATERSHAWS, WETLANDS AND WETLAND FACES SEEN RELEVANT SECTIONS OF THE PROJECT SPECIFICATIONS.
5. ALL CONSTRUCTION ACTIVITIES WILL BE CONDUCTED IN ACCORDANCE WITH THE DEPARTMENT'S STANDARD SPECIFICATIONS FOR ROADS, BRIDGES, AND INFRASTRUCTURE. CONSTRUCTION, HURD, BUS, BID, DESIGN, INSPECTION AND DATA WILL ALSO FOLLOW DEPARTMENT'S QUALITY ASSURANCE AND QUALITY ASSURANCE CONTROL MEASURES IN ACCORDANCE WITH THE DEPARTMENT'S STANDARD SPECIFICATIONS AND THE 2019 CONNECTICUT QUALITY MANUAL.

LOCATION PLAN
1" = 50'
ACOE Permit Additional Information

PROJECT 105-215
RT. 154 OVER PLUM BANK CREEK
OLD SAYBROOK
BRIDGE NO. 02708

- SHPO/THPO Coordination
- Interagency Meeting Minutes
- Environmental Report
- NOAA NMFS Coordination (EFH & ESA)
- USFWS ESA NLEB Coordination
Determination of Effect for Historic Properties

Author: Mark McMillan  Date: December 29, 2017

Project: State No.: 105-209
F.A.P. No.: 0154(019)
Project Title: Replacement of Bridges #01386 and #02708
Route 154 over Back River and Plum Bank Creek
Town: Old Saybrook

Category of Exemption: Appendix B “Screened Undertakings…”

Project Description
Using federal and state funds, the Connecticut Department of Transportation (CTDOT) proposes to replace two concrete bridges located 0.3 miles from each other on Route 154 in Old Saybrook. Inspections by CTDOT’s Bridge Safety and Evaluation Unit have found that Bridge #01386 and Bridge #02708 are in Poor and Serious condition, respectively. Both bridges will be replaced with single span precast structures supported on integral concrete abutments.

The project will raise the vertical alignment of both bridges. New curbing and retaining walls will be installed along the approach roadways in order to minimize disruption of the adjacent wetlands. While the project does not anticipate permanent right of way acquisitions, temporary construction easements will likely be required.

Traffic will be managed by road closures and detours. In total, an 11-week closure is scheduled, though this will be staggered so that only one bridge is closed at a time. Closures will occur in the spring and fall when there is less traffic demand created by beach visitors. Final design is scheduled for May, 2019 with construction to follow in Spring, 2020.

Technical Review of Project
Both Bridges #01386 and #02708 were built in 1935 as part of a larger project that created a 2,291-foot (0.4 mile) segment of Plum Bank Road (Image 1). This segment completed the 6-mile long loop of Route 154 through Old Saybrook.

1 Connecticut State Highway Department, Plan for Construction of a Section of the Plum Bank Road in the Town of Old Saybrook, Town No 105, Project No. 23, dated November 28, 1934.

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Printed on Recycled or Recovered Paper
The 1934- project utilized funds from the Federal Emergency Administration Public Works Agency (PWA). This New Deal program was created to alleviate unemployment following the Great Depression. The PWA provided funding for contracts to private construction firms who in turn, hired workers. The bridges were each designed in accordance with the Connecticut Highway Department’s Standard Form 803.² Because of this, they do not significantly differ in design or material palette from other structures built by the Connecticut Highway Department in the 1920 and 1930s.

Beyond the notation in the original drawings, neither of the subject bridges have any physical indicators (plaques, inscriptions) that provide a connection to their PWA history. Both Bridge #01386 and #02708 are categorized as Not Eligible for the National Register of Historic Places (NRHP) in the statewide bridge inventory database maintained by CTDOT. After reviewing the original project drawings and subject bridges, the cultural resources staff concurs with this ‘Not Eligible’ determination.

The Area of Potential Effect (APE) for the current undertaking is closely constrained to the existing right of way of Route 154. The roadway is built on fill soils that were introduced to artificially it above the surrounding salt meadows and marsh (Image 2). The properties abutting the east side of Route 154 remain undeveloped and are largely within the Plum Brook Wildlife Area. To the west, the band of shoreline between Long Island Sound and the western side of Route 154 (Plum Bank) was moderately developed starting in the early 20th century.

Following the completion of the loop of Route 154, the Plum Bank area underwent further development in the 1950s with a series of cottages built along Buckingham and Walker Avenues. This development has continued to a lesser extent into the 1980s.

Bridge #01386
At the north end of the project APE, Bridge #01386 carries Route 154 over the Back River. The concrete ‘T’-beam superstructure has a 28’ clear span. Its substructure consists of reinforced concrete abutments and flared wingwalls with an integrated capstone (Image 3). Both the abutments and wingwalls were designed with a shallow recess in which 3x12 timber planks were bolted (Image 4). The timber facing is an original design element, though it is likely that at least some of the wood has been replaced in kind since 1935.

The only alterations from the original design is the addition of a water utility line on the south face of the bridge and retrofit of the parapets with metal beam rails that are installed inboard of the parapets. The modern guiderails partially obscure the ‘1935’ date incised in the leading endblocks.

There are four properties that abut Bridge #01387. Three of these are vacant and undeveloped. At the northwest corner of the bridge is a 0.2 acre parcel with a 2 story single family home that was built in 1974. This property is not eligible for the

² The Connecticut Highway Department was CTDOT’s predecessor.
National Register of Historic Places.

Bridge #02708
Located 0.3 miles south of Bridge #01386 is Bridge #02708. This is a smaller structure that carries Route 154 over Plum Bank Creek. It consists of a single span concrete slab that rests on concrete abutments and flared wingwalls. Its parapets consist of two panels of open balusters set between concrete endblocks (Image 5).

Aside from its concrete slab superstructure, it is very similar to Bridge #01386. Its substructure has timber planks bolted to its surface. Metal beam guidewails have been installed inboard of its parapets and there is a water main attached to the bridge’s east fascia.

All of the properties that abut Bridge #02708 and its approaches are vacant. Toms Road intersects with Route 154 approximately 135 feet south of the bridge. This road is the sole means of land access to 12 properties on the peninsula between the Back River and Long Island Sound. This road will remain accessible to the properties owners throughout construction.

The sediments in the APE are characterized as Westbrook Mucky Peat. This type of sediment is predicted to have high archaeological sensitivity. There is only one known archaeological site within the APE. Site #106-2. It was surface collected in 1979 and has since been destroyed. This archaeological sensitivity within the APE is reduced by the known introduction of fills soils and the constrained footprint of the project. The roadway itself has been altered since 1935 by the introduction of subterranean utility lines and the installation of fire hydrants and overhead utility lines. There is minimal potential for impacting previously undiscovered properties that would be intact and NRHP-eligible.

Scenic Road Designation
A 6.10 mile segment of Route 154 that loops from the Old Boston Post Road (Route 1) was designated a Connecticut Scenic Road in December, 2004. The defining scenic features of this road include “numerous historic buildings and homes; churches; cemeteries; Saybrook Point; State significant trees; parks; South Cove; the Fenwick and Knollwood neighborhoods; and many scenic views of salt marshes and Long Island Sound.”3

The Scenic Road features within the project APE include Plum Bank, Town Beach, and The Back River / Back River Inlet. The latter two properties are crossed by Bridge #02708. Of importance is the open water, marshes, and undeveloped natural setting of Back River that is “one of a kind” along the developed Connecticut shoreline.

Staff from the Office of Environmental Planning (OEP) have reviewed the project documents and find that there are no historic properties that contribute to the Scenic Road that will be impacted by the proposed undertaking. This recommendation will be forwarded to the Scenic Road committee for their review and comment.

3 Colleen Kissane (CTDOT Scenic Road Committee) letter to William Peace (Town of Old Saybrook), Scenic Road Request, Route 154, dated January 7, 2005.
Determination

Neither Bridge #01386 nor #02780 is eligible for the National Register of Historic Places. The project’s APE is within previously disturbed soils of the existing road right of way. Qualified cultural resource staff have screened this undertaking and found that the proposed rehabilitation work meets the criteria of a “Bridge/Culvert Related Project” as defined in Appendix B “Screened Undertakings Not Requiring Connecticut SHPO Review” of the Section 106 Programmatic Agreement4. Appendix B lists the types of undertakings that, due to their limited potential to impact historic resources, are exempt from Section 106 review.

A copy of this finding will be included in the quarterly report of Minor Transportation Projects that is submitted to the Connecticut State Historic Preservation Officer. It will also be sent to FHWA, who will initiate consultation with federally-recognized tribes.

Mark McMillan
National Register Specialist
Office of Environmental Planning
Connecticut Department of Transportation

Image 1: Aerial view of project location in 1934. The segment of Route 154 (highlighted in yellow) was constructed 1935-36. The future locations of Bridges #01386 and #02708 are also shown.

4Programmatic Agreement among the Federal Highway Administration, the Connecticut Department of Transportation, the Connecticut State Historic Preservation Officer, and the Advisory Council on Historic Preservation Regarding Implementation of Minor Transportation Projects, signed October 26, 2012. Accessible online at www.ct.gov/culturalresources
Image 2: LIDAR image of the project area showing both bridges along Route 154. The roadway is artificially elevated about the surrounding topography by introducing fill soils.

Image 3: East face of Bridge #01386, which carries Route 154 over the Back River.
Image 4: Detail of Bridge #01386 with open concrete baluster, capstone on the wingwalls, and timber fenders. Note the cracking and efflorescence of the bridge fascia and T-beams.

Image 5: West face of Bridge #02708. This concrete slab bridge carries Route 154 over Plum Bank Creek. Like Bridge #01386, it has an open baluster parapet, integrated concrete capstones on its flared wingwalls, and timber fenders bolted to the substructure.
From: Hansen, Christopher (FHWA) <christopher.hansen@dot.gov>
Sent: Friday, December 29, 2017 3:06 PM
To: McMillan, Mark J.
Subject: RE: Tribal Consultation: Project #105-209 Old Saybrook (Replacement of Bridges #01386 & #02708, Route 154)

Mark,

I have carefully reviewed CTDOT's proposed project #0105-0209 for Replacement of Bridges #01386 & #02708, Route 154 in Old Saybrook. As per email and documentation sent December 29, 2017, I understand that the project primarily occurs in previously disturbed right-of-way. As per the THPO Section 106 Agreements with FHWA-CT Division, dated January 4, 2012 and May 14, 2013, this project would generally fall within the category of "resurfacing or repair of existing ramps or roadways within the previously disturbed right-of-way".

With this email, and taking all these items into consideration, the FHWA-CT Division has determined that tribal consultation would not be required for this project. Should any changes be made to the scope of work for this project that would involve additional ground disturbance beyond what is currently proposed, tribal consultation would have to be reconsidered.

Chris Hansen
Environmental Protection Specialist
Federal Highway Administration
628-2 Hebron Avenue, Suite 303
Glastonbury, CT 06033
860.494.7577
christopher.hansen@dot.gov

From: McMillan, Mark J. [mailto:Mark.McMillan@ct.gov]
Sent: Friday, December 29, 2017 2:16 PM
To: Hansen, Christopher (FHWA) <christopher.hansen@dot.gov>
Subject: Tribal Consultation: Project #105-209 Old Saybrook (Replacement of Bridges #01386 & #02708, Route 154)

Chris,

Attached is a Bridge/Culvert Exemption letter for State Project #105-209 in Old Saybrook. The undertaking will replace two 1935 concrete bridges on Route 154. Construction activities are limited to the raised roadway due to the marshy soils surrounding the bridges. I spoke with the project engineers and the only ground disturbance will be in the installation of additional fill at base of the roadbed slopes. Excavation is limited to what is needed to remove the abutments of the existing bridges.

For these reasons, I would recommend that tribal consultation is not required.

Mark
Mark McMillan
National Register Specialist
Office of Environmental Planning
Connecticut Department of Transportation
2800 Berlin Turnpike
Newington, CT 06111
☎ (860) 594-2135
☎ (860) 594-3028 - Fax
✉ mark.mcmillian@ct.gov
INTERAGENCY COORDINATION MEETING NOTES
January 18, 2018
Room 3130

Meeting Notes:
The meeting notes for December were raised for discussion. No comments were made and the notes are accepted.

Project 0083-0263 Bridge 06755, Route 162 over Turtle Creek, Milford

01/18/2018 – The project proposes to replace Bridge 06755 (existing as three arch culvert CMP’s) with twin 8’x4’ precast concrete box culverts sunken 1’. The project was presented at an Interagency Meeting in October 2014, but the design process was impacted by the construction of a new sanitary sewer line nearby. Existing pipe slopes are nearly flat (water is always sitting.) Additional drainage system improvements are proposed adjacent to the culvert to address a change in road grade. The change in road grade is proposed, in part, because a portion of the roadway is below CIL. The site is all within the 100-year flood plain. Approximately 630’ of Turtle Creek upstream of this Bridge is in a 42”x70” CMP.

Project Impacts: 4,300 sq.ft. of impact below CIL, which includes impacts to 400 sq.ft. of tidal vegetation. 1010 sq.ft. of mitigation area is proposed adjacent to the inlet. Rip rap with natural material cover is proposed at the inlet and outlet. The project is planned for one construction season without a road closure.

Permitting Requirements: Flood Management Certification, USACE PCN, CTDEEP Structures Dredging and Fill and Tidal Wetlands. Subsequent to the meeting it was confirmed that an application to the ACOE will be required for the PCN. Fisheries coordination was initiated in 2013 and no further review was warranted at that time. Fisheries coordination will be continued to obtain final sign-off. The project is within an NDDB area and comments were received by design staff in May 2013.

Agency Comments: CTDEEP Land & Water Resources staff requested that all proposed rip rap be minimized (not on bottom) and noted that the designer described limited scour potential at the bridge. CTDOT Office of Environmental Planning staff noted that the mitigation plan specified bayberry at elevation 3’+/− and that was not a suitable plant for that tidal wetland soil elevation. If needed, OEP is available for assistance with vegetation selection for the design of the mitigation area. CTDEEP Land & Water Resources staff requested that elevation datum information be shown to reflect NGVD ’29 and NGVD ’88 conversions so coastal jurisdiction elevation would be clear.

Action Items: Designer should: Revise mitigation planting. Note elevation datum conversion. Review proposed rip-rap to verify it is minimized. An updated NDDB review form should be submitted to OEP. When plans are revised, they should be submitted to OEP to obtain DEEP fisheries sign-off.

Project 0105-0209 Bridges 01386 & 02708, Route 154 over Back River & Plum Bank Creek, Old Saybrook

01/18/2018 – The project involves the replacement of Bridges 02708 and 01386. The bridges will be completed in consecutive years as they are near each other and are both connected to the Plum Bank Marsh. The project will be administered with 1 contract. These are coastal bridges in a low lying area with beaches, residential uses, and coastal resources nearby. The proposed structures are designed for overtopping conditions. Permanent sheet piling will be employed to protect the proposed bridges and
Interagency Coordination Meeting 01/18/2018
Meeting Notes

approach slabs and allow the majority of the work to be completed in the dry. In-water work will be needed to remove portions of existing abutments and provide scour protections. The majority of the work is proposed outside of the busy “beach” season. Roadway profiles will be raised 8”-15” and road shoulder widths will be increased to address the raised road profile and current guiderail/safety standards. 2:1 vegetated slopes are proposed.

**Project Impacts:** Bridge 02708: Impact below HTL=2,014 sq.ft.; Impact below CJL=1617 sq.ft.
Bridge 01386: Impact below HTL=2,327 sq.ft.; Impact below CJL=1658 sq.ft.
Total of 4300+/- sq.ft. of tidal vegetation impacted. Mitigation TBD.

**Permitting Requirements:** Not under Coast Guard Jurisdiction. The project will have a Flood Management Certification, CTDEEP Structures Dredging and Fill and Tidal Wetlands, and USACE PCN (GP-19). Two permit applications for SD&F will be needed (separated for each bridge.) Other permits and mitigation will be proposed under one package. Subsequent to the meeting it was confirmed that an Application to the USACE will be required for the PCN. Fisheries sign-off required (no recommendations in Fisheries comments of 08/21/2017). Project is within an NDDB area and a determination is needed. OEP staff has pre-screened the project for NDDB protected species and does not anticipate additional restrictions based on the current NDDB data.

**Agency Comments:** Micheal G. of CTDEEP Land & Water Resources noted that they had contacted DEEP internal personnel to discuss options for nearby mitigation sites (no opportunity exists within the project area). CTDEEP Fisheries staff confirmed that no time of year restrictions are necessary from a fisheries perspective. CTDEEP Land & Water Resources staff commented that the public could petition for additional hearings and noted that the public information meetings held by CTDOT were a benefit to informing the public and incorporating public feedback. He also requested that the proposed water main shelf be minimized to discourage public access. It was also requested that any proposed rip rap be minimized. CTDOT design staff confirmed that they had minimized rip rap placement. USACE staff requested and received confirmation that temporary utility locations would not cause additional wetland impacts. USACE staff noted that the temporary aerial utility crossings, if over the water, will be included in the permit under Section 10 and that the temporary crossings would need to meet minimum elevations across the waterway (per 33 CFR 322.5(i)(2).)

**Action Items:** Design staff should minimize water main shelf to discourage public access. Design and OEP should continue to coordinate with CTDEEP to pursue mitigation options, including discussing options with the Town of Old Saybrook.

**Project 0302-0014 Merritt 7 Railroad Station Improvements, Norwalk**

01/18/2018 – The project proposes Railroad station improvements including a new station, high-level platform, pedestrian overpass, new parking, and drainage system improvements that will impact a mapped stream. The project also proposes full depth reconstruction of 1900’ of Glover Avenue and a slight realignment (6-7’ horizontal.) Schaab Creek runs easterly under Glover Avenue (the project area) until it reaches the Norwalk River. It is contained in an open channel, into a 2’x4’ stone culvert, and then a 30’ RCP. The proposed drainage improvements include replacing a portion of the stone culvert under and adjacent to Glover avenue with 48” RCP, drainage manholes, and a concrete endwall. One section of 36” RCP is proposed at the inlet to replicate existing hydraulic capacity until all downstream sections of culvert can be replaced with the 48” pipe. Some existing adjacent storm drainage will also be connected to the proposed manholes.

**Project Impacts:** Estimated from preliminary wetland locations: 510 sq.ft. permanent /70 sq.ft. temporary watercourse impact and 50 sq.ft. permanent/120 sq.ft. temporary wetland impact.

