TABLE OF CONTENTS OF SPECIAL PROVISIONS

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

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DATE JULY 15, 2026
FEDERAL AID PROJECT NO. H101(002)
STATE PROJECT NO. 0124-0165

SPOT IMPROVEMENT ON RIVER STREET (ROUTE 313)

Town of Seymour

The State of Connecticut, Department of Transportation, Standard Specifications for Roads, Bridges, Facilities and Incidental Construction, Form 819, dated 2024, as revised by the Supplemental Specifications dated July, 2025 (otherwise referred to collectively as "ConnDOT Form 819") is hereby made part of this contract, as modified by the Special Provisions contained herein. 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 Special Provisions relate in particular to the Spot Improvements On River Street (Route 313) in the Town of Seymour .

CONTRACT TIME AND LIQUIDATED DAMAGES

Two Hundred Forthy (240) calendar days will be allowed for completion of the work on this Contract and the liquidated damages charge to apply will be Nine Hundred Dollars ($ 900.00) per calendar day.

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 – EMERGENCY VEHICLE ACCESS

The Contractor is hereby notified that emergency vehicle access through the work zone shall be maintained at all times, except on portions of the road that are closed, during construction and shall be considered a priority in terms of public safety. The State will not consider delay or other claims associated with temporary work stoppage due to emergency responses.

Contact information for local emergency services is as follows:

Citizens Engine #2 (Fire Department)
Chris Edwards, Fire Chief
26 Deforest Street
Seymour, CT 06483
Phone: 203-888-1909
Emergency Calls: 911

Seymour Police Department
Chief John Bucherati
11 Franklin Street
Seymour, CT 06483
Phone: 203-881-7600
Emergency Calls: 911

NOTICE TO CONTRACTOR – MANDATED USE OF AASHTOWARE PROJECT CONSTRUCTION MANAGEMENT SOFTWARE (CONSTRUCTION)

The Contractor shall use ***AASHTOWare Project***® software as outlined in the specifications noted below. This will require that the Contractor and all subcontractor(s) designate and dedicate staff within 10 days after the execution of the Contract or approval to sublet as appropriate. It will also require the Contractor and all subcontractors to provide internet access, computing devices suitable for this work, training, and other related work as outlined in the specifications noted below.

All costs for these requirements shall be included in the general cost of the work.

The following special provisions are pertinent to, and detail the requirements for, this work:

SECTION 1.05 – CONTROL OF THE WORK

Article 1.05.12 – Payrolls
This Article outlines the requirements for submission of payrolls.

Article 1.05.25 – Use of AASHTOWare Project® Software
This Article outlines the overall requirements for the use of the AASHTOWare Project® Software.

SECTION 1.08 – PROSECUTION AND PROGRESS

Article 1.08.01 – Transfer of Work or Contract
This Article outlines the requirements for subcontractor payment and payment verifications.

NOTICE TO CONTRACTOR – FEDERAL WAGE DETERMINATIONS (Davis Bacon Act)

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

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

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

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

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

NOTICE TO CONTRACTOR – MINIMUM CONCRETE COMPRESSIVE STRENGTH

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

NOTICE TO CONTRACTOR – MAINTENANCE AND PROTECTION OF TRAFFIC

1.08.04 – Limitation of Operations

Typical language "Lane Closure Restrictions" is now included in 1.08.04 of the Standard Specifications and is no longer included in the 1.08.04 special provision.

0971001A – Maintenance and Protection of Traffic

Typical requirements and guidance for Maintenance and Protection of Traffic are now included in Section 9.71 of the Standard Specifications and are no longer included in the 0971001A special provision.

Section 9.71 has been updated to include the Typical Construction Traffic Control Plans which comply with the latest MUTCD.

Refer to updated requirements and guidance in the Standard Specifications which can be found on the CTDOT web site: CTDOT Manuals.

Supplemental project specific requirements are still included in the special provisions for 1.08.04 and 0971001A.

NOTICE TO CONTRACTOR – CDMS SUBMITTALS

Upon execution of the Contract, the Contractor acknowledges and agrees that contractual submittals for this Project shall be submitted and handled through the Department's Construction Document Management System (CDMS). The CDMS that the Department is currently using is COMPASS.

Contractor submittals including Shop Drawings, Working Drawings, Product Data, RFIs, and RFCs shall be generated and delivered by the Contractor in accordance with the Department's Contractor's User Manual. The administering District office will inform the Contractor of other deliverables required to be similarly submitted.

Access credentials will be provided free of charge to the Contractor.

The Department shall not be held responsible for delays, lack of processing or responses to submittals that do not follow the specified guidelines in the Contractor's User Manual.

NOTICE TO CONTRACTOR – SECTION 4.06 AND M.04 SPECIFICATION CHANGES, REV. DATE 12/18/2025

The Contractor is hereby notified that this Contract includes Special Provisions for Sections 4.06 and M.04. The following list of revisions is not all inclusive but highlights the significant updates.

M.04:

- M.04.01 Binder supplier split sample submission, save split, send upon request.
- M.04.01-1&2 Clarification that aggregate source(s) be qualified annually.
- M.04.01-4 a, d, e CTR, Certificate of Analysis (COA) submitted to Asphalt producer and Department, Anti-strip, Warm mix products listed on QPL, (link to QPL included in M.04.), WMA additive added at plant requires same testing and CTR as binder supplier.
- M.04.01-5b Daily tack coat delivery comes with Bill of Lading for Inspector to obtain.
- M.04.01-6 RAP - Producer submit monthly Materials Certification.
- M.04.02-1 Curb mix design - Table M.04.02-1 updated.
- M.04.02-2 Superpave mix design - 25% RAP S1.0 mixes.
- M.04.03-1 QCP requirement updates.
- M.04.03-2a, 2b Except curb mix, all sampling performed on Site by Contractor, S1.0 mix sample size 20,000 g, mix not meeting requirements evaluated under 1.06.04.
- M.04.03-2c Superpave Production – Table M.04.03-2 deleted, mix sample frequency is 1 per 500 ton, Table M.04.03-4 updated Pb $\pm$ 0.3.

4.06:

- 4.06.03-3 Added hopper insert when MTV is used.
- 4.06.03-4 Test Section language update.
- 4.06.03-6 Tack coat update, always use, minor update to thermometer language.
- 4.06.03-7 Butt joint use polymer joint seal material, previously was rubber material.
- 4.06.03 -8 QCP update. Valid for two years.
- 4.06.03-9 Temperature Seasonal - three temperature ranges based on lift thickness.
- 4.06.03-10 Three days to cut cores.
- 4.06.03-11 Add determining Gmm when mix testing does not exist.
- 4.06.03-12 Updates to Density Dispute Resolution - Use Gsb results to determine how dispute results are used, location of dispute core, reduced days to cut dispute cores from 7 days to 5.
- 4.06.04-2b Density limit change to meet FHWA “Gold Standard.” Maximum bonuses increase from 2.5% to 3.0% (1.5% each Mat/Joint).

NOTICE TO CONTRACTOR – UTILITY SPECIFICATIONS

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

NOTICE TO CONTRACTOR – RIGHTS OF WAY RESTRICTIONS

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

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

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

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

The following is a complete listing of properties which have not been acquired with the anticipated dates such properties will be acquired.

Serial No.	Type	Name	Location
004A	Easement	Bank Street, LLC (Title Estimate by 10/29/2026)	ST 41+38 to 42+52 LT

NOTICE TO CONTRACTOR – SECTION 1.06 UPDATED BABA REQUIREMENTS

The Contractor is hereby notified that a Special Provision for Section 1.06 Control of Materials is included in this Contract due to updated Buy America, Build America Act (BABA) requirements.

A new "Buy America Preference Source of Supply Self-Certification Form" will need to be submitted with qualifying materials documenting that all iron or steel products, manufactured products, and construction materials used in the Project have been produced in the United States. This means all manufacturing processes including application of coating for iron or steel products occurred in the United States, the manufactured product was manufactured in the United States, and all manufacturing processes for the construction material occurred in the United States. The classification of the material shall be determined upon arrival at the job Site.

Any Materials Certificate (MC) shall also include certification from the source of supply stating compliance to Buy America requirements for the applicable iron or steel products, manufactured products and construction materials. A completed "Buy America Preference Source of Supply Self-Certification Form" shall be attached to the MC.

NOTICE TO CONTRACTOR – RECENT REVISIONS

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

Section 1.07 – Legal Relations and Responsibilities

- Included digital field photos of conduit runs and grounding to the service inspection requirements.

Section 1.08 – Prosecution and Progress

- Added language regarding underground utility mark outs.

0980020A – Construction Surveying

- Added language indicating the contractor is responsible for hiring a professional underground utility locator, when necessary.

1111200.XXA - Temporary Detection (Site No. XX)

- New item numbers assigned.

1118050.XXA - Temporary Signalization (Site No. XX)

- New item numbers assigned.

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 Article 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 Article 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 Article (***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.

rev. 5/20/2013

UTILITY WORK SCHEDULE

CTDOT Project Number:	124-165	Town:	Seymour
Project Description:	Ped Improvements on River Street (Route 313) & Widening of Bridge 01585		
CTDOT Utilities Engineer:	Roger E. Beaudoin		
Phone:	860-594-2759	Email:	Roger.Beaudoin@ct.gov

Utility Company:	Eversource Electric		
Prepared By:	Thomas Woronik	Date Prepared:	5/12/2026
Phone:	860 267-3891	Email:	thomas.woronik@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.

The scope of Eversource work for the project is detailed below on a pole by pole basis:
Pole: 3141 Eversource to shift OH facitlies onto Eversource set new pole (Move 1) Pole: 60494 Eversource to recloate existing pole to accomodate side-walk and shift facilities (Move 1)
Pole: 3141 Eversource to shift facities onto Eversource set new pole on west side of bridge after the bridge work has been completed (Move 2)

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..

Inclement weather may cause a change to this schedule. Customer outages could cause a delay in this schedule. All permits to be obtained by CDOT. State must mark out all property lines, curb and sidewalks. Drainage locations will need to be marked out by State where drain is with in a 10' proximity to the utility relocation. State to make area ready to relocation prior to the utlities starting work, including all clearing and access to poles. State to ensure proper R.O.W for relocated poles.

UTILITY WORK SCHEDULE

CTDOT Project Number: 124-165 (Move 1)

Utility Company: Eversource Electric

Prepared By: Thoms Woronik Total Calendar Days: 38

Schedule

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

Location (Station to Station)	Description of Utility Work Activity	Predecessor Activity	Duration (calendar days)
Project	Order material, bid project and schedule construction	Formal notification to proceed received from CDOT	30
Project	Set poles and anchors: Poles 3141, 60494	Taking lines staked in areas of the pole installations.	2
Project	Frame poles, shift, and reconductor overhead conductors.	material recieved, set poles and anchors	5
Project	Remove existing poles 3141, 3141S and 60494	Communication company shift facilities	1

UTILITY WORK SCHEDULE

CTDOT Project Number:	124-165 (Move 2)		
Utility Company:	Eversource Electric		
Prepared By:	Thoms Woronik	Total Calendar Days:	4

Schedule

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

Location (Station to Station)	Description of Utility Work Activity	Predecessor Activity	Duration (calendar days)
Project	Set pole 3141	Taking lines staked in areas of the pole installations.	1
Project	Frame poles, shift, and reconductor overhead conductors.	material recieved, set poles and anchors	2
Project	Remove existing pole 3141	Communication company shift facilities	1

UTILITY WORK SCHEDULE Rev 08 02 2016

CTDOT Project Number: 124-165	Town: Seymour
Project Description: Spot Impr. on Bank Street (Rte 67) and River Place (Rte 313) - Bridge	
CTDOT Utilities Engineer:	
Phone:	Email:

Utility Company: Aquarion Water Company	
Prepared By: Carlos J Vizcarrondo	Date Prepared: 19-Apr
Phone: 203 337-5950	Email: :vizcarrondo@aquarionwater.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.

The Aquarion Water Company has an existing facilities within the limits of State Project 124-165. Aquarion will utilize the State's Contractor to complete the permanent relocations required for this project. The existing water main along River Street shall be relocated accoding to the contract drawings. Existing Aquarion facilities located along River Street shall be relocated and installed in coordination with project construction. Pipe and fittings will be supplied by the State's Contractor. The State's Contractor will perform the relocation work in conformance with direction provided by the Aquarion project representative. The Aquarion relocation work has been designed and detailed to be constructed in sequence with the project improvements.

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..

UTILITY WORK SCHEDULE Rev 3/2015

CTDOT Project Number: 124-165

Utility Company: Aquarion Water Company

Prepared By: Carlos J Vizcarrondo Total Working Days: 41

Schedule

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

Location (Station to Station)	Description of Utility Work Activity	Predecessor Activity	Duration (working days)
Sta. 41+50	Complete special test pit at the indicated location.	None.	1
Sta 40+50 - Sta. 41+20	Complete installation of water main on bridge, including supports	Special Test Pit.	5
Sta. 41+20 - Sta. 41+5	Tie in main from bridge to existing blowoff from Project 124-172.	Water main on bridge, including supports.	2
Sta. 39+00 - Sta. 40+5	Install main from bridge to where existing water main curently ends.	Tie in Main from bridge to existing blowoff from Project 124-172.	3
	Fill, chlorinate and pressure test new water main.	Install main from bridge to where existing water main curently ends.	30

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 – SITE NUMBERS

The Contractor is hereby notified that the below table shows the Site No. and corresponding Intersections as part of this contract:

Site No.	Intersection No.	Description
1	124-201	Route 313 at Route 67 and Franklin Street
2	124-207	Route 313 at Derby Avenue and West Street

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 **Group No. 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.

SECTION 1.05 – CONTROL OF THE WORK

Add the following to the beginning of the first paragraph of Article 1.05.12:

1.05.12 – Payrolls: The Contractor and all subcontractors shall use ***AASHTOWare Project®*** software in accordance with Article 1.05.25, with a Department-provided template, or by other means previously accepted by the Department, to electronically upload all Project payrolls, as directed herein.

Add the following to the end of Article 1.05.12:

These requirements shall be included in all subcontracts for this Project.

All costs for these requirements shall be included in the general cost of the work.

Add the following new Article 1.05.25:

1.05.25 – Use of *AASHTOWare Project*® Software: The Contractor and all subcontractor(s) shall use the ***AASHTOWare Project®*** software for electronic submittal of all payrolls as outlined in the Department's AASHTOWare Contractor's User Manual, found at the Department's AASHTOWare Training webpage, and as stated in the specifications.

The Contractor and all subcontractor(s) shall use the ***AASHTOWare Project®*** software for monthly verification of project payments at all tiers, as outlined in the Department's AASHTOWare Contractor's User Manual, found at the Department's AASHTOWare Training webpage, and as stated in the specifications. The Department will inform the Contractor of other deliverables to be similarly submitted, as required.

Within 10 days of execution of the Contract, the Contractor shall submit the name(s) of the ***AASHTOWare Software Project Liaison*** and required staff that will be using the Department's software for this work. Similarly, within 10 days after the Contractor (or a subcontractor) enters into a subcontractor agreement to sublet any work, they shall submit the name(s) of their ***AASHTOWare Software Project Liaison*** and required staff that will be using the Department's software for this work. The Contractor and subcontractors shall immediately notify the Department of any change in Project staff authorized to access the AASHTOWare system or of a need to revise the Project Liaison.

Training materials, such as videos and written guides are available on the Department website for Contractor use. The Contractor and all subcontractors shall be responsible to train their staff.

This ***AASHTOWare Project®*** software will require that the Contractor and all subcontractor(s) provide their staff with access to the internet, using devices suitable for this work, at their own expense, throughout the duration of the Project. The Department has obtained licensing that allows the Contractor and subcontractors to access (from the internet) and use of the ***AASHTOWare Project®*** software. The Department will provide the Contractor and

subcontractors with usernames and passwords to access the ***AASHTOWare Project***® software, at no cost.

The Department shall not be held responsible for delays, lack of processing, or responses to submittals that do not follow the specified guidelines in the Department's AASHTOWare Contractor's User Manual, found at the Department's AASHTOWare Training webpage.

These requirements shall be included in all subcontracts for this Project.

All costs for these requirements shall be included in the general cost of the work.

SECTION 1.06 – CONTROL OF MATERIALS

Replace Section 1.06 *in its entirety with the following:*

SECTION 1.06
CONTROL OF MATERIALS

1.06.01 – Source of Supply and Material Quality
1.06.02 – Samples and Test
1.06.03 – Storage
1.06.04 – Defective Materials
1.06.05 – Shipping Material
1.06.06 – Vacant
1.06.07 – Certified Test Reports and Materials Certificates
1.06.08 – Warranties, Guarantees and Instruction Sheets

1.06.01 – Source of Supply and Material Quality:

1. Source of Supply: A source of supply is defined as the original manufacturer of material(s) used within a project. A source of supply may fabricate material(s) such as precast concrete structures or hot mix asphalt from components originally manufactured by others. A broker, distributor, or subcontractor using the material(s) must not be identified as a source of supply.

The Contractor must notify the Engineer of the proposed source of supply for each of the materials listed on the Anticipated Source of Material (CON-083) Form within 30 days after bid opening. Should it become necessary for the Contractor to obtain material from sources other than those indicated in the submitted Anticipated Source of Material (CON-083) Form, the Contractor shall notify the Engineer and resubmit this document to the Department no later than seven (7) days prior to use of the material. The Engineer reserves the right to request additional information regarding such sources.

If, at any time, the Department discovers that materials from a source of supply do not consistently conform to the Contract specifications, the Engineer will notify the Contractor of its non-conformance and that source of supply shall no longer be used for said application.

a. Buy America Act (BAA): The BAA requires that all permanently incorporated steel and iron used in the construction of the Project must have been produced and fabricated in the United States. It is the intent of this specification to require that all manufacturing processes for all steel and iron materials and products to be used for the Project, from initial melting stage through the application of coating of steel and iron, occur within the United States, with the following exceptions:

1. The Contractor may request, in accordance with 635.410(b)(4) of Title 23 CFR, approval to include a minimal amount of foreign steel in the Project construction. This amount is defined as 0.1% of the total Contract cost or $2,500.00, whichever is greater. The cost of the foreign steel or iron is defined as its Contract value when delivered to the Project site.
2. Additionally, the FHWA has granted a nationwide waiver of the requirements of 23 CFR 635.410, Buy America Act requirements, for the production of pig iron and processed, pelletized, and reduced iron ore. Items not specifically included in

the waiver remain subject to the Buy America Act requirements. The Contractor may request the Engineer to seek from the FHWA a further waiver of said requirements, but it shall be at the sole discretion of the Engineer whether to seek such a waiver.

3. A 2021 amendment to BAA, BABA (as defined below) clarifies that (A) the term ‘‘construction materials’’ shall not include cement and cementitious materials; aggregates such as stone, sand, or gravel; or aggregate binding agents or additives and (B) shall not include cement and cementitious materials and aggregates such as stone, sand, or gravel, or aggregate binding agents or additives as inputs of the construction material.

b. Build America, Buy America (BABA) Act: BABA does not supersede the BAA iron and steel requirement, however it expands the requirements to include manufactured products and construction materials. Such products and materials permanently incorporated into projects “must be produced in the United States.” BABA requires the following:

1. All construction materials are manufactured in the United States. This means that all manufacturing processes for the construction material occurred in the United States.
2. All manufactured products used in the Project are produced in the United States. This means the manufactured product was manufactured in the United States, and, for projects obligated on or after October 1, 2026, the cost of the components of the manufactured product that are mined, produced, or manufactured in the United States is greater than 55% of the total cost of all its components of the manufactured product. Manufactured products are considered to be in their final form upon arrival at the job Site.
3. Construction materials include those listed on the Anticipated Source of Material (CON-083) Form.

2. Material Quality: Only materials conforming to the Contract and accepted by the Engineer shall be permanently incorporated into the Project.

Prior to installation, material that is damaged or otherwise changed in a way that it no longer meets Contract specifications shall not be incorporated into the Project.

When one manufacturer's product is specified in the Contract, it shall be understood that this represents the standard required. Unless otherwise stated, a comparable product of another manufacturer may be proposed by the Contractor unless the plans or special provisions indicate that no equal will be allowed. The Contractor shall submit a complete description of the proposed product, together with shop drawings, catalog cuts, product data or other descriptive literature for review in accordance with 1.05.02. Should a product be designated as an equal, this will not relieve the Contractor from any material testing requirements or a related Certified Test Report and/or Materials Certificate that may be required.

1.06.02 – Samples and Test: The Contractor shall furnish all required samples without charge and provide secure facilities for their storage. The Contractor shall provide means for, and shall assist in the verification of, all scales, measures, and other devices that it operates or uses in connection with the Project. The Contractor shall provide calibration documentation when requested.

The minimum number and size of material samples per Contract item that are required by the Department are listed in the "Minimum Schedule for Acceptance Testing" contained in the Department's Materials Testing Manual. The acceptance methods used to determine compliance with the Contract are also listed. Should the Contract documents specify additional acceptance methods than those listed in the "Minimum Schedule for Acceptance Testing," the Contractor shall adhere to those additional requirements. Where applicable, physical testing will be performed in accordance with the test standards which are in effect at the time of bidding, unless otherwise indicated in the Contract. Any item or material not listed in the "Minimum Schedule for Acceptance Testing," or Contract shall be sampled and tested and/or certified, as directed by the Engineer.

Certification may be used as the basis for approval of such materials as the Contract documents specify or as the Engineer may require. With regard to such materials, the Contractor shall furnish the Engineer a Certified Test Report (CTR) and/or Materials Certificate (MC), in accordance with 1.06.07 for each type of material, as may be required in the "Minimum Schedule for Acceptance Testing." The Contractor shall bear any costs involved in furnishing the CTR and MC.

If the Contractor has purchased materials for use on a previous Department project and if they meet the requirements of this Contract, then those materials, with the approval of the Engineer, may be used for the Project, provided that the Contractor, acting as the "supplier," submits a related MC meeting the requirements of 1.06.07. This MC shall further identify the project for which the material was originally purchased and shall be accompanied by a copy of the original MC. Materials that require quality assurance inspection for acceptance such as structural steel and precast components will be subject to re-inspection.

Materials will be rejected by the Engineer whenever, in their judgment, they fail to meet Contract requirements. The Engineer may accept material or the combination of materials and thereby waive noncomplying test results, provided that the following conditions are met:

1. The Engineer finds results of prior and subsequent series of tests of the material or materials from the same source or sources to be satisfactory.
2. The incidence and degree of nonconformance with the Contract requirements are, in the Engineer's judgment, within reasonable limits.
3. The Contractor, in the Engineer's judgment, had diligently exercised material controls consistent with good practices.
4. No adverse effect on the value or serviceability of the completed work could result from said degree of nonconformance.

The Engineer may, in their discretion, waive testing of minor quantities of a particular material if said material was obtained from sources that have furnished supplies of the material that have consistently met Department testing standards.

1.06.03 – Storage: The Contractor shall store all materials for the Project in a way that will prevent damage, deterioration, and loss, including theft and vandalism. The Engineer will have easy and prompt access to them for inspection purposes. Materials shall be kept on wooden platforms or on other hard, clean surfaces and not on the ground. When so directed by the Engineer, the Contractor shall store materials in a weatherproof

building.

The Contractor shall not store materials in any way that would lead to a violation of these specifications including but not limited to 1.10. Stored materials, even if they have been approved by the Engineer prior to their storage, must be inspected by the Engineer and meet all pertinent Contract requirements immediately prior to use of those materials for the Project.

The Contractor shall

1. store products in accordance with the manufacturer's recommendations;
2. store products at the Site in a manner that will facilitate inspection and measurement or counting of units;
3. store heavy materials away from Project structures so as not to endanger the supporting construction;
4. if the products are subject to damage by the elements, store them off the ground, under cover in a weatherproof enclosure, with ventilation adequate to prevent condensation; and
5. maintain temperature and humidity within any range recommended by the manufacturer.

Off-site staging and storage of materials and equipment may be required due to restrictive Project limits and other operational constraints. Arrangement for off-site staging and storage of materials and equipment shall be the responsibility of the Contractor. Payment for off-site staging and storage of material and equipment shall be in accordance with 1.09.06.

1.06.04 – Defective Materials: Unless otherwise permitted by the Engineer, all materials not meeting Contract requirements shall be considered defective, shall be rejected, and shall be removed immediately from the Project site.

If deemed necessary, the Engineer may require retesting of materials previously tested, accepted and incorporated into the Project. If materials do not meet the Contract requirements after retesting, the Engineer will decide whether to allow materials to be left in place (with an equitable reduction of payment) or be removed and replaced. No rejected material, the defects of which have been subsequently corrected, shall be used until approval has been given by the Engineer. Should the Contractor fail to comply with these requirements, the Engineer has the authority to order the removal and replacement of defective material and deduct the cost of such removal and replacement from any future payments to the Contractor.

When a material is fabricated, or treated with another material, or when any combination of materials is assembled to form a product, any, or all of which are covered by the Contract specifications, the failure of any components of the product to meet the requirements of the specifications may be sufficient cause for the rejection of the whole combination or product.

1.06.05 – Shipping Material: Any conveyance used for transporting materials must be clean when used, be in proper working condition, have a strong and substantial body that will prevent the loss of materials during transportation, and be approved by the Engineer.

1.06.06 – Vacant

1.06.07 – Certified Test Reports and Materials Certificates: The Contractor shall

furnish the Engineer with any Certified Test Report and Materials Certificate required by the Contract and the "Minimum Schedule for Acceptance Testing" contained in the Department's Materials Testing Manual.

The Contractor shall forward the Certified Test Report and Materials Certificate to the Engineer, and, in addition, shall deliver a copy of same to the Department's inspector at the Site. Materials for which such documentation is required may be conditionally incorporated into the Project prior to the Engineer's acceptance of a Certified Test Report and a Materials Certificate; however, payment for such incorporated material may not be made prior to acceptance by the Department of a Certified Test Report and Materials Certificate indicating that the material meets the Contract requirements.

1. A Certified Test Report (CTR) is a document containing a list of the dimensional, chemical, metallurgical, electrical and physical results obtained from a physical test of the materials involved and shall demonstrate that the materials meet the requirements of the Contract. The CTR shall be signed by a duly authorized and responsible agent of the original manufacturer of the material(s), and the signature must include the date the CTR was signed.

The CTR shall also include the following information:

- **a.** Description of material(s)
- **b.** Date of manufacture of the material(s)
- **c.** Date of test(s)
- **d.** Name of organization to which the material has been consigned
- **e.** Quantity of material represented
- **f.** Means of identifying the consignment, such as label, marking, lot number, etc.
- **g.** Date and method of shipment
- **h.** Name of organization performing the test(s)

2. A Materials Certificate (MC) is a document certifying that the materials, components, and equipment furnished meet all requirements of the Contract, including the location where such material, components and equipment were produced. The MC shall be signed by a duly authorized and responsible agent of the organization assembling or fabricating the materials and the signature must include the date the MC was signed. When a CTR is also required, the means of identifying the consignment, such as label, marking, lot numbers, etc. in the MC and CTR shall be equivalent.

The MC shall also include the following information:

- **a.** Project for which the material has been consigned
- **b.** Name of Contractor to which material is supplied
- **c.** Item number and description of material
- **d.** Quantity of material represented by the MC
- **e.** Means of identifying the consignment, such as label, marking, lot numbers, etc.
- **f.** Identification of all sources of supply of material components
- **g.** Means of verifying Buy America requirements for steel and/or steel components
- **h.** Certification from the source of supply stating compliance to Buy America requirements of the applicable construction materials and manufactured products. Attach completed form "Buy America Preference Source of Supply Self-Certification Form."
- **i.** Date and method of shipment

1.06.08 – Warranties, Guarantees and Instruction Sheets: Manufacturers' warranties and guaranties furnished for materials used for the Project, as well as instruction sheets and parts lists supplied with Project materials, shall be delivered to the Engineer prior to acceptance of the Project. Each warranty or guaranty so furnished shall indicate its commencement and expiration dates.

SECTION 1.07 – LEGAL RELATIONS AND RESPONSIBILITIES

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

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

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

Water Pollution Control Authority
723 Derby Avenue
Seymour, CT 06483
Nickolas McLay (Consultant)

Nafis & Young
1355 Middletown Avnue
Northford, CT 06472

Mr. Christopher Simeone,
Comcast of Connecticut, Inc
Construction Manager CT/NY
222 New Park Drive
Berlin, CT 06037
PHONE: EXT: Mobile: 860-491-6701

Mr. Carlos Vizcarrondo
Aquarion Water Company of Connecticut
Relocations Coordinator
600 Lindley Street
Bridgeport, CT 06606
Phone: (203) 337-5950
Mobile: (203) 395-3097

Mr. Mark Bonjuklian,
Eversource Energy- Electric Distribution
Manager - Distribution Projects and Programs
9 Tindall Avenue
Norwalk, CT 06851
PHONE: 203-845-3456

Ms. Lynne DeLucia
The Southern New England Telephone Company dba Frontier Communications of Connecticut
Manager – Engineering & Construction
1441 North Colony Road
Meriden, CT 06450
Phone: (203) 238-5000

Mr. Kenneth Cook,
Yankee Gas Services Company dba Eversource Energy - Gas
Lead Engineer, Gas Project Engineering
107 Selden Street, Mail Stop NUE2
Berlin, CT 06037
PHONE: 860-978-5465

The following Department representative shall be contacted by the Inspector or Field Engineer to coordinate an inspection of the service entrance into the controller/flasher cabinet for controllers

within the State right-of-way. When ready for inspection, the Contractor should be present for the release of the connection of electrical service. The local Building Department shall be contacted for electrical service inspections for controllers located on Town roads located within the respective municipality.

Property & Facilities
Department of Transportation
Newington, CT 06111
DOT.BUILDINGCODEINSP@CT.GOV
860-594-2238

Please provide the electrical service request number provided by the power company. This is a Work Request (WR) Number provided by Eversource (formerly Northeast Utilities [CL&P]). For State-owned traffic signals in Eversource territory, contact the Department's Traffic Electrical Unit to obtain the WR Number.

SECTION 1.08 – PROSECUTION AND PROGRESS

Add the following to the beginning of the first paragraph of Article 1.08.01:

1.08.01 – Transfer of Work or Contract: The Contractor and all subcontractors shall use the *AASHTOWare Project*® software in accordance with Article 1.05.25, for monthly verification of project payments at all tiers, in accordance with the Department's AASHTOWare Contractor's User Manual, found at the Department's AASHTOWare Training webpage, and as stated in the specifications.

Add the following to the end of Article 1.08.01:

All costs for the requirements of this Article shall be included in the general cost of the work.