**Permitting Requirements:** USACE SV (GP-19), FM General, IW-General, and Stormwater Permit
Interagency Coordination Meeting 01/18/2018
Meeting Notes

Agency Comments: CTDOT Staff requested verification that the pipe downstream of the proposed repairs/improvements was functioning. CTDOT design staff and the consultant stated that the engineering study was done by the City of Norwalk and indicated that the drainage within Glover Avenue was compromised but there was no indication that it was compromised downstream of Glover Avenue. DEEP Fisheries indicated no concerns with the project given that the watercourse runs intermittently.

Action Items: Submission of plans to DEEP Fisheries for final sign-off should be coordinated with OEP.

Project 0148-0208  Hall Avenue Pedestrian Improvement Project, Wallingford

01/18/2018 — The project proposes pedestrian improvements along Hall Avenue, Washington Street, and Oak Street that will include pedestrian lighting, street trees, ADA compliance modifications, and bicycle signage. The vast majority of these proposed improvements are outside of the travel way with the exception of pedestrian crossing striping upgrades. The project also includes a multi-use trail extending to the senior center with an overlook spur at Community Lake. The primary reason for being at the Interagency Meeting is to discuss the proposed relocation of an existing culvert outfall. The existing outfall is a concrete channel that outlets in a vegetated area and shows signs of significant erosion and sedimentation. The existing outfall is above an intermittent watercourse. The proposed outlet will include a more stable outfall (scour hole) and plantings, and be downstream from the existing location. 48” HDPEP is proposed for the new drainage. The concrete in the channel at the old outfall will be removed. An “overflow” at the plunge pool would be used to continue some hydric connectivity between the proposed outlet and the existing outlet location to maintain some of the existing wetland functions and values in this area.

Project Impacts:
At proposed outlet: Permanent wetland impact= 4,075 sq.ft.; Temp. wetland impact= 1,225 Sq.ft.
At existing outlet: Permanent wetland impact= 900 sq.ft.; Temp. wetland impact= 300 Sq.ft.

Permitting Requirements: FM-MOU, USACE PCN (GP-18), Local Inland Wetlands (received), CT Addendum, NDDB Determination (received).

Agency Comments: OEP Staff noted that DEEP Fisheries had reviewed this project with a proposed pipe extension at the current outfall and not the currently proposed outlet location. DEEP Fisheries stated that this was an intermittent watercourse and they had no concerns. CTDEEP Land & Water Resources staff inquired about the location of cuts and fills within the floodplain. The town representative responded that cuts and fills within the floodplain are nearly balanced but there is a net cut within the floodplain. The fill locations along the multi-use trail were highlighted on the plans. USACE staff inquired about the quality of wetlands at the new outfall location and an image was shown showing the sedimentation and erosion in that area. USACE staff requested and received verification that total wetland impacts for the project are greater than 5,000 sq.ft.

Action Items: Updated plans need to be submitted to OEP for review and submittal to DEEP Fisheries for sign-off.
Interagency Meeting Notes  
October 18, 2018  
Room 3130

**Project 82-312, Bridge 00524, Arrigoni Bridge - Route 66 over the Connecticut River, Middletown/Portland**  
10/18/2018 – The project consists of superstructure steel repairs/strengthening, spot painting of the superstructure, steel and concrete substructure repairs, approach span deck replacement, and replacement of deteriorated electrical components. The entire bridge will be upgraded to state of good repair. Initial rehab work was done six years ago. For access they plan to use the same method - a platform system that will hang just below the low chord of the structure – there will not be in water work and no work done on the piers. A protective fence will be installed during construction. Three year construction timeframe.

**Project Impacts:** Currently no impacts. NDDB shows Falcon/Eagle; specifications will be included in project. There was discussion of a nest on pier 19, but not of these species.

**Permitting Requirements:** Flood Management General, Coastal Maintenance General Permit (to be completed by OEP). Coordination with the Coast Guard will be required.

**Agency Comments:** USACE staff commented that if there will be fill in the wetland, then an Army Corps permit would be needed. Mike Hogan (H&D) asked about work occurring in the floodplain (is the access road/lay down area in the floodplain?). As currently shown, the floodplain impacts would qualify for an FM General. There is one area between the two rail lines on the Middletown side that needs to be checked for wetlands. DEEP confirmed the project is eligible for a coastal general permit. The Designer mentioned the potential for “jetting” of the drainage structure at Pier 8 and DEEP questioned whether or not the waters would be captured prior to discharge to the Connecticut River.

**Action Items:** Consultant is finalizing wetlands assessment to determine if there will be any impacts due to the proposed access road.

**Project 96-201, Bridges 01218 & 04180, I-84 over Housatonic River in Newtown/Southbury.**  
10/18/2018 - This Project previously attended the Interagency Meeting on 5/18/2017. This project consists of the rehabilitation of Bridges 01218 and 04180 that carry I-84 east and westbound over the Housatonic River. Bridge 01218 and 04180 are both 4-span continuous steel two girder floor system structures. On Bridge 01218, there is rust on the steel girders and the deck needs extensive repair. On Bridge 04180 there are cracks in the cantilevered floorbeam and map cracking on the underside of the deck. The proposed work is to replace the superstructure on both structures; lengths/widths match existing. The demolition of the existing superstructure will be done with cranes from a work trestle and barges. The work trestle platform would be above the 100-year flood elevation. There will be new pier caps on all piers on both bridges. Cofferdams and dewatering are required around Pier 3 on Bridge 04180. Proposed low chord elevations will be greater than current low chord. They are proposing to make repairs to south embankment on Bridge 01218 as existing riprap has eroded. The work trestle would be located in Spans 3 and 4, with waterway in that area closed to boat traffic. Barges could be used in Span 1; however, a work trestle could also be used in that area. Span 2 would remain open to boat traffic during the duration of construction. There will be a period of several days that the channel will be completely closed to boat traffic. The Lake Zoar public boat launch has been proposed to be used to launch safety boats and work crews.
DEEP/USACE/EPA/DOT
Interagency Coordination Meeting
Project Meeting Agenda – 10/18/2018

Project Impacts:

NDDB indicates Eastern Box Turtle and Bald Eagle.

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<th>Watercourse</th>
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<tr>
<td>floodplain</td>
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</table>

Permitting Requirements: USACE SV, DEEP FMC, Stormwater General Permit. 401 permitting is TBD (potentially Individual 401 from DEEP, see notes below). Project will also require First Light coordination, Coast Guard coordination, and coordination with DEEP Boating.

Agency Comments:
Boating/channel use: Fisheries commented that DEEP Boating will need to be notified / coordinated with regarding the complete closure oto boat traffic for certain days during construction. DEEP Fisheries mentioned these days would have to be scheduled well in advance. Fisheries also inquired whether public use of the DEEP boat launch would be compromised — the consultant responded it would still be open for public use as the launch would only be used for safety boats and work crews. District 1 Construction commented that this is a highly recreational area and it is important to minimize the days the channel will be completely closed to recreational boat traffic.
Riprap/haul roads: DEEP asked if placement of rip rap or haul roads would have wetland impacts and designer confirmed that these areas would be outside wetland limits.
USACE/Pier 3/Trestle Piles: The Army Corps asked for clarification on what work is being done at Pier 3. Army Corps requested more information / an elevation view of Pier 3 to show what is happening in terms of excavation and fill. Though it will likely still be an SV, Army Corps requested to see limits of excavation and fill (concrete) and elevation views. Army Corps also commented that the temporary pile supported trestle would not be considered impact— it is a temporary pile supported structure in a non-navigational channel (Non-Section 10 waters). If piles are to be cut and left in-place, this would be considered a permanent impact under Army Corps Jurisdiction. There was discussion on whether piles would be cut and buried or completely pulled out (TBD.) On other piers where there will be jacking towers, the temporary structures would not be considered impact under Army Corps jurisdiction. Designer said most permanent impacts are from the piles for the trestle (217 piles).
Soils: DEEP said data from soil testing should be submitted to Remediation Division at DEEP for review as there is a concern for the resuspension of PCBs (if present) from the sediments into the water column when the temporary trestle piles and sheeting for cofferdams are pulled. This information will help determine what type of 401 permit is required.

Action Items:
Soils: Information from soil testing should be submitted to DEEP Remediation Division through
Environmental Compliance. Pending coordination with DEEP Remediation, the 401 permitting needs will need to be re-evaluated.

Boating: Coordination documents for DEEP boating need to be submitted to OEP.

USACE: Army Corps would like to see elevation views of work being done around Pier 3. The elevation views will need to show excavation and fill limits below OHW.

**Project 113-107/108, Bridges 02931 & 02932, Route 2A over Poquetanuck Cove & Dickerman’s Brook, Preston 10/18/2018** – This Project previously attended the Interagency Coordination Meeting on 5/18/2017. This project involves the rehabilitation of Bridge 02931 (project 113-107) and Bridge 02932 (project 113-108). The proposed work on both bridges includes superstructure replacement and repairs to abutments and wingwalls. Low chords will be raised 6” and 12” respectively. Drainage areas are 0.046 sq. mi. and 0.79 sq. mi. respectively. NDDB indicates several species concerns in this area including saltmarsh bulrush, tufted hairgrass, and lilaeopsis. There is also an archaeologically sensitive area in the vicinity of Project 113-107. These projects require mitigation. The mitigation site has been determined and includes an area of 4,200 sq feet of phragmites treatment, restoration of the treated area with a native tidal planting plan, as well as improvements to the Stoddard Hill boat launch. Consultant will submit a plan for fisheries sign-off once permit plans are developed.

**Project Impacts:** The temporary wetland impacts are 14,400 sq feet and permanent 17,100 sq feet – the consultant provided rough estimates of 400 cy cut and 330 cy fill in the floodplain – but expressed these provided numbers need to be updated.

**Permitting Requirements:** OLSIP Tidal Wetlands, Structures, Dredging and Fill, FM General and USACE PCN.

**Agency Comments:** Mike Grzywinski from DEEP commented that the mitigation site will be permitted as part of the Tidal Wetlands, Structures, Dredging and Fill and 401 permit, not under the Coastal Maintenance GP, as identified in the presentation. Army Corps commented that a mitigation checklist following the tidal wetland module will need to be prepared as part of the PCN application and the consultant should refer to the USACE mitigation guidance for the planting plan. Army Corps also commented plans should include elevation of temporarily located utilities to show the clearance at the bridge, and add high tide lines to all plans. It was also mentioned there is Coast Guard coordination for this project. A comment was made that an herbicide application permit/license was required for the mitigation site. DOT said there has been communication with Roger Wolfe from DEEP Wildlife Division, WHAMM Unit, and his program will be conducting the phragmites removal at the mitigation site and is aware of all permitting requirements.

**Action Items:** Make required changes to plans as requested by Army Corps (see comments above). Provide OEP with an updated mitigation plan to facilitate coordination with DEEP Parks and Boating Divisions.

**Project 141-154, Bridge 06793 & 06794, I-395 over Little Mountain Brook & Unnamed Brook, Thompson 10/18/2018**—This Project attended the Interagency Meeting on 4/21/2016. Both structures are single 72” asphalt-coated corrugated metal pipes in very poor condition under as much as 50’ of fill. The proposed rehabilitations will
Project No. 0105-0215

Interagency Coordination Meeting
Project Meeting Agenda – 10/18/2018

utilize a 60” internally corrugated HDPE slip lining for repair. Bridge 06794 currently has no endwalls, which will be installed.
This project was sent to Fisheries and received comments in February 2016 reporting the project has negligible effects on Fisheries resources.

**Project Impacts:**
For Bridge 06793

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For Bridge 06794

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**Permitting Requirements:** Permits will be submitted separately for each bridge: DEEP IW General, DEEP PGP Addendum, USACE PCN

**Agency Comments:** In regards to a proposed swale and pipe underneath one of the access roads, DOT staff questioned if providing a traversable swale across the access road made more sense than installing a pipe - the swale being a better option for maintenance purposes. EPA said in-lieu fee would be required for permanent impacts associated with the upstream permanent access road for Bridge 06794 (1,342 sq feet). DEEP commented to provide plans for the restoration areas.

**Action Items:** The in-lieu fee worksheet and calculation will need to be included in the permit application, as well as a plans for planting/restoration of disturbed areas.

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**Project 76-222, Bridge 06650, I-384 over Folly Brook, Manchester**

10/18/2018 – This Project previously attended the Interagency Meeting on 1/18/2018. The existing structure is a 10-foot diameter asphalt-coated corrugated metal pipe under 25 feet of fill. The pipe conveys Folly Brook into Hop Brook a short distance away. The structure is hydraulically adequate but its invert has numerous perforations and there is settlement of the upstream collar. The pipe will be rehabilitated by installing a cast-in-place concrete invert in the bottom quarter of the pipe. New concrete wingwalls will be constructed at the inlet and outlet. The pipe length will be reduced from 362 feet to 288 feet; shortening the pipe at the outlet provides 50’ of new watercourse channel and can possibly improve the angle that Folly Brook enters Hop Brook. Baffles will be installed within the rehabilitated culvert per request from Fisheries. Design is considering open cutting I-384 to
replace existing drainage roadway pipes to allow for 2-year flow and to bypass pump Folly Brook through that structure.

**Project Impacts:** No NDDB concerns. FEMA mapping depicts the 100-year floodplain and floodway through the pipe.

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<th>Impacts sq. ft</th>
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**Permitting Requirements:** DEEP FMC, DEEP GP Addendum, DEEP IW General, USACE PCN

**Agency Comments:** Two baffle-style alternatives were presented with perpendicular baffles being acceptable to DEEP Fisheries. Fisheries staff will need to know water depths during low flow conditions and the water depth within the baffles. DEEP IW staff want to see a detailed planting plan. OEP staff noted a previous project, which used a by-pass pipe to lift flow up to another culvert.

**Action Items:** OEP will send designer the project number where this water handling technique was done. Designer to determine water depths at low-flow with the baffles installed.

**Project 59-164, US Route 1 & CT Route 22, Guilford**

**10/18/2018** – The proposed project will construct a modern 3-legged roundabout to replace the existing T-intersection. Construction of the roundabout will improve safety and efficiency for all modes of traffic. There is a potential historic property in the northwest quadrant of the project location (a historical well). Wetland/watercourse impacts are proposed at an existing drainage outlet and channel that goes into Kneuer Pond. This area falls within 100-year floodplain in one small area (zone A) but the drainage area to that point is less than one square mile. There are no Fisheries concerns or NDDB concerns.

**Project Impacts:**

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<tr>
<td>floodplain</td>
<td>86</td>
<td>36</td>
<td>-50</td>
</tr>
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**Permitting Requirements:** USACE SV, DEEP IW General, Stormwater Permit.
Interagency Coordination Meeting
Project Meeting Agenda – 10/18/2018

Agency Comments: DEEP H&D commented the drainage area is less than 1 sq mile so no Flood Management permit is needed. USACE stated that the historic resources are outside their agency’s jurisdictional area, therefore, this project is eligible for an USACE SV even if there are impacts to the historical property.

Action Items: No action items identified.

Project 53-190, Putnam Bridge Trail Connections, Wethersfield/Glastonbury
10/18/2018 – The project attended the Interagency Meeting on 12/21/2017. The project proposes a new 4,750-foot long shared use path connecting the Putnam Bridge walkway between Great Meadow Road in Wethersfield and Niantic Avenue in Glastonbury. In Wethersfield the path starts at the intersection of I-91 exit 25 off-ramp and Great Meadows Road and utilizes the existing walkway on the Putnam Bridge over the river. This project is presented again because the hydraulic analysis has been completed and designers wanted to present the final project design to DEEP.

Project Impacts: This project has 590 sq feet of Federal wetland impact (USACE), and 15,700 sq feet of State wetland impact (DEEP).

Permitting Requirements: USACE SV GP 19, Individual IW Permit (because of state wetland impacts on Glastonbury side), Individual FMC. At a previous meeting, DEEP agreed there was no need for an Exemption, as long as the Town provides written support.

Agency Comments: Some Fiberglass panels on the Putnam Bridge walkway are damaged; Mike Grzywinski said that if a previous permit that included fiberglass panel work is good for 5 years, he can process the extension request for that permit. Bob asked if state wetlands were non- hydraulic floodplain soils, OEP confirmed. Susan (USACE) and Susan (DEEP) both inquired about elevation over Keeny Cove / how this area will be handled. Mike Hogan from H&D has prepared a hydraulic analysis which indicates that there is no adverse effect due to the loss of flood storage. Municipal Floodplain regulations were discussed briefly. Typically a project requires a Flood Management Exemption if it does not meet town zoning regulation requirements for compensatory flood storage/conveyance. DEEP may not require an exemption if the town provides a letter supporting that the project will not have an adverse impact. DEEP makes the final decision on if an exemption will be required in association with the submitted Individual FMC. Based on the proposed impacts the project would not be eligible for an IWGP and would require an Individual Inland Wetlands and Watercourses permit. DEEP indicated that no mitigation will be required for the state-only wetland impacts.

Action Items: Coordinate extension request from OLISP (permit is still good until 2020). Designer to obtain support letter from Town regarding Town Flood Management requirement for DEEP to alleviate the need for an exemption.

Project 105-209, Bridge 02708 & 01386, Route 154 over Plum Bank Creek & Back River, Old Saybrook
10/18/2018 - The project attended the Interagency Meeting on 1/18/2018. The project proposes to replace the existing bridges with a single span structures comprised of pre-stressed concrete box beams integral with concrete
abutments, wingwalls, and decks. To protect the bridges from scour the project proposes permanent sheet piling around the new piles. Most of the conversation centered around the proposed mitigation. The projects are going to be separated into different construction contracts so they will have separate permits. Bridge 02708 is going to construction first, Bridge 01386 is under further review by a coastal engineer to address concerns from nearby Homeowners Association (following the coastal engineering assessment, the bridge design may be revisited, and the span could increase, thereby increasing proposed impacts). Current mitigation proposal is acquisition of 1-acre parcel at the mouth of Ragged Rock Creek. This mitigation proposal is for both bridges. The parcel is surrounded by ~250 acres of preserved land (comprising of state, The Nature Conservancy, and Old Saybrook Land Trust). DOT would like to ultimately transfer the 1 acre parcel to DEEP or the Land Trust to be maintained in perpetuity. The mitigation parcel provides a mitigation ratio of approximately 15.9:1 on the impacts for both bridges combined.

Project 105-209 Impacts:

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<td>Impacts below MHW</td>
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<tr>
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Total permanent impacts below HTL: 2,585 sq feet
Total permanent impact below MHW: 140 sq feet
Total temporary: 1,270 sq feet

Permitting Requirements: Separately for each bridge - USACE PCN, OLISP Tidal Structures, Dredging and Fill
Agency Comments: USACE asked to clarify if this could be an in-lieu fee project – DOT commented that in-lieu fee would meet the USACE mitigation requirements but that DEEP would not accept in-lieu fee as suitable mitigation for this project and therefore DOT is seeking a single mitigation measure to meet both agency needs. It is DEEP’s position that the mitigation proposal is suitable for impacts as they have been calculated to date for both bridges. It is also their position that if a change in span length on Bridge 01386 causes an increase in impacts, that no additional mitigation would be required. EPA was supportive of the mitigation proposal because the parcel will be able to be managed in the future if acquired, which it will not be if left in private hands. DEEP Fisheries indicated that Ragged Rock Creek Wildlife Area is a state designated waterfowl hunting area, and that preservation of the parcel would allow additional access to marsh for hunters, given its position at the mouth of Ragged Rock Creek. Bob Gilmore was also supportive of the mitigation. There was a discussion regarding the future “development threat” pressure on the
mitigation parcel (or the lack thereof). Bob Gilmore indicated that in-lieu fee monies are being awarded to other projects which the proposed preserve lands are not under development pressure.

**Action Items:** DOT to return to the Interagency Meeting for Bridge 01386 to report if, at the conclusion of the coastal engineering assessment, the design will be changed and if there are any additional wetland impacts.
Environmental Report
State Project 105-215
Replacement of Bridge 02780, Route 154 o/Plum Bank Creek
Old Saybrook, CT

Introduction
This project involves the replacement of Bridge 02780 which carries Route 154 over Plum Bank Creek in the Town of Old Saybrook. The existing bridge is a single span concrete slab on concrete abutments with timber clad wingwalls upstream and downstream of the structure. Concrete struts connect the structures’ abutments at/near the mudline. The existing structure has a span length of approximately 19’ and 30’ curb to curb width. The bridge was built in 1934. The proposed structure consists of single span, pre-stressed concrete box beam superstructure with integral abutments. The proposed abutments will be built behind the existing. A slight raise in the roadway profile at the bridge will necessitate roadway improvements at the approaches to the bridge. The project limits extend from approximately 250’ south of the bridge to approximately 275’ north of the bridge.

General Site Characteristics
The project site is located on Route 154 as it crosses through Plum Bank Marsh. With the exception of areas of residential development next to the roadway, Route 154 is essentially a causeway across Plum Bank Marsh running in a north-south direction. Plum Bank Creek is tidal and flows from the Sound into Plum Bank Marsh. Approximately 1/2mi upstream, the creek meets the confluence of the Back River which flows to the north of the project site. These two watercourses create the island community between the subject bridge and the bridge to the north. The southwest quadrant of the bridge has a small residential beach community. The northwest, northeast, and southeast quadrants of the bridge are undeveloped areas dominated by saltmarsh at the base of the roadway embankment.

The project is located within the South Central Shoreline subregional drainage basin (Basin No. 5000). Route 154 through this section has no formal drainage system and all runoff drains via sheetflow down the roadway embankments which are elevated above the marsh. The site is located within mapped FEMA 100-year floodplain designated as Zone VE (elev. 14). Groundwater quality for the site is mapped as GA. The soils of the site are a mix of Udorthents soils within the ROW (right-of-way) and Westbrook mucky peat comprises the marsh substrate. (Soils are further described in the soils report appended to this document).

The entrance to Toms Road is located on the western side of the road near the south approach roadway. Toms Road services approximately one dozen residences in a beach community. There are no other roadway intersections or driveway entrances within the project limits. Overhead utilities are located on the western side of the roadway and cross over the water just to the west of the fascia of the bridge. The poles carry 13.8kV electric lines and communication lines. A water main is located on the downstream fascia of the bridge.
Habitat Assessment

There are slight differences in the vegetative community downstream and upstream of the bridge due to the presence of vast open marsh upstream of the bridge. The roadway and bridge are elevated above the marsh surface through the project limits and as such there are slight roadway embankments formed of fill at the edge of the roadway. For the most part, tidal wetlands exist at the base of the embankment with tidal wetland vegetation being present up to the CIL elevation and extending slightly above the CIL/HTL making the ultimate limit of Coastal Jurisdiction for purposes of DEEP permitting CIL +1ft (elevation 3.9 NAVD 88). Mean High Water (MHW) is identified at elevation 1.3 and Mean Low Water (MLW) is identified at elevation -2.3. The High Tide Line (used for ACOE permitting) has been determined to be elevation 3.2 (NGVD 88). The only locations where tidal wetland vegetation does not extend above the CIL is directly proximate to the bridge where existing areas of riprap have been placed for slope stabilization. Those are not capable of supporting tidal wetland vegetation due to the presence of the riprap. Mapping of the tidal wetland vegetation is depicted on an existing conditions plan appended to this report.

The marsh and creek provide excellent wildlife habitat for a myriad of species. There are no osprey platforms (natural or manmade) within 500’ of the structure but osprey can be seen hunting the creek and the Sound to the west. Other wading birds such as great blue heron, little egrets, snowy egrets and various shorebirds, waterfowl, and gulls work the marsh and creek edges foraging for crabs and fish. The site is mapped in the NDDB for Saltmarsh sparrow. While the Creek is expected to support typical tidal and brackish fish species, it is expected to function as forage and refugia for juvenile life stages. The creek is mapped as a restricted relay shellfish area. There are no known mapped shellfish beds in proximity to the project (CTDEEP GIS). Diamondback Terrapin are known from the vicinity of Harvey’s Beach, to the north of the project site. No impact is expected to the species due to the minimization of impacts and lack of in-water disturbance.

Vegetative Community Downstream

The vegetation at the toe of the embankment on the downstream side of the bridge (the northwest and southwest quadrants) is dominated by high tide bush (*Iva frutescens*) and groundsel tree (*Baccharis halimifolia*). Within the marsh proper, the vegetation is dominated by saltwater cordgrass (*Spartina alterniflora*) and salt meadow cordgrass (*Spartina patens*) in the high marsh. Additional tidal vegetation just above the jurisdictional limits are scattered occurrences of beach plum (*Prunus maritima*) and seaside goldenrod (*Solidago sempervirens*), and bayberry (*Myrica pensylvanica*) in this area. Areas of common reed* (*Phragmites australis*) straddle the marsh edge and lower roadway embankment. Beyond the roadway embankment the marsh areas are vast and healthy with little evidence of disturbance. There is a portion of maintained “lawn” area beyond the southwest quadrant of the bridge. This area received tidal inundation, and though not part of the marsh proper does support tidal wetland species, namely blackgrass (*Juncus gerardii*).

The uplands of the embankment are a mixture of shrubs and herbaceous species. The dominant shrub is winged sumac (*Rhus copallinum*). There are occurrences of autumn olive (*Elaeagnus umbellata*), smooth sumac (*Rhus glabra*), and cedar (*Juniperus virginiana*). The herbaceous layer is dominated by little bluestem (*Schizachyrium scoparium*) and bitternsweet* (*Celastrus orbiculatus*). Additional species

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* Denotes a species known to be invasive in Connecticut
include spotted knapweed* (*Centaurea stoebe*), poison ivy (*Toxicodendron radicans*) and assorted grasses.

**Vegetative Community Upstream**

While similar in composition the vegetation upstream of the bridge (on the northeast and southeast quadrants) is structurally different. The southeast quadrant of the bridge is dominated by shrubs along the embankment, primarily bayberry, smooth sumac, and cedars. The northeast quadrant has only a few small shrubs of autumn olive and cedar. The uplands are mostly dominated by a patch of Japanese knotweed* (*Fallopia japonica*). Additional shrubs on the upstream side of the roadway include winged sumac, Japanese honeysuckle* (*Lonicera japonica*) and rugose rose* (*Rosa rugosa*). Herbaceous species include little bluestem, spotted knapweed, evening primrose (*Onothera biennis*), and poison ivy.

Tidal wetland vegetation within the regulatory limits include similar species as the downstream wetlands, being dominated by saltwater cordgrass. The fringes have high tide bush and marsh elder, as well as seaside goldenrod.

**Proposed Conditions**

The proposed replacement bridge will have abutments built behind the existing abutments. The existing abutments will be cut down and left in place. The proposed bridge is a single 40'6" span structure of concrete box beams with integral abutments. To protect the bridge from future scour in critical storms (100-year storm) the new abutments will be enclosed in permanent sheet pile. This will allow the bridge to resist a record storm without failure. A concrete block revetment will be placed between the existing abutments and the new abutments to stabilize the shoreline above the waterline. The existing wingwalls will be used, and additional riprap will be placed at the four corners of the bridge to stabilize the shoreline around the abutments. The proposed low chord of the bridge will match the existing at elevation 5ft.

There will be temporary relocation of the aerial utility poles during construction. The utility pole relocations will be accomplished via the installation of temporary earth retaining systems along the western slope to allow for the installation of the temporary poles. Minimum clearances in accordance with CFR 322.5 will be maintained during the temporary aerial utility relocations. An existing water main will be replaced on the east fascia of the bridge. The existing watermain will be temporarily relocated upstream during construction on temporary supports. The bottom chord of the temporary watermain structure will match the existing bridge. As the new bridge will be a slightly deeper structure there will be a slight increase in the vertical alignment of the roadway at the bridge, necessitating some roadway reconstruction of the approaches which includes reforming the roadway embankments to accommodate current standard guideway. A work float is proposed to be used in the water during the removal of the bridge superstructure as a debris control system and to facilitate work when the abutments are being cut down. The work float will have a waterproof membrane to prevent any debris or slurry from discharging from the float to the waterway. The work float will not be stored in the waterway when not in use, and at no time will it be allowed to 'bottom-out' on the riverbed. When not in use, it will be stored within the disturbed project limits. It will not be stored in undisturbed marsh areas.

**Impact Assessment**

The wetland impacts for the proposed bridge replacement are relatively minor and mostly restricted to the fringes of wetland at the base of the roadway embankment and are mostly due to the roadway reconstruction and guideway installation. There is some impact associated with refreshing the riprap at the four corners of the abutments. Total impacts below the CJI amount to 1680sf (1095sf Perm, 585sf Temp). Of the total impacts below CJI only 20sf are below the MHW. Total impacts below the HTL
amount to 930sf (625sf Perm, 305sf Temp), of which again, only 20sf are below the MHW. In total most
of the wetland impacts are to the fringe wetlands at the base of the roadway embankment and not to the
large intact marsh system which is beyond the bridge and roadway toe. Measures have been taken to
minimize impacts to the extent practical. Areas which are temporarily disturbed will be restored with
native plantings.

There are no anticipated impacts to fish or wildlife species from the proposed activity. Because the
existing abutments will be used for water handling, there will be no impacts to fish passage through the
structure during construction. The impacts to vegetation along the roadway is minor, and there are areas
of invasive species that will benefit from treatment and replacement by native vegetation. Though the
marsh is mapped as Saltmarsh Sparrow habitat, the timing of the construction is such that it should not
affect breeding of the sparrows in the marsh. The NDDB response letter is appended to the Application
which shows no negative effects are expected to species from the project.

Mitigation and Minimization

The Department is proposing preservation as a means to mitigate the permanent impacts resulting from
the bridge replacement to satisfy DEEP mitigation requirements. The Department underwent an
exhaustive search for on-the-ground mitigation sites to either restore or create within the surrounding
area. Because the impacts of the project are so limited, it also means that limited mitigation would be
required, even at a ratio of 3:1. Given that ratio the Department was seeking an area of approximately
5000sf, or 0.1ac. The adjacent marsh is one of the larger intact marshes within Old Saybrook and little
opportunity exists to find an accessible isolated 0.1ac patch that is degraded and in need of restoration.
While there are areas of Phragmites incursions, we were unable to find any that were isolated enough
where the success of the restoration was probable, let alone reliably predictable. The Department also
involved the Old Saybrook Planning Department, Old Saybrook Land Trust, and the DEEP WHAMM
unit in an attempt to identify a suitable restoration area.

The Old Saybrook Land Trust was able to identify a parcel for acquisition within the Ragged Rock Creek
Marsh area. The parcel is located at the mouth of Ragged Rock Creek adjacent to the Connecticut River.
The parcel is approximately 1ac in size and is currently undeveloped. The parcel is surrounded by
approximately 250ac of adjacent preserved land owned by the DEEP, the Nature Conservancy, the Old
Saybrook Land Trust and the Town of Old Saybrook. It is the last remaining unpreserved parcel in this
portion of the marsh. It is the intention of the Department to acquire the parcel (currently in process with
our Rights-of-Way division) and then turn over the ownership to DEEP to incorporate into their
management of existing preserved lands. The parcel is currently identified by the Town of Old Saybrook
Assessors Map as MBL 049/036-0000, Account Number 00533000.

Ragged Rock Creek Marsh has long been deemed a valuable resource of the lower Connecticut River
valley. In 1990 Congress sponsored a study the “Northeast Coastal Areas Study of Significant Coastal
Habitats” for the U.S. Fish & Wildlife service to identify areas in Southern New England and Long Island
in need of protection for fish & wildlife habitat and to preserve natural diversity. Ragged Rock marsh
was called out as part of the Connecticut River and Tidal Wetlands complex worthy of protection. An
article from the Hartford Courant in 1995 lauded the donation of land from private ownership to the
Nature Conservancy within the marsh. DEEP sponsored an extensive vegetation study in 2009
documenting the diverse vegetation of the marsh. The mouth of the Connecticut River has been
designated by the Audubon Society as a Landscape-scale Important Bird Area (IBA) of which Ragged
Rock Creek Wildlife Management Area is specifically called out. Ragged Rock Creek marsh was also
identified in the Plan for Implementing the Silvio O. Conte National Wildlife Refuge as a target area for
conservation in the 2015 FEIS (Final Environmental Impact Statement).

Because the parcel is approximately 1ac, and in excess of what would be required for preservation for this
bridge, the Department, in consultation with CTDEEP at the November 2018 monthly Interagency
Coordination Meeting, has proposed that the parcel not only serve as mitigation for the replacement of Br.
02708, but also serve as mitigation for the replacement of Br. 01386, which is located just north of the subject bridge. Br. 01386 is currently under design for replacement, and was to be contract bid at the same time as Br. 02708 however the design schedule has fallen behind. We expect the construction of Br. 01386 to follow the year after the construction of the subject bridge. As such, we are proposing to provide State mitigation for both projects by the acquisition of the single parcel. As discussed at the Interagency Coordination Meeting, the impacts for Br. 01386, as known at that time, would be mitigated for by the acquisition parcel. It was CTDEEP's position that the acquisition parcel would be sufficient for both bridges, as it is expected that any increase in impacts at Br. 01386 would be the result of increasing the bridge opening, which they found to an activity that would provide mitigation via increased flushing of the tidal marsh, so that nothing further would be required to satisfy the CTDEEPs mitigation requirements. Location maps for the mitigation site are provided in the Appendix to this report. In order to satisfy the mitigation requirements for the ACOE, a payment will be made to the CT In-Lieu Fee program to compensate for the unavoidable permanent impacts to wetlands and waters within the ACOE jurisdiction.

In addition to the off-site mitigation mentioned above, all temporarily disturbed areas will be stabilized and re-vegetated with native vegetation tolerant of coastal conditions. Invasive species identified in the Habitat Characteristics section above will be treated within the project limits utilizing the Department’s Control and Removal of Invasive Vegetation Specification. These areas will also be re-planted with native vegetation. The Contractor will adhere to the Department’s Form 817, Standard Specifications for Roads, Bridges, Facilities and Incidental Construction which guides BMPs for the protection of water quality during construction. The work float that will be utilized in the removal of the superstructure and the cutting down of the abutments will be watertight to ensure that no debris enters the waterway from work float and other debris control measures will be used during abutment and superstructure removal to contain debris. Turbidity curtains will be utilized in the water at the four corners of the bridge during the placement of the riprap to control any turbidity which may be produced from the activity. The riprap limits do not extend below the MHW line, so work should be able to be accomplished during low tidal ranges. Silt fence and sandbag cofferdams are not suitable along the wingwalls due to the steep side slopes of the waterway in and around the bridge and the short duration of the riprap placement, however silt fence will be used along the roadway for the reconstruction work. The Specification for the work float will prohibit the Contractor from allowing the work float to ground out on the riverbed at any time.

Summary

The project represents the efforts to minimize impacts to the salt marsh habitat surrounding the bridge. Keeping the existing abutments in place allows for no impacts to the waterway from the full structure replacement. Best Management Practices for the construction and use of the work float will prevent discharges to the waterway. The riprap placement has been minimized to that which is necessary to protect the existing wingwalls at the four corners of the bridge. Impacts to wildlife will be avoided by the timing of the construction in later winter and early spring prior to the breeding season for most species. The proposed mitigation is a unique opportunity to preserve the last parcel of privately held land surrounded by 250ac of adjacent preserved land in the valuable Ragged Rock Creek wildlife area and in addition will contribute to the Connecticut In-Lieu Fee mitigation fund.
Site Photographs

&

Vegetation Mapping
Upper Left: Upstream facing north
Upper Right: Downstream facing south
Center Left: Downstream facing northwest
Center Right: Looking north across downstream face of bridge
Bottom Left: Upstream facing east

Photos: 8/23/2018
EXISTING TIDAL WETLAND VEGETATION MAPPING

CTDOT 105-209 (215)
BR. 02708, RT 154 OF
PLUM BANK CREEK
Soils Information
Soil Map—State of Connecticut
(State Project 105-215, Bridge 02708)

Map Scale: 1:4744 if printed on A portrait (8.5" x 11") sheet.