SECTION 1.08 – PROSECUTION AND PROGRESS

Article 1.08.03 – Prosecution of Work:

The project will be constructed in various phases as described herein.

Stage Construction

Construction activities for this contract shall be performed in stages and shall be sequenced as specified below and in accordance with the Maintenance and Protection of Traffic plans contained in the project plans and the Construction Traffic Control Plans contained in Section 9.71 unless approved otherwise by the Engineer. Phases within each construction stage shall not be initiated until the completion of work in a prior phase, as noted below, unless approved otherwise by the Engineer. Also, where stage construction plans are provided, the Contractor shall not begin work on a new stage until the previous stage is completed and accepted by the Engineer unless approved otherwise by the Engineer.

The contract time was developed based on this construction staging and in recognition of utility relocation work. The Contractor shall coordinate the construction schedule and all construction activities with the affected utility companies to minimize delays and conflicts.

Construction Staging – Utility Relocations
The Contractor shall coordinate all work activities with the various utility companies to accommodate their work schedules with all utility company schedules.

Utilities shall relocate all facilities as required and install in conjunction with roadway construction and in consultation and coordination with the Contractor to ensure proper utility pole, sub-surface structure and pipe locations to avoid conflicts with proposed drainage and other underground structures.

The Contractor shall also coordinate clearing and grubbing activities concurrently with utility relocations to avoid conflicts and minimize interruptions of utility services.

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

Sequence of Construction

The Contractor shall perform the work on this project in accordance with the following and as outlined in the Special Provision "Maintenance and Protection of Traffic" and the Maintenance and Protection of Traffic plans contained in the project plans. The Contractor is responsible during construction for maintaining appropriate sight lines at all access points. The general sequence of work to be performed is outlined as follows:

STAGE 1

Stage 1A

1. Initiate coordination with utility companies for relocation of overhead utilities
2. Mobilize, Procure bridge beams
3. Implement One-Way Northbound Only traffic on Route 313/River Street. Place traffic along the east side of Bridge 01585. Detour Southbound traffic from Route 67/Bank Street and Franklin Street.
4. Install sediment and erosion controls
5. Install storm drainage south of the bridge
6. Construct Retaining Wall 101
7. Construct sidewalks and base for roadway widening south of the bridge

Stage 1B

8. Shift One-Way Northbound Only traffic along west side of Bridge 01585
9. Install debris shields and utility work platforms under bridge
10. Excavate behind abutments; Remove existing diaphragms
11. Install sanitary sewer supports and relocate sewer on bridge and reconstruct end diaphragms
12. Perform successful sewer leak test

STAGE 2

1. Close Route 313/River Street to traffic and implement full detour
2. Implement sanitary sewer bypass pumping and complete sewer relocation. Implement short-term lane closure on Route 67/Bank Street for access to Sanitary MH #101A.
3. Remove bridge wearing surface and perform bridge demolition
4. Reconstruct bridge seats, construct end diaphragms, and place precast concrete beams
5. Reconstruct Wingwalls 1A and 2A
6. Install water main on bridge
7. Perform deck repairs and place new deck on widened portion of bridge
8. Install drainage across Route 313/River Street at Sta. 41+45

9. Backfill abutments and wingwalls and complete water main relocation work including successful pressure test
10. Place riprap

STAGE 3

1. Construct remaining sidewalk
2. Mill roadway
3. Install base for roadway reconstruction
4. Install bridge rail and guiderail
5. Install waterproofing membrane and pave
6. Install pavement markings
7. Remove sedimentation and erosion controls and open Route 313/River Street to traffic

Project Completion

When the installation of all the intermediate courses of bituminous concrete pavement is completed for all roadways, the Contractor shall install the final courses of bituminous concrete pavement and perform all remaining roadway improvements and restoration. Final pavement markings shall be installed on the final course of bituminous concrete pavement in accordance with Article 9.71.03 as contained in the Special Provision "Maintenance and Protection of Traffic."

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 313/River Street

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

Saturday and Sunday between 10:00 a.m. and 6:00 p.m.

Additional Restrictions:

A. During Stage 1A & 1B improvements, the Contractor will be allowed to close Route 313/River Street to southbound traffic and maintain traffic in the northbound direction for a duration that shall not exceed 63 consecutive days. Closure dates shall be approved by the Engineer.

B. During Stage II and Stage III improvements, the Contractor will be allowed to close Route 313/River Street and detour traffic for a duration that shall not exceed 176

consecutive days. Closure dates shall be between June 7 and November 30 or as approved by the Engineer.

C. To perform sanitary sewer bypass pumping from manhole #101A, the Contractor will be allowed to close the crosswalk on Route 313/River Street between 6:00 p.m. Friday and 6:00 a.m. the following Monday, for a maximum of 3 weekends. Closure dates shall be approved by the Engineer.

D. During Stage 1A, the Contractor will be allowed to close one lane of traffic on Route 313 west/Broad Street between River Street and Main Street to install a pedestrian detour path.

The Contractor shall notify the Engineer at least 14 days in advance of the start of the Route 313/River Street lane and roadway closures.

Route 67/Bank Street

Monday through Friday between 6:00 a.m. and 9:00 a.m. and between 3:00 p.m. and 6:00 p.m.

Saturday and Sunday between 10:00 a.m. and 6:00 p.m.

Additional Restrictions:

To access sanitary sewer manhole #101A and perform sanitary sewer bypass pumping from this manhole, the Contractor will be allowed to close one eastbound thru lane on Route 67/Bank Street at Route 313/River Street between 6:00 p.m. Friday and 6:00 a.m. the following Monday, for a maximum of 3 weekends.

The Contractor shall notify the Engineer at least 14 days in advance of the start of the Route 67/Bank Street lane 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.

The Contractor will not be allowed to perform any work between 9:00 p.m. and 6:00 a.m. on all days.

SECTION 1.09 – MEASUREMENT AND PAYMENT

Article 1.09.06 – Partial Payments

Subarticle B. Payment for Stored Materials *is amended as follows:*

B. Payment for Stored Materials: Non-perishable materials that are required for Project construction and that the Contractor has produced or purchased specifically for incorporation into the Project, but which have not yet been so incorporated, may be included in a payment estimate if

(i) the materials meet all applicable Contract specifications,

(ii) the materials have been delivered to the Project site or to another location approved by the Engineer, and

(iii) the Contractor has submitted to the Engineer, as evidence of the Contractor's purchase of the materials, copies of notarized receipted bills and a notarized Certificate of Title, lien waiver, and right of entry to the materials, in the form approved by the Department, duly executed by the Contractor, the Vendor and any other parties deemed necessary by the Engineer to satisfy proof of unencumbered ownership.

The Engineer will decide at what fair and appropriate fraction of the applicable Contract price such materials may be included in a payment estimate.

Offsite storage may be approved by the Engineer, provided that the materials proposed for payment are stored in a secure area, segregated from other materials, clearly labeled as being owned by the Department for use on the identified Project, otherwise handled in compliance with Article 1.06.03 and stored in accordance with the manufacturer's recommendations. All such materials must be readily available for inventory and inspection by the Engineer. Storage outside of the State of Connecticut may be considered only when a representative of the Department is able to verify that the above requirements have been satisfied.

For items requiring extended fabrication, manufacturing or assembly time, the Contractor may propose to the Engineer a schedule of values for completely fabricated portions of the related material. If the Engineer accepts such a schedule of values, it shall become the Basis of Payment for the stored materials, so long as all other pertinent Contract requirements have been satisfied.

Generic materials having a use on many projects will be considered for payment prior to their incorporation into the Project only if stored in unopened packaging or in large lots stored at the project site.

Stock and raw materials will not be considered for such advance payment without the Engineer's prior written consent thereto.

In no case shall material payments exceed the Contract unit price or lump sum price less the actual value of the remaining work under the item, including but not limited to delivery and

installation of the materials. If the proposed material costs do exceed such a price, the Engineer reserves the right to reduce any related payment accordingly. In such an instance the Contractor shall provide documentation of ownership and written acceptance of the amount to be paid in a form acceptable to the Engineer prior to any payments being made by the Engineer. Such reductions in payment shall in no way affect the Department's ownership interest in the stored materials or release the Contractor from any other requirements of the Contract.

SECTION 1.10–ENVIRONMENTAL COMPLIANCE

In Article 1.10.03-Water Pollution Control:
REQUIRED BEST MANAGEMENT PRACTICES

Add the following after Required Best Management Practices Number 13:

14. The Contractor is hereby notified that one or more State and/or federally listed species of bat has been documented within the Project limits. In Connecticut, the Eastern small-footed bat (*Myotis leibii*), tri-colored bat (*Perimyotis subflavus*), little brown bat (*Myotis lucifugus*), Northern long-eared bat (*Myotis septentrionalis*) and the Indiana bat (*Myotis sodalis*) are listed as State endangered; while the silver-haired bat (*Lasionycteris noctivagans*), hoary bat (*Lasiurus cinereus*) and the red bat (*Lasiurus borealis*) are listed as State species of special concern. The Northern long-eared bat, tri-colored bat, and the Indiana bat are also federally listed endangered species. Bats are the only mammals capable of actual flight and are primarily nocturnal. During the daylight, bats roost in trees and caves, but many have now adapted to roost in or on buildings including barns, houses, tunnels, and bridges. Within the Project limits, bats will use the snags, cavities, and underside of bark to roost and raise young. **This Project will have a Time of Year restriction for tree clearing, trimming and removal to protect the bat species listed.**

    The Contractor shall, through the Engineer and at least 10 days prior to the commencement of any construction activities, arrange a meeting with the District Environmental Coordinator (DEC) and Office of Environmental Planning (OEP) (or their authorized delegate) to discuss proper protocol for maintaining environmental commitments made for the protection of these bat species and their habitat. OEP will provide oversight through the DEC and Engineer to ensure that the following protocols are followed and maintained during the Project:

    a. The Contractor, through the Engineer, shall arrange a pre-construction tree-clearing Site walk to review all trees proposed to be removed for the Project.
    b. Clearing, trimming or removal of any tree three (3) inches diameter at breast height (DBH) or greater will be prohibited between April 15 and October 31.
    c. This restriction shall also apply to invasive species removal work and shall be reflected in the Contractor's Invasive Vegetation Removal Plan, if applicable.

    These practices will be applied to the entire Project unless a specified location is identified within the Project plans, which denotes specific areas of concern.

    If any bats are observed in or around the Project area, the Engineer will notify the DEC to facilitate further coordination with OEP's Environmental Resource Compliance Unit. If the DEC is unable to be reached, notify OEP at Andrew.Piraneo@ct.gov or at Marilyn.Gould@ct.gov.

    The OEP will be responsible for completing and submitting the Natural Diversity Data Base (NDDB) Vertebrate Sheet (Contribute Data to the NDDB). This completed document allows CTDEEP to update their database.

All listed bat species are protected by federal and/or State laws which prohibit killing, harming, taking, harassing, or keeping them in your possession. A CTDEEP fact sheet(s) for the listed bats noted above shall be posted in the Contractor's and Inspection field offices and can be downloaded at the link below.

CTDEEP's Fact Sheet for Bats:
Bat Fact Sheet

SECTION 4.06 – BITUMINOUS CONCRETE

Replace the entire Section with the following:

SECTION 4.06
BITUMINOUS CONCRETE

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 asphalt pavement to the grade and cross section shown on the plans.

The following terms as used in this specification are defined as:

Asphalt Mixture (formerly 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 asphalt mixture apply to all of its forms, such as those identified as hot-mix asphalt (HMA) or polymer-modified asphalt (PMA).

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

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

Density Lot: The total tonnage of all asphalt mix placed in a single lift which are:

1. PWL density lots = When the project total estimated quantity per mixture is larger than 3,500 tons
2. 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's and the Contractor's results that may affect payment.
Cool Weather Paving: Any asphalt paving that occurs when temperature is expected to be less than 50°F.
Hot Mix Asphalt (HMA): An asphalt mixture typically produced at 325°F.
Job Mix Formula (JMF): A recommended aggregate gradation and asphalt binder content to achieve the required mixture properties.
Leveling Course: A thin lift of HMA placed at an average consistent thickness, usually about an inch, as indicated on the plans to correct minor variations in the contour of the existing pavement surface.
Lift: An application of an asphalt 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): An asphalt mixture containing a polymer-modified asphalt binder and using a qualified warm mix technology.
Production Lot: The total tonnage of 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 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 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 mixture at reduced temperatures and/or increase workability of the mixture.
Wedge Course: A lift or multiple lifts of HMA placed at a varying thickness as indicated on the plans to increase or decrease the cross slope of the existing pavement surface.

4.06.02 – Materials: All materials shall meet the requirements of M.04.

1. Materials Supply: The 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 into the mixture in accordance with Project Specifications.

3. Tack Coat: Tack coat used for all applications shall be Non-Tracking Asphalt Tack Coat, meeting the requirements of M.04.01-5. Use of alternate tack coats conforming to Material for Tack Coat requirements may be requested by the Contractor. The request shall be submitted in writing to the Engineer for review prior to use.

4.06.03 – Construction Methods:

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

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

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

The Contractor must notify the Engineer immediately if, during production, there is a malfunction of the weight recording system in the automated Plant. Manually written tickets containing all required information will be allowed for no more than 1 hour.

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

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

Tack Distributor Vehicle: The Contractor shall provide a distributor vehicle capable of heating, circulating, and spraying the tack coat at the required application temperature range per the tack manufacturer's recommendations. The spray bar shall maintain a constant height above the pavement and distribute the material in an overlapping spray pattern out of the nozzles to ensure uniform coverage on the surface. The distributor vehicle shall include a tachometer, pressure gauges, and an accurate volume measuring device or a calibrated tank. Volume measuring devices shall meet all applicable state or federal sale requirements.

Lighting for Operations: As needed for paving operations, the Contractor shall provide

sufficient artificial lighting to enable the Engineer to thoroughly inspect every phase of the work. The type and number of lights to be used on each piece of equipment shall be documented by the Contractor in the Project Specific Quality Control Plan. A minimum of 10 foot candle (fc) (or approximately 108 lumens) within a twenty-five-foot radius from millers, pavers, and transfer vehicles shall be provided by the lighting at all times. A minimum of 1 fc (or approximately 11 lumens) within a sixty foot radius from rollers shall be provided at all times. Lighting shall be oriented to minimize glare to passing traffic.

Material Transfer Vehicle (MTV): A MTV shall be used when placing asphalt mixture 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 mixture from the delivery vehicle to the paver. The MTV must continuously remix the asphalt mixture throughout the placement process. When the MTV is in use the paver must have a hopper insert to prevent mix from segregating due to drop height.

The use of a MTV will be subject to the requirements stated in 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 M.04 are not met. The sampling and testing frequency for the mixture and density shall be in accordance with this specification and M.04.

The Contractor shall submit the anticipated 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 1.06.04.

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

Permanent Transitions: Defined as any gradual change in pavement elevation that remains as a permanent part of the work. A transition shall be constructed no closer than 75 feet from either side of a bridge expansion joint or parapet. All permanent transitions, leading and trailing ends shall meet the following length requirements:

Posted Speed Limit	Permanent Transition Length Required
> 35 mph	30 feet per inch of elevation change
35 mph or less	15 feet per inch of elevation change

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

Temporary Transitions: Defined as a transition that does not remain a permanent part of the work.

All temporary transitions shall meet the following length requirements:

Posted Speed Limit	Temporary Transition Length Required
> 50 mph	Leading Transition: 15 feet per inch of vertical change (thickness) Trailing Transition: 6 feet per inch of vertical change (thickness)
40, 45 or 50 mph	Leading and Trailing: 4 feet per inch of vertical change (thickness)
35 mph or less	Leading and Trailing: 3 feet per inch of vertical change (thickness)

Note: Any temporary transition to be in place over the winter shutdown period or during extended periods of inactivity (more than 30 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 subbase and other courses shall be brought to the plan grade and cross section within the allowable tolerance. Subbase material shall be free of standing water prior to placement of the mixture.

Before placing mix on an existing pavement surface, a uniform coating of tack coat shall be applied to the underlying pavement surface and on the exposed surface of a wedge joint. Such pavement surfaces shall be clean and dry. Mechanical sweeping or other means acceptable to the Engineer shall be used to clean pavement surfaces.

Tack Coat Application: The placement of Tack Coat shall not commence or continue when forecasted or unforeseen precipitation or other conditions cause the tack to runoff or prevent conformance to this specification. The Contractor shall protect appurtenances from tracking or splattering of tack coat material. All tack coat material shall be applied by pressurized spray that results in a uniform application rate over the entire surface being paved.

All tack coat material, as defined in M.04, shall be applied at an application rate of 0.04 to 0.06 gal./s.y. for a non-milled surface, and an application rate of 0.06 to 0.08 gal./s.y. for a milled surface.

The Engineer must approve the equipment and the method of measurement prior to use. The tack coat material shall be heated to 160°F ± 10°F and shall not be further diluted.

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

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.

The placement of asphalt mixtures shall not commence or continue when forecasted or

unforeseen precipitation may prevent conformance to this specification. The Engineer will not accept or pay for mixture that is placed in conditions that are not in conformance with these specifications.

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

The Contractor shall supply three infrared thermometers, acceptable to the Engineer, for mix delivery temperature verification by the Inspector and quality control personnel. At the beginning of each shift, the Engineer shall verify that the thermometers:

- have a minimum accuracy value of ±1% of reading or ± 2°F, whichever is greater.
- are in agreement within 5°F when measuring ambient, base, and mix temperature.

The Contractor shall include the thermometer verification process in the QCP, as well as the replacement or repair timeframe of a thermometer not meeting the above criteria or not functioning.

The placement temperature range shall be listed in the Quality Control Placement Plan and shall meet the requirements of Table M.04.03-4. Any material that falls outside the specified temperature range as measured by two of the three thermometers 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 impractical due to physical limitations to operate the paving equipment, the Engineer may permit the use of other methods or equipment. Where hand spreading is permitted, the mixture shall be placed by means of suitable shovels and other tools, and in a uniformly loose layer at a thickness that will result in a completed pavement meeting the designed grade and elevation.

Placement Tolerances: Each lift of mix 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 course, shall not be subject to thickness and area adjustments.

1. 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 4.06.04.

TABLE 4.06-3: Thickness Tolerances

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

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

2. 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 4.06.04.
3. 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 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 4.06.04 for any lift placed with a thickness of 1 1/2 inches or greater, and eliminate all roller marks without displacement, shoving, cracking, or aggregate breakage. This shall include wedge courses when the wedge thickness is 1 1/2 inches or greater within a single paver pass.

When placing a lift with a specified thickness less than 1 1/2 inches the Contractor shall provide a minimum rolling pattern as determined by the development of a compaction curve. This shall include wedge courses when the wedge or any portion of the wedge thickness is less than 1 1/2 inches within a single paver pass. 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 asphalt mixture, 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 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 or as directed by the Engineer 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.

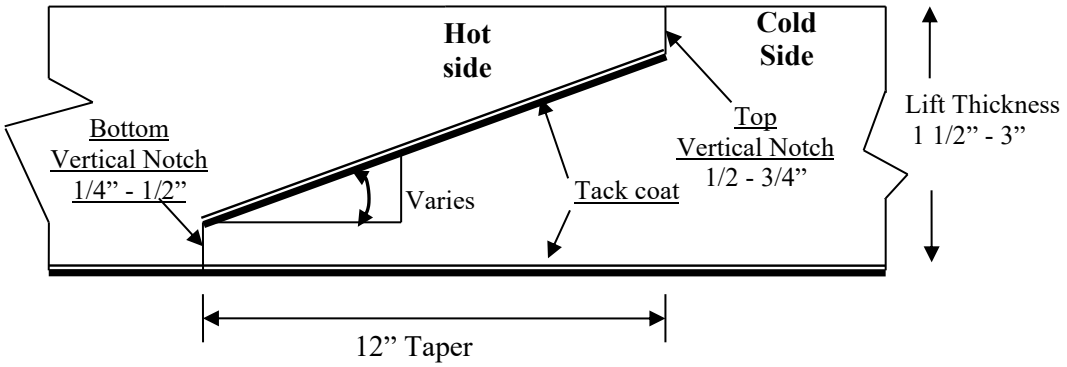
The taper portion of the wedge joint shall be evenly compacted using equipment other than the

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: Method I, 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.

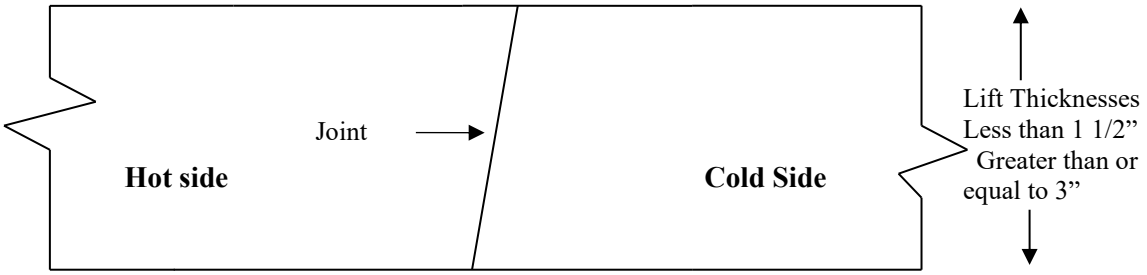
If Method I cannot be used on those lifts which are 1 1/2 inches to 3 inches, Method III may be substituted according to the requirements below for "Method III - Butt Joint with Hot Poured Rubberized Asphalt Treatment."

Method II - Butt Joint:

When adjoining passes are placed, the Contractor shall use the end gate to create a near vertical edge (refer to Figure 4.06-2). The completing pass (hot side) shall have sufficient mixture so that the compacted thickness is not less than the previous pass (cold side). During placement of multiple lifts, the longitudinal joint shall be constructed in such a manner that it is located at least 6 inches from the joint in the lift immediately below. The joint in the final lift shall be at the centerline or at lane lines or as directed by the Engineer. The end gate on the paver shall be set so there is an overlap onto the cold side of the joint.

When using this method, the Contractor must complete full width "curb to curb" paving when the vertical edge exposed to traffic would be greater than one inch, unless otherwise allowed by the Engineer.

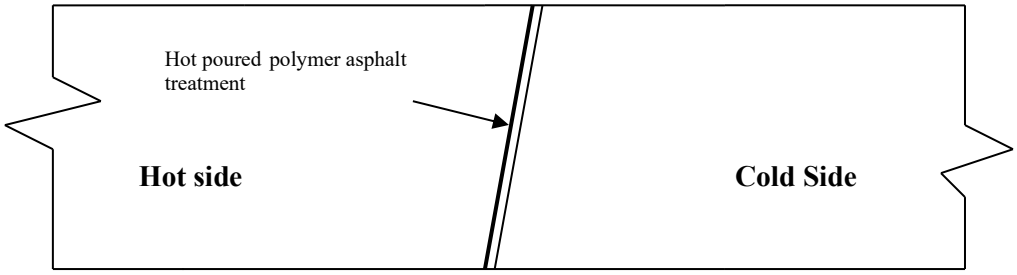
Figure 4.06-2: Method II, Butt Joint
(Not to Scale)



Method III – Butt Joint with Hot Poured Rubberized Asphalt Treatment:

If Method I cannot be used due to physical constraints in certain limited locations, the Contractor may submit a request in writing for approval by the Engineer to use Method III as a substitution in those locations. There shall be no additional measurement or payment made when Method III is substituted for Method I. When required by the Contract or approved by the Engineer, Method III (see Figure 4.06-3) shall be used.

Figure 4.06-3: Method III, Butt Joint with Hot Poured Rubberized Asphalt Treatment
(Not to Scale)



All of the requirements of Method II must be met with Method III. In addition, the longitudinal vertical edge must be treated with a joint seal material meeting the requirements of ASTM D6690, Type 2 with polymer. 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.

There are two QCP submittals required for the production and placement of asphalt mixture, one for Plant Production and the other for Mix Placement. The QCP requirements for Plant Production can be found in Section M.04.03-1.

The QCP for production shall be specific to the production facility.

There are 2 required components to the QCP for Placement: a General QCP that is applicable to all projects, and a Project Summary Pre-Pave Form that supplements the standard QCP and details Project-specific information. The General QCP shall include a cool weather paving section that addresses project operations expected to occur when ambient temperature or pavement temperature is less than 50°F. This shall include a list of potential adjustments to be considered and made when paving below 50°F.

The General QCP for Placement shall be valid for two (2) years following acceptance by the Department. The Contractor shall submit updated equipment lists and personnel, if necessary, to the Department in January of year two (2) which will be appended to the accepted General QCP for HMA Placement.

The Project Summary Pre-Pave Form shall be submitted at least 7 days prior to the scheduling of any pre-pave meeting or pavement event.

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

Each QCP shall include the name and qualifications of a Quality Control Manager (QCM). The QCM shall be responsible for the administration of the QCP, and any modifications that may become necessary.

The QCM shall have the ability to direct all Contractor personnel on the Project during paving operations.

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

Acceptance of any QCP does not relieve the Contractor of its responsibility to comply with the Project specifications. The Contractor may propose modifications to their QCP as work progresses and must document the changes in writing prior to resuming operations. These modifications include changes in quality control procedures, equipment, or personnel.

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

QCP for Placement: The General QCP for HMA Placement and Project Summary Pre-Pave Form shall include the information listed on the Pavement Advisory Team website.

The Contractor shall perform all quality control sampling and testing, provide inspection, and exercise management control to ensure that all mixture placement meets 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 format acceptable to the Engineer.

The Contractor may obtain one mat core and one 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 acceptance prior to taking the core. The core holes shall be filled to the same requirements described in 4.06.03-10.

9. Temperature and Seasonal Requirements: The following requirements shall apply to all asphalt concrete pavements (including temporary pavements) unless otherwise authorized or directed by the Engineer:

1. Mixtures shall not be placed on subbase material that is frozen.
2. Mixture or tack coat placement is limited to the following temperature ranges:

a. Mixtures placed at lift thickness of 2 1/2 inches or more shall not be placed when the air or pavement surface temperature is 35°F or less.
b. Mixtures placed at lift thicknesses between 1 1/2 and 2 1/2 inches shall not be placed when the air or pavement surface temperature is 40°F or less.
c. Mixtures placed at lift thickness of less than 1 1/2 inches shall not be placed when the air or pavement surface temperature is 45°F or less.
d. Should paving operations be scheduled during temperatures of 50°F or less, all asphalt mixes delivered shall meet the minimum delivered mix temperatures shown in Table M.04.03-4. When paving below 50°F the Contractor shall follow the cool weather paving procedures outlined in their accepted General QCP for HMA Placement and also as reflected in their accepted Project Summary Pre-pave Form.

10. Field Density:

1. The Contractor shall obtain cores in accordance with AASHTO R 67 for the determination of mat and longitudinal joint density of asphalt pavements. The Contractor's representative obtaining samples must be a certified NETTCP HMA Paving Inspector, NETTCP HMA Plant Technician, or must have successfully completed the HMA Field Sampling Course administered by The Connecticut Advanced Pavement Laboratory (CAP Lab). Within three (3) 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 lifts.

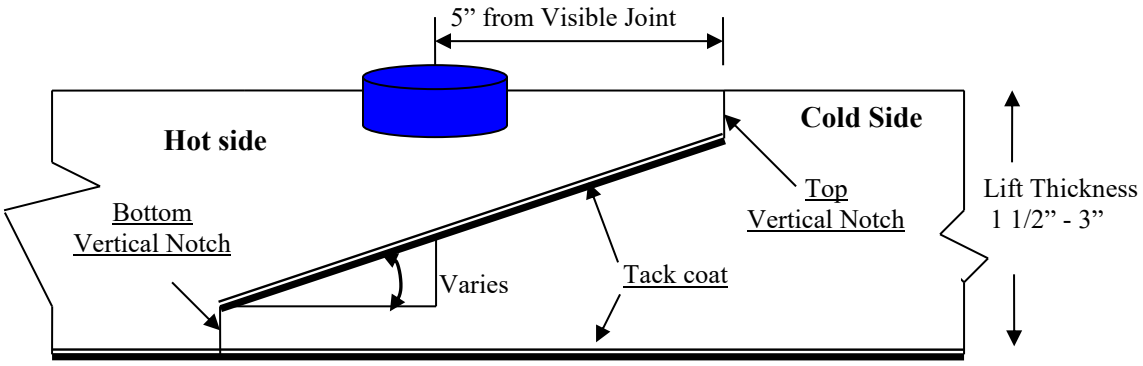
   The Contractor shall extract cores from random locations determined by the Engineer in accordance with ASTM D3665. Six (6) inch diameter cores shall be extracted for all mixes. The number and location of the cores is specified in 4.06.03-10-2 Density Lots. The Contractor shall coordinate with the Engineer to witness the extraction, labeling of cores, and filling of the core holes. The size, shape, and weight of the cores shall not be modified, altered, or manipulated by the Contractor or its representative in any way after extraction from the pavement.

   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. The Contractor and Inspector witnessing the extraction shall check each core for damage or obvious defects while being obtained. Any core determined to be damaged or defective at the time of extraction will be replaced immediately with a new core from a location within 2 feet measured in a longitudinal direction. The size, shape, and weight of the cores shall not be modified, altered, or manipulated by the Contractor or its representative in any way after extraction from the pavement.

   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.

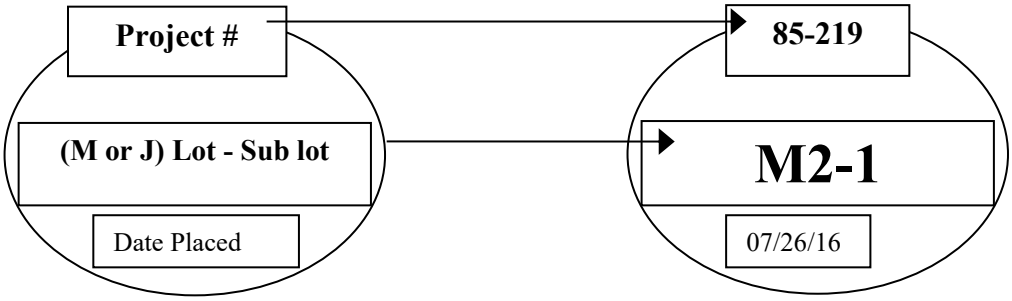
   Method I, Notched Wedge Joint cores shall be taken so that the center of the core is 5 inches from the visible joint on the hot mat side (Figure 4.06-4). When Method II or Method III Butt Joint is used, cores shall be taken from the hot side so the edge of the core is within 1 inch of the longitudinal joint.

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



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 will fill out a MAT-109 form 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 hinge(s) and at the lid opening(s). The security seals' identification number must be documented on the MAT-109. All sealed containers shall be delivered to the Department's Central Lab within two working days from time of extraction. Central Lab personnel will break the security seal and take possession of the cores.