Map projection: Web Mercator
Corner coordinates: WGS84

USDA Natural Resources Conservation Service
Web Soil Survey
545

1/3/2019 Page 1 of 3
MAP LEGEND

Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot

Spoil Area
Stony Spot
Very Stony Spot
Wet Spot
Other
Special Line Features
Streams and Canals
Transportation
Rails
Interstate Highways
US Routes
Major Roads
Local Roads
Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: State of Connecticut
Survey Area Data: Version 18, Dec 6, 2018

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Dec 31, 2009—Sep 6, 2017
The orthoimage or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.
# Map Unit Legend

<table>
<thead>
<tr>
<th>Map Unit Symbol</th>
<th>Map Unit Name</th>
<th>Acres in AOI</th>
<th>Percent of AOI</th>
</tr>
</thead>
<tbody>
<tr>
<td>98</td>
<td>Westbrook mucky peat, 0 to 2 percent slopes, very frequently flooded</td>
<td>0.1</td>
<td>33.1%</td>
</tr>
<tr>
<td>306</td>
<td>Udorthents-Urbaniand complex</td>
<td>0.1</td>
<td>23.7%</td>
</tr>
<tr>
<td>311</td>
<td>Udorthents-Urbaniand complex, coastal, rarely flooded</td>
<td>0.1</td>
<td>15.0%</td>
</tr>
<tr>
<td>W</td>
<td>Water</td>
<td>0.1</td>
<td>28.2%</td>
</tr>
<tr>
<td><strong>Totals for Area of Interest</strong></td>
<td></td>
<td><strong>0.3</strong></td>
<td><strong>100.0%</strong></td>
</tr>
</tbody>
</table>
Map Unit Description

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions in this report, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named, soils that are similar to the named components, and some minor components that differ in use and management from the major soils.

Most of the soils similar to the major components have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Some minor components, however, have properties and behavior characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.
Soils that have profiles that are almost alike make up a soil series. All the soils of a series have major horizons that are similar in composition, thickness, and arrangement. Soils of a given series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into soil phases. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A complex consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An association is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An undifferentiated group is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include miscellaneous areas. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Additional information about the map units described in this report is available in other soil reports, which give properties of the soils and the limitations, capabilities, and potentials for many uses. Also, the narratives that accompany the soil reports define some of the properties included in the map unit descriptions.

Report—Map Unit Description

State of Connecticut

98—Westbrook mucky peat, 0 to 2 percent slopes, very frequently flooded

Map Unit Setting
National map unit symbol: 2tyqf
Elevation: 0 to 10 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 250 days
Farmland classification: Not prime farmland

Map Unit Composition
Westbrook and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Westbrook

Setting
Landform: Tidal marshes
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Partly-decomposed herbaceous organic material over loamy mineral material

Typical profile
Oe - 0 to 19 inches: mucky peat
Cg - 19 to 59 inches: silt loam

Properties and qualities
Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Very low to high (0.00 to 14.17 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: Very frequent
Frequency of ponding: None
Calcium carbonate, maximum in profile: 5 percent
Salinity, maximum in profile: Nonsaline to strongly saline (0.7 to 111.6 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 33.0
Available water storage in profile: High (about 9.1 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8w
Hydrologic Soil Group: B/D
Ecological site: Tidal Salt Low Marsh mesic very frequently flooded (R144AY001CT), Tidal Salt High Marsh mesic very frequently flooded (R144AY002CT)
Hydric soil rating: Yes
Minor Components

Pawcatuck

Percent of map unit: 5 percent
Landform: Tidal marshes
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Tidal Salt Low Marsh mesic very frequently flooded (R144AY001CT), Tidal Salt High Marsh mesic very frequently flooded (R144AY002CT)
Hydric soil rating: Yes

Ipswich

Percent of map unit: 5 percent
Landform: Tidal marshes
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Tidal Salt Low Marsh mesic very frequently flooded (R144AY001CT), Tidal Salt High Marsh mesic very frequently flooded (R144AY002CT)
Hydric soil rating: Yes

306—Udorthents-Urban land complex

Map Unit Setting

National map unit symbol: 9lmg
Elevation: 0 to 2,000 feet
Mean annual precipitation: 43 to 56 inches
Mean annual air temperature: 45 to 55 degrees F
Frost-free period: 120 to 185 days
Farmland classification: Not prime farmland

Map Unit Composition

Udorthents and similar soils: 50 percent
Urban land: 35 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the map unit.

Description of Udorthents

Setting

Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Drift

Typical profile

A - 0 to 5 inches: loam
C1 - 5 to 21 inches: gravelly loam
C2 - 21 to 80 inches: very gravelly sandy loam
Properties and qualities
   Slope: 0 to 25 percent
   Depth to restrictive feature: More than 80 inches
   Natural drainage class: Well drained
   Runoff class: Medium
   Capacity of the most limiting layer to transmit water (Ksat): Very
   low to high (0.00 to 1.98 in/hr)
   Depth to water table: About 54 to 72 inches
   Frequency of flooding: None
   Frequency of ponding: None
   Available water storage in profile: Moderate (about 6.8 inches)

Interpretive groups
   Land capability classification (irrigated): None specified
   Land capability classification (nonirrigated): 3e
   Hydrologic Soil Group: B
   Hydric soil rating: No

Description of Urban Land

Typical profile
   H - 0 to 6 inches: material

Interpretive groups
   Land capability classification (irrigated): None specified
   Land capability classification (nonirrigated): 8
   Hydrologic Soil Group: D
   Hydric soil rating: Unranked

Minor Components

Unnamed, undisturbed soils
   Percent of map unit: 8 percent
   Hydric soil rating: No

Udorthents, wet substratum
   Percent of map unit: 5 percent
   Down-slope shape: Convex
   Across-slope shape: Linear
   Hydric soil rating: No

Rock outcrop
   Percent of map unit: 2 percent
   Hydric soil rating: No

311—Udorthents-Urban land complex, coastal, rarely flooded

Map Unit Setting
   National map unit symbol: 2x1kg
   Elevation: 0 to 10 feet
   Mean annual precipitation: 36 to 71 inches
   Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition
Udorthents, coastal, and similar soils: 50 percent
Urban land, coastal: 35 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Udorthents, Coastal

Setting
Landform: Tidal marshes
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy human-transported material

Typical profile
^A - 0 to 5 inches: loam
^C1 - 5 to 21 inches: gravelly sandy loam
^C2 - 21 to 79 inches: very gravelly sandy loam

Properties and qualities
Slope: 0 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Moderately well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat):
  Moderately low to moderately high (0.01 to 1.42 in/hr)
Depth to water table: About 24 to 54 inches
Frequency of flooding: Rare
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline (0.0 to 1.9 mmhos/cm)
Available water storage in profile: Low (about 5.8 inches)

Interpretive groups
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8
Hydrologic Soil Group: C
Hydric soil rating: No

Description of Urban Land, Coastal

Setting
Landform: Dunes
Down-slope shape: Linear
Across-slope shape: Linear

Typical profile
M - 0 to 10 inches: cemented material

Properties and qualities
Slope: 0 to 8 percent
Depth to restrictive feature: 0 inches to manufactured layer
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Frequency of flooding: Rare
Available water storage in profile: Very low (about 0.0 inches)

Interpretive groups
- Land capability classification (irrigated): None specified
- Land capability classification (nonirrigated): 8
- Hydrologic Soil Group: D
- Hydric soil rating: Unranked

Minor Components

Verrazano
- Percent of map unit: 6 percent
- Landform: Dunes
- Landform position (three-dimensional): Tread
- Down-slope shape: Linear, convex
- Across-slope shape: Linear, convex
- Hydric soil rating: No

Bigapple
- Percent of map unit: 6 percent
- Landform: Tidal marshes
- Landform position (three-dimensional): Tread
- Down-slope shape: Linear
- Across-slope shape: Linear
- Hydric soil rating: No

Kooksan
- Percent of map unit: 3 percent
- Landform: Dunes
- Landform position (two-dimensional): Backslope, shoulder, footslope
  - Landform position (three-dimensional): Crest, base slope, side slope
- Down-slope shape: Convex
- Across-slope shape: Convex
- Hydric soil rating: No

W—Water

Map Unit Composition
- Water: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Data Source Information

Soil Survey Area: State of Connecticut
Survey Area Data: Version 18, Dec 6, 2018
Mitigation Site Information
RIVER MEADOW DISTRICT

Location: RIVER MEADOW DISTRICT

Acct#: 00533000

Owner: LIBMAN MICHAEL

Assessment: $7,000

Appraisal: $10,000

PID: 5419

Building Count: 1

Current Value

<table>
<thead>
<tr>
<th>Valuation Year</th>
<th>Improvements</th>
<th>Land</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018</td>
<td>$0</td>
<td>$10,000</td>
<td>$10,000</td>
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</table>

<table>
<thead>
<tr>
<th>Valuation Year</th>
<th>Improvements</th>
<th>Land</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018</td>
<td>$0</td>
<td>$7,000</td>
<td>$7,000</td>
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</tbody>
</table>

Owner of Record

Owner: LIBMAN MICHAEL

Co-Owner: C/O RICHARD CASE ESQ

Address: 10 TOWER LANE
AVON, CT 06001

Sale Price: $500

Certificate: 0451/0520

Book & Page: 0451/0520

Sale Date: 11/25/2003

Ownership History

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<thead>
<tr>
<th>Owner</th>
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<th>Certificate</th>
<th>Book &amp; Page</th>
<th>Sale Date</th>
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<tr>
<td>LIBMAN MICHAEL</td>
<td>$500</td>
<td>0451/0520</td>
<td>0451/0520</td>
<td>11/25/2003</td>
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<tr>
<td>GLEASON JOSEPH H</td>
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Building Information

Building 1: Section 1

Year Built:
Living Area: 0

<table>
<thead>
<tr>
<th>Building Attributes</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>Field</td>
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<tr>
<td>Style</td>
<td>Vacant Land</td>
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<tr>
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<td>Occupancy</td>
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Building Photo
### Exterior Features

<table>
<thead>
<tr>
<th>Exterior Wall 1</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Exterior Wall 2</td>
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<tr>
<td>Roof Structure:</td>
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<td>Roof Cover:</td>
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<tr>
<td>Interior Wall 1</td>
<td></td>
</tr>
<tr>
<td>Interior Wall 2</td>
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<tr>
<td>Interior Flr 1</td>
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<td>Interior Flr 2</td>
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<td>Total Bthrms:</td>
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</tr>
<tr>
<td>Total Half Baths:</td>
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<td>Total Xtra Flxrs:</td>
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<tr>
<td>Total Rooms:</td>
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<tr>
<td>Bath Style:</td>
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<td>Kitchen Style:</td>
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### Extra Features

<table>
<thead>
<tr>
<th>Extra Features</th>
<th>Legend</th>
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</thead>
<tbody>
<tr>
<td>No Data for Extra Features</td>
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</tbody>
</table>

### Land

#### Land Use

- **Use Code**: 1320
- **Description**: Rear Land
- **Zone**: AA-2

#### Land Line Valuation

- **Size (Acres)**: 1
- **Depth**: 0
- **Assessed Value**: $7,000
- **Appraised Value**: $10,000

### Outbuildings

<table>
<thead>
<tr>
<th>Outbuildings</th>
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### Valuation History

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<th>Valuation Year</th>
<th>Improvements</th>
<th>Land</th>
<th>Total</th>
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<td>2015</td>
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### Assessment

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<th>Improvements</th>
<th>Land</th>
<th>Total</th>
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<tbody>
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<tr>
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</tbody>
</table>

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ACOE Permit Additional Information

NOAA EFH
Appendix B. Verification Form

Federal Highway Administration (FHWA) or the applicable state Department of Transportation (state DOT) will email a signed version of this completed form, together with any project plans, maps, supporting analyses, etc., to NOAA’s National Marine Fisheries Service (NMFS), Greater Atlantic Regional Fisheries Office, Habitat Conservation Division (GARFO HCD) at NMFS.GAR.EFH.Consultation@noaa.gov, upon obtaining sufficient information. FHWA/state DOT must receive a response from GARFO HCD or wait at least 30 calendar days to proceed under the programmatic EFH consultation. FHWA will compile the information from the completed Verification Forms for the purposes of tracking and annual monitoring. FHWA/state DOT must include the completed Verification Form as part of a permit application with any other federal agency, such as U.S. Army Corps of Engineers or U.S. Coast Guard, to confirm that EFH consultation is complete.

Project Activity Type
1. Bridge repair, demolition, and replacement
2. Culvert repair and replacement
3. Docks, piers, and waterway access projects
4. Slope stabilization

Transportation Project Information

<table>
<thead>
<tr>
<th>Project Name: Route 154 over Plum Bank Creek</th>
<th>Project Number: CTDOT 0105-0215</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Sponsor: Connecticut DOT</td>
<td>Contact Person: Amanda M. Saul</td>
</tr>
<tr>
<td>Email: <a href="mailto:amanda.saul@ct.gov">amanda.saul@ct.gov</a></td>
<td>Phone: 860.594.2939</td>
</tr>
<tr>
<td>Latitude (e.g., 42.625884):</td>
<td>41.271706</td>
</tr>
<tr>
<td>Longitude (e.g., -70.646114):</td>
<td>-72.393508</td>
</tr>
<tr>
<td>City/Town, State: Old Saybrook</td>
<td>Waterway: Plum Bank Creek</td>
</tr>
<tr>
<td>Project Description and Purpose:</td>
<td>The proposed project involves the replacement of Bridge 02708 which carries Route 154 over Plum Bank Creek in the Town of Old Saybrook, CT. The bridge was built in 1935 and is a 19ft single span concrete slab bridge on concrete abutments with timber clad concrete wingwalls. The proposed replacement bridge is a 406&quot; span concrete box beam structure with integral abutments which will be built behind the existing abutments. The...</td>
</tr>
<tr>
<td>Anticipated Project Start Date: 9/30/19</td>
<td>Anticipated Project End Date:</td>
</tr>
<tr>
<td>Total area of impact to EFH (in acres):</td>
<td>0.01</td>
</tr>
<tr>
<td>Include locus map with area of impact.</td>
<td></td>
</tr>
<tr>
<td>Area of impacts to sensitive habitats (in square feet):</td>
<td>No impacts to submerged aquatic vegetation (SAV) or oyster reefs allowed.</td>
</tr>
<tr>
<td>Natural rocky habitat (e.g., bedrock, boulders, cobble, and/or gravel):</td>
<td>0</td>
</tr>
<tr>
<td>Salt marsh:</td>
<td>650</td>
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<tr>
<td>Areas containing shellfish (excluding oyster reefs):</td>
<td>0</td>
</tr>
<tr>
<td>Intertidal mudflats:</td>
<td>0</td>
</tr>
<tr>
<td>Area of impact to diadromous fish habitat:</td>
<td>0</td>
</tr>
</tbody>
</table>

Disturbed but revegetated

Project No. 0105-0215 563
Potential Stressors Caused by the Activity (Check all that apply based on activity type)

☐ Underwater Noise
☐ Impingement/Entrainment and Entanglement
☒ Water Quality/Turbidity
☒ Habitat Alteration
☒ Vessel Traffic

EFH Conservation Recommendation Checklist

FHWA/state DOT will indicate how the project addresses each of the programmatic EFH conservation recommendations, by selecting the appropriate check box and providing a brief explanation where necessary. If the project is not in compliance with a particular programmatic EFH conservation recommendation and FHWA/state DOT has still determined that the effects of a project on EFH are not substantial and the project is otherwise consistent with the FHWA programmatic EFH consultation, provide justification below under the conservation recommendations that is not included.

Underwater Noise

☒ Check here if the EFH conservation recommendations in this section are not applicable because the project will not create underwater noise as a stressor. Proceed to the next stressor.

1. Use a soft start each day of pile driving, after a break of 30 minutes or more, and if any increase in pile installation or removal intensity is required. Build up power slowly from a low energy start-up over a 20-minute period to warn fish to leave the vicinity. This buildup shall occur in uniform stages to provide a constant increase in output.

☐ Not met:
  ☐ Not applicable, provide reasoning:
  ☐ Project is unable to accommodate, provide justification:

☐ Met:
  ☐ Shown on project plans
  ☐ Included in description, other terms and conditions

2. Noise-generating work conducted in diadromous streams within the spring diadromous fish TOY restriction listed in Appendix D must be isolated behind sealed, dewatered cofferdams, to avoid impeding fish migration.

☐ Not met:
  ☐ Not applicable, provide reasoning:
  ☐ Project is unable to accommodate, provide justification:

☐ Met:
  ☐ Shown on project plans
  ☐ Included in description, other terms and conditions
Impingement/Entrainment and Entanglement

☐ Check here if the EFH conservation recommendations in this section are not applicable because the project will not lead to impingement/entrainment and entanglement as a stressor. Proceed to the next stressor.

3. Turbidity control measures must be properly secured and monitored to ensure aquatic species are not entangled or trapped in the project area.

☐ Not met:
  ☐ Not applicable, provide reasoning:
  ☐ Project is unable to accommodate, provide justification:

☐ Met:
  ☐ Shown on project plans
  ☐ Included in description, other terms and conditions

4. Temporary intakes related to construction must be equipped with mesh size screening and approach velocity appropriate for the species and life stage anticipated. Per the NMFS Anadromous Salmonid Passage Facility Design manual, screen openings must not exceed 3/32 inch and screen approach velocity must be less than .25 feet per second (ft/sec).
  • In New York, New Jersey, Delaware, Maryland, and Pennsylvania, 2 millimeter (mm) wedge wire screens must be used with a maximum intake velocity of 0.5 feet per second (ft/sec).
  • In Virginia, a 1 mm wedge wire with a maximum intake velocity of 0.25 ft/sec.

☐ Not met:
  ☐ Not applicable, provide reasoning:
  ☐ Project is unable to accommodate, provide justification:

☐ Met:
  ☐ Shown on project plans
  ☐ Included in description, other terms and conditions

5. No new permanent surface water withdrawal, water intakes, or water diversions.

☐ Not met:
  ☐ Not applicable, provide reasoning:
  ☐ Project is unable to accommodate, provide justification:

☐ Met:
  ☐ Shown on project plans
  ☐ Included in description, other terms and conditions

Water Quality/Turbidity

☐ Check here if the EFH conservation recommendations in this section are not applicable because the project will not negatively affect water quality or create turbidity. Proceed to the next stressor.
6. Install soil erosion, sediment, and turbidity controls and maintain them in effective operating condition during construction. Remove controls upon completion of work, after all exposed soil and other fills, as well as any work waterward of ordinary high water or the high tide line, are permanently stabilized.

☐ Not met:
  ☐ Not applicable, provide reasoning:
  ☐ Project is unable to accommodate, provide justification:

☐ Met:
  ☑ Shown on project plans
  ☑ Included in description, other terms and conditions

7. Install and remove any in-water soil erosion, sediment, and turbidity controls outside the TOY restrictions in Appendix D.