Figure 4.06-5: Labeling of Cores



Each core hole shall be filled within 4 hours upon core extraction. Prior to being filled, the hole shall be prepared by removing any free water and applying tack coat using a brush or other means to uniformly cover the cut surface. The core hole shall be filled using an asphalt mixture at a minimum temperature of 240°F containing the same or smaller nominal maximum aggregate size as the paved surface and compacted with a hand compactor or other mechanical means to the maximum compaction possible. The asphalt mixture shall be compacted to 1/8 inch above the finished pavement.

2. Density Lots

a. *Simple Average*:

A standard simple average density lot evaluated using the Simple Average method is the quantity of material placed in a single lift within a defined area excluding any bridge decks less than 3,500 tons. For total individual mix quantities estimated on the Project below 2,000 tons, the lot will include all the material between the curb lines. For total individual mix quantities estimated on the Project between 2,000 and 3,500 tons, the lift will be evaluated as two lots each consisting of half of the total tonnage of material placed between the curb lines.

The number of cores per lot shall be determined in accordance with Table 4.06-4. For combo lots, if a randomly located 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.

A combo simple average density lot is the quantity of material placed within a defined area including bridge decks that are 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.

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.

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

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

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

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

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

b. *PWL Density Lots*:

When total individual mix quantity estimated on the Project is 3,500 tons or more, the lot shall be evaluated by PWL method.

A PWL mat density lot is 3,500 tons of material placed within 30 calendar days excluding any bridges. One randomly located mat core will be obtained per every 500 tons sublot. Should the final sublot be less than 500 tons, a randomly located mat core is still required.

A PWL joint density lot consists of seven sublots defined by the linear feet of longitudinal joint excluding any joints on bridge decks. One randomly located joint core shall be obtained per every 1,500 lineal feet when a lot includes one longitudinal joint. One randomly located joint core shall be obtained per every 2,000 linear feet of joint when a lot includes two or more longitudinal joints.

A partial PWL mat or joint lot is a lot with four to six samples due to completion of the course, or spanning past 30 calendar days.

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. Test specimens will be prepared from the cores by the Engineer. The density of each specimen 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 in accordance with the Department's Quality Assurance Manual for Materials.

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 in accordance with 4.06.03-10. Should the dispute not be resolved through evaluation of existing testing data or procedures, the Engineer may authorize the Contractor to re-core the disputed lot. The core samples must be extracted no later than 5 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. The location of each core in the lot shall be located three (3) feet from the original acceptance core located along a line parallel to the base line that results in the same type (mat, joint, or structure) of core.

The bulk specific gravity (Gsb) result of each dispute core will be compared to the original core to determine how the dispute results will be used. If the Gsb results are outside of AASHTO T 331 multilaboratory precision range of two results, the dispute result will be averaged with the original result to calculate the adjustment. When the two Gsb results are equal to or less than the acceptable range of two results, the dispute result will not be used in the adjustment calculation.

1. Simple Average Lots: The Contractor may only dispute any simple average lot that is adjusted at or below 95% payment.
2. PWL Lots: The Contractor may dispute any PWL lot when the PWL falls below 50% calculated in accordance with 4.06.04-2b.

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 asphalt pavement to the lines delineated on the plans or as directed by the Engineer. The cut shall provide a straight, clean, vertical face with no cracking, tearing or breakage along the cut edge.

4.06.04—Method of Measurement:

1. HMA S* or PMA S*: The mixture 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 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)) × (Avg. of width measurements (ft))]÷9 s.f./SY

Actual Thickness (t) = Total tons delivered / [Actual Area (SY) × 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 × W_{adj})/9] × (t) × 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 × t_{adj} × 0.0575 = (-) tons
Where: A = Area = {[L × (Design width + tolerance (lift thickness)/12)] / 9}
t_{adj} = Adjusted thickness = [(Dt + tolerance) - Actual thickness]
Dt = Designed thickness (inches)

(c) Weight: If the quantity 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 (Tw) = GVW – DGW= (-) tons
Where: DGW = Delivered gross weight as shown on the delivery ticket or measured on a certified scale

2. Bituminous Concrete Adjustment Cost:

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

i. Non-PWL Production Lot in accordance with article M.04.03-2c:
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:
Tons Adjusted for Superpave Design (T_{SD}) = [($AdjAV_t$ + $AdjPB_t$) / 100] × Tons
Where: $AdjAV_t$: Percent adjustment for air voids
$AdjPB_t$: Percent adjustment for asphalt binder
Tons: Weight of material (tons) in the lot adjusted by 4.06.04-1

Percent Adjustment for Air Voids = $AdjAV_t$ = [$AdjAV_1$ + $AdjAV_2$ + $AdjAV_i$ + … + $AdjAV_n$)] /n

Where: $AdjAV_t$ = Total percent air void adjustment value for the lot
$AdjAV_i$ = Adjustment value from Table 4.06-6 resulting from each sub lot or the average of the adjustment values resulting from multiple tests within a sub lot, as approved by the Engineer.
n = number of sub lots based on Table M.04.03-2

TABLE 4.06-6: Adjustment Values for Air Voids

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

Percent Adjustment for Asphalt Binder = $AdjPB_t = [(AdjPB_1 + AdjPB_2 + AdjPB_i + \ldots + AdjPB_n)] /n$

Where: $AdjPB_t$= Total percent liquid binder adjustment value for the lot
$AdjPB_i$ = Adjustment value from Table 4.06-7 resulting from each sub lot
n = number of binder tests in a production lot

TABLE 4.06-7: Adjustment Values for Binder Content

Adjustment Value ($AdjAV_i$) (%)	**S0.25, S0.375, S0.5, S1 Pb**
0.0	JMF Pb ± 0.3
- 10.0	≤ JMF Pb - 0.4 or ≥ JMF Pb + 0.4

ii. PWL Production Lot (3,500 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 40 and 90%: $Adj(AV_t \text{ or } PB_t \text{ or } VMA_t) = (55 + 0.5\ PWL) - 100$

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

Where: $AdjAV_t$ = Total percent AV adjustment value for the lot
$AdjPB_t$= Total percent PB adjustment value for the lot
$AdjVMA_t$= Total percent VMA adjustment value for the lot

A lot with PWL less than 40% in any of the 3 individual material quality characteristics shall be removed and replaced at the Contractor's expense..

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

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

Where : Tons = Weight of material (tons) in the lot adjusted by 4.06.04-1

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} × Unit Price = Est. (Pi)

Where: Unit Price = Contract unit price per ton per type of mixture
Est. (Pi) = Pay Unit in dollars representing incentive or disincentive per lot

(b) Density Lot Adjustment: An adjustment may be applied to each density lot as follows:

i. Simple Average Density Lot (less than 3,500 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 3 calendar days of placement.

Tons Adjusted for Density (T_D) = [{(PA_M × 0.50) + (PA_J × 0.50)} / 100] × Tons

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

PA_M = Mat density percent adjustment from Table 4.06-8

PA_J = Joint density percent adjustment from Table 4.06-9

Tons: Weight of material (tons) in the lot adjusted by 4.06.04-1

TABLE 4.06-8: Adjustment Values for Pavement Mat density

Average Core Result Percent Mat Density	Percent Adjustment (Bridge and Non-Bridge) (1)(2)
98.6 - 100	-1.667*(ACRPD-98.5)
97.1 – 98.5	-2.0*(ACRPD-98.5)
95.0-97.0	+3.0
93.6 – 94.9	+2.0*(ACRPD-93.5)
93.0 – 93.5	0
92.0-92.9	-0.5*(93.0-ACRPD)
90.0 – 91.9	-5*(92-ACRPD)
88.0 – 89.9	-10*(91-ACRPD)
87.9 or less	Remove and replace (curb to curb)

(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 4.06-9: Adjustment Values for Pavement Joint Density

Average Core Result Percent Joint Density	Percent Adjustment (Bridge and Non-Bridge) (1)(2)
98.6 - 100	-1.667*(ACRPD-98.5)
97.1 – 98.5	-2.0*(ACRPD-98.5)
94.5 – 97.0	+3.0
92.6 – 94.4	+1.5*(ACRPD-92.5)
92.0– 92.5	0
91.0 – 91.9	-0.5(92.0-ACRPD)
89.0 – 90.9	-7.5*(91-ACRPD)
88.0 – 88.9	-15*(90-ACRPD)
87.9 or less	Remove and Replace (curb to curb)

(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 simple average sublot with a density result below 88% is subject to remove and replace.

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 sublot. 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: 92.0 – 98%
Joint Density: 90.5 – 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 * PWL – 22.50

For PWL at and above 90%: PA ($_M$ or $_J$) = 0.15 * PWL – 13.5

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 3 calendar days of placement.

A lot with PWL less than 50%, the lot shall, after final evaluation and dispute resolution if approved, be removed and replaced at the Contractor's expense. The total adjustment for each PWL mat density lot will be computed as follows:

Tons Adjusted for Mat Density (T_{MD}) = (PA_M / 100) × Tons

Where: Tons= Weight of material (tons) in the lot adjusted by 4.06.04-1.

The total adjustment for each PWL joint density lot will be computed as follows:

Tons Adjusted for Joint Density (T_{JD}) = (PA_J / 100) × J_Tons

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

Where: $\text{J_Tons} = \text{Tons in project or phase adjusted by 4.06.4} - 1 \times \frac{\text{Lot joint length}}{\text{Joint length in project or phase}}$

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

Additionally, any bridge deck sublot with a density result below 88% is subject to remove and replace.

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 × Unit Price = Est. (Di)

Density Lot Adjustment (PWL Lots): (T_{MD} or T_{JD}) × Unit Price = Est. (DMi or DJi)

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

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

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

Est. (DJi)= Pay Unit in dollars representing incentive or disincentive per PWL joint lot

Additionally, any PWL sublot with a density result below 88% is subject to remove and replace.

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 asphalt pavement is not measured for payment.

4. Cut Bituminous Concrete Pavement: The quantity of asphalt pavement cut will be measured in accordance with 2.02.04.

5. Non-Tracking Asphalt Tack Coat and **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:
      1. Tack Coat (gallons at 60°F) = Measured Weight (pounds) / Weight per gallon at 60°F
      2. Tack Coat (gallons at 60°F) = 0.996 × 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 × 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 Asphalt mix 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: Σ Est (Pi) = Est. (P)
Density Lot (Simple Average Lots): Σ Est (Di) = Est. (D)
Density Lot (PWL): Σ Est (DMi) + Σ (DJi) = Est. (D)

Bituminous Concrete Adjustment Cost= Est. (P) + Est. (D)

Where: Est. ( )= Pay Unit in dollars representing incentive or disincentive in each production or density lot calculated in 4.06.04-2

The Bituminous Concrete Adjustment Cost item, if included in the bid proposal or estimate, is not to be altered in any manner by the Bidder. If the Bidder should alter the amount shown, the altered figure will be disregarded and the original estimated cost will be used for the Contract.

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

4. The cutting of asphalt pavement will be paid in accordance with 2.02.05.

5. Non-tracking asphalt tack coat will be paid for at the Contract unit price per gallon for "Non-Tracking Asphalt Tack Coat."

6. Material for tack coat will be paid for at the Contract unit price per gallon for "Material for Tack Coat."

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

Pay Item	**Pay Unit**
HMA S*	ton
PMA S*	ton
Bituminous Concrete Adjustment Cost	est.
Non-Tracking Asphalt Tack Coat	gal.
Material for Tack Coat	gal.
Material Transfer Vehicle	ton

SECTION 6.02 – REINFORCING STEEL

Revise Subarticle 6.02.03-2(a) Cutting and Bending *as follows:*

Bar reinforcement shall be cut and bent to the shapes shown on the plans. Fabrication tolerances shall be in accordance with the requirements of ACI SPEC-117. All bars shall be bent cold, unless otherwise shown on the plans.

Field cutting of epoxy coated bars shall only be performed using hydraulic-powered cutters or friction cutting tools to minimize coating damage and field touch-up. Field cut bars shall be repaired to the satisfaction of the Engineer. Flame cutting of epoxy coated or galvanized bars will not be permitted.

Field bending of bars partially embedded in concrete must be shown on the plans or permitted by the Engineer.

Revise Subarticle 6.02.03-2(b) Hooks and Bend Dimensions *as follows:*

The dimensions of hooks and the diameters of bends measured on the inside of the bar shall be as shown on the plans. When the dimensions of hooks or the diameter of bends are not shown, they shall be in accordance with the ACI CODE-318 as amended by ASTM A767 for hot-dip galvanized rebars.

Revise Subarticle 6.02.03-4(e) Repair of Coated Reinforcing Steel – Galvanized Reinforcing Steel *as follows:*

Replace the last paragraph with the following:

Field coating of damaged areas or cut ends shall be performed in accordance with the zinc-rich paint manufacturer recommendations. The zinc-rich paint shall meet the requirements of M.06.05 and shall be brush-applied in one or more coats to a minimum thickness of 2 mils.

Revise Subarticle 6.02.04-2 Bar Reinforcement *as follows:*

2. Bar Reinforcement: Uncoated, epoxy coated, hot-dip galvanized, continuously galvanized and weldable bar reinforcement will be classified as "Deformed Steel Bars," "Deformed Steel Bars - Epoxy Coated," "Deformed Steel Bars - HDG," "Deformed Steel Bars – CGR" and "Deformed Steel Bars – Weldable," respectively.

Revise Subarticle 6.02.05-1 Bar Reinforcement *as follows:*

1. **Bar Reinforcement:** This work will be paid for at the Contract unit price per pound for "Deformed Steel Bars," "Deformed Steel Bars - Epoxy Coated," "Deformed Steel Bars - HDG" or "Deformed Steel Bars – CGR" and "Deformed Steel Bars - Weldable" complete in place and accepted, including Shop Drawings, furnishing, fabricating, repair of coating, bending and placing reinforcing steel, welding splices and all materials, equipment, tools, labor and work incidental thereto.

In the Pay Item – Pay Unit *table replace* "Deformed Steel Bars – Galvanized" *with* "Deformed Steel Bars – HDG" *and add* "Deformed Steel Bars – CGR."

SECTION M.04 – BITUMINOUS CONCRETE MATERIALS

Replace the entire Section with the following:

SECTION M.04
BITUMINOUS CONCRETE MATERIALS

M.04.01 – Asphalt Materials and Facilities
M.04.02 – M ix Design and Job Mix Formula (JMF)
M.04.03 – Production Requirements

M.04.01 – Asphalt Materials and Facilities: Each source of asphalt binder, emulsion, aggregate, and production facility used to manufacture asphalt mixture, and laboratory testing the mixture must be qualified on an annual basis by the Engineer.

The basis of qualification for asphalt binder sources is participation in AASHTO Product Evaluation and Audit Solutions (formerly NTPEP), Asphalt Binder Suppliers (ABS) program and review of the sources' Quality System Manual and on-site audit report from AASHTO Product Evaluation and Audit Solutions by the Department. The supplier shall save a split sample of binder supplied to Department projects which shall be provided to the Department upon request.

The basis of qualification for emulsion sources is the submittal of a "Quality Control Plan for Emulsified Asphalt" (Tack Coat) formatted in accordance with AASHTO R 77 to the Engineer for review. The supplier shall save a split sample of binder supplied to Department projects which shall be provided to the Department upon request.

The basis of source qualification for aggregates is indicated in M.01

The basis of qualification for production facilities is indicated in M.04.01-10.

The basis of testing laboratory qualification for mixture testing is all testing equipment, 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 and requirements indicated in M.04.01-11

AASHTO/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 and be qualified annually.

2. Fine Aggregate: All fine aggregate shall meet the requirements in M.01 and be qualified annually.

3. **Mineral Filler:** Mineral filler shall meet 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 binder supplier shall submit a Certified Test Report and bill of lading representing each delivery in accordance with

AASHTO R 26(M) to the asphalt producer and the Department. 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 asphalt mix producer shall submit the name(s) of personnel responsible for receipt, inspection, and record keeping of PG binder. Asphalt mix producer personnel shall document specific storage tank(s) where binder will be transferred and stored until used and provide binder samples from the storage tank 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 one storage tank at the Plant from different suppliers, grades, or additive percentages is prohibited.

v. PG binders stored at the asphalt mix plant shall be at temperatures not to exceed the manufacturer's recommendation and each tank shall have a calibrated thermometer to monitor storage temperature.

(b) 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.

(c) 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 asphalt 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.

(d) Anti-strip and Warm Mix Additive:

i. The additive to be used must be prequalified and listed on the Department's Qualified Products List (QPL). The QPL can be found on the Department's website. Policy on New Product Evaluation at Connecticut DOT

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

iii. The blended binder shall meet the requirements of AASHTO M 332 and shall be graded or verified in accordance with AASHTO R 29 for the specified binder grade. The Binder Supplier or Mix Producer 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 additive, the manufacturer's suggested rate for the additive, and the Technology manufacturer's recommended mixing and compaction temperature range for the dose rate.

(e) Foaming Technology: Foaming shall be blended with the mix during production in accordance with the manufacturer's recommendations and at the water injection rate on the mix design. Qualification of the foaming equipment is based on the mixture meeting all requirements of M.04.

5. Emulsified Asphalts:

(a) General:

i. The emulsified asphalt shall meet the requirements of AASHTO M 140(M), AASHTO M 208, or as applicable herein.
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.
iv. Materials used for tack coat shall not be diluted.
v. The emulsion supplier shall submit a Certificate of Analysis (COA) in accordance with AASHTO R 77 to the Department's Central Laboratory for every lot or batch used on Department projects. This is to be submitted upon testing being complete.

(b) Basis of Approval:

i. Each shipment of emulsified asphalt delivered to the Project site shall be accompanied with the corresponding Bill of Lading in accordance with AASHTO R 77 listing residue by evaporation, penetration of residue, and weight per gallon at 77°F or 60°F, lot number, and grade.
ii. Non-Tracking Asphalt Tack Coat
   – Emulsion for Non-Tracking Asphalt Tack Coat shall meet the requirements of Table M.04.01-1 below.

Table M.04.01-1: Asphalt Emulsion for Non-Tracking Tack Coat

Property	Specification	Test Procedure
Viscosity, SFS, 77°F	20-100	AASHTO T 72
Sieve, %	0.3 maximum	AASHTO T 59
Asphalt Residue, %	50 minimum	AASHTO T 59
Oil Distillate, %	1.0 maximum	AASHTO T 59
Residue Penetration, at 77°F	10-40	AASHTO T 49
Original Dynamic Shear (G*/sin δ), kPa at 70°C (Base Asphalt)	1.0 minimum	AASHTO T 315
Ash, %	1.0 maximum	AASHTO T 111

iii. Material for Tack Coat
   – Anionic emulsified asphalts shall meet the requirements of AASHTO M 140. Materials used for anionic tack coat shall 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.
   – Cationic emulsified asphalt shall meet the requirements of AASHTO M 208. Materials used for cationic tack coat shall 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 asphalt mixture. 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 asphalt producer shall provide a monthly 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 Materials 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 meets the following gradation:

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

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

8. Joint Seal Material: Joint seal material must meet the requirements of ASTM D6690 - Type 2. The Contractor shall submit a Materials Certificate in accordance with 1.06.07 or 1.20-1.06.07 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 under consideration for use in asphalt mixtures must be certified as being asbestos-free and shall be entirely free of whole, intact nails. The RAS shall meet the requirements of AASHTO MP 23.

RAS shall be tested to determine the asphalt content and the gradation at a frequency acceptable to the Engineer. RAS stockpiles shall be maintained to prevent contamination.

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

10. Plant Requirements:

(a) General: The Plant producing asphalt mixtures shall comply with AASHTO M 156.

(b) Storage Silos: The Contractor may use silos for short-term storage with the approval of the Engineer. A storage silo must have heated cones and an unheated silo cylinder if it does not contain a separate internal heating system. When multiple silos are filled, the Contractor shall discharge 1 silo at a time. Simultaneous discharge of multiple silos for the same Project is not permitted.

Type of silo cylinder	Maximum storage time for all classes (hr)	
	64S-22 Mixes	64E-22 Mixes
Open Surge	4	Mfg Recommendations*
Unheated - Non-insulated	8	Mfg Recommendations*
Unheated - Insulated	18	Mfg Recommendations*
Heated - No inert gas	24	Mfg Recommendations*

*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. The plant documentation system shall monitor the batching sequence of each component of the mixture and produce an electronic record of these operations as specified herein. All electronic records shall be available to the Engineer upon request.

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

If an additive or warm mix foaming technology is added at the Plant, the Plant electronic record shall include the actual dosage rate.

For drum Plants, the electronic record 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 electronic record shall be produced for each batch and maintained by the vendor for a period of 3 years after the completion of the Project. In addition, an asterisk (*) shall be automatically printed next to any individual batch weight(s) exceeding the following tolerances:

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

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

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

(d) Aggregates: Aggregate stockpiles shall be managed to prevent segregation and cross contamination. For drum Plants only, the percent moisture content, at a minimum prior to production and halfway through production, shall be determined.

(e) Mixture: The plant dry and wet mix times shall provide a uniform mixture with a minimum particle coating of 95% as determined by AASHTO T 195(M).

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

(f) RAP: RAP moisture and binder content shall be updated in the plant settings prior to production.

(g) Asphalt Binder: A binder log shall be maintained by the asphalt producer and submitted to the Department's Central Lab on a monthly basis. The log shall include the grade and tank loaded for each shipment. Asphalt binder plant setting shall not be set below the minimum binder content specified in Table M.04.02-5.

(h) Warm mix additive: For mechanically foamed WMA, the water injection rate shall be monitored during production, not to exceed 2.0% by total weight of binder, and must be documented on the electronic record.

11. Testing Laboratory: The laboratory performing acceptance testing on box samples shall be provided with functioning equipment and adequate supplies to test asphalt mixtures in accordance with Table M.04.03. 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. The laboratory shall have a PC with internet connection capable of submitting electronic test results to the Engineer.

The laboratory shall be equipped with a heating system capable of maintaining a minimum temperature of 65°F. It shall be clear 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 shall maintain a list of 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.

M.04.02 – Mix design and Job Mix Formula (JMF)

1. Curb Mix:

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

(b) Basis of Approval: Annually, an approved JMF based on a mix design for curb mix must be on file with the Engineer prior to use.

The Contractor shall test the mixture for compliance with the submitted JMF and Table

M.04.02-1. The maximum theoretical density (Gmm) will be determined by AASHTO T 209. If the mixture does not meet the requirements, the JMF shall be adjusted within the ranges shown in Table M.04.02-1 until an acceptable mixture is produced.

An accepted JMF from the previous operating season may be acceptable to the Engineer provided that there are no changes in the sources of supply for the coarse aggregate, fine aggregate, recycled material (if applicable) and the Plant operation had been consistently producing acceptable mixture.

Any change in component source of supply or consensus properties must be approved by the Engineer. A revised JMF shall be submitted prior to use.

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

Mix	**Curb Mix**	**Production Tolerances from JMF Target**
Grade of PG Binder content %	**PG 64S-22 6.50 - 9.00**	**0.30**
Sieve Size: No. 200	3.0 - 8.0 (b)	2.0
No. 50	10 - 30	4
No. 30	20 - 40	5
No. 8	40 - 70	6
No. 4	65 - 87	7
1/4 inch		
3/8 inch	95 - 100	8
1/2 inch	100	8
3/4 inch		8
1 inch		
2 inch		
Additionally, the fraction of material retained between any 2 consecutive sieves shall not be less than 4%.		
Mixture Temperature	265-325°F	
Mixture Properties	**Air Voids (VA) %**	0 – 4.0 (a)
Notes: (a) Compaction Parameter 50 gyrations (N_{des}) (b) The percent passing the No. 200 sieve shall not exceed the percentage of PG asphalt binder.		

2. Superpave Mix 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 14 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 properties listed in tables M.01.02-1 through M.01.03-2, Table M.04.02-3, and specific gravities including absorption shall be tested at an AASHTO re:source accredited laboratory by a NETTCP Soil and Aggregate Laboratory Technician Certified technician(s)

annually and submitted to the Engineer.

All asphalt 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. A JMF revision requires a new mix design TSR test. The compacted specimens may be fabricated at the Plant and then tested at an AASHTO re:source accredited laboratory by NETTCP HMA Plant Certified Technicians and submitted to the Engineer. The test report shall include Job Mix Formula blend percentages and anti-strip dosage, if applicable. The design TSR test can be performed on either laboratory or plant produced mixture.

A minimum of 45,000 grams of laboratory or plant blended mixture and the corresponding complete Form MAT-412s shall be submitted to the Department's Central Laboratory for design TSR testing verification. The mixture submitted shall be representative of the corresponding mix design as determined by the Engineer.

1. 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 over 15% and 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. RAP amounts over 20% and up to 25% may be used in S1 or P1 mixes only provided a new JMF is accepted by the Engineer. The virgin binder grade shall be a PG 58S-28 or PG 64E-28 based on final PG grade of mix specified. In accordance with M.04.01-4, the virgin binder grade selected shall be "neat" or modified with SBS only. The JMF submittal shall include the true grade of the virgin binder and extracted rap binder. 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.
   - A representative sample of RAP shall be tested for binder content in accordance with AASHTO T 164 and in accordance with AASHTO T 308. A split sample shall be submitted to the Engineer.
   - RAP material shall not be used with any other recycling option.
2. 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 JMF Approval: The following information must be included in the JMF submittal:

i. Gradation, consensus properties, durability tests (Abrasion and Soundness), and specific gravities of the aggregate, RAP or RAS.
ii. Average asphalt content of the RAP or RAS by AASHTO T 164.
iii. RAP or RAS and percentage to be used.
iv. Warm mix technology and additive rate.
v. TSR test report and anti-strip manufacturer and dosage rate if applicable.
vi. Mixing and compaction temperature ranges for the mix with/without warm-mix technology.
vii. JMF ignition oven correction factor by AASHTO T 308.

With each JMF submittal, the following samples shall be submitted to the Central Lab:

- 4 - one (1) quart cans of PG binder with anti-strip and/or warm mix additive as applicable, with corresponding Safety Data Sheet (SDS) and PG binder lot Certified Test Report
- 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 M.04.02-4 and M.04.02-5. 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 Asphalt Mixture Design Target Values

	S0.25		S0.375		S0.5		S1	
Sieve	Control Points		Control Points		Control Points		Control Points	
inches	Min (%)	Max (%)	Min (%)	Max (%)	Min (%)	Max (%)	Min (%)	Max (%)
2.0	-	-	-	-	-	-	-	-
1.5	-	-	-	-	-	-	100	-
1.0	-	-	-	-	-	-	90	100
3/4	-	-	-	-	100	-	-	90
1/2	100	-	100	-	90	100	-	-
3/8	97	100	90	100	-	90	-	-
No. 4	72	90	-	72	-	-	-	-
No. 8	32	67	32	67	28	58	19	45
No. 16	-	-	-	-	-	-	-	-
No. 30	-	-	-	-	-	-	-	-
No. 50	-	-	-	-	-	-	-	-
No. 100	-	-	-	-	-	-	-	-
No. 200	2.0	10.0	2.0	10.0	2.0	10.0	1.0	7.0
VMA (%)	16.5 -0.5, +1.0		16.0 -0.5, +1.0		15.0 -0.5, +1.0		13.0 -0.5, +1.0	
VA (%)	4.0 ±0.5		4.0 ±0.5		4.0 ±0.5		4.0 ±0.5	
Dust / effective binder	0.6 - 1.2		0.6 - 1.2		0.6 - 1.2		0.6 - 1.2	
TSR	≥ 80%		≥ 80%		≥ 80%		≥ 80%	
T-283 Stripping	2 or less							

(c) Mix Status: Each facility will have each type of asphalt mixture rated based on the results of the previous year of production. Mix status will be developed for each facility 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 : Percentage of acceptance test results with compliant air voids, VMA, VFA, Density to Nini and dust to Pbe.

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.

"U" – Not Approved: Status assigned to a type of mixture that does not have an approved JMF. Asphalt mixtures with a "U" status cannot be used on Department projects.

"PPT" – Pre-Production Trial: Temporarily assigned to each mixture type from a production facility when:

1. no compliant acceptance production test results have been 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. mixture being evaluated under "U" status.

Asphalt mixtures rated with a "PPT" status cannot be used on Department projects until modifications are made at the facility. Sufficient testing by NETTCP certified personnel must confirm that specification requirements in Tables M.04.02-2 through M.04.02-4 are met and the binder content (Pb) meets the requirements in Table M.04.03-2 before material can be used. One of the following methods must be used to verify the test results:

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

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

Department Witness or verification 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 and meet all requirements in Table M.04.02-2, Table M.04.02-4 and Table M.04.02-5 in order to be verified.

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

Traffic Level	Design ESALs (80kN) Millions	Coarse Aggregate Angularity[1] ASTM D5821, Minimum %	Fine Aggregate Angularity AASHTO T 304, Method A Minimum %	Flat and Elongated Particles[2] ASTM D4791, Maximum %	Sand Equivalent AASHTO T 176, Minimum %
1	< 0.3	55/- -	40	10	40
2	0.3 to < 3.0	75/- -	40	10	40
3	≥ 3.0	95/90	45	10	45

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

Traffic Level	Design ESALs	Number of Gyrations by Superpave Gyratory Compactor			Percent Density of Gmm from HMA/ WMA Specimen			Voids Filled with Asphalt (VFA) Based on Nominal Mix Size - Inch			
	(million)	N_{ini}	N_{des}	N_{max}	N_{ini}	N_{des}	N_{max}	0.25	0.375	0.5	1
1	<0.3	6	50	75	≤91.5	96.0	≤98.0	63-78	73-76	71-75	67-71
2	0.3 to <3.0	7	75	115	≤90.5	96.0	≤98.0				
*3	≥3.0	7	75	115	≤90.5	96.0	≤98.0				

***Note 1-** All Traffic Level 3 mixes shall include polymer modified asphalt.

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

Mix Type	Level	Binder Content Minimum
S0.25	1	5.80
S0.25	2	5.70
S0.25	3	5.70
S0.375	1	5.70
S0.375	2	5.60
S0.375	3	5.60
S0.5	1	5.10
S0.5	2	5.00
S0.5	3	5.00
S1	1	4.60
S1	2	4.50
S1	3	4.50

M.04.03 – Production Requirements:

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

Control Chart(s) shall be developed and maintained for critical aspect(s) of the production process as determined by the Contractor. The control chart(s) shall identify the material property, applicable upper and lower control limits, and be updated with current test data. As a minimum, the following quality characteristics shall be included in the control charts:

- percent passing No. 4 sieve
- percent passing No. 200 sieve
- binder content
- air voids

- Gmm
- Gse
- VMA

The control chart(s) shall be used as part of the quality control system to document variability of the production process. The control chart(s) shall be submitted to the Engineer the first day of each month.