☐ Not met:
  ☐ Not applicable, provide reasoning:
  ☑ Project is unable to accommodate, provide justification:

☐ Met:  The project is scheduled for off-season construction, primarily in the spring of 2023. One of the last stages in the project is to
  ☑ Shown on project plans
  ☑ Included in description, other terms and conditions

8. Work that produces greater than minimal turbidity or sedimentation in diadromous streams or EFH must not be done during the TOY restriction(s) in Appendix D.

☐ Not met:
  ☐ Not applicable, provide reasoning:
  ☑ Project is unable to accommodate, provide justification:

☐ Met:  The project is scheduled for off-season construction, primarily in the spring of 2023. One of the last stages in the project is to
  ☑ Shown on project plans
  ☑ Included in description, other terms and conditions

9. Prevent construction debris and sediment from entering aquatic areas and remove all construction debris and excess/deteriorated materials and dispose of in an upland area.

☐ Not met:
  ☐ Not applicable, provide reasoning:
  ☐ Project is unable to accommodate, provide justification:

☐ Met:
  ☑ Shown on project plans
  ☑ Included in description, other terms and conditions
10. Dredged and/or excavated materials, including any fine-grained materials removed from inside culverts, shall either be moved to an upland location and stabilized to prevent reentry into the waterway or disposed of at a previously approved disposal site.

☐ Not met:
  ☐ Not applicable, provide reasoning: No culvert in project.
  ☐ Project is unable to accommodate, provide justification:

☐ Met:
  ☐ Shown on project plans
  ☐ Included in description, other terms and conditions

11. Completely remove and do not reuse existing creosote piles that are affected by project activities and do not install new creosote piles.

☐ Not met:
  ☐ Not applicable, provide reasoning: There are no creosote piles associated with the project.
  ☐ Project is unable to accommodate, provide justification:

☐ Met:
  ☐ Shown on project plans
  ☐ Included in description, other terms and conditions

12. Coat any chemically or pressure treated piles (CCA, ACQ, etc.) with an impact-resistant, biologically inert substance. Coat the piles at the point of manufacture, not on site.

☐ Not met:
  ☐ Not applicable, provide reasoning: There are no chemically or pressure treated piles associated with the project.
  ☐ Project is unable to accommodate, provide justification:

☐ Met:
  ☐ Shown on project plans
  ☐ Included in description, other terms and conditions

13. Derelict, degraded, or abandoned piles, except for those inside of existing work footprints for piers, must be completely removed or cut and driven three feet below the surface.

☐ Not met:
  ☐ Not applicable, provide reasoning: None associated with the project.
  ☐ Project is unable to accommodate, provide justification:

☐ Met:
  ☐ Shown on project plans
  ☐ Included in description, other terms and conditions

14. Ensure that raw concrete does not contact the water; wet pours of concrete must be confined within sealed forms until the concrete is set or pre-cast members installed.

☐ Not met:
☐ Not applicable, provide reasoning:
☐ Project is unable to accommodate, provide justification:

Met:
☐ Shown on project plans
☐ Included in description, other terms and conditions

Habitat Alteration
☐ Check here if the EFH conservation recommendations in this section are not applicable because the project will not cause habitat alteration. Proceed to the next stressor.

15. Remove temporary and/or obsolete structures and fills in their entirety. Use geotextile barriers prior to placement of temporary fill material to ensure complete removal.
☐ Not met:
☐ Not applicable, provide reasoning:
☐ Project is unable to accommodate, provide justification:

Met:
☐ Shown on project plans
☐ Included in description, other terms and conditions

16. Install a riprap bedding layer (such as a gravel filter blanket or geotextile) prior to riprap placement to prevent underlying soils from washing through the riprap during high water.
☐ Not met:
☐ Not applicable, provide reasoning:
☐ Project is unable to accommodate, provide justification:

Met:
☐ Shown on project plans
☐ Included in description, other terms and conditions

17. Return areas impacted by temporary activities, fills, or structures to pre-construction or better condition, including elevations and substrate, and replant with native species.
☐ Not met:
☐ Not applicable, provide reasoning:
☐ Project is unable to accommodate, provide justification:

Met:
☐ Shown on project plans
☐ Included in description, other terms and conditions

18. Temporary monitoring devices shall be removed and the substrate restored to preconstruction elevations no later than 24 months from initial installation, or upon completion of data acquisition.
19. Pipelines and cables that cross a waterway must not rest on the substrate. They may be attached to an overwater structure or be buried to allow an area to return to preexisting conditions.

Met:
- Shown on project plans
- Included in description, other terms and conditions

20. Any fill, including planting media and placement of any seed shellfish, spatted-shell, or cultch must be free of all non-native or invasive species and/or contaminants. An invasive species control plan must be part of the project if the transportation agency cannot guarantee this.

Met:
- Shown on project plans
- Included in description, other terms and conditions

21. Prevent dislodging of coir logs, mats, or native oyster shell.

Met:
- Shown on project plans
- Included in description, other terms and conditions

22. Incorporate measures to increase the ambient light transmission under overwater structures.

Met:
- Shown on project plans
- Included in description, other terms and conditions
23. The lowermost part of floating docks must be \( \geq 18 \) inches above the substrate at all times, to avoid grounding and propeller scour and to provide adequate circulation and flushing.

- Not met:
  - Not applicable, provide reasoning: There are no floating docks in the project. There will be a temporary work float used during the superstructure removal.
  - Project is unable to accommodate, provide justification:

24. Conduct and submit pre-dredge benthic biological surveys to determine benthic communities present and conduct post-dredge surveys to ensure targeted depths have been reached and to determine benthic recovery.

- Not met:
  - Not applicable, provide reasoning: Areas which will be permanently disturbed waterward of the high tide line are quieting zones over which will be.
  - Project is unable to accommodate, provide justification:

25. Grain size of any sediment used as part of habitat restoration must be the same size or larger than the native material at the site.

- Not met:
  - Not applicable, provide reasoning:
  - Project is unable to accommodate, provide justification:

- Met:
  - Shown on project plans
  - Included in description, other terms and conditions

26. If rock relocation is necessary, move them to an area of equivalent depth and substrate.

- Not met:
  - Not applicable, provide reasoning: There is no movement of native rock involved in the project.
  - Project is unable to accommodate, provide justification:

- Met:
  - Shown on project plans
27. Incorporate natural habitats (e.g., living shorelines) and soft approaches (e.g., vegetative plantings and large woody debris) into the stabilization design in addition to or instead of hardened structures. See NOAA’s Guidance for Considering the Use of Living Shorelines for more information.

☐ Not met:
- Not applicable, provide reasoning:
- Project is unable to accommodate, provide justification:

☐ Met:
- Shown on project plans
- Included in description, other terms and conditions

*Sensitive Habitats (SAS, natural rocky habitats, intertidal areas, and areas containing shellfish)*

28. Locate all temporary structures, construction, access, and dewatering actives outside of sensitive habitats.

☐ Not met:
- Not applicable, provide reasoning:
- Project is unable to accommodate, provide justification:

☐ Met:
- Shown on project plans
- Included in description, other terms and conditions

29. Prior to construction, identify and mark in the field any SAV at the project site. An SAV survey is required for activities adjacent to mapped or known SAV if a survey has not been conducted in three years.

☐ Not met:
- Not applicable, provide reasoning: No SAV present.
- Project is unable to accommodate, provide justification:

☐ Met:
- Shown on project plans
- Included in description, other terms and conditions

30. Provide compensatory mitigation for all permanent and temporary impacts to sensitive habitats. This could include a contribution to an existing in-lieu fee program. When impacts are unavoidable:
- conduct a biological survey to map the coverage of the sensitive habitats;
- develop a compensatory mitigation plan for biological resource losses, including success criteria, monitoring plan, and long-term maintenance plan;
• submit the results of the biological survey and the mitigation plan to GARFO HCD for review; and
• undertake compensatory mitigation prior to or concurrent with any impacts to sensitive habitat.

☐ Not met:
☐ Not applicable, provide reasoning:
☐ Project is unable to accommodate, provide justification:

☐ Met:
☐ Shown on project plans
☐ Included in description, other terms and conditions

31. Where construction requires heavy equipment operation in or across wetlands or mudflats, the equipment shall have low ground pressure (typically ≤ 3 pounds per square inch); be placed on construction timber mats that are adequate to support the equipment; or be operated on dry or frozen wetlands such that shear pressure does not cause subsidence of the wetlands immediately beneath equipment and upheaval of adjacent wetlands. Construction mats must not be dragged into position.

☐ Not met:
☐ Not applicable, provide reasoning: There will be no heavy equipment use in or across wetlands or mudflats in the project.
☐ Project is unable to accommodate, provide justification:

☐ Met:
☐ Shown on project plans
☐ Included in description, other terms and conditions

32. Habitat restoration or mitigation projects must not result in a permanent conversion or loss of sensitive habitats.

☐ Not met:
☐ Not applicable, provide reasoning: Project is not a habitat conversion project.
☐ Project is unable to accommodate, provide justification:

☐ Met:
☐ Shown on project plans
☐ Included in description, other terms and conditions

33. No dredging shall occur within:
• intertidal areas;
• 100 feet of SAV; or
• 25 feet of SAS, natural rocky habitats, or areas containing shellfish.

☐ Not met:
☐ Not applicable, provide reasoning: There is no dredging proposed in the project.
☐ Project is unable to accommodate, provide justification:
Met:
- Shown on project plans
- Included in description, other terms and conditions

34. The height of docks and piers must be at least four feet above salt marsh substrate and must be greater than or equal to the width of the deck, to minimize shading impacts. The height must be measured from the marsh substrate to the bottom of the longitudinal support beam.

Not met:
- Not applicable, provide reasoning: There are no docks/piers proposed in the project.
- Project is unable to accommodate, provide justification:

Met:
- Shown on project plans
- Included in description, other terms and conditions

35. Outlets must not discharge directly into sensitive habitats.

Not met:
- Not applicable, provide reasoning: There are no proposed stormwater outlets in the project.
- Project is unable to accommodate, provide justification:

Met:
- Shown on project plans
- Included in description, other terms and conditions

Fish Passage/Migration Habitat
36. Design replacement crossings to provide diadromous and resident fish and aquatic organism passage. Structures must:
   - provide sufficient water depth and maintain suitable water velocities during migration periods; and
   - maintain or replicate natural stream channel and flow conditions.

Not met:
- Not applicable, provide reasoning:
- Project is unable to accommodate, provide justification:

Met:
- Shown on project plans
- Included in description, other terms and conditions

37. Incorporate climate change projections into the project design. Use the Intergovernmental Panel on Climate Change (IPCC) Representative Concentration Pathways (RCP) 8.5/high greenhouse gas emission scenario and RCP 4.5/intermediate greenhouse gas emission scenario (IPCC 2014) and the global mean and regional sea level rise projections for
intermediate-high and extreme scenarios referenced in Sweet et al. (2017) in design
calculations for replacement structures.

☐ Not met:
  ☐ Not applicable, provide reasoning:
  ☐ Project is unable to accommodate, provide justification:

☐ Met:
  ☑ Shown on project plans
  ☐ Included in description, other terms and conditions

38. Replaced or upgraded crossings must be "in kind" or go up in order of preference set out
in NMFS’ Anadromous Salmonid Passage Facility Design:
  • Road abandonment and reclamation or road realignment to avoid crossing the stream.
  • Bridge or stream simulation spanning the stream flood plain, providing long-term
dynamic channel stability, retention of existing spawning areas, maintenance of
benthic invertebrate production, and minimized risk of failure. If a stream crossing is
proposed in a segment of stream channel that includes a salmonid spawning area,
only full-span stream simulation designs are acceptable.
  • Embedded pipe culvert, bottomless arch designs or non-floodplain spanning stream
simulation.
  • Hydraulic design method, associated with more traditional culvert design approaches-
limited to low stream gradients (0 to 1%) or for retrofits.
  • Culvert designed with an external fishway (including roughened channels) for steeper
slopes.
  • Baffled culvert or internal weirs- to be used only for when other alternatives are
infeasible.

☐ Not met:
  ☑ Not applicable, provide reasoning: Not Applicable as this is a coastal structure on a causeway
leading to a salt marsh. That being said, the replacement.
  ☐ Project is unable to accommodate, provide justification:

☐ Met:
  ☐ Shown on project plans
  ☐ Included in description, other terms and conditions

39. For activities that require soil erosion, sediment, and turbidity controls
  • in non-tidal streams containing diadromous fish:
    i. They must not encroach >25% of the stream width measured from
ordinary high water during the diadromous TOY restriction; and
    ii. They must maintain safe, timely, and effective downstream fish passage
throughout the project.
  • in tidal waters:
    i. They must not encroach >50% of a tidal stream’s width as measured from
mean high water.
☐ Not met:
  ☐ Not applicable, provide reasoning:
  ☐ Project is unable to accommodate, provide justification:

☒ Met:
  ☒ Shown on project plans
  ☐ Included in description, other terms and conditions

Vessel Traffic
☐ Check here if the EFH conservation recommendations in this section are not applicable
because the project will not use vessels.

40. Project vessels shall be operated in adequate water depths to avoid propeller scour and
grounding at all tides. Shallow draft vessels will be used in shallow areas to maximize the
navigational clearance between the vessel and the bottom substrate. Spuds may be used to
elevate the vessel.

☐ Not met:
  ☐ Not applicable, provide reasoning:
  ☐ Project is unable to accommodate, provide justification:

☒ Met:
  ☒ Shown on project plans
  ☐ Included in description, other terms and conditions

41. Project vessels shall not be moored in or use spuds in SAV or be located in such a way
that the vessel could shade SAV.

☒ Not met:
  ☒ Not applicable, provide reasoning: No SAV present.
  ☐ Project is unable to accommodate, provide justification:

☐ Met:
  ☐ Shown on project plans
  ☐ Included in description, other terms and conditions

NEW CLAUSE
Other Justification for Use of the Programmatic EFH Consultation
If the project is outside of the covered activities in the programmatic EFH consultation (i.e., is
one of the actions described in the Excluded Activities list noted below) and FHWA/state DOT
believes the effects are not any more significant and that the project should be eligible for
programmatic EFH consultation, provide additional justification in the space below. FHWA/state
DOT must provide appropriate rationale and GARFO HCD must review and approve it. The
automatic concurrence period does not apply for transportation activities in this section that fall
outside of the programmatic EFH consultation as described.

☐ The project is not listed as an excluded activity.
The project is listed as an excluded activity.

Indicate the activity number from the list below (1 through 21):

Provide additional justification on why the activity should be eligible:

**Activities that Require Individual Consultation**

1. Any work (including anchoring) that results in impacts to:
   - existing or historically mapped submerged aquatic vegetation (SAV) beds or areas within 100 feet of existing or historically mapped SAV beds;
   - ≥ 1,000 square feet of salt marsh, areas containing shellfish, and intertidal areas;
   - ≥ 100 square feet of natural rocky habitat (e.g., bedrock, boulders, cobble, and/or gravel);
2. Stream channelization.
3. Any temporary structures, construction access, and dewatering activities proposed to be in place for ≥ two years.
4. Slip-lining or invert lining existing culverts.
5. Any permanent structures longer than 150 linear feet over salt marsh.
6. Construction of new or expansion of existing boating facilities or ferry terminals.
7. Independent pedestrian trails or bridges located directly adjacent to an existing crossing.
8. New or improvement dredging.
9. Any nearshore disposal or beach nourishment activities.
10. New fill/stabilization placed below mean low water in excess of 200 linear feet (lf).
11. Replacement or maintenance of:
   - sloped stabilization structures > 200 lf and waterward of the existing toe, or
   - vertical structures > 18 inches waterward of the existing face and > 200 lf.
12. In-water utility lines ≥ 100 lf installed by trench excavation, or ≥ 200 lf installed by jetplow, fluidization or other direct burial methods.
13. Thin layer deposition as a part of wetland restoration.
14. Placement of any seed shellfish, spatted-shell, or cultch in SAS.
15. Any exploratory trenching or other similar survey activities.
16. Airgun seismic activities.
17. Any new permanent surface water withdrawal, water intakes, or water diversions.
18. Any blasting or use of explosives that affects EFH or diadromous species habitats.
19. Construction of new bridges or culverts, where no crossing existed previously.
20. Any new or replacement causeways (raised roadways across waters or wetlands).
21. Any in-water work on dams, tide gates, or breakwaters.
FHWA’s Determination of Effects to Essential Fish Habitat and Signature
After reviewing the programmatic EFH conservation recommendations in Appendix A, FHWA/state DOT will select the appropriate determination:

☐ The activity is in compliance with all programmatic EFH conservation recommendations in the FHWA programmatic EFH consultation and adverse effects to EFH will not be substantial.

☐ The activity is not in compliance with all of the programmatic EFH conservation recommendations in the FHWA programmatic EFH consultation, however, the justification below demonstrates that the adverse effects to EFH are not substantial. This does not apply to EFH conservation recommendations that are not applicable to the project.

Use the electronic fillable fields to include the name and signature of the FHWA/state DOT preparing this Verification Form, along with the date.

Amanda M. Saul  
FHWA/state DOT Name  Signature  
3/29/19  
Date  

By providing your determination and signature, you are certifying that to the best of your knowledge the information provided in this form is accurate and based upon the best available scientific information. This form must be filled out and signed by FHWA or state DOT staff, as an officially designated non-federal representative. Do not lock the form when saving, as HCD will be unable to sign and finalize. Email this Verification Form as a fillable PDF to NMFS.GAR.EFH.Consultation@noaa.gov.

GARFO HCD Determination and Signature (To be filled out by NMFS)
After receiving the Verification Form, GARFO HCD will contact FHWA/state DOT with any concerns. HCD will email the completed form back to the FHWA/state DOT for record keeping.

☐ GARFO HCD concurs with FHWA’s determination that the proposed project is consistent with the programmatic EFH consultation (without the need for justification).

☐ GARFO HCD concurs with FHWA’s determination that the proposed project is consistent with the programmatic EFH consultation, with justification described above.

☐ GARFO HCD does not concur with FHWA’s determination that the project is consistent with the programmatic EFH consultation. FHWA/state DOT must conduct additional coordination with GARFO HCD and a separate individual EFH consultation may be required.

Alison Verkade  
GARFO HCD Name  Signature  
4/5/19  
Date
ACOE Permit Additional Information

NOAA ESA
Appendix A. Verification Form

Federal Highway Administration (FHWA) or the applicable state Department of Transportation (state DOT) will submit a signed version of this completed form, together with any project plans, maps, supporting analyses, etc., to NOAA’s National Marine Fisheries Service (NMFS), Greater Atlantic Regional Fisheries Office, Protected Resources Division (GARFO PRD) at nmfs.gar.esa.section7@noaa.gov with “FHWA GARFO 2018 NLAA Program” in the subject line, upon obtaining sufficient information.

Project Activity Type (check all that apply to entire action):

- 1. Bridge repair, demolition, and replacement
- 2. Culvert repair and replacement
- 3. Docks, piers, and waterway access projects
- 4. Slope stabilization

Transportation Project Information

<table>
<thead>
<tr>
<th>Name of Project:</th>
<th>CTDOT Project 105-215, Bridge 02708</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Sponsor:</td>
<td>Connecticut Department of Transportation</td>
</tr>
<tr>
<td>Contact Person:</td>
<td>Amanda M. Saul</td>
</tr>
<tr>
<td>Email/Phone:</td>
<td><a href="mailto:amanda.saul@ct.gov">amanda.saul@ct.gov</a></td>
</tr>
<tr>
<td>Latitude (e.g., 42.625884):</td>
<td>41.27917</td>
</tr>
<tr>
<td>Longitude (e.g., -70.646114):</td>
<td>-72.383442</td>
</tr>
<tr>
<td>Anticipated Project Start Date:</td>
<td>09/30/2019</td>
</tr>
<tr>
<td>Anticipated Project End Date:</td>
<td>05/30/2020</td>
</tr>
<tr>
<td>Total Area of Habitat Alteration (acres):</td>
<td>0.006ac</td>
</tr>
</tbody>
</table>

Project/Action Description and Purpose (include town/city/state and water body where project is occurring):

The proposed project involves the full replacement of Bridge 02/08 which carries Route 154 over Plum Island Creek in the Town of Old Saybrook, CT. The bridge was built in 1958 and is a 108’ single span concrete slab bridge on concrete abutments with timber clad concrete wingwalls. The proposed replacement bridge is a 408’ spans concrete box beam structure with integral abutments which will be built behind the existing abutments. The existing abutments (and concrete slabs which connect the abutments below the medians) will remain in place, however, will be cut down to approx. elevation 1.0 NAVD88. Riprap will be placed at the four corners of the wingwalls to stabilize the slopes. A slight increase in the roadway embankment box which will impact tidal wetlands to the north of the bridge. The bridge will be constructed during a 12-week duration in the spring of 2020 with the roadway scheduled to be opened to traffic by Memorial Day of the construction season. Most work will be conducted from the roadway. A work float will aid in the superstructure removal and partial abutment removal. There are no proposed impacts to the wetlands, and no water-handling in the wetlands. Turbidity curtains will be used during the installation of the piers on the four corners of the bridge, and will be placed above the Mean High Water (MHW) line at elevation 1.3. The new abutments will be built on pile that are installed on the uplands behind the existing abutments.

ESA-Listed Species and/or Critical Habitat Present (Check all that apply)

<table>
<thead>
<tr>
<th>Atlantic sturgeon (all DPSs)</th>
<th>Kemp’s ridley sea turtle</th>
</tr>
</thead>
<tbody>
<tr>
<td>If not all DPSs, list which here:</td>
<td>Loggerhead sea turtle (Northwest Atlantic DPS)</td>
</tr>
<tr>
<td>Shortnose sturgeon</td>
<td>Leatherback sea turtle</td>
</tr>
<tr>
<td>Atlantic salmon (GOM DPS)</td>
<td>North Atlantic right whale</td>
</tr>
<tr>
<td>Atlantic salmon critical habitat (GOM DPS)</td>
<td>North Atlantic right whale critical habitat</td>
</tr>
<tr>
<td>Green sea turtle (North Atlantic DPS)</td>
<td>Fin whale</td>
</tr>
</tbody>
</table>
The following stressors are applicable to the action (check all that apply: use Table 1 for guidance)

☐ Underwater Noise
☐ Impingement/Entrainment and Entanglement
☐ Water Quality/Turbidity
☐ Habitat Alteration
☐ Vessel Traffic

FHWA's Determination of Effects to ESA-Listed Species and/or Critical Habitat
By submitting this Verification Form, FHWA, or state DOT as FHWA's designated non-federal representative, indicates that they determined that the proposed activity described above is not likely to adversely affect (NLAA) ESA-listed species or designated critical habitat under NMFS' jurisdiction in accordance with the Program, and all effects (direct, indirect, interrelated, and interdependent) are either insignificant (so small they cannot meaningfully be measured, detected, or evaluated) and/or discountable (extremely unlikely to occur).

☐ The activity complies with all of the Project Design Criteria (PDC) in the Program, as confirmed in the PDC checklist.

☐ The activity does not comply with all of the PDC in the Program, but the additional justification demonstrates how the project conforms to the Program. This does not apply to PDC that are not applicable to the project.

FHWA/state DOT preparer:

Amanda M. Saul

Name

2/28/19

Date

By providing your determination and signature, you are certifying that to the best of your knowledge the information provided in this form is accurate and based upon the best available scientific information. This form must be filled out and signed by FHWA or state DOT staff, as an officially designated non-federal representative.

Project Design Criteria (PDC) Checklist
FHWA/state DOT shall incorporate all general PDC and all applicable PDC in the appropriate stressor category. For any PDC that are not incorporated, additional justification is required for a project to be eligible for the Program. FHWA/state DOT shall check the corresponding box for each PDC that is, or will be, incorporated into the project.

General
☐ 1. Ensure all operators, employees, and contractors are aware of all FHWA environmental commitments, including these PDC, when working in areas where ESA-listed species may be present or in critical habitat.
2. No work will individually or cumulatively have an adverse effect on ESA-listed species or critical habitat.

3. No work will occur in the tidally influenced portion of rivers/streams where Atlantic salmon presence is possible from April 10 through November 7.

4. No work will occur in areas identified as Atlantic or shortnose sturgeon spawning grounds as follows:
   i. Gulf of Maine: April 1 through August 31
   ii. Southern New England/New York Bight: March 15 through August 31
   iii. Chesapeake Bay: March 15 through July 1 & September 15 through November 1

5. No work will occur in areas identified as sturgeon overwintering grounds where dense aggregations are known to occur, as follows:
   i. Gulf of Maine: October 15 through April 30
   ii. Southern New England/New York Bight: November 1 through March 15
   iii. Chesapeake Bay: November 1 through March 15

6. Within designated Atlantic sturgeon critical habitat, no work will affect hard bottom substrate (e.g., rock, cobble, gravel, limestone, boulder, etc.) in low salinity waters (i.e., 0.0-0.5 parts per thousand (ppt) range) for settlement of fertilized eggs, refuge, growth, and development of early life stages (PBF 1).

7. Work will result in no or only temporary/short-term changes in water temperature, water flow, salinity, or dissolved oxygen levels.

8. If it is possible for ESA-listed species to pass through the action area, a zone of passage with appropriate habitat for ESA-listed species (e.g., depth, water velocity, etc.) must be maintained (i.e., physical or biological stressors such as turbidity and sound pressure must not create barrier to passage).

   If the “maximum extent of stressor” exceeds the “width of water body,” PDC 9 is NOT met, and justification is required to proceed with the Verification Form.

   Width (m) of waterbody in action area: 6.3m

   Stressor category (stressor that extends furthest distance into waterbody- e.g., turbidity plume, sound pressure wave): turbidity

   Maximum extent (m) of stressor into the waterbody: 1,000

9. The project will not directly affect any submerged aquatic vegetation (SAV) or oyster reefs.

10. No blasting or use of explosives will occur.

11. No in-water work on dams or tide gates.

Underwater Noise

12. If pile driving is occurring during a time of year when ESA-listed species may be present, and the anticipated noise is above the behavioral noise threshold, a 20-minute “soft start” is required to allow animals an opportunity to leave the project vicinity before sound pressure increases.

13. If the project involves driving steel piles, non-steel piles greater than 24-inches in diameter, or any other noise-producing mechanism, the expected underwater noise (pressure) must be below the physiological/injury noise threshold for ESA-listed species in the action area.

Submit your calculation showing that the noise is below the injury thresholds.
<table>
<thead>
<tr>
<th>Pile material (e.g., steel pipe, timber, concrete)</th>
<th>Pile diameter/width (inches)</th>
<th>Number of piles</th>
<th>Installation method (e.g., impact hammer, vibratory start and then impact hammer to depth)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

☐ 14. Any new pile-supported structure must involve the installation of no more than 50 piles (below MHW).

Impingement/Entrainment/Entanglement

☐ 15. Only mechanical, cutterhead, and low volume hopper dredges may be used.

☐ 16. No new dredging in Atlantic sturgeon or Atlantic salmon critical habitat (maintenance dredging still must meet all other PDC). New dredging outside Atlantic sturgeon or salmon critical habitat is limited to one-time dredge events (e.g., burying a utility line) and minor (<2 acres) expansions of areas already subject to maintenance dredging.

☐ 17. Temporary intakes related to construction must be equipped with 2 mm wedge wire mesh screening and must not have greater than 0.5 feet per second intake velocities, to prevent impingement or entrapment of any ESA-listed species.

☐ 18. Work behind cofferdams, turbidity curtains, and other methods to block access of animals to dredge footprint is required when ESA-listed species may be present.

☐ 19. No new permanent surface water withdrawal, water intakes, or water diversions.

☐ 20. Turbidity control measures, including cofferdams, must be designed to not entangle or entrap ESA-listed species.

☐ 21. Any in-water lines, ropes, or chains must be made of materials and installed in a manner to minimize or avoid the risk of entanglement by using thick, heavy, and taut lines that do not loop or entangle. Lines can be enclosed in a rigid sleeve.

Water Quality/Turbidity

☐ 22. In-water offshore disposal may only occur at designated disposal sites that have already been the subject of ESA section 7 consultation with NMFS and where a valid consultation is in place.

☐ 23. Any temporary discharges must meet state water quality standards (i.e., no discharges of substances in concentrations that may cause acute or chronic adverse reactions, as defined by EPA water quality standards criteria).

☐ 24. Only repair of existing discharge pipes or replacement in-kind allowed; no new construction.

☐ 25. Work behind cofferdams, turbidity curtains, or other methods to control turbidity are required when ESA-listed species may be present.

Habitat Alteration

☐ 26. Minimize all new waterward encroachment and permanent fill.

☐ 27. In Atlantic salmon critical habitat, replaced culverts must be constructed at a minimum of 1.2 bankfull width (BFW).
28. In Atlantic salmon critical habitat, no culvert end extensions, invert line culvert rehabilitation, or slipline culvert rehabilitation may occur.

Vessel Traffic
☐ 29. Maintain project vessel speed limits below 10 knots and dredge vessel speeds of 4 knots maximum, while dredging.
☐ 30. Maintain a 150-foot buffer between project vessels and ESA-listed whales and sea turtles (1,500 feet for right whales) and while dredging, at least a 300-foot buffer between dredge vessels and ESA-listed whales and sea turtles (1,500 feet for right whales).
☐ 31. The number of project vessels must be limited to the greatest extent possible, as appropriate to size and scale of project.
☐ 32. A project must not result in the permanent net increase of commercial vessels.

Justification for NLAA Determination if not Incorporating All PDC
If the project is not in compliance with all of the applicable PDC, but FHWA/state DOT determined that the project is consistent with the Program and all effects are insignificant and/or discountable, provide justification below and identify which PDC are not incorporated. Project modifications must not result in different effects not already considered.

GARFO PRD Determination (To be filled out by GARFO PRD)
After receiving the Verification Form, GARFO PRD will contact FHWA/state DOT with any concerns and indicate whether GARFO PRD concurs with FHWA/state DOT’s determination.

☐ GARFO PRD concurs with FHWA’s determination that the proposed project complies with the Program.

☐ GARFO PRD concurs with FHWA’s determination that the proposed project complies with the Program, with the justification described.

☐ GARFO PRD does not concur with FHWA’s determination that the project complies with the Program and FHWA/state DOT should initiate a separate individual consultation.

GARFO PRD reviewer:
Zachary Jylkka

Name

03/04/2019

Date

Signature
ACOE Permit Additional Information

USFWS ESA
Northern Long-Eared Bat 4(d) Rule Streamlined Consultation Form

Federal agencies should use this form for the optional streamlined consultation framework for the northern long-eared bat (NLEB). This framework allows federal agencies to rely upon the U.S. Fish and Wildlife Service’s (USFWS) January 5, 2016, intra-Service Programmatic Biological Opinion (BO) on the final 4(d) rule for the NLEB for section 7(a)(2) compliance by: (1) notifying the USFWS that an action agency will use the streamlined framework; (2) describing the project with sufficient detail to support the required determination; and (3) enabling the USFWS to track effects and determine if reinitiation of consultation is required per 50 CFR 402.16.

This form is not necessary if an agency determines that a proposed action will have no effect to the NLEB or if the USFWS has concurred in writing with an agency’s determination that a proposed action may affect, but is not likely to adversely affect the NLEB (i.e., the standard informal consultation process). Actions that may cause prohibited incidental take require separate formal consultation. Providing this information does not address section 7(a)(2) compliance for any other listed species.

Information to Determine 4(d) Rule Compliance:

<table>
<thead>
<tr>
<th></th>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Does the project occur wholly outside of the WNS Zone?</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>2. Have you contacted the appropriate agency to determine if your project is near known hibernacula or maternity roost trees?</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>3. Could the project disturb hibernating NLEBs in a known hibernaculum?</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>4. Could the project alter the entrance or interior environment of a known hibernaculum?</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>5. Does the project remove any trees within 0.25 miles of a known hibernaculum at any time of year?</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>6. Would the project cut or destroy known occupied maternity roost trees, or any other trees within a 150-foot radius from the maternity roost tree from June 1 through July 31.</td>
<td></td>
<td>✓</td>
</tr>
</tbody>
</table>

You are eligible to use this form if you have answered yes to question #1 or yes to question #2 and no to questions 3, 4, 5 and 6. The remainder of the form will be used by the USFWS to track our assumptions in the BO.

Agency: FHWA – Connecticut Division

Applicant (Name, Email, Phone No.):
Connecticut Department of Transportation
Amanda M. Saul, Office of Environmental Planning
DOT.NLEB@ct.gov, (860)594-2939

Project Name: CTDOT0105-0209

Project Location (include coordinates if known): Route 154 in the Town of Old Saybrook; 41.2719, -72.9395

Basic Project Description (provide narrative below or attach additional information):
Replacement of Bridge #02708 (Rt 154 over Plum Bank Creek) & Bridge #01386 (Rt 154 over Back River) in Old Saybrook.

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2 See http://www.fws.gov/midwest/endangered/mammals/nleb/nhisites.html
3 If applicable - only needed for federal actions with applicants (e.g., for a permit, etc.) who are party to the consultation.
### General Project Information

<table>
<thead>
<tr>
<th>Question</th>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Does the project occur within 0.25 miles of a known hibernaeulum?</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Does the project occur within 150 feet of a known maternity roost tree?</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Does the project include forest conversion (if yes, report acreage below)</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Estimated total acres of forest conversion</td>
<td>&lt;0.1 ac</td>
<td></td>
</tr>
<tr>
<td>If known, estimated acres of forest conversion from April 1 to October 31</td>
<td></td>
<td></td>
</tr>
<tr>
<td>If known, estimated acres of forest conversion from June 1 to July 31</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Does the project include timber harvest? (if yes, report acreage below)</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Estimated total acres of timber harvest</td>
<td></td>
<td></td>
</tr>
<tr>
<td>If known, estimated acres of timber harvest from April 1 to October 31</td>
<td></td>
<td></td>
</tr>
<tr>
<td>If known, estimated acres of timber harvest from June 1 to July 31</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Does the project include prescribed fire? (if yes, report acreage below)</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Estimated total acres of prescribed fire</td>
<td></td>
<td></td>
</tr>
<tr>
<td>If known, estimated acres of prescribed fire from April 1 to October 31</td>
<td></td>
<td></td>
</tr>
<tr>
<td>If known, estimated acres of prescribed fire from June 1 to July 31</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Does the project install new wind turbines? (if yes, report capacity in MW below)</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Estimated wind capacity (MW)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Agency Determination:

By signing this form, the action agency determines that this project may affect the NLEB, but that any resulting incidental take of the NLEB is not prohibited by the final 4(d) rule.

If the USFWS does not respond within 30 days from submittal of this form, the action agency may presume that its determination is informed by the best available information and that its project responsibilities under 7(a)(2) with respect to the NLEB are fulfilled through the USFWS January 5, 2016, Programmatic BO. The action agency will update this determination annually for multi-year activities.

The action agency understands that the USFWS presumes that all activities are implemented as described herein. The action agency will promptly report any departures from the described activities to the appropriate USFWS Field Office. The action agency will provide the appropriate USFWS Field Office with the results of any surveys conducted for the NLEB. Involved parties will promptly notify the appropriate USFWS Field Office upon finding a dead, injured, or sick NLEB.

### Signature:

**Amanda M. Saul**

Signature: ___________________________  Date Submitted: 7/2/2018

---

4 Any activity that temporarily or permanently removes suitable forested habitat, including, but not limited to, tree removal from development, energy production and transmission, mining, agriculture, etc. (see page 48 of the BO).

2 If the project removes less than 10 trees and the acreage is unknown, report the acreage as less than 0.1 acre.

6 If the activity includes tree clearing in June and July, also include those acreage in April to October.
(State Funded Only Contracts)

Index

2. Contract Wage Rates
3. Americans with Disabilities Act of 1990, as Amended
4. 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)
5. Tax Liability - Contractor’s Exempt Purchase Certificate (CERT – 141)
6. Executive Orders (State of CT)
7. Non Discrimination Requirement (pursuant to section 4a-60 and 4a-60a of the Connecticut General Statutes, as revised)
8. Whistleblower Provision
9. Connecticut Freedom of Information Act
   a. Disclosure of Records
   b. Confidential Information
10. Service of Process
11. Substitution of Securities for Retainages on State Contracts and Subcontracts
13. Forum and Choice of Law
14. Summary of State Ethics Laws
15. Audit and Inspection of Plants, Places of Business and Records
16. Campaign Contribution Restriction
17. Tangible Personal Property
19. Bid Rigging and/or Fraud – Notice to Contractor

20. Consulting Agreement Affidavit

Index of Exhibits

EXHIBIT A – Contractor Work Force Utilization / Equal Employment Opportunity (page 12)
EXHIBIT B – Health Insurance Portability and Accountability Act of 1996 (HIPAA) (page 15)
EXHIBIT C - Campaign Contribution Restriction (page 23)
EXHIBIT D - State Wage Rates (Attached at the end)

(a) The Contractor shall comply with the Contractor Work Force Utilization / Equal Employment Opportunity requirements attached at Exhibit B and hereby made part of this Contract, whenever a contractor or subcontractor at any tier performs construction work in excess of $10,000. These goals shall be included in each contract and subcontract. Goal achievement is calculated for each trade using the hours worked under each trade.