The QCP shall document the Contractors Reclaimed Asphalt Pavement (RAP) management practices, including stockpile management, and sampling and testing frequencies. At a minimum, RAP moisture, binder content and gradation shall be tested daily when asphalt mixture is being produced for the Department. The Contractor shall maintain control charts for RAP binder content.

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 including all testing records, RAP binder and moisture content, and testing equipment print outs, such is gyratory compactors and ignition oven print outs. These records must be maintained for a minimum of three years after project completion.

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 asphalt mix that complies with these specifications. The Contractor shall submit any changes to the QCP as work progresses.

2. Acceptance Requirements:

(a) General:

All mixtures except for curb mix shall be sampled at the Project site by the Contractor as directed by the Engineer. A Contractor representative shall obtain a field sample of the material placed at the Project site in accordance with AASHTO R 97 or an alternate procedure acceptable to the Engineer. The Contractor's representative obtaining mix samples must be a certified NETTCP HMA Paving Inspector, NETTCP HMA Plant Technician, or has successfully completed the HMA Field Sampling Course administered by the Connecticut Advanced Pavement Laboratory. The bulk sample shall be quartered by the Contractor in accordance with AASHTO R 47 using a Type A Mechanical Splitter and placed into four new cardboard containers acceptable to the Engineer. The cardboard container shall be sealed with 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 14,000 grams with the exception of 1.0 mixes which require minimum sample size of 20,000 grams. If needed, more than four boxes can be used for 1.0 mixes. 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 sample for acceptance in accordance with past practice within 2 days of sampling.

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 QC personnel must be present at the facility prior to, during, and until completion of production, and be certified as a NETTCP 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.

If the Contractor disputes the Engineer's test results, the Contractor must submit in writing a request to initiate the dispute resolution process within 24 hours of receiving the adjustment and must include supporting documentation or test results to justify the request. If the dispute resolution is granted by the Engineer, all sublots for the disputed lot(s) shall be transported by the Contractor to the Department's Central Laboratory for testing.

(b) Curb Mix Acceptance Sampling and Testing Procedures: Curb Mixes may be sampled and tested by Central Laboratory personnel at any time. 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

Protocol	Reference	Description
1	**AASHTO T 30(M)**	Mechanical Analysis of Extracted Aggregate
2	**AASHTO R 97**	Sampling Asphalt Mixtures
3	**AASHTO R 47**	Reducing samples of Asphalt Mixtures to Testing Size
4	**AASHTO T 308**	Asphalt Binder Content of Asphalt Mixtures by Ignition Oven Method (Method A)
5	**AASHTO T 209(M)[(2)]**	Theoretical Maximum Specific Gravity and Density of Asphalt Mixtures (average of 2 tests)
6	**AASHTO T 312[(2)]**	[(1)] Density of Asphalt Mixture Specimens by Means of Superpave Gyratory Compactor (1 set Compacted to N_{des})
7	**AASHTO T 166**	Bulk Specific Gravity of Compacted Asphalt Mixtures Using Saturated Surface Dry Specimens
8	**AASHTO T 329**	Moisture Content of Asphalt Mixtures by Oven Method
9	**AASHTO R 35**	Air voids (average 2 specimens)

Notes: [(1)] One (1) set equals 2 each of 6 inch molds. Molds to be compacted to 50 gyrations.

i. Determination of "U" Status:
   1. Curb Mix is considered on "U" status when test results indicate that any single value for bitumen content, Va, or gradation are not within the tolerances shown in Table M.04.02-1 for that mixture. If the mix is on "U" status the Contractor must take action to correct the deficiency. A passing PPT and supporting documentation must be submitted and approved by the Engineer prior to the next day of production.
   2. Material not meeting the requirements of Table M.04.02-1 will be evaluated under Article 1.06.04.

ii. JMF Revisions
   1. 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: All mixture will begin as a PWL Production Lot. A PWL Lot will be defined as each 3,500 tons of mixture produced within 30 calendar days.

If a Lot is closed before reaching four (4) acceptance tests it will be processed as Non-

PWL.

Lots will be closed 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.

Production Sub Lot:

- 500 tons or portions thereof for last sub-lot. Last sub-lot may be less than 500 tons. For Project quantities under 75 tons no sample will be required. For quantities produced over 500 ton, the final acceptance test shall always be performed with material from the last sub lot regardless of the predetermined random location.

Partial Production Lots (For PWL only): A Lot with four (4) or more acceptance tests, but less than 3,500 tons.

The acceptance sample(s) location(s) shall be selected using stratified - random sampling in accordance with ASTM D3665.

The payment adjustment will be calculated as described in 4.06.

The following test procedures shall be used for acceptance:

TABLE M.04.03-3: Superpave Acceptance Testing Procedures

Protocol	Procedure	Description
1	AASHTO R 97	Sampling of Asphalt Mixtures
2	AASHTO R 47	Reducing Samples of Asphalt Mixtures to Testing Size
3	AASHTO T 308	Asphalt Binder Content of Asphalt Mixtures by Ignition Oven Method (Method A)
4	AASHTO T 30(M)	Mechanical Analysis of Extracted Aggregate
5	AASHTO T 312	(1) Density of Asphalt Mixture Specimens by Means of Superpave Gyratory Compactor (Compacted to N_{des})
6	AASHTO T 166	(2)Bulk Specific Gravity of Compacted Asphalt Mixtures Using Saturated Surface Dry Specimens
7	AASHTO R 35	(2)Air voids, VMA
8	AASHTO T 209(M)	Theoretical Maximum Specific Gravity and Density of Asphalt Mixtures (average of 2 tests)
9	AASHTO T 329	Moisture content of Asphalt Mixtures

Notes: (1) One (1) set equals 2 each of 6 inch molds. Molds to be compacted to Nmax for PPTs and to Ndes 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.

Asphalt mixtures may be randomly sampled and tested by the Central Lab personnel at any time to verify compliance with the TSR requirements in Table M.04.02-2. If the material fails to meet specification requirements, The Central Laboratory will issue a notification to the Project, including test data, stating that the material does not meet Contract specification requirements.

If the Contractor receives a Non-Conformance Notice from the Engineer, the Contractor shall submit a corrective action plan within 24 hours to address the deficiency. The corrective action plan must be accepted by the Engineer prior to continued paving operations.

Supporting documentation demonstrating that the corrective action was implemented and resolved the issue, including test results, shall be submitted to the Engineer within 7 business days to allow completion of TSR testing on plant or lab produced mixture.

All deficient mixture will be evaluated in accordance with Article 1.06.04. The mix will be assigned a "U" (Unapproved) status if additional tests performed by the Department demonstrate that the mixture does not meet Contract specification requirements.

Determination of "U" Status: Superpave mixes shall be considered on *"U" status* when any control point sieve, binder content, VA, VMA, VFA, N_{ini}, dust to effective binder ratio, and Gmm value is outside of the limits specified in Table M.04.03-4 on four (4) consecutive tests in any combinations, or the target binder content at the Plant is below the minimum binder content stated in Table M.04.02-5. In addition the average of 10 consecutive acceptance results for VFA, Density to N_{ini} or dust to effective binder ratio does not meet the criteria in tables M.04.02-2 and M.04.02-4. Note that further testing of samples or portions of samples not initially tested for this purpose cannot be used to change the status.

1. Any time the asphalt mixture is designated as "U" status:
   A. The Contractor shall notify the Engineer.
   B. The Contractor must take immediate actions to correct the deficiency, minimize material shipped 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.

      As a result of a U status, upon the submittal of an acceptable revised JMF, the mix status will be changed to PPT until the mix is corrected and a passing PPT is successfully completed.
2. 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 AASHTO re:source 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

	S0.25		**S0.375**		**S0.5**		**S1**		Tolerances
Sieve	Control Points		Control Points		Control Points		Control Points		From JMF Targets[2]
inches	Min (%)	Max (%)	Min (%)	Max (%)	Min (%)	Max (%)	Min (%)	Max (%)	+/- Tolerance
1.5	-	-	-	-	-	-	100	-	
1.0	-	-	-	-	-	-	90	100	
3/4	-	-	-	-	100	-	-	90	
1/2	100	-	100	-	90	100	-	-	
3/8	97	100	90	100	-	90	-	-	
No. 4	72	90	-	72	-	-	-	-	
No. 8	32	67	32	67	28	58	19	45	
No. 16	-	-	-	-	-	-	-	-	
No. 200	2.0	10.0	2.0	10.0	2.0	10.0	1.0	7.0	
Pb	JMF value		JMF value		JMF value		JMF value		0.30
VFA	JMF value		JMF value		JMF value		JMF value		5
VMA (%)	16.5		16.0		15.0		13.0		1.0[3]
VA (%)	4.0		4.0		4.0		4.0		1.0[4]
Gse	JMF value		JMF value		JMF value		JMF value		0.030
Gmm	JMF value		JMF value		JMF value		JMF value		0.030
Mix Temp. – HMA[5]	265-325°F [1]		265-325°F [1]		265-325°F [1]		265-325°F [1]		
Mix Temp. – PMA[5]	285-335°F [1]		285-335°F [1]		285-335°F [1]		285-335°F [1]		
Prod. TSR	N/A		N/A		≥80%		N/A		
T 283 Stripping	N/A		N/A		2 or less		N/A		

Notes: [1] 300°F minimum when temperature is below 50°F.
[2] JMF tolerances shall be defined as the limits for production compliance.
[3] 1.30 for all PWL lots except S/P 0.25 mixes. 1.10 for S/P 0.25 Non-PWL lots. 1.40 for S/P 0.25 PWL lots
[4] 1.2 for PWL lots
[5] Also applies to placement

Table M.04.03-5:
Modifications to Standard AASHTO and ASTM Test Specifications and Procedures

AASHTO Standard Method of Test	
Reference	**Modification**
T 30	Section 7.2 through 7.4 Samples are not routinely washed for production testing *Wash gradation required for mix design and PPT
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.
AASHTO Standard Recommended Practices	
Reference	**Modification**
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 AASHTO re:source. 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

Replace M.06.01 – 1 Bar Reinforcement *in its entirety with the following:*

1. **Bar Reinforcement:** Bar reinforcement shall be deformed and conform to the following: Uncoated bar reinforcement shall meet the requirements of ASTM A615, Grade 60. Epoxy coated bar reinforcement shall meet the requirements of ASTM A615, Grade 60 and shall be epoxy coated to the requirements of ASTM A775. All field repairs of the epoxy coating shall meet the requirements of ASTM D3963.

   Hot-dip galvanized bar reinforcement (HDG) shall meet the requirements of ASTM A615, Grade 60 and be galvanized, after fabrication, to the requirements of ASTM A767, Class 1, including supplemental requirements.

   Dowels and tie bars for masonry facing and for granite curbing shall be galvanized, after fabrication, in accordance with ASTM A767, Class 1.

   Continuously galvanized reinforcement (CGR) shall meet the requirements of ASTM A615, Grade 60 and be galvanized to the requirements of ASTM A1094, including supplemental requirements.

   Weldable bar reinforcement shall meet the requirements of ASTM A706.

Add the following:

M.06.05 – Repair of Damaged Galvanized Coatings: Zinc-rich paint for repair of zinc coatings on galvanized steel and for corrosion protection on uncoated bar reinforcement shall meet the following requirements:

- ASTM A780, Annex A2 with zinc dust concentration above 92% in the dried film;
- Zinc dust pigment shall conform to ASTM D520, Type III;
- The VOC content shall meet the current DEEP Air Compliance regulations for the coating category "zinc-rich primer;" (https://eregulations.ct.gov/eRegsPortal/Browse/RCSA/Title_22aSubtitle_22a-174Section_22a-174-41a/)
- Corrosion Performance Criteria: Must pass a minimum of 2000 hours of salt spray testing for a minimum of 2 mils of zinc in the dry film, without failure, in accordance with ASTM B117.
- **The use of aerosol galvanizing products is strictly prohibited. This applies to both shop and field touch ups or repairs.**

The products listed below meet the above requirements. If selecting one of these products, the Contractor shall submit a Materials Certificate in accordance with 1.06.07 or 1.20-1.06.07. Other products will be considered for the Engineer's acceptance by submitting a Materials Certificate and a Certified Test Report in accordance with

1.06.07 or 1.20-1.06.07, showing that the coating meets the specific requirements listed above.

Crown Low VOC Cold Galvanize Coating 93% Zinc Rich 7007VG
Aervoe Industries, Inc.
P.O. Box 485
Gardnerville, NV
89410
1-800-227-0196 or 1-775-783-3100
www.aervoe.com

ZRC Cold Galvanizing Repair Compound
ZRC 221
ZRC Worldwide
145 Enterprise Drive Marshfield, MA 02050-2132
1-800-831-3275 or 1-781-319-0404
www.zrcworldwide.com

SECTION 12.00 – GENERAL CLAUSES FOR HIGHWAY SIGNING

Description:

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

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

The Contractor shall obtain and provide to the Engineer sign installation data, including Global Positioning System (GPS) latitude and longitude coordinates, for all new permanent State owned and maintained signs (temporary and construction signs are not to be included) installed in the project. The Engineer shall forward the sign data to the Division of Traffic Engineering 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.

The horizontal datum is to be set to the State Plane Coordinate System, North American Datum of 1983 (NAD83) in feet. The minimum tolerance must be within 10 feet. The format of the GPS information shall be provided in a Microsoft Office compatible spreadsheet (Excel) file with data for each sign. The record for each sign installed is to be compatible with the anticipated CTDOT Sign Inventory and Management System (CTSIMS). The following format shall be used. However, the data fields noted by "#" are not required for the project submission. These entries will be completed as part of the Traffic Engineering CTSIMS data upload.

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

	Field Number	Type	size	Description
	1	text	20	Record Number (starting at 1…)
	2	text	20	Sign Catalog Number
#	3	text	10	Size Height
#	4	text	10	Size Width
	5	text	25	Legend
#	6	text	10	Background Color
#	7	text	10	Copy Color
	8	Link	25	Material (see acceptable categories)
	9	text	30	Comments if any
#	10	text	20	MUTCD Type
	11	text	15	Town

	12	text	5	Route
	13	text	5	Route direction
#	14	text	10	Highway Log Mileage
	15	text	15	Latitude
	16	text	15	Longitude
	17	text	25	Mounting Type
	18	text	25	Reflective Sheeting Type
	19	date	25	Date Installed
	20	text	10	Number of Posts
	21	text	255	Sheeting Manufacturer name and address
	22	text	15	State Project Number (or)
	23	text	15	Encroachment Permit number.
	24	Graphic	*	Sign Picture Graphic.

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

ITEM #0107090A – CTDOT BOUNDARY MARKER (SURVEY MONUMENT)

Description: Work done under this item consists of setting survey boundary markers (monuments, disks in ledge or concrete structures, or capped rebar) along new Right–of–Way acquisition lines in the locations indicated on the plans or as directed by the Engineer.

Materials: CTDOT concrete boundary monuments, CTDOT boundary disks, and CTDOT capped reinforcing bars (rebars) will be provided by the Department. All other materials (Granular Fill or quick setting grout) shall be the responsibility of the Contractor. The Contractor shall arrange to pick up CTDOT-supplied materials from the District Office or other designated location within the District.

Construction Methods: The Contractor shall be responsible for all computations, location, staking, and setting of highway boundary markers at all P.C.'s, P.T.'s and any other angle points in the State's Property Acquisition and Defined Highway Easement Lines as shown on the plans and the attached details, or as directed by the Engineer.

The standard boundary marker will be the CTDOT concrete boundary monument. Boundary disks set in ledge or structures and capped rebar shall be set at locations as shown in the plans or where the Engineer determines that it is impractical to set a concrete boundary monument.

The setting of boundary markers shall not begin until all excavation, filling operations, grading and drainage has been completed and approval has been granted by the Engineer.

The Contractor shall retain the services of a Land Surveyor licensed in the State of Connecticut to serve as Project Surveyor to directly oversee this work and to ensure that each marker has been set in accordance with CTDOT Standards. The Contractor shall provide to the Engineer the name, place of professional employment, business address, phone number, and license number of the Project Surveyor to the Department.

All boundary and staking computations shall be provided by the Project Surveyor to the Engineer and shall be approved by the District Survey Office prior to staking the locations of the boundary markers.

The Project Surveyor shall stake the location of the boundary markers at the location(s) shown on the plans or as directed by the Engineer. This work shall meet or exceed a positional accuracy of 1:5000 (0.02 feet per 100 feet) as defined in Section 20-300b-11 of the Regulations of Connecticut State Agencies.

Excavation for the placement of the CTDOT Boundary Monuments shall be by hand or with a power auger. The use of a backhoe or other heavy equipment for excavation purposes will not be allowed. The bottom of the hole shall be hand-tamped granular fill and the concrete monument shall be set plumb to the finished grade and backfilled with granular fill and suitable native soil, as shown in the detail (attached). The remaining backfill shall be compacted in six (6) inch layers or as directed by the Engineer.

In locations where the Engineer determines that concrete monuments cannot be set, the Project Surveyor shall set CTDOT Boundary disks or CTDOT Boundary capped rebars as directed. Rebar driving sleeves shall be used in the setting of capped rebars. All disks set in ledge or concrete shall be secured with ROCKITE®, KWIXSET®, QUIKRETE®**,** or approved equal fast setting hydraulic anchoring cement compound.

Concrete boundary monuments must be allowed to settle for fourteen (14) days. Once all concrete boundary monuments are completed and allowed to settle and all other boundary markers are in place, the Contractor shall notify the Engineer that the boundary marker disks are ready to be drilled. The CTDOT District Survey Office will verify the location of the boundary markers or monuments by drilling the exact location of the highway acquisition or highway easement lines on the boundary monuments or markers within 60 days of notification from the Engineer.

If any boundary marker disks are found to be outside of the boundary point locations and are unable to be drilled, the boundary monuments or boundary markers shall be removed and replaced at the Contractor's expense. Once the boundary monuments or markers have been drilled and found to meet Contract requirements, the Engineer will notify the Contractor of this acceptance.

Method of Measurement: This work will be measured for payment by the number of CTDOT boundary markers, (either monuments, disks, or capped rebar) complete and accepted in place.

Basis of Payment: This work will be paid for at the Contract unit price each for "CTDOT Boundary Marker (Survey Monument)" complete and accepted in place, which price shall include all computations, equipment, tools, transportation of Department-supplied materials, non-Department supplied materials, and labor incidental to the location, staking and setting of boundary markers, and shall include any disposal of excess excavated materials. The removal and replacement of non-conforming markers will not be paid.

Pay Item	**Pay Unit**
CTDOT Boundary Marker (Survey Monument)	ea.

CONNECTICUT DEPARTMENT OF TRANSPORTATION
Boundary/Control Monument Setting Procedures

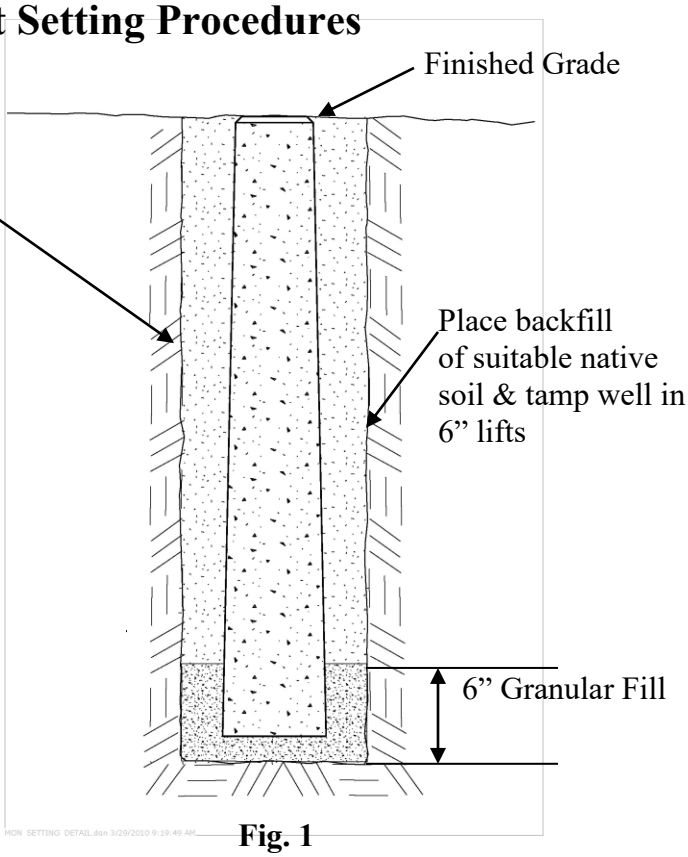
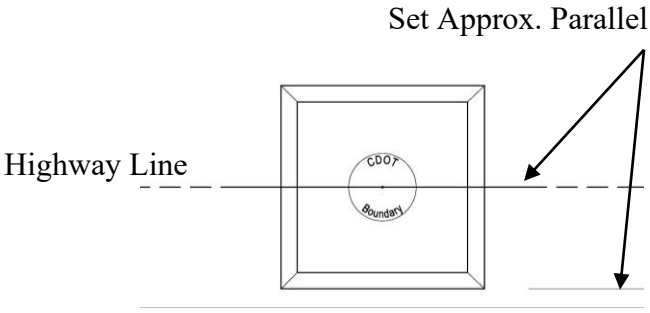


Fig. 1

Fig. 2



Procedure "A"
Setting CT DOT Survey Monuments to a specific point:
The Project Surveyor shall compute and stake the layout of each new CHD monument to be set. The stake shall be a 2" x 2" x 18" (or larger) hardwood stake and tack. The new monument shall be tied in to three points, the hole dug, and new monument placed as indicated above. The new monument is to be set plumb in the same horizontal position as the existing staked point to within three, one-hundredths (0.03') of a foot. It shall be positioned by the Contractor, to an exact point, within the specified tolerance. Any monuments not falling within the specified limits shall be reset at the Contractor's expense.

Procedure "B"
Setting CT DOT Survey Disc in ledge:
When a new CHD point falls on ledge which is exposed or within less than 2' of the ground surface, a CT DOT disc shall be set. A ¾" diameter hole shall be drilled to a depth of 3" and the surface of the ledge leveled so that the disc sits flush when complete. Discs shall be affixed using ROCKITE®, KWIXSET®, QUIKRETE®, or approved equal fast setting hydraulic anchoring cement compound in accordance with the manufacturer's recommended procedures.

Procedure "C"
Setting CT DOT "RECHD" (Capped Rebar)
This procedure shall follow the standards of Procedure "A" except a ¾" x 3' section of rebar is substituted for the traditional concrete monument. The rebar shall be driven with a protective sleeve and shall be set to within three one-hundredths (0.03') of a foot of the staked point, then topped with a two (2") inch diameter CT DOT aluminum cap, which receives the final precise drill hole. The capped "Re-CHD" shall be set flush to the ground.

ITEM #0202454A – SPECIAL TEST PIT – WATER MAIN

Description:

Work under this item shall include the completion of test pits for the purpose of locating the existing water main and to identify the occurrence, location and dimensions of existing subsurface structures. Work under this item shall also include excavation, inspection, measurements of the pipe, and backfilling. Measurements of the pipe shall include, but are not limited to, depth to the top of the pipe from the ground surface, outside diameter of the pipe, pipe size, pipe type, and the location of the pipe (test pit) using swing ties.

Work under this section shall include all labor, tools, materials, and equipment necessary for:

- obtaining road opening permit, if directed by the Engineer
- coordination of Call-Before-You-Dig mark out
- saw-cutting of the roadway, sidewalks, or driveways
- traffic control equipment (signs, barriers, etc.)
- traffic control coordination, including scheduling of policemen and flagmen
- furnishing and maintaining lighting
- mobilization and demobilization
- excavation and backfill
- furnishing, installing, operating and maintaining a dewatering system
- furnishing, installing and removing sheeting, bracing and trench boxes
- backfill and compaction of the excavation
- stockpiling, loading, hauling and legally disposing of surplus material
- asphalt and concrete pavement removal and disposal (including necessary saw cutting)
- removal and restoration of surfaces, walls, fences, signs and any other structures which must be removed to carry out the work
- removal of topsoil and sod
- care and protection of existing pipes, utilities, and other structures
- piling and storage of excavated materials

Materials:

Materials to be used for backfilling test pits shall consist of materials similar to the bedding material and Additional Backfill Material as specified in these specifications. When test pits are performed in areas that require pavement restoration, the subbase, base and surface courses must conform to the requirements for Temporary Pavement as specified in the special provision for Item #1304060A – Temporary Pavement Repairs (Water Main) and as shown on the drawings within Subset 07 – Utility – AWC associated with the installation of the Water Main.

Construction Methods:

If, in the opinion of the Aquarion Representative, the excavated material is unsuitable for backfill, it shall be removed and disposed of to such limits as directed by the Aquarion Representative.

Test pits shall be backfilled in accordance with these specifications.

Method of Measurement:

Special Test Pits will be measured for payment per each test pit performed, complete in place, and accepted.

Special Test Pits shall include the cost of excavating and backfilling a hole six feet long by six feet wide. Any excavation beyond the horizontal limits specified will not be measured separately for payment.

The quantity of additional material excavated and replaced, measured in place, as directed by the Aquarion Representative, will not be measured separately for payment.

Bedding material furnished, installed, and compacted, to the bedding material limits shown on the Typical Trench Detail, will not be measured separately for payment, but shall be included in the cost per each test pit performed.

Rock In Trench, Excavation and Disposal of Unsuitable Material, Additional Backfill Material and Temporary Pavement Repairs will be measured separately for payment under those appropriate Items.

Basis of Payment:

Special Test Pits will be paid for at the contract unit price per each test pit performed, complete in place, and accepted.

No separate payment will be made for any work beyond the horizontal limits specified above, but will be included in the contract unit price per each test pit performed, of the type specified, complete in place, and accepted.

No separate payment will be made for the quantity of additional material excavated or replaced, measured in place, as directed by the Aquarion Representative. No separate payment will be made for bedding material furnished, installed, and compacted, to the bedding material limits shown on the Typical Trench Detail, but will be included in the cost per each test pit performed.

Rock In Trench, Excavation and Disposal of Unsuitable Material, Additional Backfill Material and Temporary Pavement Repairs, related to the water main work will be paid for separately at the contract unit price under those appropriate Items.

Pay Item	**Pay Unit**
Special Test Pit – Water Main	ea.

ITEM #0210821A – WATER POLLUTION CONTROL

Description: This work shall consist of measures to control water pollution and soil erosion which become necessary for the completion of the work, but for which no item is provided in the Contract. Such measures include:

- temporary check dams, water bars, berms, dikes, dams
- temporary sediment traps
- pump settling basins
- silt fence
- inlet protection
- hay bales
- erosion control matting
- fiber rolls, coir rolls, wattles
- gravel, stone, riprap
- mulch
- permanent or temporary seeding
- slope drains, ditches, channels, temporary drainage measures
- dust control
- topsoil
- other erosion control materials, devices, or methods

If a situation arises that requires immediate deployment of water pollution control measures, the Engineer will direct the Contractor to use this item to prosecute the work.

If the Contractor proposes changes in construction methods or staging which would affect the as designed pollution controls, plans for revised pollution controls shall be submitted for the Engineer's approval prior to start of work.

Materials: The materials shall meet the pertinent articles of the Standard Specifications. The Contractor shall submit Product Data for the materials.

Construction Methods: The Engineer has the authority to control the surface area of earth material exposed by construction operations and to direct the Contractor to immediately provide permanent or temporary pollution control measures to protect watercourses, wetlands, or other natural resources. Every effort shall be made by the Contractor to prevent erosion on the Site and prevent runoff onto abutting property.

All disturbed areas shall be permanently or temporarily stabilized by mulching, seeding or other methods as the work progresses to comply with the intent of this specification.

All damaged slopes shall be repaired as soon as possible. The Engineer will limit the surface area of earth material exposed if the Contractor fails to sufficiently protect the slopes.

The Contractor shall always have on hand the necessary materials and equipment to provide for slope stabilization and corrective measures to damaged slopes.

Temporary channels, ditches, water bars and outfalls shall be protected prior to directing water into them.

The erosion control features installed by the Contractor shall be maintained by the Contractor, and such installations shall be removed if ordered by the Engineer. Maintenance of erosion control measures by the Contractor shall include the clean out of accumulated sediment.

Method of Measurement: The work and materials required for Water Pollution Control measures will be measured for payment as provided for under 1.09.04 - Extra and Cost-Plus Work.

The sum of money shown on the estimate and in the itemized proposal as "Estimated Cost" for this work 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: Work will be paid for as provided under 1.09.04 - Extra and Cost-Plus Work.

Control measures that are made necessary by the Contractor's failure to install and maintain controls as a part of the work as scheduled or ordered by the Engineer shall be performed by the Contractor at its own expense.

Control work at off-Site areas selected by the Contractor shall be the responsibility of the Contractor.

Pay Item	Pay Unit
Water Pollution Control	est

ITEM #0219011A – SEDIMENT CONTROL SYSTEM AT CATCH BASIN

Description: Work under this item shall consist of furnishing, installing, maintaining, replacing, and removing sediment control system at catch basins, herein referred to as Silt Sack, at the locations as shown on plans or as directed by the Engineer. The work shall also include removal of accumulated sediment, and disposal of accumulated sediment,

Materials: The Silt Sack must be commercially produced and marketed for the specific application(s) on the Project. All Silt Sack must be manufactured from a specially designed woven polypropylene geotextile sewn material. The Silt Sack must be able to handle flows of at least 180 gallons per minute per square foot, fit any sized catch basin or drop inlet, and be UV resistant.

The Silt Sack product shall be one of the following or an approved equal:

1. Siltsack®
2. Dandy Sack®
3. FleXstorm Catch-It™
4. PIG®Sediment-Drain Filter
5. ACF Environmental Silt Sack

The Sediment Control System at Catch Basin must have the following features: two dump straps attached at the bottom to facilitate the emptying of the Silt Sack and lifting straps to be used to lift the Silt Sack from the catch basin or drop inlet. The Silt Sack shall have a restraint cord approximately halfway up to keep the sides away from the catch basin or drop inlet walls. When required, a curb deflector shall be installed as directed by the Engineer.

Product Data for the Silt Sack to be used by the Contractor must be submitted for review and acceptance by the Engineer or their authorized delegate prior to the installation on-Site.

Construction Methods: The Contractor shall install the Silk Sack per the manufacturer's instructions and recommendations at each catch basin or drop inlet as shown on the plans or as directed by the Engineer to provide inlet protection to prevent silt, sediment, or debris from entering the stormwater drainage system.

When the Silt Sack becomes 1/2 full of accumulated sediment, the Contractor shall empty, clean, and replace the Silt Sack back into the catch basin or drop inlet. Sediment emptied shall be considered unsuitable material and be disposed of at an off-Site approved upland facility per federal, State, and local environmental laws and regulations.

At the completion of the Project, the Contractor shall remove all Silt Sacks within the Project limits. Any spilled sediment material during removal operations shall be removed by the Contractor at no cost to the State.

Method of Measurement: Sediment Control System at Catch Basin will be measured as each installed, maintained, accepted, and removed. There will be no separate measurement for maintenance or replacement associated with this item.

Basis of Payment: The item "Sediment Control System at Catch Basin" will be paid at the Contract unit price for each completed system in place and accepted, which price shall include installing, maintaining, replacing, removal of material, off-Site disposal of accumulated material, materials, equipment, tools, and labor incidental thereto.

The cost of installing hay bales, geotextile, check dam, or fiber roll for inlet protection shall be paid for under their respective Contract item or special provision.

Pay Item	**Pay Unit**
Sediment Control System at Catch Basin	ea.

ITEM #0406002A – TEMPORARY PAVEMENT

Description: This work shall consist of the installation and removal of temporary pavement for new catch basins, manholes, storm drainage pipe and sanitary sewer pipe as shown on the plans or as directed by the Engineer. The work shall include the following:

1. Excavation, removal, and disposal of all existing materials within the limits of the temporary pavement including sawcutting of any existing pavement,
2. Grading and compacting remaining subbase or subgrade,
3. Furnishing, installation, and compaction of new subbase,
4. Application of tack coat as required on the vertical edges of any sawcut areas and between pavement lifts,
5. Placement and compaction of bituminous concrete pavement,
6. Removal of all materials associated with the temporary pavement work as shown in the Contract documents or determined by the Engineer.

This work does not include restoration of the area to a permanent condition after temporary pavement is removed, including turf establishment or final paving, which shall be performed under separate items.

Materials: Materials for this work shall consist of the following:

1. Subbase meeting the requirements of Article M.02.02.
2. Bituminous concrete meeting the requirements of Section M.04. The bituminous concrete mix used shall be HMA S0.5 Traffic Level 2 unless indicated otherwise on the Plans, or when an equivalent mix type is requested by the Contractor and approved by the Engineer at least 5 days in advance.
3. Tack coat meeting the requirements of Section M.04.

Construction Methods: Equipment for this work shall include pavement cutting as required, excavation, removal, handling, grading, placement, and compaction equipment for existing or new materials to perform all temporary pavement installation and removal operations. The Contractor shall also provide a 10-foot straightedge.

1. The limits of temporary pavement shall be identified as shown on the Plans or as directed by the Engineer.
2. Any existing pavement shall be sawcut as required. All existing materials within the temporary pavement limits (including but not limited to asphalt or concrete pavement, granular base, subbase, subgrade, fill, topsoil, and curbing) shall be excavated to the depth indicated on the Plans in accordance with Section 2.02. Excavated materials shall be removed and properly disposed of in accordance with Article 1.10.03.
3. Remaining subbase or subgrade shall be graded and compacted in accordance with Section 2.09. A minimum of four (4) passes, or coverages, shall be made by any one compaction device.

4. Subbase shall be installed and compacted in accordance with Section 2.12 to the depth shown on the Plans.
5. When applicable, the sawcut sides of any excavated areas shall be wiped or swept clean, and tack coat shall be applied covering the entire area of the vertical pavement faces and allowed to cure in accordance with Section 4.06.
6. HMA S0.5, or other approved mix type, shall be placed and compacted in accordance with Article 4.06.03 and as shown on the Plans.
7. The Contractor shall confirm that the surface elevation of the finished temporary pavement matches the elevation of the surrounding pavement surface to within ¼ inch using the 10-foot straightedge when applicable.
8. Each lift of the temporary pavement surface course shall not vary more than ¼ inch from a Contractor-supplied 10-foot straightedge. Any surface that exceeds this tolerance shall be corrected by the Contractor at their own expense.
9. All materials associated with the temporary pavement work shall be removed and properly disposed of in accordance with Article 1.10.03 at a time specified within the Contract documents or as directed by the Engineer.
10. All temporary pavement work shall be maintained in a safe and satisfactory condition until the temporary pavement area has been restored to its preexisting condition or replaced with the construction of permanent pavement or other surface type as shown in the Contract documents. All temporary pavement repairs shall be provided by the Contractor at no additional cost to the State.

Method of Measurement: This work will be measured by the number of square yards of temporary pavement installed and removed at the locations shown on the Plans or as directed by the Engineer.

Basis of Payment: This work will be paid for at the Contract unit price per square yard for "Temporary Pavement," completed and accepted. The price shall include all tools, materials, labor, and equipment including sawcutting, excavation, removal, and disposal of all materials, grading and compacting existing subbase or subgrade, placement, grading, and compacting new subbase, application of tack coat, and placement and compaction of bituminous concrete materials.

Restoration of the area to a permanent condition after temporary pavement is removed, including turf establishment or final paving, will be paid under separate items.

There will be no additional payment for correction of temporary pavements that do not meet the specified surface tolerance when measured with the 10-foot straightedge. There will be no additional payment for repair of temporary pavements.

Pay Item	**Pay Unit**
Temporary Pavement	s.y.

ITEM #0406312A – GUTTER LINE SEALING FOR BRIDGES

Description: This work shall consist of applying hot-applied asphalt crack sealant along the gutter line of bridges after paving to seal the joint between the bituminous concrete overlay and parapet, curb, or barrier at the locations and to the limits shown on the Plans.

Materials:

1. Crack Seal: The crack seal material shall be composed of a hot-applied asphalt meeting ASTM D6690 Type II requirements.

   Prior to the start of work, the Contractor shall submit a Materials Certification (MC) in accordance with Article 1.06.07 certifying the joint seal material meets these requirements. The Contractor must submit to the Engineer all Safety Data Sheets (SDS) from the material manufacturer prior to the commencement of work.

2. Blotting Agent – Detackifier: This material shall be a fine-graded granular material with 100% aggregate passing the 3/16-inch sieve and no more than 5% passing the #200 sieve when tested in accordance with AASHTO T 27 and T 11.

   The material shall be as recommended by the supplier of the crack sealant and shall be used as recommended by the supplier, except that no paper, cotton, or other organic materials will be allowed. Product Data shall be submitted to the Engineer for review in accordance with Article 1.05.02.

Construction Methods: The 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 the following:

   a. Melter Applicator: This 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. Thermometers shall monitor the material temperature and the heating oil temperature. Thermostatic controls shall 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 and be designed with a configuration to properly strike off the sealant placed along the gutter line of the bridge, adjacent bituminous concrete overlay and parapet, curb, or barrier to the dimensions specified. It shall be of a size adequate to strike off, flush with the surrounding areas, all crack seal material placed. This tool shall be either attached to the applicator wand or be a separate long handled tool.

c. Hot Air Lance: This shall be designed for cleaning and drying the pavement edge along the curb parapet or barrier. Minimum compressed air capacity shall be 100 psi. The oil-free compressed air emitted from the tip of the lance shall be oil free and capable of achieving a temperature of at least 1500°F.

2. Weather Requirements: The pavement shall be dry without frost, snow, ice, or standing water on the roadway surface and within the areas to be sealed. The ambient temperature must be at least 40ºF and rising during application.

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 sealant shall never exceed 400°F. The treatment material shall be maintained at the manufacturer's specified/recommended application temperature range during application. The sealing operation shall be suspended if the temperature of the crack sealant falls outside the specified temperature range and shall remain suspended until the crack sealant is brought within the specified range.

4. Delineation of Areas to be Sealed: Prior to the sealing operation, the Contractor shall locate and mark out the start and end limits of the work. The sealing shall span the entire length of the structure and be done along each side of the bridge such that both gutter lines are completely sealed, as shown on the Plans. Sealing shall be performed after the surface lift of the bituminous concrete overlay is placed, at a time determined by the Engineer, not to exceed 4 weeks after final paving is completed. The sealing operation shall not damage or otherwise negatively impact the performance of any portion of the overlay, membrane waterproofing, bridge deck, joint, or other structural element.

Sealing Preparation: Areas to be sealed shall be treated with a hot air lance prior to application of the crack seal material. A minimum of two (2) passes shall be made. Within 10 minutes of the second hot air lance treatment the sealant shall be applied. The use of the hot air lance is not intended to heat the areas to be sealed. It is to be used to blow away all debris and remove any latent moisture from the areas to be sealed until the area 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. If standing water is present, 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 to help accelerate the natural evaporation process.

If standing water remains after using compressed air, the area shall be allowed to dry naturally until remaining standing water evaporates. The hot air lance shall be used after visible water has evaporated. If an area is already completely dry as determined by the Engineer, the hot air lance shall be operated at its lowest temperature possible.

The parapet, curb, or barrier face shall be masked off above the sealant line to ensure straight, clean, and neat lines are provided along the vertical surface and that crack seal material is placed within the dimensions specified below.

5. Sealing Operation: Once prepared, all specified areas shall be sealed along their entire length with the crack seal applicator. Crack seal shall be placed 2 inches up onto the parapet, curb, or barrier face and 4 to 6 inches onto the adjacent bituminous concrete overlay. There shall be no build-up of sealant material above or adjacent to the sealed areas beyond these limits. Sealed areas are to be flattened with the squeegee applicator immediately following application of the crack sealant, striking excess material flat and even with the adjacent surface(s). If the initial application of crack sealant fails to fill the area flush or shrinks upon cooling with a depression of 1/8 inch or greater, additional applications of sealant shall be placed where necessary. Care shall be taken during the sealing operation to ensure that overfilling and spilling of material is avoided.

6. Protection of Sealed Areas: Traffic shall not be permitted on the sealed area of pavement along the gutter line until the crack sealant is set, so that the material does not deform or track and be pulled out by tires. If work under this item is not followed by placement of an overlay of any kind, a detackifier or blotting agent shall be used. If the work under this item is being performed prior to placing a surface treatment (e.g., chip seal), a detackifier or blotting agent will not be allowed.

7. Removal and Disposal of Material: All debris generated from the operations described above shall be removed by the Contractor. Treatment material remaining in the Contractor's kettle at the end of the work shift shall be properly discarded. Treatment material shall not be re-heated for use in subsequent crack sealing applications unless permitted by the Engineer. All debris and surplus treatment material shall be properly disposed of in accordance with Article 1.10.03 and State of Connecticut regulations.

8. Acceptance of Work: When work is complete, an inspection shall be scheduled. The Engineer will note all deficiencies including areas exhibiting adhesion failure, cohesion failure, tracking of sealant material, locations of missing, incompletely or incorrectly constructed sealant, or other factors that show the work is not acceptable. 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 sealed, verified and accepted by the Engineer.

Basis of Payment: This work will be paid for at the Contract unit price per linear foot for "Gutter Line Sealing for Bridges" 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.

Pay Item	**Pay Unit**
Gutter Line Sealing for Bridges	l.f.

ITEM #0406314A – 80 MIL PAVEMENT MARKING GROOVE 5" WIDE

ITEM #0406315A – 80 MIL PAVEMENT MARKING GROOVE 7" WIDE

Description: Work under this item shall consist of grooving the pavement surface in continuous or intermittent intervals for the placement of recessed pavement markings. Unless otherwise noted, the groove shall be 1 inch wider than the anticipated pavement marking. The groove for double-yellow centerline markings shall consist of two grooves, each 5 inches wide.

Groove Width: 5 inches wide for 4-inch markings

Groove Depth: 0.080 inches ± 0.010 inches

The groove shall not be installed continuously for intermittent (Dotted Lines and Broken Lane Lines) pavement markings, but only where markings are to be applied.

The groove shall not be installed on metal bridge decks, on bridge joints, at drainage structures, at loop detector sawcut locations, or in other areas identified by the Engineer.

Construction Methods:

Equipment:

The grooving equipment shall be equipped with a free-floating, depth-controlled head which provides a consistent groove depth over irregular pavement surfaces. The grooving head shall only be equipped with diamond saw blades. Any ridges in the bottom of the groove shall have a maximum height of 0.015 inches. The grooving equipment shall be capable of installing a groove 6 inches away from any vertical or horizontal obstruction.

Installation: The pavement marking groove shall be installed in accordance with the current CTDOT pavement marking standard drawings.

The Contractor shall establish control points for measuring offsets and pre-marks along the entire distance of pavement being grooved. Prior to installation of the groove, the Contractor shall verify that the equipment is capable of installing the correct width and spacing of the groove. The control points, pre-marks, and equipment will be reviewed by the Engineer prior to commencement of the work.

The groove will be considered defective if any edge of the groove varies more than 0.25 inch in a 10-foot length, or if the alignment of the groove visibly deviates from the normal alignment of the road.

Final Cleaning: The Contractor shall immediately collect all debris and dust resulting from the grooving operation by vacuuming the pavement groove and adjacent pavement surface. Collected debris and any waste material shall be properly disposed of by the Contractor.

The work area shall be returned to a debris-free state prior to re-opening to traffic.

Repair of Unacceptable Groove:
The Contractor shall repair any defective groove(s) to the satisfaction of the Engineer. All work in conjunction with this repair shall be performed at no additional cost to the State.

Pavement Marking Requirements:
The Contractor is required to install permanent pavement markings in the grooves before the lane or roadway is opened to live traffic. If the permanent pavement markings cannot be installed before the lane or roadway is opened to live traffic, the Contractor will need to obtain approval from the Engineer to open the lane or roadway. Liquidated Damages based on Limitation of Operations restrictions will be enforced. If approved by the Engineer, the Contractor will be allowed to open the lane or roadway to live traffic and the Contractor will be required to install temporary hot-applied waterborne pavement markings without glass beads, at their own expense, within 24 hours of opening the lane or roadway. Temporary hot-applied waterborne pavement markings shall be applied at a 5 mil thickness. Within 5 calendar days after the installation of the groove, permanent pavement markings shall be applied in the groove over the temporary hot-applied waterborne pavement markings.

Groove Depth Gauge:
The Contractor shall supply the Engineer with two accurate, easily readable gauges with which to verify groove depth for the duration of the Project. The gauges shall be delivered at least one week prior to the anticipated beginning of grooving operations. Gauges shall be accompanied by the manufacturer's instructions for their use. The gauges will be returned to the Contractor at the conclusion of the Project.

Method of Measurement: This work will be measured for payment by the number of linear feet of grooves installed in the pavement as ordered and accepted by the Engineer.

Basis of Payment: This work will be paid for at the Contract unit price per linear foot of "Pavement Marking Groove" installed in the pavement and accepted. This price shall include cleaning of the pavement, all materials, equipment, tools, depth gauges, and labor incidental thereto, and disposal of any waste material resulting from the grooving operation.

Pay Item	**Pay Unit**
80 Mil Pavement Marking Groove 5" Wide	l.f.
80 Mil Pavement Marking Groove 7" Wide	l.f.

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 the following:

I. Hot Mix Asphalt (HMA) and Polymer Modified Asphalt (PMA),
II. Ultra-Thin Bonded HMA (UTB-HMA) and Ultra-Thin Bonded PMA (UTB-PMA),
III. Thin Friction Wearing Course (TFWC),
IV. Binder Rich Intermediate Courses (BRIC) and Stone Matrix Asphalt (SMA),
V. Balanced Mix Design (BMD), and
VI. Asphalt Rubber Chip Seal (ARCS) treatments 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 the following conditions are met per mixture:

I. For HMA, PMA, TFWC, BRIC, SMA, and BMD mixtures:
   a. The HMA, PMA, TFWC, BRIC, SMA, or BMD 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, PMA, TFWC, BRIC, SMA, and BMD 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 UTB-HMA and UTB-PMA mixtures:
   a. The UTB-HMA or UTB-PMA mixture for which the adjustment would be applied is listed as a Contract item.
   b. ***The total quantity for the UTB-HMA or UTB-PMA mixture in the Contract exceeds:***
      i. 800 tons if the UTB-HMA or UTB-PMA item has a pay unit of tons,
      ii. 30,000 square yards if the UTB-HMA or UTB-PMA item has a pay unit of square yards, or
      iii. the Project duration is greater than 6 months.
      Note: The quantity of UTB-HMA or UTB-PMA measured in tons shall be determined from the material documentation requirements set forth in the UTB-HMA or UTB-PMA item specification.
   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 UTB-HMA or UTB-PMA mixture system.

III. For Asphalt Rubber Chip Seal (ARCS) treatments:
   a. The ARCS treatment for which the adjustment would be applied is listed as a Contract item.

b. ***The total quantity for the ARCS treatment in the Contract exceeds 30,000 square yards or the Project duration is greater than 6 months.***

Note: The quantity of asphalt binder measured in tons used for the Asphalt Rubber Chip Seal treatment shall be determined from the material documentation requirements set forth in the ARCS item specification. The Asphalt Adjustment Cost will also be applied to the asphalt binder used to pre-coat the cover aggregate as part of the ARCS and will be considered as a portion of the total tons of binder for the treatment. The additional quantity of binder measured in tons will be determined based on a percentage of the cover aggregate weight per the requirements set forth in the ARCS item specification.

c. The difference between the posted *Asphalt Base Price* and *Asphalt Period Price* varies by more than $5.00 per ton.

Regardless of the binder used in all mixtures or treatments, 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:

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

Where:

- **HMA:**
  1. For HMA, PMA, UTB-HMA, UTB-PMA, TFWC, BRIC, SMA, and BMD mixtures with pay units of tons:
     The quantity in tons of accepted HMA, PMA, UTB-HMA, UTB-PMA, TFWC, BRIC, SMA, or BMD mixture measured and accepted for payment.
  2. For UTB-HMA and UTB-PMA mixtures with pay units of square yards:
     The quantity of UTB-HMA and UTB-PMA mixture delivered, placed, and accepted for payment, calculated in tons as reported according to the Material Documentation provision of the UTB-HMA and UTB-PMA specification.
- ***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, PMA, UTB-HMA, UTB-PMA, TFWC, BRIC, SMA, or BMD 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 UTB-HMA, UTB-PMA, TFWC, BRIC, SMA, and BMD 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%)

B. For Asphalt Rubber Chip Seal:

Formula B: Total Tons x [(*Period Price - Base Price*)] = $ ____

Where:

- ***Total tons:*** The tons of asphalt binder for each lot of asphalt rubber produced, as reported according to the Testing and Certification article of the specification for Asphalt Rubber Chip Seal, and the tonnage of binder used to coat the cover aggregate calculated as follows: 0.6% x tons of cover aggregate.
- ***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 Asphalt Rubber Chip Seal mixture was placed.

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 applicable formula(s) indicated above. A payment will be made for an increase in costs. A deduction from monies due the Contractor will be made for a decrease in costs.

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

Pay Item	Pay Unit
Asphalt Adjustment Cost	est.

ITEM #0503001A – REMOVAL OF SUPERSTRUCTURE

Section 5.03 is supplemented with the following:

Description: Add the following: Also included in the work is the removal of concrete diaphragms and safe removal and disposal of existing abandoned gas service, sanitary sewer, and water main in connection with partial demolition of existing superstructure.

Construction Methods: Add the following: Removal of existing inactive 2-inch gas service shall be coordinated with Eversource.

The Contractor shall coordinate removal of existing 24-inch ductile iron sanitary sewer with the Town of Seymour Water Pollution Control Authority (WPCA). Removal of the sanitary sewer may not begin until the relocated sanitary sewer has been completely installed, tested, accepted, and placed into service.

The Contractor shall coordinate removal of the existing 8-inch water main with the Aquarion representative and shall confirm flow to the pipe segment has been terminated and the pipe dewatered prior to removal.

ITEM #0514020A – PRECAST CONCRETE BEAM

Work under this item shall meet the requirements of Section 5.14, amended as follows:

Delete Article 5.14.02 and replace with the following:

All materials shall meet the requirements of M.14.01 supplemented with the following:

10. All hardware cast into the precast components, for lifting, anchoring, adjusting, and seating the precast components shall be steel, galvanized in accordance with ASTM A153 or ASTM B695, Grade 50; or be stainless steel.

5.14.03 – Construction Methods:

1. Submittals:

B. Shop Drawings: *Add the following*:

The shop drawings for the prefabricated concrete components shall include the following:

- Details and locations of all through holes and cast-in-place hardware for lifting, anchoring, adjusting, and seating the beams.
- Minimum concrete compressive strengths required prior to form removal and prior to loading the precast components for shipping from the fabricator plant.
- Supplemental temporary bracing, including installation and removal requirements.
- Key/schedule of concrete surface finishes

C. Working Drawings: *Delete the two paragraphs and replace with the following:*

1. General: The Contractor shall submit Working Drawings, supporting computations, product and equipment data for form removal, handling, shipping, erection, and placement of the prefabricated components at the site in accordance with 1.05.02-2.

The working drawing submittals shall be divided into two parts: a plant fabrication submittal, and a field construction submittal.

2. Plant Fabrication Submittal: The plant fabrication working drawing submittal shall be submitted simultaneously with the shop drawing submittal and shall address the form removal, handling, storage, including dunnage requirements, shipping, including dunnage and tie down requirements, unloading and re-orienting precast components at the project site to the upright position and lifting precast components with rigging using embedded lifting hardware.

The Contractor/Fabricator shall evaluate the precast components to ensure the components meet the requirements of the AASHTO LRFD Bridge Design Specification and the AASHTO LRFD Guide Specification for Accelerated Bridge Construction 1st edition, Article 8.4 for form removal, handling, shipping, and erection. The evaluation shall account for changes in concrete strength and load/support conditions of the precast components. The evaluation shall be included in the working drawing plant fabrication submittal.

The Contractor/Fabricator is responsible for determining all pick points required for lifting and re-orienting/rotating the precast components at the fabrication plant and at the project site, and for the final erection of the components. Hardware for lifting shall be designed and evaluated based on the concrete strength at the time of the intended lift and the rigging orientation to ensure its adequacy.

Any fabrication or construction limitations and requirements resulting from the evaluation of the precast components shall be shown on the shop drawings and the working drawing fabrication submittal.

The need for supplemental temporary bracing (i.e. tension ties, tendons, or rods; struts) to minimize and mitigate load effects on the beams being rotated, lifted, moved, relocated, or transported at the fabrication facility, being transported from the fabrication facility to an intermediate site or the final project site, or being rotated, lifted, or erected at the project site shall be investigated by the Contractor/Fabricator. The need for temporary bracing to support the erected precast components until the structure is in complete being shall be investigated by the Contractor/Fabricator. The evaluation performed to determine whether temporary bracing is required shall be documented in the plant fabrication working drawing submittal. Justification shall be provided when no temporary bracing is required. The temporary bracing shall be designed by the Contractor/Fabricator and located so that it will not impact field construction. Requirements for the installation and removal of the temporary bracing shall be shown on the shop drawings and the working drawing submittals.

The use of post installed anchorages in the precast components is not permitted.

All cast-in place hardware shall be designed and located by the Contractor/Fabricator. The type, number, alignment of the hardware shall be chosen by the Contractor/Fabricator and located to not adversely affect the fabrication of the design shown on the plans or field construction. The use of supplemental reinforcement with the hardware is permitted. All hardware shall be recessed below adjacent concrete surfaces. Keyways that recess the hardware to facilitate installation are permitted. The keyways shall have roughened, exposed aggregate surfaces. Prior to applying load to the embedded hardware, the concrete shall attain the minimum concrete compressive strength associated with the safe working load of the hardware. All cast-in-place hardware in the precast components, including supplemental reinforcement, shall be shown on the shop drawings.

3. **Field Construction Submittal:** The field construction working drawing submittal shall be submitted prior to delivery of the precast components and shall address the erection methods and equipment used for unloading and placement of the prefabricated components at the site. The submittal shall be coordinated with the shop drawings and fabrication working drawing submittal. The field construction working drawing submittal shall include the following:

   - Plan of the work area showing all structures, roads, 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 or pedestrian 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. The orientation of the rigging shall match that assumed for the design and evaluation of the precast components and embedded hardware as shown on the shop drawings and fabrication working drawing submittal.

- 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. The adequacy of the of the earth or structure to support the construction loads from the crane shall be verified.

- 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.).

- Requirements for installation and removal of temporary bracing for handling, unloading, re-orienting precast components, and erection.

- Requirements for dunnage for handling, unloading, and re-orienting precast components.

- Requirements for installation and removal temporary bracing to support to support of the erected precast components until the structure is in complete being.

The Contractor shall be solely responsible for the adequacy of the drawings and computations, falsework, and other equipment and material necessary to place the precast components safely and without damage to the components.

D. Quality Control Sampling and Testing: *Add the following after the first paragraph*:

Concrete cylinder compressive tests shall be performed to verify the concrete compressive strength requirements have been met before the forms are removed from a precast component, the precast component be rotated, lifted, moved, relocated, or transported at the fabrication facility; and before the precast components are transported from the fabrication facility.

Delete Article 5.14.03-2 through 8 and replace with the following:

2. Plant Fabrication: The plant fabrication of all prefabricated concrete structural components shall be in accordance with the latest edition of PCI MNL-116 amended as follows:

A. Inspection: Inspection shall meet the requirements of 1.05.10.

The Engineer will perform inspection, including sampling and testing, during fabrication and installation, to evaluate the quality and degree of compliance of the precast components to the Contract documents. Additionally, the Engineer will monitor the Fabricator's QC activities to ensure the Fabricator is properly administering and in conformance with the QC Plan.

An Engineer will be assigned to perform inspection activities during fabrication, which includes the inspection of the materials, work procedures, and the precast components. The CTDOT shall be given at least 5 working days' notice of the scheduled fabrication start date.

The Engineer's inspection activities performed at the Fabricator's facilities shall remain independent from the Fabricator and does not replace the Fabricator's required QC activities.

As noted in the contract documents and when otherwise requested by the Engineer, advance notice of specific Fabricator activities, such as form removal, handling and storage, shipping, and loading shall be provided to the Department.

B. Tolerances: Fabrication shall comply with tolerances specified on the contract plans. In the absence of specifications on the plans, tolerances shall comply with the latest version of the PCI MNL 135, Precast Tolerance Manual.

C. Forms: The finishes of formed surfaces shall be in accordance with the schedule of finishes shown on the shop drawings.

D. Reinforcement and Hardware: Reinforcement placement and assembly shall be in accordance with 6.02.

E. Concrete: The Contractor shall provide the Engineer advance notification prior to placement, in accordance with 1.05.10.

The use of truck-mixed or ready-mixed concrete from a source not located at the precast facility is prohibited.

The concrete temperature shall be 60°F to 90°F at the time of placement.

Surfaces shall be finished in accordance with the schedule of finishes shown on the shop drawings.

F. Temperature Monitoring: At a minimum, temperatures of the form, ambient temperatures surrounding the concrete, and temperatures of the concrete shall be continuously and without interruption monitored, recorded, and reported as specified below:

1. Prior to placement of concrete to verify that $T_i \geq 60°F$.
2. Immediately after placement to verify that $T_i \geq 60°F$ is maintained.
3. Throughout the entire duration of the curing cycle, at regular intervals not to exceed one hour until 100% of the specified design compressive strength, f'_c, is attained and concrete has cooled to within 40°F of the ambient temperature surrounding the precast components.

At a minimum, the temperature measuring devices shall record and report the temperature of the concrete to the nearest 2°F. At least two temperature sensors (thermocouples) shall be positioned to record the maximum and minimum anticipated concrete temperatures. The anticipated minimum temperature shall be measured with one or more thermocouples at a distance no greater than 2 inches from the surface of the thinnest component. The anticipated maximum temperature shall be measured with one or more thermocouples at the center of the thickest component. Proposed temperature measurement locations shall be submitted to the Engineer for approval. Temperature recording devices shall be located within the curing enclosure and calibrated as required by PCI MNL-116 Section 4.18.4. Maximum heat increase and cool down rates shall comply with PCI MNL-116, Section 4.19. Temperature logs, recorded at a minimum frequency of once per hour, shall be submitted with each post-pour QC inspection report.

G. Concrete Curing:

1. **Initial Curing Methods:** After the placement of concrete and prior to concrete finishing, initial curing methods shall be initiated when the concrete surface begins to dry, to reduce moisture loss from the surface. Application of one or more of the following initial curing methods shall occur immediately after the bleed water sheen has disappeared.

    a. Fogging: Fogging nozzles shall atomize water into a fog-like mist. The fog spray shall be directed and remain visibly suspended above the concrete surface, to increase the humidity of the air and reduce the rate of evaporation. Water from fogging shall not be worked into the surface during finishing operations and shall be removed or allowed to evaporate prior to finishing.

    b. Liquid-applied Evaporation Reducers: Evaporation reducers shall be sprayed onto the freshly placed concrete surface to produce an effective monomolecular film that reduces the risk of plastic-shrinkage cracking and rate of evaporation of the bleed water from the concrete surface. Evaporation reducers shall be applied in accordance with manufacturer's recommendations.

2. **Intermediate Curing Methods:** Intermediate curing methods shall be initiated if concrete finishing has taken place prior to the concrete reaching final set. The freshly finished concrete surface shall be protected from moisture loss, by the continuation of initial curing methods (fogging and evaporation reducers) until final curing methods are applied or by the use of liquid membrane-forming curing compounds (5.14.3-2.G.3d).

3. **Final Curing Methods:** Final curing methods shall be initiated and applied to the concrete immediately after the following conditions are met:

    - Completion of concrete finishing
    - Final set of concrete
    - Concrete has hardened sufficiently enough to prevent surface damage

    During curing of the fabricated of precast concrete components, the required concrete temperature shall be maintained within the range specified for the final curing method used until the time and strength conditions are met. Controlled and gradual termination of the sustained concrete temperature shall occur after all specified conditions are met. The concrete temperature shall be reduced at a rate not to exceed 36°F per hour until the concrete temperature is within 20°F of the ambient temperature outside of the final curing enclosure. A minimum concrete temperature of 40°F shall be maintained until 100% of

the specified design compressive strength, f'_c , is attained (see 5.14.3-2.I - Handling and Storage).

a. Water Spray Curing: All exposed concrete surfaces shall remain moist with a continuous fine spray of water throughout the entire duration of the final curing. Water spray curing shall meet the requirements of Table 5.14.3-2.G.3a-1.

Table 5.14.3-2.G.3a-1
Final Curing Method Requirements for Water Spray

Sustained Concrete Temperature	Curing Cycle Duration	Concrete Compressive Strength
60°F ≤ °F ≤ 90°F	≥ 5 days	≥ 70% f'_c

b. Saturated Covers for Curing: All exposed concrete surfaces shall remain moist with a continuous application of saturated covers throughout the entire duration of the final curing. Saturated covers curing shall meet the requirements of Table 5.14.3-2.G.3b-1. Saturated covers shall be allowed to dry thoroughly before removal to provide uniform, slow drying of the concrete surface.