(b) Companies with contracts, agreements or purchase orders valued at $10,000 or more will develop and implement an Affirmative Action Plan utilizing the ConnDOT Affirmative Action Plan Guideline. This Plan shall be designed to further the provision of equal employment opportunity to all persons without regard to their race, color, religion, sex or national origin, and to promote the full realization of equal employment opportunity through a positive continuation program. Plans shall be updated as required by ConnDOT.

2. Contract Wage Rates

The Contractor shall comply with:

The State wage rate requirements indicated in Exhibit E hereof are hereby made part of this Contract.

Prevailing Wages for Work on State Highways; Annual Adjustments. With respect to contracts for work on state highways and bridges on state highways, the Contractor shall comply with the provisions of Section 31-54 and 31-55a of the Connecticut General Statutes, as revised.

As required by section 1.05.12 (Payrolls) of the State of Connecticut, Department of Transportation’s Standard Specification for Roads, Bridges and Incidental Construction (FORM 816), as may be revised, every Contractor or subcontractor performing project work on a federal aid project is required to post the relevant prevailing wage rates as determined by the United States Secretary of Labor. The wage rate determinations shall be posted in prominent and easily accessible places at the work site.

3. 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.

4. 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

5. 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 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).

6. 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.

7. 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 wit
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

8. 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.

9. 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.

10. 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.

11. Substitution of Securities for Retainages on State Contracts and Subcontracts

This Contract is subject to the provisions of Section 3-ll2a of the General Statutes of the State of Connecticut, as revised.


The Contractor shall comply, if applicable, with the Health Insurance Portability and Accountability Act of 1996 and, pursuant thereto, the provisions attached at Exhibit C, and hereby made part of this Contract.

13. 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.

14. 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.

15. 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.

16. Campaign Contribution Restriction

For all State contracts, defined in Conn. Gen. Stat. §9-612(f)(1) as having a value in a calendar year of $50,000 or more, or a combination or series of such agreements or contracts having a value of $100,000 or more, the authorized signatory to this contract expressly acknowledges receipt of the State Elections Enforcement Commission’s notice advising state contractors of state campaign contribution and solicitation prohibitions, and will inform its principals of the contents of the notice, as set forth in "Notice to Executive Branch State Contractors and Prospective State Contractors of Campaign Contribution and Solicitation Limitations," a copy of which is attached hereto and hereby made a part of this contract, attached as Exhibit D.

17. 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:
October 2019

(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.

18. 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.

19. Consulting Agreement Affidavit

The Contractor shall comply with Connecticut General Statutes Section 4a-81(a) and 4a-81(b), as revised. Pursuant to Public Act 11-229, after the initial submission of the form, if there is a change in the information contained in the form, a contractor shall submit the updated form, as applicable, either (i) not later than thirty (30) days after the effective date of such change or (ii) prior to execution of any new contract, whichever is earlier.

The Affidavit/Form may be submitted in written format or electronic format through the Department of Administrative Services (DAS) website.
EXHIBIT A

CONTRACTOR WORKFORCE UTILIZATION / EQUAL EMPLOYMENT OPPORTUNITY

1. **Project Workforce Utilization Goals:**
   These goals are applicable to all the Contractor’s construction work (whether or not it is Federal or Federally assisted or funded) performed in the covered area. If the contractor performs construction work in a geographical area located outside of the covered area, it shall apply the goals established for the geographical area where the work is actually performed.

   Whenever the Contractor, or any Subcontractor at any tier, subcontracts a portion of the work involving any construction trade, it shall physically include in each subcontract in excess of $10,000 the provisions of these specifications which contain the applicable goals for minority and female participation.

   The goals for minority and female utilization are expressed in percentage terms for the contractor’s aggregate work-force in each trade on all construction work in the covered area, are referenced in the Appendix A below.

   **STATE FUNDED PROJECTS (only)**

   **APPENDIX A**

   **(Labor Market Goals)**

   **LABOR MARKET AREA GOAL**

   **Minority**

   **Female**

<table>
<thead>
<tr>
<th>Bridgeport</th>
<th>Beacon Falls</th>
<th>Bridgeport</th>
<th>Derby</th>
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<tr>
<td>Trumbull</td>
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   **Danbury**

   **Minority**

   **3.8%**

   | Bethel     | Bridgewater  | Brookfield | Danbury|
   | Kent       | New Fairfield| New Milford| Newtown|
   | Redding    | Ridgefield   | Roxbury    | Sherman|
   | Washington |              |            |       |

   **Danielson**

   **Minority**

   **1.8%**

   | Brooklyn   | Eastford     | Hampton    | Killingly|
   | Pomfret    | Putnam       | Scotland   | Sterling |
   | Thompson   | Voluntown    | Union      | Woodstock|

   **Hartford**

   **Minority**

   **2.1%**

   | Andover    | Ashford      | Avon       | Barkhamsted|

Page 12 of 25
Belin  Bloomfield  Bolton  Bristol
Burlington  Canton  Chaplin  Colchester
Columbia  Coventry  Cromwell  Durham
East Granby  East Haddam  East Hampton  East Hartford
East Windsor  Ellington  Enfield  Farmington
Glastonbury  Granby  Haddam  Hartford
Harwinton  Hebron  Lebanon  Manchester
Mansfield  Marlborough  Middlefield  Middletown
Newington  Plainville  Plymouth  Portland
Rocky Hill  Simsbury  Somers  South Windsor
Southington  Stafford  Suffield  Tolland
Vernon  West Hartford  Wethersfield  Willington
Winchester  Windham  Windsor  Windsor Locks

**Lower River**

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<tr>
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<td>Old Lyme</td>
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**LABOR MARKET AREA GOAL**

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**New Haven**

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Rev. 4/24/2019
EXHIBIT B

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 Contactor must comply with all terms and conditions of this Section of the Contract. If the Contactor is not a Business Associate under HIPAA, this Section of the Contract does not apply to the Contactor for this Contract.

(b) The Contactor 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 Contactor, 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 Contactor is a “business associate” of the Department, as that term is defined in 45 C.F.R. § 160.103; and

(f) The Contactor 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 Contactor.

(3) “Covered Entity” shall mean the Department of the State of Connecticut named on page 1 of this Contract.

(4) “Designated Record Set” shall have the same meaning as the term “designated record set” in 45 C.F.R. § 164.501.

(5) “Electronic Health Record” shall have the same meaning as the term is defined in section 13400 of the HITECH Act (42 U.S.C. §17921(5))
(6) “Individual” shall have the same meaning as the term “individual” in 45 C.F.R. § 160.103 and shall include a person who qualifies as a personal representative as defined in 45 C.F.R. § 164.502(g).

(7) “Privacy Rule” shall mean the Standards for Privacy of Individually Identifiable Health Information at 45 C.F.R. part 160 and parts 164, subparts A and E.

(8) “Protected Health Information” or “PHI” shall have the same meaning as the term “protected health information” in 45 C.F.R. § 160.103, limited to information created or received by the Business Associate from or on behalf of the Covered Entity.

(9) “Required by Law” shall have the same meaning as the term “required by law” in 45 C.F.R. § 164.103.

(10) “Secretary” shall mean the Secretary of the Department of Health and Human Services or his designee.

(11) “More stringent” shall have the same meaning as the term “more stringent” in 45 C.F.R. § 160.202.

(12) “This Section of the Contract” refers to the HIPAA Provisions stated herein, in their entirety.

(13) “Security Incident” shall have the same meaning as the term “security incident” in 45 C.F.R. § 164.304.

(14) “Security Rule” shall mean the Security Standards for the Protection of Electronic Protected Health Information at 45 C.F.R. part 160 and parts 164, subpart A and C.

(15) “Unsecured protected health information” shall have the same meaning as the term as defined in section 13402(h)(1)(A) of HITECH. Act. (42 U.S.C. §17932(h)(1)(A)).

(h) Obligations and Activities of Business Associates.

(1) Business Associate agrees not to use or disclose PHI other than as permitted or required by this Section of the Contract or as Required by Law.

(2) Business Associate agrees to use appropriate safeguards to prevent use or disclosure of PHI other than as provided for in this Section of the Contract.

(3) Business Associate agrees to use administrative, physical and technical safeguards that reasonably and appropriately protect the confidentiality, integrity, and availability of electronic protected health information that it creates, receives, maintains, or transmits on behalf of the Covered Entity.

(4) Business Associate agrees to mitigate, to the extent practicable, any harmful effect that is known to the Business Associate of a use or disclosure of PHI by Business Associate in violation of this Section of the Contract.
(5) Business Associate agrees to report to Covered Entity any use or disclosure of PHI not provided for by this Section of the Contract or any security incident of which it becomes aware.

(6) Business Associate agrees to insure that any agent, including a subcontractor, to whom it provides PHI received from, or created or received by Business Associate, on behalf of the Covered Entity, agrees to the same restrictions and conditions that apply through this Section of the Contract to Business Associate with respect to such information.

(7) Business Associate agrees to provide access, at the request of the Covered Entity, and in the time and manner agreed to by the parties, to PHI in a Designated Record Set, to Covered Entity or, as directed by Covered Entity, to an Individual in order to meet the requirements under 45 C.F.R. § 164.524.

(8) Business Associate agrees to make any amendments to PHI in a Designated Record Set that the Covered Entity directs or agrees to pursuant to 45 C.F.R. § 164.526 at the request of the Covered Entity, and in the time and manner agreed to by the parties.

(9) Business Associate agrees to make internal practices, books, and records, including policies and procedures and PHI, relating to the use and disclosure of PHI received from, or created or received by, Business Associate on behalf of Covered Entity, available to Covered Entity or to the Secretary in a time and manner agreed to by the parties or designated by the Secretary, for purposes of the Secretary determining Covered Entity’s compliance with the Privacy Rule.

(10) Business Associate agrees to document such disclosures of PHI and information related to such disclosures as would be required for Covered Entity to respond to a request by an Individual for an accounting of disclosures of PHI in accordance with 45 C.F.R. § 164.528 and section 13405 of the HITECH Act (42 U.S.C. § 17935) and any regulations promulgated thereunder.

(11) Business Associate agrees to provide to Covered Entity, in a time and manner agreed to by the parties, information collected in accordance with clause h. (10) of this Section of the Contract, to permit Covered Entity to respond to a request by an Individual for an accounting of disclosures of PHI in accordance with 45 C.F.R. § 164.528 and section 13405 of the HITECH Act (42 U.S.C. § 17935) and any regulations promulgated thereunder. Business Associate agrees at the Covered Entity’s direction to provide an accounting of disclosures of PHI directly to an individual in accordance with 45 C.F.R. § 164.528 and section 13405 of the HITECH Act (42 U.S.C. § 17935) and any regulations promulgated thereunder.

(12) Business Associate agrees to comply with any state or federal law that is more stringent than the Privacy Rule.

(13) Business Associate agrees to comply with the requirements of the HITECH Act relating to privacy and security that are applicable to the Covered Entity and with the requirements of 45 C.F.R. sections 164.504(e), 164.308, 164.310, 164.312, and 164.316.
(14) In the event that an individual requests that the Business Associate (a) restrict disclosures of PHI; (b) provide an accounting of disclosures of the individual’s PHI; or (c) provide a copy of the individual’s PHI in an electronic health record, the Business Associate agrees to notify the covered entity, in writing, within two business days of the request.

(15) Business Associate agrees that it shall not, directly or indirectly, receive any remuneration in exchange for PHI of an individual without (1) the written approval of the covered entity, unless receipt of remuneration in exchange for PHI is expressly authorized by this Contract and (2) the valid authorization of the individual, except for the purposes provided under section 13405(d)(2) of the HITECH Act, (42 U.S.C. § 17935(d)(2)) and in any accompanying regulations.

(16) Obligations in the Event of a Breach

A. The Business Associate agrees that, following the discovery of a breach of unsecured protected health information, it shall notify the Covered Entity of such breach in accordance with the requirements of section 13402 of HITECH (42 U.S.C. 17932(b) and the provisions of this Section of the Contract.

B. Such notification shall be provided by the Business Associate to the Covered Entity without unreasonable delay, and in no case later than 30 days after the breach is discovered by the Business Associate, except as otherwise instructed in writing by a law enforcement official pursuant to section 13402(g) of HITECH (42 U.S.C. 17932(g)). A breach is considered discovered as of the first day on which it is, or reasonably should have been, known to the Business Associate. The notification shall include the identification and last known address, phone number and email address of each individual (or the next of kin of the individual if the individual is deceased) whose unsecured protected health information has been, or is reasonably believed by the Business Associate to have been, accessed, acquired, or disclosed during such breach.

C. The Business Associate agrees to include in the notification to the Covered Entity at least the following information:

1. A brief description of what happened, including the date of the breach and the date of the discovery of the breach, if known.

2. A description of the types of unsecured protected health information that were involved in the breach (such as full name, Social Security number, date of birth, home address, account number, or disability code).

3. The steps the Business Associate recommends that individuals take to protect themselves from potential harm resulting from the breach.

4. A detailed description of what the Business Associate is doing to investigate the breach, to mitigate losses, and to protect against any further breaches.

5. Whether a law enforcement official has advised either verbally or in writing the Business Associate that he or she has determined that notification or notice to
individuals or the posting required under section 13402 of the HITECH Act would impede a criminal investigation or cause damage to national security and; if so, include contact information for said official.

D. Business Associate agrees to provide appropriate staffing and have established procedures to ensure that individuals informed by the Covered Entity of a breach by the Business Associate have the opportunity to ask questions and contact the Business Associate for additional information regarding the breach. Such procedures shall include a toll-free telephone number, an e-mail address, a posting on its Web site and a postal address. Business Associate agrees to include in the notification of a breach by the Business Associate to the Covered Entity, a written description of the procedures that have been established to meet these requirements. Costs of such contact procedures will be borne by the Contractor.

E. Business Associate agrees that, in the event of a breach, it has the burden to demonstrate that it has complied with all notifications requirements set forth above, including evidence demonstrating the necessity of a delay in notification to the Covered Entity.

(i) Permitted Uses and Disclosure by Business Associate.

(1) General Use and Disclosure Provisions Except as otherwise limited in this Section of the Contract, Business Associate may use or disclose PHI to perform functions, activities, or services for, or on behalf of, Covered Entity as specified in this Contract, provided that such use or disclosure would not violate the Privacy Rule if done by Covered Entity or the minimum necessary policies and procedures of the Covered Entity.

(2) Specific Use and Disclosure Provisions

(A) Except as otherwise limited in this Section of the Contract, Business Associate may use PHI for the proper management and administration of Business Associate or to carry out the legal responsibilities of Business Associate.

(B) Except as otherwise limited in this Section of the Contract, Business Associate may disclose PHI for the proper management and administration of Business Associate, provided that disclosures are Required by Law, or Business Associate obtains reasonable assurances from the person to whom the information is disclosed that it will remain confidential and used or further disclosed only as Required by Law or for the purpose for which it was disclosed to the person, and the person notifies Business Associate of any instances of which it is aware in which the confidentiality of the information has been breached.

(C) Except as otherwise limited in this Section of the Contract, Business Associate may use PHI to provide Data Aggregation services to Covered Entity as permitted by 45 C.F.R. § 164.504(e)(2)(i)(B).

(j) Obligations of Covered Entity.
(1) Covered Entity shall notify Business Associate of any limitations in its notice of privacy practices of Covered Entity, in accordance with 45 C.F.R. § 164.520, or to the extent that such limitation may affect Business Associate’s use or disclosure of PHI.

(2) Covered Entity shall notify Business Associate of any changes in, or revocation of, permission by Individual to use or disclose PHI, to the extent that such changes may affect Business Associate’s use or disclosure of PHI.

(3) Covered Entity shall notify Business Associate of any restriction to the use or disclosure of PHI that Covered Entity has agreed to in accordance with 45 C.F.R. § 164.522, to the extent that such restriction may affect Business Associate’s use or disclosure of PHI.

(k) Permissible Requests by Covered Entity. Covered Entity shall not request Business Associate to use or disclose PHI in any manner that would not be permissible under the Privacy Rule if done by the Covered Entity, except that Business Associate may use and disclose PHI for data aggregation, and management and administrative activities of Business Associate, as permitted under this Section of the Contract.

(l) Term and Termination.

(1) Term. The Term of this Section of the Contract shall be effective as of the date the Contract is effective and shall terminate when the information collected in accordance with clause h. (10) of this Section of the Contract is provided to the Covered Entity and all of the PHI provided by Covered Entity to Business Associate, or created or received by Business Associate on behalf of Covered Entity, is destroyed or returned to Covered Entity, or, if it is infeasible to return or destroy PHI, protections are extended to such information, in accordance with the termination provisions in this Section.

(2) Termination for Cause Upon Covered Entity’s knowledge of a material breach by Business Associate, Covered Entity shall either:

   (A) Provide an opportunity for Business Associate to cure the breach or end the violation and terminate the Contract if Business Associate does not cure the breach or end the violation within the time specified by the Covered Entity; or

   (B) Immediately terminate the Contract if Business Associate has breached a material term of this Section of the Contract and cure is not possible; or

   (C) If neither termination nor cure is feasible, Covered Entity shall report the violation to the Secretary.

(3) Effect of Termination

   (A) Except as provided in (l)(2) of this Section of the Contract, upon termination of this Contract, for any reason, Business Associate shall return or destroy all PHI received from Covered Entity, or created or received by Business Associate on behalf of Covered Entity. Business Associate shall also provide the information collected in accordance with clause h. (10) of this Section of the Contract to the Covered Entity.
within ten business days of the notice of termination. This provision shall apply to PHI that is in the possession of subcontractors or agents of Business Associate. Business Associate shall retain no copies of the PHI.