Table 5.14.3-2.G.3b-1
Final Curing Method Requirements for Saturated Covers

Sustained Concrete Temperature	Curing Cycle Duration	Concrete Compressive Strength
60°F ≤ °F ≤ 90°F	≥ 3 days	≥ 70% f'_c

Saturated covers, such as burlap, cotton mats, and other coverings of absorbent materials shall meet the requirements of AASHTO M 182, Class 3. Saturated covers shall be in good condition, free from holes, tears, or other defects that would render it unsuitable for curing concrete. Saturated covers shall be dried to prevent mildew when storing. Prior to application, saturated covers shall be thoroughly rinsed in water and free of harmful substances that are deleterious or cause discoloration to the concrete. Saturated covers shall have sufficient thickness and proper positioning onto the concrete surface to maximize moisture retention.

Saturated covers shall contain a sufficient amount of moisture to prevent moisture loss from the surface of the concrete. Saturated covers shall be kept continuously moist so that a film of water remains on the concrete surface throughout the entire duration of the final curing. The saturated covers shall not be permitted to dry and absorb water from the concrete. Use of polyethylene film (see 5.14.3-2G.3c.1 - Polyethylene Film) may be applied over the saturated cover to potentially decrease the need for continuous watering.

c. Sheet Materials for Curing: All exposed concrete surfaces shall remain moist with a continuous application of curing sheet materials throughout the entire duration of the final curing. Sheet materials curing shall meet the requirements of Table 5.14.3-2.G.3c-1.

Table 5.14.3-2.G.3c-1
Final Curing Method Requirements for Sheet Materials

Sustained Concrete Temperature	Curing Cycle Duration	Concrete Compressive Strength
60°F ≤ °F ≤ 90°F	≥ 3 days	≥ 70% f'_c

Sheet materials used for curing, such as polyethylene film, white burlap-polyethylene sheeting, and reinforced paper shall meet the requirements of ASTM C171 and the specifications herein. Sheet materials shall inhibit moisture loss and reduce temperature rise in concrete exposed to radiation from the sun during the final curing. Adjoining covers shall overlap not less than 12 inches. All edges of the covers shall be secured to maintain a moist environment.

1. **Polyethylene Film:** Polyethylene film shall meet the requirements of ASTM C171, consist of a single sheet manufactured from polyethylene resins, be free of visible defects, and have a uniform appearance. Careful considerations shall be taken by the Fabricator to prevent the film from tearing during storage and application, so as to not disrupt the continuity of the film (polyethylene film reinforced with glass or other fibers is more durable and less likely to be torn). The Fabricator shall monitor the application of the film to prevent uneven spots from appearing (mottling) on the concrete surface, due to variations in temperature, moisture content, or both. The Fabricator shall prevent mottling from occurring on the concrete surface by applying additional water under the film or applying a combination of polyethylene film bonded to absorbent fabric to the concrete surface to retain and evenly distribute the moisture.

   Immediately following final finishing, polyethylene film shall be placed over the surface of the fresh concrete surface, so as to not damage the surface of the concrete and shall be placed and weighted so that it remains in contact with the concrete throughout the entire duration of the final curing. The film shall extend beyond the edges of the concrete surface. The film shall be placed flat on the concrete surface, avoiding wrinkles, to minimize mottling. Edges of adjacent polyethylene film shall overlap a minimum of 6 inches and be tightly sealed with the use of sand, wood planks, pressure-sensitive tape, mastic, or glue to maintain close contact with the concrete surface, retain moisture, and prevent the formation of air pockets throughout the entire duration of the final curing.

2. **White Burlap-Polyethylene Sheeting:** White burlap-polyethylene sheeting shall meet the requirements of ASTM C171, be securely bonded to the burlap so to avoid separation of the materials during handling and curing of the concrete and be applied in the same manner as the polyethylene film.

3. **Reinforced Impervious Paper:** Reinforced impervious paper shall meet the requirements of ASTM C171, consist of two sheets of kraft paper cemented together with a bituminous adhesive and reinforced with embedded cords or strands of fiber running in both directions, and be white in color. Reinforced impervious paper shall be treated to prevent tearing when wetted and dried.

   Reinforced impervious paper can be reused so long as it is effective in retaining moisture on the concrete surface. The Fabricator shall visually inspect the reinforced impervious paper for all holes, tears, and pin holes from deterioration of the paper through repeated use by holding the paper up to the light. The paper shall be discarded and prohibited from use when the moisture is no longer retained.

   After the concrete has hardened sufficiently to prevent surface damage, the concrete surface shall be thoroughly wetted prior to the application of the reinforced impervious paper and be applied in the same manner as the polyethylene film.

d. Liquid Membrane-Forming Compounds for Curing: All exposed concrete surfaces shall remain moist with a continuous application of liquid membrane-forming compounds throughout the entire duration of the final curing method cycle. Liquid membrane-forming compounds curing shall meet the requirements of Table 5.14.3-2.G.3b-1.

Table 5.14.3-2.G.3d-1
Final Curing Method Requirements for Liquid Membrane-Forming Compounds

Sustained Concrete Temperature	Curing Cycle Duration	Concrete Compressive Strength
60°F ≤ °F ≤ 90°F	≥ 7 days	≥ 70% f'_c

Liquid membrane-forming compounds shall meet the requirements of ASTM C 1315, Type I, Class A and shall exhibit specific properties, such as alkali resistance, acid resistance, adhesion-promoting quality, and resistance to degradation by ultraviolet light, in addition to moisture-retention capabilities. Liquid membrane-forming compounds shall consist of waxes, resins, chlorinated rubber, or other materials to reduce evaporation of moisture from concrete. Liquid membrane-forming compounds shall be applied in accordance with the manufacturer's recommendations.

Liquid membrane-forming compounds shall be applied immediately after the disappearance of the surface water sheen following final finishing. All exposed surfaces shall be wetted immediately after form removal and kept moist to prevent absorption of the compound, allowing the curing membrane to remain on the concrete surface for proper membrane moisture retention. The concrete shall reach a uniformly damp appearance with no free water on the surface prior to the application of the compound.

If patching or finishing repairs are to be performed prior to the application of the compound, the precast component shall be covered temporarily with saturated covers until the repairs are completed and the compound is applied. Only areas being repaired shall be uncovered during this period. While the saturated covers are removed to facilitate the patching process, the work shall continue uninterrupted. If for any reason the work is interrupted, saturated covers shall be placed onto the uncovered concrete surface, until the work continues and is completed, at which time the curing compound shall be applied to the repaired area.

If the evaporation rate is exceeding the rate of bleeding, thus causing the surface to appear dry even though bleeding is still occurring, the application of liquid membrane-forming compounds to the concrete surface shall be delayed, in order to prevent bleed water from being sealed below the concrete surface and avert map cracking of the membrane films, reduction in moisture-retention capability, and reapplication of the compound. To diagnose and prevent this condition, a transparent plastic sheet shall be placed over a test area of the uncured and unfinished concrete surface determine if any bleed water accumulates under the plastic.

The compound shall be applied in two applications at right angles to each other to ensure uniform and more complete coverage. On very deeply textured surfaces, the surface area to be treated shall be at least twice the surface area of a troweled or floated

surface. In such cases, two separate applications may be needed, each at 200 ft^2/gal., with the first being allowed to become tacky before the second is applied.

The curing compound shall be applied by power sprayer, using appropriate wands and nozzles with pressures between 25 and 100 psi. For very small areas such as repairs, the compound shall be applied with a wide, soft-bristled brush or paint roller. The compound shall be stirred or agitated before use and applied uniformly in accordance with the manufacturer's recommended rate. The application rate of the curing compound shall in accordance with the manufacturer's recommendations.

When the concrete surface is to receive paint, finishes, or toppings that require positive bond to the concrete, it is critical that the curing procedures and subsequent coatings, finishes, or toppings be compatible to achieve the necessary bond.

After the termination of the final curing method cycle has occurred, liquid membrane-forming compounds shall be removed by blast-cleaning from any concrete surface that is to receive paint, finishes, plastic concrete from secondary pour, grout, or any other toppings that require bonding to the concrete surface. These surfaces shall be further blast-cleaned to remove the cement matrix down to exposed aggregate to ensure proper bonding to the material. The method used to remove the curing compound shall not damage the reinforcement and coating. Compounds are prohibited on any concrete surface that will have a penetrating or coating type treatment such as a sealer, stain, or waterproofing membrane applied to it.

e. Accelerated Curing: Accelerated curing shall use live steam or radiant heat with moisture in accordance with PCI MNL-116 as modified herein. The concrete temperature shall meet the maximum heat increase and cool down rates as specified herein. Concrete temperature monitoring shall meet the requirements of the 5.14.3-2.F. Excessive and fluctuating rates of heating and cooling shall be prohibited. The concrete temperature shall not exceed 158°F at any time. The Fabricator shall meet the following accelerated curing sequencing and requirements.

1. **Initial Delay Period:** The initial delay period shall be defined as the duration immediately following the placement of the concrete and the attainment of initial set of the concrete. The Fabricator shall determine the time of initial set in accordance with AASHTO T 197 specifications. Throughout the entire duration of the preset period, initial curing shall be implemented. The temperature increase period shall not occur until initial set of the concrete is attained. During the initial delay period, the concrete temperature shall meet the following requirements:

    - Concrete temperature rate of increase shall not exceed 10°F per hour.
    - Total concrete temperature increase shall not exceed 40°F higher than the placement concrete temperature or 100°F, whichever is less

2. **Temperature Increase Period:** The temperature increase period shall be defined as the duration immediately following the completion of the initial delay period (after initial set) and immediately prior to the start of the constant maximum temperature period. Application of steam to the enclosure shall not occur until the initial delay period is complete. After the initial delay period is complete, all exposed concrete surfaces shall be cured in a moist environment where the concrete temperature increases at a rate not to exceed 36°F per hour.

3. **Constant Maximum Temperature Period:** The constant maximum temperature period shall be defined as the duration immediately following the completion of the temperature increase period and immediately prior to the start of the temperature decrease period. After the temperature increase period is complete, all exposed concrete surfaces shall be cured in a moist environment at a controlled and constant elevated temperature throughout the entire duration of the constant maximum temperature period. Termination of the constant maximum temperature period and the start of the termination decrease period shall occur after all specified conditions in Table 5.14.3-2.G.3e3-1 are met.

Table 5.14.3-2.G.3e3-1
Constant Maximum Temperature Period

Sustained Concrete Temperature	Constant Maximum Temperature Period	Concrete Compressive Strength
120°F ≤ °F ≤ 158°F	6 hrs ≤ Time ≤ 48 hrs	≥ 70% f'_c

4. **Temperature Decrease Period:** After the constant maximum temperature period is complete, the concrete temperature shall be cured in a moist environment at a controlled and reduced rate not to exceed 36°F per hour until the concrete temperature is within 20°F of the ambient temperature outside of the curing enclosure.

H. Product identification: Each precast concrete component shall be clearly marked at a visible location with the following information: Project number, Bridge number, Town and State, mark/position number of the component in the structure, casting date, producer./fabricator identification with job number using a non-corrosive tag embedded permanently in the concrete or by stenciling the information with indelible ink on the concrete.

I. Form Stripping and Removal from Forms: Forms shall not be stripped and removed from a precast component, a precast component shall not be removed from the forms, nor shall a formed precast component be lifted, rotated, moved, relocated, or transported for storage at the fabrication facility, until the concrete obtains a compressive strength no less than 70 percent of the specified design compressive strength shown on the plans based on concrete cylinder compressive tests.

After form removal and removal from the forms, surfaces requiring an exposed aggregate finish shall be prepared as indicated on the shop drawings; all fins, runs, or mortar shall be removed from the concrete surfaces; and form marks on exposed surfaces shall be smoothed by grinding. The precast components shall be inspected for defects and damage, and be repaired or replaced, in accordance with 5.14.3-4. The Engineer shall be notified of all defects, damage, and repairs.

After form removal and removal from the forms, all the precast components shall continue to be cured in accordance with 5.14.3-2.G.

J. Handling and Storage: After the forms have been removed, the precast components may be handled and stored.

All precast components shall be handled and stored in a manner to prevent damage and avoid chipping, cracking, and fractures.

The precast components shall only be lifted at the designated points by lifting devices embedded in the concrete at the locations shown on the fabrication submittal. The orientation of the rigging shall match that assumed for the design and evaluation of the precast components and embedded hardware as shown on the shop drawings and fabrication working drawing submittal. The concrete edges shall be protected by dunnage during handling.

Storage areas shall be smooth and well compacted to prevent damage due to differential settlement. Precast components shall be supported by adequate dunnage and blocking placed on the ground and at the locations required by the fabrication submittal. Stacking of components shall only be allowed if shown on the fabrication submittal. Stacked components shall be supported by adequate dunnage and blocking.

Precast components may be exposed to temperatures below freezing (32°F) when the chosen curing method has been completed, provided that the following conditions are met:

1. Precast components are protected from precipitation with polyethylene curing covers until the concrete obtains 100 percent of the specified design compressive strength.
2. Precast components maintain a minimum concrete temperature of 40°F until the concrete obtains 100 percent of the specified design compressive strength.

K. Inspection of Precast Components: While in storage, after the curing is complete and the concrete has obtained 100 percent of the specified design compressive strength shown on the plans based on concrete cylinder compressive tests, and prior to dry fitting and loading, the precast components shall be inspected for defects and damage, and be repaired or replaced, in accordance with 5.14.3-4. The Engineer shall be notified of all defects, damage, and repairs.

The CTDOT shall be given at least 5 working days' notice prior to inspection of the precast components for defects and damage.

L. Loading for shipping: After the inspection of the precast components, the precast components may be loaded for shipping.

Precast components shall be loaded onto a trailer and supported on and protected with dunnage placed at the locations shown on the fabrication submittal. Blocking shall be provided at all locations of tie-down straps or chains. Shock-absorbing cushioning material shall be used at all tie-down points.

3. Field Construction

A. Shipping and Delivery: Upon delivery to the site, the precast components shall be inspected by the Contractor for defects and damage, and be repaired or replaced, in accordance with 5.14.3-4. The Engineer shall be notified of all defects, damage, and repairs.

B. Field Handling, Erection, and Installation: Precast components delivered to the site shall be unloaded, handled, rotated/re-oriented to the upright position using the hardware, pick points, rigging, and dunnage as shown on the field construction working drawing submittal. The precast components shall be re-rigged for the final erection pick.

All lifts and picks, including methods and equipment, shall meet the requirements shown on the field construction working drawing submittal. Cranes shall be operated in accordance with the Connecticut Department of Public Safety regulations. The Contractor is responsible for verifying the weight of each lift.

4. **Defects, Damage and Repairs:** Defects and damage identified in the precast components by the Fabricator (prior to shipping) and the Contractor (after delivery to the project site) Quality Control personnel shall be documented in the quality control records via written description and drawings that include the date, type, description, size, location, and category of all defects. The documentation shall be updated if the defects or damage change or as additional defects or damage are identified. As required by the defect/damage category, a non-conformance report (NCR) that identifies the defects/damage and describes proposed repair procedures and materials shall be submitted to CTDOT for review and action.

   Concrete cracks are classified as critical and non-critical as defined by the CTDOT Bridge Inspection Manual, Article 10.3. Cracks are also described as insignificant cracks and moderate width cracks as defined by AASHTO Manual for Bridge Element Inspection, Article 3.2.1.3.

   Defects and damage shall be categorized as follows:

   A. Category 1 – Surface Defects

   Category 1 surface defects are defined as the following:

   1. Surface voids or bug holes that are less than 5/8-inch in diameter and less than ¼-inch deep

   Category 1 defects shall be documented. Category 1 defects do not need to be repaired, and an NCR does not need to be submitted.

   B. Category 2 – Minor Defects and Damage

   Category 2 minor defects are defined as the following:

   1. Spalls, honeycombing, surface voids that are less than 2 inches deep and have no dimension greater than 12 inches
   2. Non-critical insignificant cracks less than 0.012 inches in width that do not extend the full width and depth of an element
   3. Broken or spalled corners

   Category 2 defects shall be documented and repaired. An NCR does not need to be submitted.

   C. Category 3 – Major Defects and Damage

   Category 3 major defects are defined as the following:

   1. Spalls, honeycombing and surface voids that are deeper than 2 inches or have any dimension greater than 12 inches, when measured along a straight line
   2. Exposed reinforcing steel

3. Non-critical moderate width cracks greater than or equal to 0.012 inches and less than or equal to 0.050 inches in width that do not extend the full width and depth of an element
4. Bearing area spalls with dimensions not exceeding 3 inches

Category 3 defects shall be documented and repaired. An NCR shall be prepared that documents the defects and describes a proposed repair procedure. The NCR shall be submitted to CTDOT for review and action prior to performing any repairs.

D. Category 4 – Rejectable Defects and Damage

Rejectable defects and damage may include the following:

1. Surface defects that in total make up more than 5% of the surface area which will be exposed to view after installation
2. Minor defects that in total make up more than 5% of the surface area of the fabricated component. In determining the surface area impacted by a concrete crack, assume a crack impacts an area 0.5 ft wide for the length of the crack.
3. Major defects that in total make up more than 5% of the surface area of the fabricated component. In determining the surface area impacted by a concrete crack, assume a crack impacts an area 0.5 ft wide for the length of the crack.
4. Non-critical wide cracks greater than 0.050 inches in width of any length or depth
5. Non-critical cracks that extend the full width and depth of an element
6. Critical cracks of any size and length
7. Cold joints resulting from the interruption of concrete placement
8. Elements fabricated outside of the specified tolerances
9. Compressive strength testing that does not meet the specified design compressive strength, f'_c

Fabricated components with rejectable defects and damage are subject to rejection as determined by the CTDOT. The Contractor may submit an NCR that documents the defects and damage and describes a proposed repair procedure to CTDOT for review and action.

Defect and damage repairs shall be in accordance with the standard repair procedures presented in the PCI Northeast Region Guidelines for Resolution of Non-Conformances in Precast Concrete Bridge Elements, Report Number PCINE-18-RNPCBE. In the case of conflicts with this Special Provision, this Special Provision shall govern. Spalls, honeycomb and surface voids that will be encased in cast in place concrete need not be repaired by a standard repair procedure unless directed otherwise by the CTDOT. Concrete crack repair materials shall penetrate and fill the cracks. At crack repairs that will be encased in cast in place concrete, excess concrete crack repair material adjacent to cracks shall be removed so that the bond of the cast in place concrete adversely affected. The use of waterproofing products for concrete crack repair is not permitted.

All defects and damage in a precast component identified at the plant shall be repaired prior to shipping the precast component unless directed otherwise by the CTDOT. All defects and damage in a precast component identified at the site shall be repaired prior to the use of the precast component in any further construction unless otherwise directed by the CTDOT.

All repairs shall be completed by the Contractor at its expense to the satisfaction of CTDOT. All defects and damage in precast components determined by the Engineer to not be repairable, shall be replaced by the Contractor at its expense.

5.14.04 – Method of Measurement: *Add the following:*

7. Precast Concrete Beam: Precast Concrete Beams will be measured for payment by the number of linear feet installed and accepted of the size and at the location indicated on the plans.

5.14.05 – **Basis of Payment:** *Add the following:*

7. Precast Concrete Beam: This work will be paid for at the Contract unit price per linear foot for the precast concrete beams of the size shown on the plans, complete in place, including all materials equipment and tools and labor incidental thereto.

The sole plate for the bearing assembly shall be cast into the beams and shall be provided to the fabricator by the Contractor. The cost of casting the sole plate into the beam ends shall be included in the unit price for "Precast Concrete Beam". The cost of the sole plate material shall be included in the cost of the item "Steel Bearing Assemblies."

ITEM #0520036A – ASPHALTIC PLUG EXPANSION JOINT SYSTEM

Description: Work under this item shall consist of furnishing and installing an asphaltic plug expansion joint system (APJ) in conformance with ASTM D6297, as shown on the plans, and as specified herein.

Work under this item shall also consist of the removal and disposal of bituminous concrete, membrane waterproofing, existing joint components and sealing elements, cleaning and sealing median barrier joints, parapet joints, and sidewalk joints as shown on the Plans.

Work under this item excludes the removal of Portland cement concrete headers and furnishing and installing preformed joint seals.

Materials: The APJ component materials shall conform to ASTM D6297 and the following:

Aggregate: The aggregate shall meet the following requirements:

a) Loss on abrasion: The material shall show a loss on abrasion of not more than 25% using AASHTO Method T96.
b) Soundness: The material shall not have a loss of more than 10% at the end of five cycles when tested with a magnesium sulfate solution for soundness using AASHTO Method T 104.
c) Gradation: The aggregate shall meet the requirements of Table A below:
d) Dust: Aggregate shall not exceed 0.5% of dust passing the #200 sieve when tested in accordance with AASHTO T-11.

Table A

Square Mesh Sieves	1" (25.0 mm)	¾" (19.0 mm)	½" (12.5 mm)	⅜" (9.5 mm)	No. 4 (4.75 mm)
% passing	100	90 - 100	20 - 55	0 - 15	0 - 5

A sample of the aggregate shall be submitted to the Department with a Certified Test Report in accordance with Article 1.06.07 for each 20 tons of loose material or its equivalent number of bags delivered to the job site. The Certified Test report must include a gradation analysis resulting from a physical test performed on the actual material that accompanies the report.

Anti-Tacking Material: This material shall be a fine graded granular material with 100% passing the $^{3}/_{16}$" sieve and no more than 5% passing the #200 when tested in accordance with AASHTO T-27.

Backer Rod: All backer rods shall satisfy the requirements of ASTM D5249, Type 1.

Bridging Plate: The bridging plates shall be steel conforming to the requirements of ASTM A36 and be a minimum ¼" thick and 8" wide. For joint openings in excess of 3" the minimum

plate dimensions shall be ⅜" thick by 12" wide. Individual sections of plate shall not exceed 4' in length. Steel locating pins for securing the plates where shown on the Plans shall be size 16d minimum, hot-dip galvanized, and spaced no more than 12" apart.

Concrete Leveling Material: Shall be one of the Neat products listed on the Qualified Products List (QPL) for the category Rapid Hardening Concrete Patching (RHCP) Materials. The product shall be suitable for use at the thickness it will be applied as specified by the Manufacturer.

Parapet Sealant: The sealant used in parapet joint openings shall be a single component non-sag silicone sealant that conforms to the requirements of ASTM D5893.

Sidewalk Sealant: The sealant used in sidewalk joint openings shall be a rapid cure, self-leveling, cold applied, two-component silicone sealant. The silicone sealant shall conform to the requirements listed in Table B:

Table B

Properties - As Supplied	**Test Method**	**Requirement**
Extrusion Rate	ASTM C1183	200-600 grams/min
Leveling	ASTM C639	Self-Leveling
Specific Gravity	ASTM D792	1.20 to 1.40
Properties - Mixed	**Test Method**	**Requirement**
Tack Free Time	ASTM C679	60 min. max.
Joint Elongation – Adhesion to concrete	ASTM D5329 [1,2,3]	600% min
Joint Modulus @ 100% elongation	ASTM D5329 [1,2,3]	15 psi max
Cure Evaluation	ASTM D5893	Pass @ 5 hours

1. Specimens cured at 77±3^{0}F and 50±5% relative humidity for 7 days
2. Specimens size: ½"wide by ½"thick by 2" long
3. Tensile Adhesion test only

The date of manufacture shall be provided with each lot. No sealant shall be used beyond its maximum shelf-life date.

The two–part silicone sealants shown in Table C are known to have met the specified requirements:

Table C

Product	Supplier
Dow Corning 902RCS	Dow Corning Corporation 2200 W Salzburg Road Auburn, Michigan 48611
Wabo SiliconeSeal	BASF/Watson Bowman Acme Corporation 95 Pineview Drive Amherst, New York 14228

Other two-component silicone joint sealants expressly manufactured for use with concrete that conform to the aforementioned ASTM requirements will be considered for use provided they are submitted in advance for approval to the Engineer. Other joint sealants will be considered for use only if a complete product description is submitted, as well as documentation describing at least five installations of the product. These documented installations must demonstrate that the product has performed successfully for at least three years on similar bridge expansion joint applications.

A Materials Certificate and Certified Test Report for the asphaltic binder shall be submitted by the Contractor in accordance with the requirements of Article 1.06.07 certifying that the asphaltic binder satisfies the requirements of the most current version of ASTM D6297.

A Materials Certificate for all other components of the APJ, leveling material, backer rod and sealant used in sealing parapet and sidewalk joint openings, shall be submitted by the Contractor in accordance with the requirements of Article 1.06.07

Construction Methods: The APJ shall be installed at the locations shown on the Plans and in stages in accordance with the traffic requirements in the special provisions "Maintenance and Protection of Traffic" and "Prosecution and Progress".

At least 30 days prior to start of the work, the Contractor shall submit to the Engineer for approval a detailed Quality Control Plan for the installation of the APJ. The submittal shall include:

a) A list of all manufactured materials and their properties to be incorporated in the joint system, including, but not limited to the asphaltic binder, anti-tack material, backer rod, sealant, leveling material, as well as the aggregate's source.
b) A detailed step by step installation procedure and a list of the specific equipment to be used for the installation. The Quality Control Plan must fully comply with the specifications and address all anticipated field conditions, including periods of inclement weather.
c) Documented measurements taken during an exploration of the deck as detailed on the plans. Documentation shall include:

i. Wearing surface thickness measurements
ii. Location of end of deck / Layout of joint

iii. Deck joint gap measurements and ambient temperature at the time the measurements are taken.

The APJ shall not be installed when bituminous concrete overlay or joint cutout is wet or weeping. The APJ shall only be installed when the bridge superstructure surface temperature is at or below the maximum temperature specified on the Contract Plans and when the ambient air temperature is within the range of 45^0F to 95^0F. The bridge superstructure surface temperature range is determined using the thermal movement range provided on the Plans for the proposed APJ deck installation location and the selected normal or expanded use APJ product.

The superstructure surface temperature shall be determined from the average of three or more surface temperature readings taken at different locations on the interior girder surfaces by the Contractor as directed by the Engineer. Temperature measurements of the superstructure shall be taken by the contractor with a calibrated handheld digital infrared laser-sighted thermometer on the surfaces of an interior steel girder, or interior concrete girder protected from direct sunlight. The infrared thermometer to be supplied by the Contractor for this purpose shall meet certification requirements of EN61326-1, EN61010-1, and EN60825-1 maintained by the European Committee for Electrotechnical Standardization (CENELEC). The thermometer shall have a minimum distance-to-spot ratio of 50:1 and shall have adjustable emissivity control. The thermometer shall have a minimum accuracy value of $\pm$1% of reading or $\pm$2^{o}F, whichever is greater. The thermometer shall be used in strict accordance with the manufacturer's written directions. An additional infrared thermometer satisfying the same standards to be used in this application shall also be provided to the Engineer for quality assurance purposes

Prior to installing the APJ, the Contractor shall determine the exact location of the deck joint beneath the bituminous concrete overlay and be able to locate the joint relative to the curb, sidewalk or parapet once the finished bituminous overlay is placed.
The APJ shall be installed symmetrically about the deck joint opening (except where detailed otherwise on the Plans) to the dimensions shown on the Plans or as directed by the Engineer. The proposed saw cut lines shall be marked on the bituminous concrete overlay by the Contractor and approved by the Engineer, prior to saw-cutting. The saw-cuts delineating the edges of the APJ shall extend full depth of the bituminous concrete overlay.

The existing bituminous concrete overlay, waterproofing membrane and/or existing expansion joint material, within the saw cut limits shall be removed and disposed of by the Contractor to create the joint cutout.

Concrete surfaces that will support the bridging plates shall be smooth and form a plane along and across the deck joint. Rough or damaged concrete surfaces shall be repaired with a leveling compound meeting the requirements of this specification. Deteriorated concrete areas within the joint limits shall be repaired as directed by the Engineer. The Contractor will be compensated for such repairs under the applicable concrete deck repair items in the Contract. The existing and repaired concrete surfaces shall provide continuous uniform support for the bridging plate and prevent the plate from rocking and deflecting.

Prior to the installation of the bridge joint, all horizontal and vertical surfaces of the joint cutout shall be abrasive blast cleaned using an oil-free, compressed air supply. The entire cutout shall then be cleared of all loose blast media, dust, debris and moisture using an oil-free, hot air lance capable of producing an air stream at 3,000ºF with a velocity of 3,000 feet per second. The hot air lance shall not be used to boil off or dry water weeping from the bituminous concrete overlay within the joint cutout. If this situation occurs, the weeping water shall be allowed to drain and dry naturally.

When an open joint is present below the proposed asphaltic plug joint, a single backer rod, with a diameter at least 25% greater than the existing joint opening at the time of installation or a foam-supported preformed joint seal, as shown on the Plans shall be installed. The seal shall be placed at a depth of 3/4 inch below the bridging plate in the existing deck joint opening between the concrete edges. The preformed joint seal shall be made continuous as it extends into the curb, sidewalk or parapet.

Asphaltic binder shall be heated to a temperature within the manufacturer's recommended application temperature range which shall be provided in the Quality Control Plan. During application, the temperature of the binder shall be maintained within this range. In no case shall the temperature of the binder go below 350º F nor exceed the manufacturer's recommended maximum heating temperature.

Asphaltic binder shall then be poured into the joint opening until it completely fills the gap above the preformed joint seal or backer rod. A thin layer of binder shall next be applied to all horizontal and vertical surfaces of the joint cutout. When preformed joint seals are used the manufacture shall be consulted on how to treat/protect the preformed joint seals from the asphaltic binder if required.

Bridging plates shall be abrasive blast-cleaned on-site prior to installation and then placed over the deck joint opening in the joint cutout. The plates shall be aligned over the joint opening as shown on the Plans. The plates shall be placed end to end, without overlap, such that the gap between plates does not exceed ¼". The plates shall extend to the gutter line and be cut to match the joint's skew angle, where concrete support exists on both sides of the joint. Within APJ installation limits, where concrete support does not exist at both sides of the joint opening (such as where a bridge deck end abuts a bituminous concrete roadway shoulder), bridging plates shall not be installed. Installed bridging plates shall not rock or deflect in any way. After installation of bridging plates, a thin layer of asphaltic binder shall be applied to all exposed surfaces of the plates.

The remainder of the joint cutout shall then be filled with a mixture of hot asphaltic binder and aggregate prepared in accordance with the submitted Quality Control Plan and the following requirements:

- The aggregate shall be heated in a vented, rotating drum mixer by the use of a hot-compressed air lance to a temperature of between 370° F. to 380° F. This drum mixer shall be dedicated solely for the heating and, if necessary, supplemental cleaning of the aggregate. Venting of the gas and loose dust particles shall be accomplished through ¼" drilled holes spaced no more than 3" on center in any direction along the entire outside surface of the drum

- Once the aggregate has been heated, it shall then be transferred to a secondary drum mixer where it shall be fully coated with asphaltic binder. A minimum of two gallons of binder per 100lbs of stone is required.
- The temperature of the aggregate and binder shall be monitored by the contractor with a calibrated digital infrared thermometer.
- The coated aggregate shall be loosely placed in the joint cutout in lifts not to exceed 2 inches.
- Each lift shall be leveled, compacted and then flooded with hot asphaltic binder to the level of the aggregate to fill all voids in the coated aggregate layer. The surface of each lift shall be flooded until only the tips of the aggregate protrude out of the surface.
- The final lift shall be placed such that no stones shall project above the level of the adjacent overlay surface following compaction of the coated aggregate.
- Following installation of the final lift, sufficient time and material shall be provided to allow all voids in the mixture to fill. This step may be repeated as needed.
- The joint shall then be top-dressed by heating the entire area with a hot-compressed air lance and applying binder. The final joint surface must be smooth with no protruding stones and be absent of voids.
- Once top-dressed, the joint shall have an anti-tack material spread evenly over the entire surface to prevent tracking.

The Contractor shall be responsible for removing all binder material that leaks through the joint and is deposited on any bridge component, including underside of decks, headers, beams, diaphragms, bearings, abutments and piers.

Traffic shall not be permitted over the joint until it has cooled to 130º F when measured with a digital infrared thermometer. Use of water to cool the completed joint is permitted.

Sidewalk, parapet, and/or curb joint openings

Before placement of any sealing materials in parapets, curbs, or sidewalks, the joints shall be thoroughly cleaned of all scale, loose concrete, dirt, dust, or other foreign matter by abrasive blast cleaning. Residual dust and moisture shall then be removed by blasting with oil free compressed air using a hot air lance. Projections of concrete into the joint space shall also be removed. The backer rod or preformed joint seal shall be installed in the joint as shown on the Plans. The joint shall be clean and dry before the joint seal or silicone joint sealant is applied. Under no circumstances is the binder material to be used as a substitute for the joint sealant.

Whenever abrasive blast cleaning is performed under this specification, the Contractor shall take adequate measures to ensure that the abrasive blast cleaning will not cause damage to adjacent traffic or other facilities.

Where silicone joint sealant is shown on the plans, the sealant shall be prepared and placed in accordance with the manufacturer's instructions and with the equipment prescribed by the manufacturer. Extreme care shall be taken to ensure that the sealant is placed in accordance with the manufacturer’s recommended thickness requirements.

The joint sealant shall be tooled, if required, in accordance with the manufacturer's instructions.

Primer, if required, shall be supplied by the sealant manufacturer and applied in accordance with the manufacturer's instructions.

When the sealing operations are completed, the joints shall be effectively sealed against infiltration of water. Any sealant which does not effectively seal against water shall be removed and replaced at the Contractor's expense.

Any installed joint that exhibits evidence of failure, as determined by the Engineer, such as debonding, cracking, rutting, or shoving of the APJ mixture shall be removed and replaced full-width and full–depth to a length determined by the Engineer at no additional cost to the State.

Method of Measurement: This work will be measured for payment by the number of cubic feet of "Asphaltic Plug Expansion Joint System" installed and accepted within approved horizontal limits. No additional measurement will be made for furnishing and installing backer rod and joint sealant in the parapets, concrete medians, curbs and/or sidewalks. Where Plans show a preformed joint seal below the asphaltic plug joint and in the curb, sidewalk or parapet, the seal will be measured for payment under a separate item.

Basis of Payment: This work will be paid for at the contract unit price per cubic foot for "Asphaltic Plug Expansion Joint System," complete in place, which price shall include the saw-cutting, removal and disposal of bituminous concrete, membrane waterproofing, existing joint components and sealing elements, the furnishing and placement of the leveling compound, cleaning of the joint surfaces, furnishing and installing bridging plates, the furnishing and installing of the asphaltic plug joint mixture, the cost of furnishing and installing joint sealant in the parapets, concrete medians, curbs and sidewalks, and all other materials, equipment including, but not limited to, portable lighting, tools, and labor incidental thereto. No additional payment shall be made for the 12" wide bridging plates that are required for deck joint openings with widths in excess of 3".

If directed by the Engineer, additional deck repairs will be addressed and paid for under the applicable concrete deck repair items in the Contract.

ITEM #0522281A – STEEL BEARING ASSEMBLIES

Description: Work under this item shall consist of furnishing and installing steel bearing assemblies and all other necessary materials and equipment to complete the work as shown on the plans.

Materials:

1. **Structural Steel:** The masonry plates, beveled sole plates, and welded studs shall conform to the requirements of M.06.02 and shall be galvanized in accordance with M.06.03.
2. **Anchor Dowels:** The anchor dowels shall conform to the requirements of M.06.02-3.
3. **Self-Lubricating Bronze Plates:** The bronze plates shall conform to ASTM B22 C90500 Type 1 or C91100 Type 2.

   The self-lubricating recesses in the bronze plates shall conform to the following:
   - The bearing surfaces shall have lubricant recesses consisting of either concentric rings, with or without circular recesses with a depth equal to at least the width of the rings or recesses.
   - The recesses or rings shall be arranged in a geometric pattern so that the adjacent rows overlap in the direction of motion.
   - The entire area of the bearing surface shall be lubricated by means of lubricant filled recesses.
   - The lubricant filled areas shall comprise not less than 25 percent of the total bearing surface.
   - The lubricating compound shall be integrally molded at high pressure and compressed into the rings or recesses and project not less than 0.010 inches above the surrounding bronze plate.
4. **Non-Shrink Grout:** The non-shrink grout used to fill the anchor dowel holes in the precast beams at the fixed bearings shall conform to M.03.05.
5. **Asphalt Cement:** The asphalt cement used to fill the anchor dowel holes in the precast beams at the expansion bearings shall meet the requirements of the table below. The asphalt cement shall be homogeneous, free from water, and shall not foam when heated to 350°F. Each delivery of asphalt cement shall be accompanied by a Certified Test Report and a Material Certificate.

Test Requirements	Minimum	Maximum
Penetration, 77°F (25°C), 100g, 5 second (AASHTO T 49)	18	60
Flash Point, COC, °F (AASHTO T 48)	393	-
Solubility in trichloroethylene, % (AASHTO T 44)	99.5	-
Softening Point, °F (AASHTO T 53)	130	167
Loss on Heating, 325°F (163°C), 5 hour, % (AASHTO T 47)	-	1.0
Penetration of Residue, % of Original (AASHTO T 49)	60	-
Ductility, 77°F (25°C), 5 cm/minute, cm (AASHTO T 51)	5	-

6. **Adhesive Bonding Materials:** Adhesive bonding material for drilling and bonding the anchor dowel shall meet the requirements of 6.10.02.

Construction Methods:

1. **Shop Drawings:** Before fabricating any materials, the Contractor shall submit drawings to the Engineer for approval in accordance with 1.05.02-3. These drawings shall include but not be limited to the following information:
    a. Name of Manufacturer
    b. Complete Details of the Bearing Assemblies
    c. Material Designations
2. **Setting the Bearings:** The Contractor shall set the steel bearing assemblies in accordance with the following requirements:
    a. The masonry plate shall be cast in the bridge seat to the dimensions and locations shown on the plans. The masonry plate shall be cast to provide a level surface for setting the beam and self-lubricating bronze plates.
    b. There shall be uniform bearing between the masonry plate, self-lubricating bronze plate, and beveled sole plate after application of dead load.
3. **Drilling and Bonding the Anchor Dowels:** The construction methods for drilling and bonding the anchor dowels shall conform to the requirements of 6.10.03

Method of Measurement: This work will be measured for payment by the actual number of steel bearing assemblies (fixed and expansion) installed and accepted.

Basis of Payment: This work will be paid for at the Contract unit price each for "Steel Bearing Assemblies," which price shall include furnishing and installing masonry plates with welded studs, beveled sole plates with welded studs, self-lubricating bronze plates, anchor dowels, dowel hole filler, and all material, equipment, tools, and labor incidental thereto.

Pay Item	**Pay Unit**
Steel Bearing Assemblies	ea.

ITEM #0601186A – MORTAR PATCH

Description: Work under this item shall consist of the repair of concrete beams affected by the partial demolition of existing concrete diaphragms and replacement with rapid hardening patching material as shown on the plans, as directed by the Engineer and specified herein.

Work under this item shall also include the furnishing and installation of wire ties for reinforcing bar and supports on inadequately supported or vibrating reinforcing steel within patch areas, as ordered by the Engineer.

Materials: The materials shall meet the following requirements:

1) Patching Material: The patching material shall be a concrete composed of a rapid hardening cement, fine aggregate, and water. This concrete shall harden within 40 minutes, and develop minimum compressive strengths of 2,000 psi within 1 hour after set and 5,000 psi within 28 days. The patching material shall be from the Department's Qualified Products List for Rapid Hardening Concrete Patch (RHCP) Material for Structures.

Construction Methods:

1) Surface Preparation: The reinforcing steel connecting the diaphragms to the bridge beams shall be cut to allow for a minimum of 1-inch of cover over the end of the cut reinforcement.

   Reinforcing bar wire ties and supports shall be installed on inadequately supported or vibrating reinforcing steel, as directed by the Engineer.

   The concrete surface and reinforcing steel to receive patching material shall be either sandblasted or water blasted, followed by air blasting in order to remove all loose particles and dust. All blasting operations shall be performed using techniques acceptable to the Engineer, taking care to protect all pedestrians, traffic, and adjacent property. All compressed air sources shall have properly sized and designed oil separators attached and functional to allow delivered air at the nozzle to be oil-free. The patch area shall be cleaned of all additional loose or powder-like rust, oil, solvent, grease, dirt, dust, bitumen, loose particles, and foreign matter just prior to patching.

   If the patch area was not cleaned and flushed with clean water immediately following hydro-demolition, or if run-off from a nearby hydro-demolition operation was allowed to travel through the previously cleaned and flushed patch surface, all affected concrete and steel reinforcing bonding surfaces shall be water blast cleaned at a nozzle pressure not less than 3,000 psi as directed by the Engineer, to assure that all remaining bond inhibiting laitance is completely removed.

   The entire concrete surface to be patched shall be dampened. All excess free water shall be removed from the patch area.

2) Mixing, Placing, and Finishing: Unless a winter operations plan has been submitted to the Engineer by the Contractor, mixing and placing concrete shall only take place when the ambient temperature is above 35°F or per manufacturer's recommendations, whichever is higher. All mixing shall be accomplished by means of a standard drum-type portable mixer. A continuous type mobile mixer may be used if permitted by the Engineer and in accordance with the manufacturer's recommendations. The Contractor shall calibrate the mobile mixer under supervision of the Engineer. Calibration shall be in accordance with the applicable

sections of ASTM method C685. The total mix shall be limited to the quantity that can be mixed and placed in 15 minutes.

The prepared surface shall be Saturated Surface Dry (SSD). The patching material shall be applied in accordance with Manufacturer's recommendations.

Finishing operations shall be completed before initial set takes place.

Cured patches, having a hollow sound when tapped, (indicating delamination), shall be replaced by the Contractor at its expense until a patch acceptable to the Engineer is in place.

3) Tolerances in Finished Patched Surfaces: The surface profile of the patched area shall not vary more than 1/8 inch in a distance of 10 feet, when a 10 foot long straightedge is placed on the surface at any angle relative to the centerline of the bridge. Humps in the patch that exceed the 1/8 inch tolerance shall be ground down by acceptable machinery. Sags or depressions in the surface of the patch area that exceed the 1/8 inch tolerance shall be repaired by removal of the concrete in the depression over an area determined by the Engineer to a depth of 1 inch and repaired in the previously described manner.
4) Test Cylinders: The Contractor shall make and perform compressive strength tests on representative cylinders under the supervision of the Engineer in accordance with ACI requirements. The dimensions, type of cylinder mold and number of cylinders will be specified by the Engineer. Traffic shall not be permitted on the structure until the patch material attains a strength of 4,000 psi, as determined by breaks of the test cylinders.

   A portable compression testing machine shall be provided by the Contractor and available on site for cylinder testing. All testing and equipment shall conform to ASTM C39.

   Note: The compression machine must be calibrated in accordance with the provisions of Section 5, ASTM C39.

Method of Measurement: This work will be measured for payment by the actual number of square feet of patching material placed in acceptable concrete beam patches, except where the Engineer determines that the Contractor has unnecessarily removed sound concrete. Where sound concrete has been unnecessarily removed, the replacement concrete will not be measured for payment. Providing safe access for delineation and inspection of the performed repairs will not be measured for payment.

Replacement of deteriorated rebar and coating of rebar at popouts, if required, will be measured for payment under other Contract items.

Basis of Payment: This work will be paid for at the Contract unit price per square foot of concrete patching concrete repaired under "Mortar Patch," complete and accepted in place, which price shall include surface preparation of patch areas, concrete replacement, the furnishing and installation of reinforcing bar wire ties and supports for inadequately supported existing reinforcing steel, inspection access, all materials, equipment, including the portable compression testing machine required for the testing of the repair material, tools, labor and work incidental thereto.

Removal of existing concrete diaphragms will be paid for under the item "Removal of Superstructure."

Replacement of deteriorated rebar, if required, will be paid for under the item "Deformed Steel Bars – Galvanized."

Coating of exposed rebar in the areas where concrete has been partially demolished, if required, will be paid for under the item "Clean and Coat Exposed Reinforcing Steel."

Pay Item	**Pay Unit**
Mortal Patch	s.f.

ITEM #0601318A – PARTIAL DEPTH PATCH

Description: Work under this item shall consist of the removal of spalled, delaminated or otherwise deteriorated concrete from existing bridge decks, approach slabs and headers by pneumatic hammers or hydro-demolition methods, and replacement with fast setting patching material as shown on the plans, as directed by the Engineer and specified herein.

Where ordered by the Engineer, work under this item shall also include inspecting the underside of the deck concrete for popouts caused by the removal of deteriorated concrete.

Work under this item shall also include the furnishing and installation of wire ties for reinforcing bar and vertical supports on inadequately supported or vibrating reinforcing steel within deck patch areas, as ordered by the Engineer.

Materials: The materials shall meet the following requirements:

1) Patching Material: The patching material shall be a concrete composed of a quick setting cement, fine aggregate, coarse aggregate and water. This concrete shall harden within 40 minutes, and develop minimum compressive strengths of 1,000 psi within 1 hour after set and 3,000 psi within 3 days.

The Contractor shall design and submit a quick setting mix to the Engineer for acceptance. Said mix design shall meet the strength requirements noted above and shall attain a minimum of 2500 psi prior to allowing traffic on patched surfaces. The mix proportions and method of application shall be in accordance with the manufacturer's recommendations. Sources of supply of all the materials shall be clearly indicated.

Fine aggregate shall meet the requirements of Subarticle M.03.01-2.

The coarse aggregate shall meet the requirements of Subarticle M.03.01-1. The required grading shall be obtained by using 100% of No. 8 size coarse aggregate. Grading of the aggregate shall conform to the gradation for No. 8 stone in Article M.01.01.

Water shall meet the requirements of Subarticle M.03.01-4.

The quick setting cement shall be one of the following materials:

MasterEmaco T 415
BASF
23700 Chagrin Blvd.
Beachwood, OH 44122
216-839-7016
www.master-builders-solutions.basf.us

Perma Patch
Dayton Superior Corporation
7130 Ambassador Dr.
Allentown, PA 18106
800-745-3707
www.daytonsuperior.com

Rapid Set DOT Cement
CTS Cement Manufacturing Corporation
12442 Knott Street
Garden Grove, CA 92841
800-929-3030 ext. 188
www.ctscement.com

Speed Crete Green Line
Tamms Industries
730 Casey Ave.
Wilkes-Barre, PA 18702
800-218-2667
www.dpproducts.com/products/tamms.html

Fastcrete
Silpro Corporation
2 New England Way
Ayer, MA 01432
800-343-1501
www.silpro.com/products/fastcrete.shtml

Gypsum Based Materials will not be allowed.

Construction Methods: Removal of concrete for partial depth patch will be performed by one of two methods: Hammer Demolition or Hydro-demolition. Prior to beginning any work, the Contractor shall provide submittals outlining intended method, as defined herein.

1) Inspection of the Deck: Before any existing concrete is removed, the Contractor shall provide the Engineer clear access to the bridge deck. During this time, the Engineer will perform an inspection of the structural slab and will designate areas where concrete removal shall be required. It shall be the responsibility of the Contractor to arrange the construction schedule so that the required operations may be performed without causing delay to the work.

   No operations will be performed by the Engineer until after the following construction work has been completed:

   a) The existing bituminous overlay or concrete wearing course, if present, has been removed.
   b) The existing waterproofing system, if present, has been removed.

   Note: The removal of this material will be paid for under other applicable items.

It shall be the responsibility of the Contractor to inform the Engineer, in writing, of the date that a structure will be available for inspection operations. Notification shall be given to the Engineer at least 7 days prior to the date that the area in question will be in a condition acceptable to the Engineer.

The Contractor is hereby informed that the following time period will be necessary to perform the required inspection operations:

One working day with suitable weather conditions per each six thousand (6,000) square feet, or portion thereof, of deck area.

The Contractor will not be allowed to do any further work to the structure, until all necessary inspection operations have been performed, unless given permission by the Engineer.

The Contractor shall include any costs related to the allowance for this inspection in the general cost of the work.

2) Hammer Demolition: The maximum allowable noise level caused by equipment used for the removal of deck concrete shall not exceed 90 decibels on the "A" weighted scale, as measured at the nearest residence or occupied building. The Contractor shall demonstrate, to the satisfaction of the Engineer, that the equipment will meet this requirement before the use of such equipment will be allowed.

   The weight of pneumatic hammers when used shall not exceed 30 pounds for concrete removal above the top reinforcing steel nor 15 pounds for concrete removal below the top reinforcing steel.

3) Hydro-Demolition Water and Equipment: All hydro-demolition equipment shall be capable of selectively removing spalled, delaminated or otherwise deteriorated concrete and cleaning the existing reinforcing steel of all rust and corrosion products by use of high-velocity water jets acting under continuous automatic control.

   The hydro-demolition equipment shall consist of filtering and pumping units operating in conjunction with a remote-controlled robotics device.

   All hydro-demolition equipment shall be equipped with an angled and rotating water nozzle to prevent interference of the existing reinforcing steel with the removal of concrete.

   The maximum allowable noise level caused by equipment used for the removal of deck concrete shall not exceed ninety (90) decibels on the "A" weighted scale, as measured at the nearest residence or occupied building. The Contractor shall demonstrate, to the satisfaction of the Engineer, that the equipment will meet this requirement before the use of such equipment will be allowed.

   The make and model numbers of hydro-demolition equipment shall be submitted for acceptance by the Engineer. No hydro-demolition work shall be initiated until this acceptance is granted.

   The Contractor shall provide structurally adequate shields approved by the Engineer for protection of adjacent traffic lanes in the vicinity of the removal and cleanup operations.

   Water used for the hydro-demolition shall be potable.

The Contractor is advised that the withdrawal of more than 50,000 gallons of water per day from a single source other than from a municipal water system shall require a diversion permit issued by the Department of Energy and Environmental Protection, Water Resources Unit, in accordance with the Connecticut Water Diversion Policy Act PA 84-402, CGS Sections 22a-365 through 22a-378.

4) Hydro-Demolition Drainage Runoff Control: At least 2 weeks prior to the planned initiation of hydro-demolition operations, the Contractor shall submit to the Engineer for acceptance a comprehensive plan for the hydro-demolition operation. This Hydro-Demolition Plan shall include the following:
   a) Equipment
   b) Containment
   c) Filtration
   d) Location of trial areas
   e) Disposal of hydro-demolition runoff and concrete debris in conformance with these specifications

   The Plan shall ensure that all concrete debris and particulate matter will be removed from hydro-demolition runoff water prior to its release to the environment.

   The Plan shall include provision for the concurrent vacuuming of all runoff water at the immediate vicinity of the hydro-demolition operation. Runoff water shall be completely contained and vacuumed into a suitably sized water tight mobile tank for transport to a disposal site sedimentation basin acceptable to the Engineer.

   Hydro-demolition operations shall proceed only with the simultaneous operation of a runoff water vacuum pickup in the immediate area of the hydro-demolition operation. Runoff water shall not be allowed to flow across adjacent travel lanes, across bridge joints nor through any existing bridge drainage system.

   The size and location of the disposal site sedimentation basin shall be detailed in the Hydro-Demolition Plan. The sedimentation basin shall be properly sized so that uncontrolled overflow does not occur. At the conclusion of hydro-demolition operations, the sedimentation basin and all concrete debris shall be removed and the area restored to its original condition.

   The Plan shall additionally conform to all applicable requirements of Section 1.10 Environmental Compliance of the Standard Specifications.

   The acceptance by the Engineer of the Hydro-Demolition Plan shall in no way relieve the Contractor of any responsibility for its safe and effective performance.

5) Calibration and Testing of Hydro-Demolition Equipment: A trial area will be designated by the Engineer to demonstrate that the equipment, personnel and methods of operation are capable of producing satisfactory results. The trial area will consist of 2 patches, each of

approximately 20 square feet, one area of deteriorated or defective concrete and one area of "sound" concrete as determined by the Engineer.

Area of sound concrete is defined as: An area free from chemical defects, delamination, spalling, cracks, etc.

In the "sound area of concrete," the equipment shall be programmed to remove concrete to a depth 1 inch $\pm$ 1/4 inch below the top reinforcing steel mat.

After completion of the sound concrete test area, the equipment shall be located over the deteriorated or defective concrete and, using the same parameters as for sound concrete removal, shall remove all deteriorated or defective concrete. If a satisfactory result is obtained, these parameters may be used as a basis for production removal.

If, after calibrating the hydro-demolition equipment and beginning removal operations in a particular zone or area, insufficient removal of concrete is observed, in the opinion of the Engineer, the Contractor shall recalibrate the hydro-demolition equipment for that zone or area to the satisfaction of the Engineer.

6) Removal of Deteriorated Concrete: All deteriorated concrete designated for removal under this construction item shall be removed within the limits shown on the plans and where ordered by the Engineer. The lateral limits of each area to be repaired will be delineated by the Engineer and suitably marked. Where several areas to be repaired are very close together, the Engineer may combine these individual patches into a large area. The outlines of each such area shall first be cut to a depth of 1/2 inch with a powersaw capable of making straight cuts prior to pneumatic demolition. In the event that reinforcing steel is encountered within the upper 1/2 inch depth during sawing operations, the depth of saw-cut shall immediately be adjusted to a shallower depth so as not to damage the steel bars. If so directed by the Engineer, saw cutting shall again be carried down to the 1/2 inch depth at other locations of repair provided reinforcing steel is not again encountered. Where over-breakage occurs resulting in a featheredge, the featheredge shall be squared up to a vertical edge in an acceptable manner. Where sawing is impractical, the area shall be outlined by chisel or other acceptable means.

   All deteriorated concrete shall be removed by pneumatic hammers or hydro-demolition methods.

   The depth of concrete removal shall be at least 1 inch below the top reinforcing steel mat but shall be such as to include all spalled, delaminated, or otherwise deteriorated concrete. The Engineer will be the sole determiner of what constitutes deteriorated concrete, using sounding methods or other evaluation measures.

   Within 1 hour following the initiation of a concrete removal operation in any patch area, all loose concrete debris shall be removed, followed by water flushing of the existing concrete bonding surface to completely remove all traces of concrete debris and cement residue so

that rebonding to the surface of the remaining sound concrete will be prevented. If it is not convenient to clean and flush the patch area within this time frame, all steel reinforcing and concrete bonding surfaces shall be cleaned subsequently by high pressure water blasting at a nozzle pressure not less than 3,000 psi with a sufficient volume to completely remove all rebonded debris and laitance.

Where the existing reinforcing steel is damaged or corroded, it shall be cut out and replaced with new reinforcing steel of the same size. Any sound reinforcing steel damaged during the concrete removal operations, shall be repaired or replaced by the Contractor at its expense, as directed by the Engineer. New steel shall be attached beneath or beside existing steel with a minimum splice length as indicated on the plans, or as directed by the Engineer. The concrete shall be removed to a minimum depth of 1 inch below the new steel.

7) Surface Preparation: Sound reinforcing steel which is in the proper position in the slab shall be left in place and cleaned of all concrete, the smaller fragments to be removed with hand tools in patch areas where pneumatic hammers were used.

Reinforcing bar wire ties and vertical supports shall be installed on inadequately supported or vibrating reinforcing steel, as directed by the Engineer.

The concrete surface and reinforcing steel to receive patching material shall be either sandblasted or water blasted, followed by air blasting in order to remove all loose particles and dust. All blasting operations shall be performed using techniques acceptable to the Engineer, taking care to protect all pedestrians, traffic, and adjacent property. All compressed air sources shall have properly sized and designed oil separators attached and functional to allow delivered air at the nozzle to be oil-free. The patch area shall be cleaned of all additional loose or powder-like rust, oil, solvent, grease, dirt, dust, bitumen, loose particles, and foreign matter just prior to patching.

If the patch area was not cleaned and flushed with clean water immediately following hydro-demolition, or if run-off from a nearby hydro-demolition operation was allowed to travel through the previously cleaned and flushed patch surface, all affected concrete and steel reinforcing bonding surfaces shall be water blast cleaned at a nozzle pressure not less than 3,000 psi as directed by the Engineer, to assure that all remaining bond inhibiting laitance is completely removed.

The entire concrete surface to be patched shall be dampened. All excess free water shall be removed from the patch area.

8) Mixing, Placing, and Finishing: Unless a winter operations plan has been submitted to the Engineer by the Contractor, mixing and placing concrete shall only take place when the ambient temperature is above 35°F or per manufacturer's recommendations, whichever is higher. All mixing shall be accomplished by means of a standard drum-type portable mixer. A continuous type mobile mixer may be used if permitted by the Engineer. The Contractor shall calibrate the mobile mixer under supervision of the Engineer. Calibration shall be in

accordance with the applicable sections of ASTM method C685. The total mix shall be limited to the quantity that can be mixed and placed in 15 minutes. The concrete mix shall be spread evenly and compacted to a level slightly above the pavement surface. Vibration, spading or rodding shall be used to thoroughly compact concrete and fill the entire patch area. Where practical, internal vibration shall be used in cases where concrete has been removed below the reinforcing steel. Hand tamping shall be used to consolidate concrete in smaller patches, including popouts.

Vibrating plates or vibrating screeds shall be used on the surface of all patches for strike off and consolidation. After the concrete has been spread evenly and compacted to a level slightly above the pavement surface, the vibrating plate or screed shall be drawn over the surface at a uniform speed without stopping, in order to finish the surface smooth and even with adjacent concrete.

The surface shall be float finished.

Finishing operations shall be completed before initial set takes place.

Cured patches, having a hollow sound when chain dragged or tapped, (indicating delamination), shall be replaced by the Contractor at its expense until a patch acceptable to the Engineer is in place.

9) Tolerances in Finished Patched Surfaces: The surface profile of the patched area shall not vary more than 1/8 inch in a distance of 10 feet, when a 10 foot long straightedge is placed on the surface at any angle relative to the centerline of the bridge. Humps in the patch that exceed the 1/8 inch tolerance shall be ground down by acceptable machinery. Sags or depressions in the surface of the patch area that exceed the 1/8 inch tolerance shall be repaired by removal of the concrete in the depression over an area determined by the Engineer to a depth of 1 inch and repaired in the previously described manner.

10) Underside of Bridge Deck Treatment: The Engineer will examine the underside of the bridge deck for popouts caused by the removal of deteriorated concrete. The exposed reinforcing steel shall be coated with a zinc-rich coating where ordered by the Engineer and in accordance with accepted written procedures and working drawings for "Clean and Coat Exposed Reinforcing Steel."

    If the popouts extend beyond the bottom layer of reinforcing steel, the popouts shall be repaired as ordered by the Engineer.

11) Test Cylinders: The Contractor shall make and perform compressive strength tests on representative cylinders under the supervision of the Engineer in accordance with ACI requirements. The dimensions, type of cylinder mold and number of cylinders will be specified by the Engineer. Traffic shall not be permitted on patched surfaces until the patch material attains a strength of 2500 psi, as determined by breaks of the test cylinders.

A portable compression testing machine shall be provided by the Contractor and available on site for cylinder testing. All testing and equipment shall conform to ASTM C39.

Note: The compression machine must be calibrated in accordance with the provisions of Section 5, ASTM C39.

12) Time Schedule: Work under this item begun on any specific bridge during a construction season shall be completed, at least, to include this item, membrane waterproofing and placing of first course of wearing surface as soon as possible and specifically before the beginning of the construction season's winter shutdown.

All work shall proceed as required by the "Maintenance and Protection of Traffic" and "Prosecution and Progress" specifications elsewhere within the Contract.

Method of Measurement: This work will be measured for payment by the actual volume in cubic feet of patching material used in acceptable concrete deck patches, except where the Engineer determines that the Contractor has unnecessarily removed sound concrete. Where sound concrete has been unnecessarily removed, the replacement concrete will not be measured for payment. Providing safe access for delineation and inspection of the performed repairs will not be measured for payment.

Replacement of deteriorated rebar and coating of rebar at popouts, if required, will be measured for payment under other Contract items.

Basis of Payment: This work will be paid for at the Contract unit price per cubic foot of deck concrete repaired under "Partial Depth Patch," complete and accepted in place, which price shall include removal of deteriorated concrete, surface preparation of patch areas, concrete replacement, the furnishing and installation of reinforcing bar wire ties and vertical supports for inadequately supported existing reinforcing steel, inspection access, all materials, equipment, including the portable compression testing machine required for the testing of the repair material, tools, labor and work incidental thereto.

Replacement of deteriorated rebar, if required, will be paid for under the item "Deformed Steel Bars – Galvanized."

Coating of exposed rebar at the underside of the deck, if required, will be paid for under the item "Clean and Coat Exposed Reinforcing Steel."

Pay Item	**Pay Unit**
Partial Depth Patch	c.f.

ITEM #0601490.01A – EMBANKMENT WALL (SITE NO. 1)

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

Retaining Wall Selection: The embankment wall type shall be selected from the list of embankment walls shown on the plans. The Engineer will reject any proposed embankment wall type that is not listed on the plans.