(B) In the event that Business Associate determines that returning or destroying the PHI is infeasible, Business Associate shall provide to Covered Entity notification of the conditions that make return or destruction infeasible. Upon documentation by Business Associate that return or destruction of PHI is infeasible, Business Associate shall extend the protections of this Section of the Contract to such PHI and limit further uses and disclosures of PHI to those purposes that make return or destruction infeasible, for as long as Business Associate maintains such PHI. Infeasibility of the return or destruction of PHI includes, but is not limited to, requirements under state or federal law that the Business Associate maintains or preserves the PHI or copies thereof.

(m) Miscellaneous Provisions.

(1) Regulatory References. A reference in this Section of the Contract to a section in the Privacy Rule means the section as in effect or as amended.

(2) Amendment. The Parties agree to take such action as in 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/seec.

Click on the link to “Lobbyist/Contractor Limitations.”
DEFINITIONS

“State contractor” means a person, business entity or nonprofit organization that enters into a state contract. Such person, business entity or nonprofit organization shall be deemed to be a state contractor until December thirty-first of the year in which such contract terminates. “State contractor” does not include a municipality or any other political subdivision of the state, including any entities or associations duly created by the municipality or political subdivision exclusively amongst themselves to further any purpose authorized by statute or charter, or an employee in the executive or legislative branch of state government or a quasi-public agency, whether in the classified or unclassified service and full or part-time, and only in such person’s capacity as a state or quasi-public agency employee.

“Prospective state contractor” means a person, business entity or nonprofit organization that (i) submits a response to a state contract solicitation by the state, a state agency or a quasi-public agency, or a proposal in response to a request for proposals by the state, a state agency or a quasi-public agency, until the contract has been entered into, or (ii) holds a valid prequalification certificate issued by the Commissioner of Administrative Services under section 4a-100. “Prospective state contractor” does not include a municipality or any other political subdivision of the state, including any entities or associations duly created by the municipality or political subdivision exclusively amongst themselves to further any purpose authorized by statute or charter, or an employee in the executive or legislative branch of state government or a quasi-public agency, whether in the classified or unclassified service and full or part-time, and only in such person’s capacity as a state or quasi-public agency employee.

“Principal of a state contractor or prospective state contractor” means (i) any individual who is a member of the board of directors of, or has an ownership interest of five per cent or more in, a state contractor or prospective state contractor, which is a business entity, except for an individual who is a member of the board of directors of a nonprofit organization, (ii) an individual who is employed by a state contractor or prospective state contractor, which is a business entity, as president, treasurer or executive vice president, (iii) an individual who is the chief executive officer of a state contractor or prospective state contractor, which is not a business entity, or if a state contractor or prospective state contractor has no such officer, then the officer who duly possesses comparable powers and duties, (iv) an officer or an employee of any state contractor or prospective state contractor who has managerial or discretionary responsibilities with respect to a state contract, (v) the spouse or a dependent child who is eighteen years of age or older of an individual described in this subparagraph, or (vi) a political committee established or controlled by an individual described in this subparagraph or the business entity or nonprofit organization that is the state contractor or prospective state contractor.

“State contract” means an agreement or contract with the state or any state agency or 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.

“State contract” means an agreement or contract with the state or any state agency or quasi-public agency, let through a procurement process or otherwise, having a value of fifty thousand dollars or more, or a combination of several 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 D

(state wages will be inserted here)
Minimum Rates and Classifications for Heavy/Highway Construction

Connecticut Department of Labor
Wage and Workplace Standards Division

**ID#: H 26743**

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.

<table>
<thead>
<tr>
<th>CLASSIFICATION</th>
<th>Hourly Rate</th>
<th>Benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Boilermaker</td>
<td>33.79</td>
<td>34% + 8.96</td>
</tr>
<tr>
<td>1a) Bricklayer, Cement Masons, Cement Finishers, Plasterers, Stone Masons</td>
<td>34.72</td>
<td>32.15</td>
</tr>
<tr>
<td>2) Carpenters, Piledrivermen</td>
<td>33.53</td>
<td>25.66</td>
</tr>
<tr>
<td>2a) Diver Tenders</td>
<td>33.53</td>
<td>25.66</td>
</tr>
</tbody>
</table>

As of: Monday, November 25, 2019
### Project No. 105-215; Replacement Of Bridge No. 02708 Carrying Route 154 Over Plum Bank Creek

<table>
<thead>
<tr>
<th>Task Description</th>
<th>Hours</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>3) Divers</td>
<td>41.99</td>
<td>25.66</td>
</tr>
<tr>
<td>03a) Millwrights</td>
<td>34.04</td>
<td>26.09</td>
</tr>
<tr>
<td>4) Painters: (Bridge Construction) Brush, Roller, Blasting (Sand, Water, etc.), Spray</td>
<td>51.00</td>
<td>21.80</td>
</tr>
<tr>
<td>4a) Painters: Brush and Roller</td>
<td>34.62</td>
<td>21.80</td>
</tr>
<tr>
<td>4b) Painters: Spray Only</td>
<td>36.62</td>
<td>21.80</td>
</tr>
<tr>
<td>4c) Painters: Steel Only</td>
<td>35.62</td>
<td>21.80</td>
</tr>
<tr>
<td>4d) Painters: Blast and Spray</td>
<td>37.62</td>
<td>21.80</td>
</tr>
</tbody>
</table>

**As of:** Monday, November 25, 2019
Project:  Project No. 105-215; Replacement Of Bridge No. 02708 Carrying Route 154 Over Plum Bank Creek

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 erecters, pneumatic tool operators, powdermen  
31.00  20.84

_As of:_  Monday, November 25, 2019
**Project:** Project No. 105-215; Replacement Of Bridge No. 02708 Carrying Route 154 Over Plum Bank Creek

10) Group 3: Pipelayers

<table>
<thead>
<tr>
<th>Rate</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>31.25</td>
<td>20.84</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Rate</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>31.25</td>
<td>20.84</td>
</tr>
</tbody>
</table>

12) Group 5: Toxic waste removal (non-mechanical systems)

<table>
<thead>
<tr>
<th>Rate</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>32.75</td>
<td>20.84</td>
</tr>
</tbody>
</table>

13) Group 6: Blasters

<table>
<thead>
<tr>
<th>Rate</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>32.50</td>
<td>20.84</td>
</tr>
</tbody>
</table>

Group 7: Asbestos/lead removal, non-mechanical systems (does not include leaded joint pipe)

<table>
<thead>
<tr>
<th>Rate</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>31.75</td>
<td>20.84</td>
</tr>
</tbody>
</table>

Group 8: Traffic control signalmen

<table>
<thead>
<tr>
<th>Rate</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>18.00</td>
<td>20.84</td>
</tr>
</tbody>
</table>

Group 9: Hydraulic Drills

<table>
<thead>
<tr>
<th>Rate</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>29.30</td>
<td>18.90</td>
</tr>
</tbody>
</table>

*As of:* Monday, November 25, 2019
Project:  Project No. 105-215; Replacement Of Bridge No. 02708 Carrying Route 154 Over Plum Bank Creek

---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

<table>
<thead>
<tr>
<th>Rate</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>32.98</td>
<td>20.84 + a</td>
</tr>
</tbody>
</table>

13b) Brakemen, Trackmen

<table>
<thead>
<tr>
<th>Rate</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>32.01</td>
<td>20.84 + a</td>
</tr>
</tbody>
</table>

---CLEANING, CONCRETE AND CAULKING TUNNEL---

14) Concrete Workers, Form Movers, and Strippers

<table>
<thead>
<tr>
<th>Rate</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>32.01</td>
<td>20.84 + a</td>
</tr>
</tbody>
</table>

15) Form Erectors

<table>
<thead>
<tr>
<th>Rate</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>32.34</td>
<td>20.84 + a</td>
</tr>
</tbody>
</table>

---ROCK SHAFT LINING, CONCRETE, LINING OF SAME AND TUNNEL IN FREE AIR:---

As of:  Monday, November 25, 2019
As of: Monday, November 25, 2019

<table>
<thead>
<tr>
<th>Description</th>
<th>Rate</th>
<th>Wage Increase</th>
</tr>
</thead>
<tbody>
<tr>
<td>16) Brakemen, Trackmen, Tunnel Laborers, Shaft Laborers</td>
<td>32.01</td>
<td>20.84 + a</td>
</tr>
<tr>
<td>17) Laborers Topside, Cage Tenders, Bellman</td>
<td>31.90</td>
<td>20.84 + a</td>
</tr>
<tr>
<td>18) Miners</td>
<td>32.98</td>
<td>20.84 + a</td>
</tr>
<tr>
<td>TUNNELS, CAISSON AND CYLINDER WORK IN COMPRESSED AIR:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18a) Blaster</td>
<td>39.47</td>
<td>20.84 + a</td>
</tr>
<tr>
<td>19) Brakemen, Trackmen, Groutman, Laborers, Outside Lock Tender, Gauge Tenders</td>
<td>39.27</td>
<td>20.84 + a</td>
</tr>
<tr>
<td>20) Change House Attendants, Powder Watchmen, Top on Iron Bolts</td>
<td>37.29</td>
<td>20.84 + a</td>
</tr>
<tr>
<td>Description</td>
<td>Rate 1</td>
<td>Rate 2</td>
</tr>
<tr>
<td>----------------------------------------------------------------------------</td>
<td>---------</td>
<td>---------</td>
</tr>
<tr>
<td>Mucking Machine Operator</td>
<td>40.06</td>
<td>20.84</td>
</tr>
</tbody>
</table>

---TRUCK DRIVERS---(*see note below)

<table>
<thead>
<tr>
<th>Description</th>
<th>Rate 1</th>
<th>Rate 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Two axle trucks</td>
<td>29.51</td>
<td>24.52</td>
</tr>
<tr>
<td>Three axle trucks; two axle ready mix</td>
<td>29.62</td>
<td>24.52</td>
</tr>
<tr>
<td>Three axle ready mix</td>
<td>29.67</td>
<td>24.52</td>
</tr>
<tr>
<td>Four axle trucks, heavy duty trailer (up to 40 tons)</td>
<td>29.72</td>
<td>24.52</td>
</tr>
<tr>
<td>Four axle ready-mix</td>
<td>29.77</td>
<td>24.52</td>
</tr>
</tbody>
</table>

*As of:* Monday, November 25, 2019
Project: Project No. 105-215; Replacement Of Bridge No. 02708 Carrying Route 154 Over Plum Bank Creek

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: Monday, November 25, 2019
Project:  Project No. 105-215; Replacement Of Bridge No. 02708 Carrying Route 154 Over Plum Bank Creek

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)

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Rate (a)</th>
<th>Hrs (a)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asphalt Reclaiming Machine</td>
<td>38.87</td>
<td>24.80 + a</td>
</tr>
<tr>
<td>Line Grinder</td>
<td>38.87</td>
<td>24.80 + a</td>
</tr>
<tr>
<td>Concrete Pumps</td>
<td>38.87</td>
<td>24.80 + a</td>
</tr>
<tr>
<td>Drills with Self Contained Power Units</td>
<td>38.87</td>
<td>24.80 + a</td>
</tr>
<tr>
<td>Boring Machine</td>
<td>38.87</td>
<td>24.80 + a</td>
</tr>
<tr>
<td>Post Hole Digger</td>
<td>38.87</td>
<td>24.80 + a</td>
</tr>
<tr>
<td>Auger</td>
<td>38.87</td>
<td>24.80 + a</td>
</tr>
<tr>
<td>Pounder</td>
<td>38.87</td>
<td>24.80 + a</td>
</tr>
<tr>
<td>Well Digger</td>
<td>38.87</td>
<td>24.80 + a</td>
</tr>
<tr>
<td>Milling Machine (over 24&quot; Mandrell)</td>
<td>38.87</td>
<td>24.80 + a</td>
</tr>
</tbody>
</table>

Group 5 continued: Side Boom; Combination Hoe and Loader; Directional Driller.

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Rate (a)</th>
<th>Hrs (a)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Side Boom</td>
<td>38.87</td>
<td>24.80 + a</td>
</tr>
<tr>
<td>Combination Hoe and Loader</td>
<td>38.87</td>
<td>24.80 + a</td>
</tr>
<tr>
<td>Directional Driller</td>
<td>38.87</td>
<td>24.80 + a</td>
</tr>
</tbody>
</table>

Group 6: Front End Loader (3 up to 7 cubic yards); Bulldozer (rough grade dozer).

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Rate (a)</th>
<th>Hrs (a)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Front End Loader (3 up to 7 cubic yards)</td>
<td>38.55</td>
<td>24.80 + a</td>
</tr>
<tr>
<td>Bulldozer (rough grade dozer)</td>
<td>38.55</td>
<td>24.80 + a</td>
</tr>
</tbody>
</table>

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).

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Rate (a)</th>
<th>Hrs (a)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asphalt Roller</td>
<td>38.20</td>
<td>24.80 + a</td>
</tr>
<tr>
<td>Concrete Saws and Cutters (ride on types)</td>
<td>38.20</td>
<td>24.80 + a</td>
</tr>
<tr>
<td>Vermeer Concrete Cutter</td>
<td>38.20</td>
<td>24.80 + a</td>
</tr>
<tr>
<td>Stump Grinder</td>
<td>38.20</td>
<td>24.80 + a</td>
</tr>
<tr>
<td>Scraper</td>
<td>38.20</td>
<td>24.80 + a</td>
</tr>
<tr>
<td>Snooper</td>
<td>38.20</td>
<td>24.80 + a</td>
</tr>
<tr>
<td>Skidder</td>
<td>38.20</td>
<td>24.80 + a</td>
</tr>
<tr>
<td>Milling Machine (24&quot; and Under Mandrel)</td>
<td>38.20</td>
<td>24.80 + a</td>
</tr>
</tbody>
</table>

Group 8: Mechanic, Grease Truck Operator, Hydroblaster, Barrier Mover, Power Stone Spreader; Welder; Work Boat under 26 ft.; Transfer Machine.

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Rate (a)</th>
<th>Hrs (a)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mechanic</td>
<td>37.79</td>
<td>24.80 + a</td>
</tr>
<tr>
<td>Grease Truck Operator</td>
<td>37.79</td>
<td>24.80 + a</td>
</tr>
<tr>
<td>Hydroblaster</td>
<td>37.79</td>
<td>24.80 + a</td>
</tr>
<tr>
<td>Barrier Mover</td>
<td>37.79</td>
<td>24.80 + a</td>
</tr>
<tr>
<td>Power Stone Spreader</td>
<td>37.79</td>
<td>24.80 + a</td>
</tr>
<tr>
<td>Welder</td>
<td>37.79</td>
<td>24.80 + a</td>
</tr>
<tr>
<td>Work Boat under 26 ft.</td>
<td>37.79</td>
<td>24.80 + a</td>
</tr>
<tr>
<td>Transfer Machine</td>
<td>37.79</td>
<td>24.80 + a</td>
</tr>
</tbody>
</table>

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).

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Rate (a)</th>
<th>Hrs (a)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Front End Loader (under 3 cubic yards)</td>
<td>37.34</td>
<td>24.80 + a</td>
</tr>
<tr>
<td>Skid Steer Loader</td>
<td>37.34</td>
<td>24.80 + a</td>
</tr>
<tr>
<td>Fork Lift, Power Chipper</td>
<td>37.34</td>
<td>24.80 + a</td>
</tr>
<tr>
<td>Landscape Equipment (including hydroseeder)</td>
<td>37.34</td>
<td>24.80 + a</td>
</tr>
</tbody>
</table>

Group 10: Vibratory Hammer, Ice Machine, Diesel and Air Hammer, etc.

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Rate (a)</th>
<th>Hrs (a)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vibratory Hammer</td>
<td>35.24</td>
<td>24.80 + a</td>
</tr>
<tr>
<td>Ice Machine</td>
<td>35.24</td>
<td>24.80 + a</td>
</tr>
<tr>
<td>Diesel and Air Hammer</td>
<td>35.24</td>
<td>24.80 + a</td>
</tr>
</tbody>
</table>

As of: Monday, November 25, 2019
Project: Project No. 105-215; Replacement Of Bridge No. 02708 Carrying Route 154 Over Plum Bank Creek

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

As of: Monday, November 25, 2019
Project: Project No. 105-215; Replacement Of Bridge No. 02708 Carrying Route 154 Over Plum Bank Creek
Group 18: Power Safety Boat; Vacuum Truck; Zim Mixer; Sweeper; (minimum for any job requiring CDL license).

**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: Monday, November 25, 2019
<table>
<thead>
<tr>
<th>Job Description</th>
<th>Hourly Rate</th>
<th>% Increase</th>
<th>Total Hourly Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Truck Driver</td>
<td>40.96</td>
<td>6.5%</td>
<td>44.62</td>
</tr>
<tr>
<td>Driver Groundmen</td>
<td>30.92</td>
<td>6.5%</td>
<td>33.04</td>
</tr>
<tr>
<td>Groundmen</td>
<td>22.67</td>
<td>6.5%</td>
<td>24.12</td>
</tr>
<tr>
<td>Heavy Equipment Operators</td>
<td>37.10</td>
<td>6.5%</td>
<td>39.73</td>
</tr>
<tr>
<td>Linemen, Cable Splicers, Dynamite Men</td>
<td>41.22</td>
<td>6.5%</td>
<td>44.30</td>
</tr>
<tr>
<td>Material Men, Tractor Trailer Drivers, Equipment Operators</td>
<td>35.04</td>
<td>6.5%</td>
<td>37.55</td>
</tr>
</tbody>
</table>

**As of:** Monday, November 25, 2019
Project:  Project No. 105-215; Replacement Of Bridge No. 02708 Carrying Route 154 Over Plum Bank Creek

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**

As of:       Monday, November 25, 2019
Project: Project No. 105-215; Replacement Of Bridge No. 02708 Carrying Route 154 Over Plum Bank Creek

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 journeyperson 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.

The Department of Labor will continue to issue the initial prevailing wage rate schedule to the Contracting Agency for the project.

All subsequent annual adjustments will be posted on our Web Site for contractor access.

Contracting Agencies are under no obligation pursuant to State labor law to pay any increase due to the annual adjustment provision.

As of: Monday, November 25, 2019
Project: Project No. 105-215; Replacement Of Bridge No. 02708 Carrying Route 154 Over Plum Bank Creek

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.
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**


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**


**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 4th, 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.
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, facia, 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 requires 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

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. 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
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.
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;

(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 ULTILATELY 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.
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 ________________,

______________________________

Notary Public

Return to:

Connecticut Department of Labor
Wage & Workplace Standards Division
200 Folly Brook Blvd.
Wethersfield, CT 06109