The plans will list all proprietary embankment walls that are appropriate for each Site. This list does not warrant that the walls can be designed to meet either the dimensional, structural, or geotechnical constraints at each Site.

Refer to the Department's Qualified Product List (QPL) for the current approved proprietary embankment wall and for the suppliers' contact information; no other proprietary embankment walls will be allowed. The Department's QPL can be found at:

https://portal.ct.gov/-/media/DOT/documents/dresearch/conndotqplpdf.pdf?la=en

NOTE: SEE THE PLANS FOR THE SPECIFIC EMBANKMENT WALL TYPES THAT ARE ACCEPTABLE FOR EACH SITE.

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

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

Design:

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

2 - Designer's Liability Insurance: The Designer of the proprietary retaining wall shall secure and maintain, at no direct cost to the Department, a Professional Liability Insurance Policy for errors and omissions in accordance with Articles 1.03.07 and 1.05.02.

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

a. Detailed Plans:

- Stamped by a licensed Professional Engineer (Connecticut).

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

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

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

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

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

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

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

- Design parameters used along with AASHTO references.

- Material designations for all materials to be used.

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

- Details of installation of protective fencing where required.

- Details of Architectural Treatment where required.

- Details of Temporary Earth Retaining System(s) where required.
- Details of wall treatment where the wall abuts other structures.
- Treatment at underground utilities where required.

b. Design Computations:

- Stamped by a licensed Professional Engineer (Connecticut).
- Computations shall clearly refer to the applicable AASHTO provisions as stated in the Notes on the Contract Drawings.
- Documentation of computer programs including all design parameters.

c. Construction Specifications:

- Construction methods specific to the proprietary retaining wall chosen. These specifications should include construction limitations including vertical clearance, right-of-way limits, etc. Submittal requirements for materials such as certification, quality, and acceptance/rejection criteria should be included. Details on connection of modular units and connection of reinforcements such that assurance of uniform stress transfer should be included.
- Any requirements not stated herein.

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

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

4 - Final Submissions: Once a proprietary retaining wall design has been reviewed and accepted by the Department, the Contractor shall submit working drawings in accordance with Article 1.05.02.

The working drawings submission shall be made within 14 days of acceptance by the Department. No work shall be performed on the embankment wall until the final submission has been received by the Department.

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

The actual designer of the proprietary retaining wall is responsible for the review of any shop drawings prepared for the fabrication of the wall. One set of accepted Shop Drawings shall be submitted per Article 1.05.02 Submittals.

5 - General Design Requirements:

a. All designs for proprietary walls and temporary earth retaining systems shall conform to the latest edition of the American Association of State Highway and Transportation Officials (AASHTO) LRFD Bridge Design Specifications, including the latest interims, as specified in the plans, except as noted otherwise herein:

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

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

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

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

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

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

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

i. The minimum length of internal soil reinforcement shall be as specified in AASHTO 11.10.2.1, except for the minimum eight (8.0') foot length requirement.

j. If there are specific surcharges acting on the wall, they shall also be accounted for. The minimum equivalent fluid pressure used to design the wall shall be 33 lbs./ft^2 per linear foot of wall.

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

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

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

a. Drycast Concrete:

i. The minimum compressive strength of the block shall be 4000 psi measured at 28 days.

ii. The maximum water absorption shall be less than five percent.

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

b. Precast Concrete: Shall conform to the requirements of Section M.14 and as follows:

i. The minimum compressive strength of the block shall be 4000 psi measured at 28 days.

ii. All precast concrete components shall be air-entrained composed of Portland cement, fine and coarse aggregates, admixtures and water. The air-entraining feature may be obtained by the use of either air-entraining Portland cement or an approved air-entraining admixture. The entrained-air content shall be not less than four percent or more than seven percent.

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

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

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

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

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

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

6 - Facing Sealer: The face of all exposed drycast block shall be coated with clear Penetrating Sealer Protective Compound conforming to the requirements of Article M.03.09

Construction Methods: All construction methods for items not listed below shall be in accordance with the detailed requirements prescribed for the construction of the several contract items entering into the completed structure as specified in the Standard Specifications for Roads, Bridges, and Incidental Construction.

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

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

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

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

All blocks above the first course shall interlock with the lower courses by means of connecting pins. Vertical joints shall be staggered with each successive course as shown on the working drawings. Vertical tolerances and horizontal alignment tolerances measured from the face line shown on the plans shall not exceed ½ inch when measured along an 8-foot

straightedge. The overall tolerance of the wall from top to bottom shall not exceed ½ inch per eight feet of wall height or one inch total, whichever is the lesser, measured from the face line shown on the plans. A bond breaker shall be placed between the blocks and any adjacent cast-in-place concrete.

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

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

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

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

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

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

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

3 - Face Sealer: After the wall has been erected, the entire exposed face of the wall shall be coated with Penetrating Sealer Protective Compound. The application of the sealer shall conform to the requirements Article 5.14.03.

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

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

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

1. Design, detailing, and specifications for the wall.

2. Excavation for the wall

3. Design and Construction of temporary earth retaining systems for the support of the slope during construction.

4. Construction of the Embankment Wall, including the unreinforced concrete leveling pad.

5. The furnishing, placing and compacting of pervious structure backfill within the maximum payment lines.

6. The furnishing and placing of backfill drainage systems for the wall.

7. Any other work and materials shown on the plans for the construction of the wall.

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

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

ITEM #0602980A – CLEAN AND COAT EXPOSED REINFORCING STEEL

Description: This item includes cleaning and coating exposed reinforcing steel with a zinc-rich coating system. This work also includes removal and disposal of loose or delaminated concrete and severely deteriorated reinforcing steel as determined by the Engineer.

Materials: The Contractor may select one of the following products and shall submit a Materials Certificate in accordance with 1.06.07:

Crown Cold Galvanize Coating 93% Zinc Rich
7007VG
Aervoe Industries, Inc.
P.O. Box 485
Gardnerville, NV 89410
1-800-227-0196 or 1-775-783-3100
www.aervoe.com

ZRC Cold Galvanizing Repair Compound
ZRC 221
ZRC Worldwide
145 Enterprise Drive
Mansfield, MA 02050-2132
1-800-831-3275 or 1-781-319-0404
www.zrcworldwide.com

The Contractor may propose other products for the Engineer's acceptance by submitting a Materials Certificate and Certified Test Report in accordance with 1.06.07, showing that the coating meets these requirements:

- ASTM A780, Annex A2 with zinc dust concentration above 92% in the dried film;
- Zinc dust pigment shall conform to ASTM D520, Type III;
- The VOC content shall meet the current DEEP Air Compliance regulations for the coating category "zinc-rich primer;"
- Corrosion Performance Criteria: Must pass a minimum of 2000 hours of salt spray testing for a minimum of 2 mils of zinc in the dry film, without failure according to ASTM B117.

Construction Methods:

Submittals: The Contractor shall prepare and submit written procedures and working drawings in accordance with 1.05.02.

The Submittals shall address the following:

- Proposed equipment and removal methods;
- Debris shields and access;
- Coating product information, including coating manufacturer, product name, application instructions, technical data and MSDS/SDS;
- The Manufacturer's written application instructions at a minimum shall contain the following:
    - Number of coats needed to meet the Corrosion Performance Criteria
    - Minimum wet film and dry film thickness per coat
    - Minimum and maximum recoat time

- Thinning requirements if allowed by the Manufacturer.

1. Inspection of the Repair Area: The limits of concrete removal around the exposed reinforcing steel to be coated will be determined by the Engineer. The Engineer will also identify any severely corroded reinforcing steel that requires removal.

   The Contractor shall provide clear access to the repair areas to determine the limits of concrete removal. During this time, the Engineer will perform an inspection of the repair area and designate where concrete removal is required. The inspection will use visual assessment as well as sounding for delamination (hammer tapping).

   The Contractor must inform the Engineer, in writing, of the date that the repair location will be available for inspection operations and the method that will be used for access. Notification shall be given to the Engineer at least 7 days prior to the date so that the Engineer can plan accordingly and verify that the proposed method of access is acceptable.

   The Contractor shall not perform any work to the repair location until all necessary inspection operations have been performed, unless given permission in writing by the Engineer. The Contractor shall include the time required for inspection in its overall construction schedule and shall include all costs associated with providing access for the Engineer.

2. Removal of Deteriorated Concrete**:** All deteriorated concrete designated for removal under this item shall be removed within the limits shown on the plans and where ordered by the Engineer. The limits of each area of concrete to be removed will be delineated by the Engineer and suitably marked.

   Hand tools shall be used first to remove loose and hollow sounding concrete. If the concrete cannot be removed with hand tools, the Engineer may authorize the use of pneumatic hammers. The weight of pneumatic hammers, when used shall not exceed 15 pounds. The Contractor shall provide structurally adequate shields approved by the Engineer for protection of adjacent areas.

   Where reinforcing steel is identified by the Engineer to be removed, a portion of the reinforcing steel shall be cut and removed.

3. Cleaning Exposed Reinforcing Steel: The surface of the exposed reinforcing steel shall be power tool cleaned according to SSPC-SP3 requirements to remove all concrete fragments, loose or powder-like rust, dust, dirt, loose particles, and other bond inhibiting matter. Surfaces shall be wiped down to remove the remaining dust and contaminants. Cleaning shall be done just prior to coating.

4. Coating Exposed Reinforcing Steel: The zinc-rich coating shall be prepared according to the Manufacturer's recommendations. During application, the container shall be agitated often to provide a homogenous mixture. The coating material shall be brush-applied in accordance with the manufacturer's written requirements. The surrounding concrete shall not be coated.

Care shall be taken to coat all exposed portions of each bar's perimeter and all exposed surfaces where bars overlap or are in contact with each other. Manufacturer's requirements for recoat times shall be strictly adhered to.

5. Supply and Storage of Material: All coatings shall be supplied in sealed containers bearing the Manufacturer's name, product designation and expiration date. Coating shall be furnished in the Manufacturer's original, sealed and undamaged containers. The Contractor shall provide a suitable facility for the storage of the coating, which is in accordance with the latest federal and state regulations.

Method of Measurement: This work will be measured for payment by the actual number of linear feet of reinforcing steel cleaned and coated and accepted by the Engineer. The length of coated reinforcing steel shall be measured along the exposed face of the bar. Where bars are adjacent to each other, the length of each bar shall be measured. No deduction in length shall be made where bars overlap.

Basis of Payment: This work will be paid for at the Contract unit price per linear foot for "Clean and Coat Exposed Reinforcing Steel," complete and accepted, which price shall include all materials, equipment, tools and labor incidental thereto, including access to the repair areas for repair and inspection, debris shields and disposal of debris.

Pay Item	**Pay Unit**
Clean and Coat Exposed Reinforcing Steel	l.f.

ITEM #0603602A – DUCTILE IRON PIPE SUPPORTED ON BRIDGE

Description: Work under this item shall consist of furnishing and installing a 24-inch ductile iron sanitary sewer interceptor on Bridge No. 01585 at Route 313 (River Street) over Little River in the location and to the limits shown on the plans. The Contractor shall furnish and install ductile iron pipe, structural steel, pipe support system, sleeves, link seals, anchors, threaded rods, sealants, hardware and all materials required for complete sanitary sewer installation. Also included in the work will be low-pressure air testing of the completed sanitary sewer on the bridge. All materials and work shall be subject to inspection and approval by the Town of Seymour Water Pollution Control Authority (WPCA).

Materials: The materials for this work shall meet WPCA standards. The Contractor shall submit to the Engineer Certified Test Reports and Materials Certificates in accordance with Article 1.06.07. The WPCA shall be permitted to inspect and approve all materials furnished by the Contractor at the manufacturer's plant. All pipe, bends, fittings, and appurtenances shall be subject to inspection by WPCA at the point of delivery. Material found to be defective due to manufacture or damage in shipment shall be rejected, recorded on the bill of lading and removed from the job site. In case of failure of the pipe or appurtenance to comply with such specifications, the replacement of the defective materials shall become the responsibility of the Contractor.

1. **Ductile Iron Pipe:**

Pipe shall be Thickness Class 54 manufactured and finished in The United States of America and in accordance with ANSI/AWWA C151/A21.5, latest revision. All ductile iron pipe shall be double cement mortar-lined and double bituminous seal coated inside and bituminous seal coated on the exterior per ANSI/AWWA C104/A21.4, latest revision.

All fittings shall be ductile iron in accordance with ANSI/AWWA C153/A21.53, rated for 350 PSI working pressure, double cement lined and double seal coated inside and bituminous seal coated on the exterior per ANSI/AWWA C104/A21.4, latest revision.

Pipe and fitting joints shall be push-on type with mechanical or restrained flexible jointing (TR Flex) configuration matching connecting pipe, and/or as identified on the drawings. All pipe and fitting joints shall employ a single, elongated grooved rubber gasket to affect the joint seal.

Approved Manufacturers of Mechanical Joint Ductile Iron Pipe / Fittings

McWane Ductile
American Cast Iron Pipe Company
U. S. Pipe

All ductile iron pipes, fittings, and specialty items installed in the permanent underground sewer system, and where called out, shall have mechanical joints utilizing ductile iron restraints on all pipe joints. Restraints shall consist of a ductile iron harness bolted to the flange of the adjacent pipe bell, and utilizing serrated wedge type anchors to grip the pipe barrel. The harness shall be constructed of ASTM A 536 ductile iron. The harness shall be a one-piece design. The

anchors shall employ torque limiting twist-off nuts. Set screw type restraints shall not be used. Field Lok 350 gaskets (by U.S. Pipe) may be used for restraint.

Approved manufacturers of joint restraints
Megalug Series 1100, manufactured by EBAA Iron Inc.
Romagrip MJ Restraining gland, manufactured by Romac Industries, Inc.
Field Lok 350 gasket by U.S. Pipe

Gaskets shall be Styrene Butadiene Rubber (SBR) conforming to the requirements of ANSI A21.11/AWWA C111, supplied by the pipe or fitting manufacturer.

2. Restrained Couplings:

Restrained couplings shall consist of a coupling sleeve of ductile iron per ASTM A536, with end restraint rings of ductile iron per ASTM A536, with gaskets and corrosion resistant, low alloy high strength, double ended threaded rods with nuts per AWWA C111/A21.11. Steel sleeves or steel restraint rings shall not be used. Wetted parts shall be lined with a minimum 15 mil fusion bonded epoxy coating per ANSI/AWWA C213, conforming to ANSI/NSF-61. Restraint rings shall have a heat cured protective coating and shall employ heat cured epoxy coated serrated wedges with torque limiting nuts to grip the connecting pipe. Set screw types shall not be used.

Approved Manufacturers

Restrained coupling shall be Series 3800 by EBAA Iron, Eastland, TX,
Alpha restrained Joint Coupling by Romac Industries
Hymax Grip Coupling by Mueller

3. Penetration Sealant (Backwall or Diaphragm)

A mechanical rubber linking seal shall be installed for permanent hydrostatic seal between the outside of sanitary sewer pipe and concrete bridge backwall or diaphragm. Mechanical rubber linking seal shall be Link-Seal as furnished by Garlock, or approved equal.

4. Structural Steel

Structural steel for pipe supports including channels, tees, angles, and rolled plates shall meet the requirements of Section 6.03. Drilling Holes and Bonding Anchors and Dowels shall meet the requirements of Section 6.10. Threaded rods shall meet the requirements of AASHTO M270, Grade 50 T2. All structural steel, anchors and dowels, and anchor rods and nuts shall be galvanized.

Construction Methods: The Contractor shall coordinate with the Town of Seymour Water Pollution Control Authority (WPCA) and permit WPCA access to the work for inspection.

The Contractor shall submit Shop Drawings and Product Data to the Engineer for approval in accordance with Article 1.05.02. These drawings and submittals shall include, but not be limited to, the following information: The location, layout, dimensions, and material type for pipe support system, and resulting elevations and slopes for sanitary sewer pipe on the bridge and at the abutments.

Sanitary sewer shall be laid and maintained to the lines and grades shown on the plans or based on approved shop drawings. Pipe elevations shall be adjusted, as needed, based on sanitary sewer test pit findings. No portion of the sanitary sewer and pipe support assembly shall protrude below the bottom elevation of adjacent concrete beams. The pipe shall be laid on a continuous slope across the bridge for positive gravity flow. The Contractor will be responsible for all ladders, scaffolding, debris containment system, and temporary pipe supports required to safely perform the work and the Contractor shall prevent construction materials or debris from entering wetlands and watercourses.

1. Pipe Supports:

Structural steel pipe supports shall be installed level and plumb at the approved locations. All field-drilled holes through galvanized members shall be painted with CRC zinc rich cold galvanizing compound and allowed to dry. Pipe supports shall support the weight of live sanitary sewer flowing full without deflection of the sanitary sewer main pipe segments. Pipe supports, threaded rods, and steel plate pipe saddle shall be installed such that when the pipe is seated no portion of the pipe or support assembly protrudes below the elevation of the bottom of adjacent bridge beams.

2. Pipe and Fittings:

All pipe, fittings, and accessories shall be loaded and unloaded in a manner that avoids damage or distortion of the pipes. Under no circumstances shall material be dropped. All materials shall be stored in a manner they will be protected from damage. Pipe shall not be stacked higher than the limits specified by the manufacturer. The bottom tier of stacked pipe shall be kept off the ground on timbers, rails, or concrete, etc. Pipe in tiers shall be alternated: bell, plain end; bell, plain end and shall not make contact with one another. All gaskets shall be stored in a cool location protected from direct sunlight. Gaskets shall not come in contact with petroleum products. Gaskets shall be used on a first-in, first out basis.

All pipe, fittings and other appurtenances shall be examined carefully for damage and other defects prior to installation. Defective materials may be rejected the Engineer. All lumps, blisters, and excess coating shall be removed from the socket and plain ends of each pipe, and the outside of the plain end and the inside of bell end shall be wiped clean and dry and be free from dirt, sand, grit or any foreign materials before the pipe is laid. No foreign materials shall be allowed to enter the pipe or fittings prior to, during, or after installation. Any material accumulating within the pipe and fittings shall be removed. When installed, fittings and bends shall be fully seated ensuring gaskets remain in the intended position. Care shall be taken to avoid damage to pipe and fittings when joining.

At times when pipe laying is not in progress, the open ends of pipe shall be closed by a watertight plug or other means approved by the Engineer. The plug shall be fitted with a means for venting. The plug shall remain in place until the trench is pumped dry. Prior to removal of the plug, air and/or water pressure in the pipeline shall be safely released.

3. Ductile Iron Pipe Joints and Assembly:

The Contractor shall be responsible for all temporary measures required to lift or slide the pipe in place on the pipe supports including all ladders, scaffolding, and temporary supports required to accomplish the work. All temporary measures shall be completely removed from the site upon completion of the work.

For Mechanical Joints (Restrained), the Contractor shall wipe clean the socket and the plain end. The plain end, socket and gasket shall be washed with a soap solution to improve gasket seating. Place the restraint gland on the plain end with the lip extension toward the plain end, followed by the gasket with the narrow edge of the gasket toward the plain end. Use manufacturer approved mechanical joint restraint system at all joints made up under this item. Insert the pipe into the socket and press the gasket firmly and evenly into the gasket recess. Keep the joint straight during assembly. Make deflection after joint assembly but before tightening bolts. Push the restraint gland toward the socket and center it around the pipe with the gland lip against the gasket. Insert bolts and hand-tighten nuts. Mechanical joint bolts (3/4-inch) for pipe sizes ranging from 4" to 24" diameter shall be tightened to the normal sequence and range of bolt torque recommended by the manufacturer, while at all times maintaining approximately the same distance between the restraint gland and the face of the flange at all points around the socket. This can be accomplished by partially tightening the bottom bolt first, then the top bolt, next the bolts at either side, finally the remaining bolts, or follow the manufacturer's recommended alternation sequence. Repeat the process until all bolts are within the appropriate range of torque. The final torque application will snap off the retainer bolt heads. When it is necessary to deflect the pipe from a straight line in either the horizontal or vertical plane, the amount of joint deflection shall not exceed 75% of the manufacturer's requirements.

Cutting pipe shall be done in conformance with all safety recommendations of the manufacturer of the cutting equipment. Field cutting of ductile iron pipe shall only be done on "gauged" pipe, that is, pipe so marked at the factory as to be within proper O.D. diameter and out of round tolerance for proper jointing at any position along the length. Cutting shall be done in a safe, workmanlike manner without creating damage to the pipe or cement-mortar lining. Ductile-iron pipe may be cut using an abrasive pipe saw, rotary wheel cutter, guillotine pipe saw, or milling wheel saw. Oxyacetylene or plasma torch or any flame cutting method shall not be used. Cut ends and rough edges shall be ground smooth, and sufficiently beveled for gasket makeup.

Fittings, plugs and caps shall be set and joined to the pipe in the manner specified in the specifications for cleaning, laying and joining pipe.

All pipe joints and fittings shall be installed with thrust restraining glands or retainers, as described above.

Pressure testing of the sanitary sewer shall be performed using low-pressure air testing in accordance with ASTM F1417 Standard Practice for Installation of Plastic Non-pressure Sewer Lines Using Low-Pressure Air and Uni-Bell Specification UBPPA UNI-B-6 Recommended Low-Pressure Air Testing of Installed Sewer Pipe. The Contractor shall be responsible for any repairs or adjustments necessary to satisfy minimum testing requirements.

Method of Measurement: Ductile Iron Pipe Supported on Bridge will be measured for payment by the number of liner feet installed and accepted in accordance with the pay limits shown on the plans.

Basis of Payment: This work will be paid for at the Contract unit price per linear foot for "Ductile Iron Pipe Supported on Bridge" which price shall include all materials, equipment and tools, testing of bonded dowels, and all labor incidental thereto.

There will be no separate payment for drilling holes and bonding anchors and dowels, the cost for which shall be included under this item.

There will be no separate payment for low-pressure air testing, the cost for which shall be included under this item.

Demolition of existing concrete diaphragms and removal of existing sanitary sewer shall be paid under Item "0503001A – Removal of Superstructure".

Pay Item	**Pay Unit**
Ductile Iron Pipe Supported on Bridge	l.f.

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, and as directed by the Engineer. Work shall also include conditioning of the surface to be coated, and all submittals and quality-control testing noted herein.

The completed membrane system shall be comprised of a primer coat, reinforcing material as specified or directed, membrane coating (minimum total thickness of 80 mil and maximum total thickness not to exceed 120 mil), an additional 40 mil membrane layer with aggregate broadcast into the material while still wet, and an application of tack coat.

Materials: The Contractor shall select a waterproofing membrane system from the Department's Qualified Products List (QPL) for Spray-Applied Membrane Waterproofing System. All materials incorporated in the work shall meet the Manufacturer's specification for the chosen system. A Manufacturer is the original source of supply as defined in Article 1.06.01 of CTDOT's Standard Specifications. The Engineer will reject any system that is not on the QPL.

Reinforcing material (to bridge gaps, joints and cracks) shall be as recommended by the manufacturer.

Aggregate: The aggregate shall be a nonfriable, durable #8 aggregate stone with no more than one-half percent (0.5%) passing the #200 sieve by weight.

Concrete Deck Repair Material: Depressions greater than ½ inch that are required to be filled before application of the membrane shall be repaired with a neat repair mortar as approved by the Engineer. If the repair includes engagement of reinforcing steel, the repair shall be performed under separate, appropriate Contract items.

Construction Methods:

1. Submittals:
   Prior to submission, the Contractor shall ensure that the Manufacturer and Supplier are fully informed regarding any site constraints or specific structural materials on which the membrane system is to be installed on.
   At least 30 days prior to installation of the membrane system, the Contractor shall submit to the Engineer the following:
   (a) A Site-specific Installation Plan that includes, but is not limited to, the manufacturer's recommended equipment, materials and procedure for:
      1) Authorization by Manufacturer of applicator
      2) Safety precautions, SDS documents
      3) On site storage of material
      4) preparation of the deck surface and recommended surface moisture content at time of priming, including the manufacturer's recommendation for primer based on substrate material or environmental conditions

5) Pre-treatment or preparation procedure at cracks and gaps, treatment at curbs, vertical surfaces or discontinuities
6) Overspray protections (masking and shielding)
7) Method and equipment for taking/calculating onsite temperatures and dewpoint temperatures as well as listing of acceptable temperature and dewpoint ranges for application of primer and/or membrane
8) Method and equipment for application of the primer and membrane
9) Treatment of already primed areas when delays occur; include allowable time frame for covering already placed primer or treatment if the primed surface is compromised
10) Treatment at overlap areas
11) Method for placement of the aggregated coat
12) All Quality Control (QC Plan) tests and procedures to be performed prior to and during the membrane system's installation
13) Recommended repair methods for system non-compliant issues identified during application

(b) Materials Certificate for the primer, membrane and aggregate in accordance with the requirements of Article 1.06.07.
(c) Concrete Mix Design: At least two weeks before installation, the Contractor shall submit the concrete mix design to the Engineer for acceptance. For RSCP material, NTPEP lab test data shall be submitted that demonstrates that the concrete mix matches the mix that was tested by NTPEP and meets the pre-qualification criteria in the QPL. This test data shall be submitted with a Materials Certificate and a Certified Test Report in accordance with Article 1.06.07.

Automated mechanical applicators will be considered for approval for use, provided there is a trial installation area to demonstrate that the required thickness can be consistently achieved. The Installation Plan shall identify and differentiate between areas using automated applicators and areas where hand application will be used, such as on vertical surfaces and at areas prior to installation of reinforcing material.

2. A technical representative, in the employ of the manufacturer, shall be present on-Site immediately prior to and during application of the membrane. The technical representative shall not be an employee of the installation contractor but is on Site solely to perform QC. The technical representative shall review environmental conditions for proper application, inspect and approve the surface prior to priming, provide guidance on the handling, mixing and addition of components, observe application of the primer and membrane. The technical representative is required to notify the Engineer immediately when conditions are not within acceptable parameters and any further installation will be analyzed by the Engineer under Article 1.06.04. The technical representative shall be qualified and shall perform all required QC testing and remain on the Project site until the membrane has fully cured.

   All QC testing, including verbal direction or observations at the time of installation, shall be recorded and submitted to the Engineer for inclusion in the Project records. The QC testing

data shall be received by the Department's Project personnel prior to any paving over the finished membrane, or within 24 hours following completion of any staged portion of the work.

3. Applicator Approval: The Contractor's membrane Applicator shall be fully trained and authorized by the membrane manufacturer and shall have successfully completed at least six spray membrane projects in the past two 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 submittal of the Installation Plan. 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.

4. Job Conditions:
   (a) Environmental Requirements: Air and substrate temperatures shall be between 40°F and 104°F and the substrate shall be above the dew point. Outside of this range, the Manufacturer shall be consulted.

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

   Extra care shall be taken to prevent the introduction of moisture onto the area to be membraned including, but not limited to, locating water rest break areas/devices away from the works, prevent vehicles from accessing the prepared areas that may have AC units that drip water. If there is any potential for moisture to impact application, operations shall cease until conditions warrant proper adherence to specification requirements.

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

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

5. 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 product type, lot and batch number, manufactured date and expiry or "Best-used-by Date."

   (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 Safety Data Sheets (SDS) 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 original shelf life has expired shall be used.

6. Pre-application Meeting: A minimum one week prior to beginning any membrane waterproofing work, an on-site Pre-application meeting shall be scheduled to review all requirements of the approved Installation Plan. This meeting shall include representatives from the membrane system's Manufacturer and from the Installer as well as the Prime Contractor.

7. Surface Preparation:
   (a) Protection: The Contractor shall be responsible for the protection of equipment, adjacent areas, and affected pedestrians/traffic from over spray or other contamination. Permanent highway features adjacent to the work such as, but not limited to, curbs, parapets, sidewalks and bridge joints shall be masked prior to application of the materials.

   (b) Surface Preparation: Surfaces shall be free of oil, grease, curing compounds, loose particles, moss, algae, growth, laitance, friable matter, dirt, bituminous products, previous waterproofing materials or any material that will affect the proper bonding/adhesion of the membrane to the surface receiving the membrane application. If required, degreasing shall be done by detergent washing in accordance with ASTM D4258.

   Sharp peaks and discontinuities within the areas to be coated shall be ground smooth. Any peak greater than ¼ inch above the surface profile of the prepared substrate shall be ground to the surrounding elevation and voids and holes greater than ½" in the surface patched with appropriate material. The surface shall be abrasively cleaned, in accordance with ASTM D4259, to provide a sound substrate free from laitance and shall achieve a Concrete Surface Profile (CSP) as defined by the International Concrete Repair Institute (ICRI) of between 4 and 6. The QC representative shall have on their person and available for use by Department Engineers, a full CSP Chip Set to confirm concrete surface meets above profile requirement. Areas not falling within the noted range shall be re-addressed as needed.

   Steel components to receive membrane waterproofing shall be blast cleaned in accordance with the Society of Steel Protective Coatings' SSPC-SP6, Commercial Blast Cleaning, and shall be coated with the membrane waterproofing system within the same work shift.

8. Inspection and Testing: Prior to priming of the surface, the Engineer, the 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 Contractor at the Site using a "Sovereign Portable Electronic Moisture Master Meter," "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 shift for each contiguous section worked on during that shift. Additional tests may be required if atmospheric conditions change and retesting of the substrate moisture content is warranted.

The membrane system shall not be installed on substrate with a moisture content greater than 6%, or at a moisture content above the amount recommended by the written submittal installation documentation from the system's Manufacturer.

(b) The ambient air temperature and dew point temperature readings shall be taken immediately prior to starting any primer or membrane application and continuously throughout the installation process. No primer or membrane application shall be allowed if the difference between the two is 5° deg or less, or is not within the recommended air and dew point temperature ranges noted in the submitted Installation Plan from the system's Manufacturer.

(c) Random tests for adequate tensile bond strength shall be conducted by the Contractor on the substrate using an adhesion tester in accordance with the requirements of ASTM D7234 for concrete substrate or ASTM D4541 for steel substrate. The minimum frequency shall be one test per 5,000 s.f. but not less than three adhesion tests per shift for each contiguous section worked on during that shift. The locations of the pull tests shall be at least a distance from each other equal to or greater than 1/3 of the width or length (whichever is greater) of the area being worked in that section. The location of the pull tests shall be located in accordance with ASTM D3665 or a statistically based procedure of stratified random sampling approved by the Engineer.

Adequate surface preparation will be indicated by tensile bond strengths of 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.

(d) Grouted joints, materials that the membrane cannot bond to, and cracks or discontinuities that cannot be bridged over by the membrane material shall be covered by a reinforcing material recommended by the membrane system's Manufacturer prior to application of membrane layers as approved or directed by the Engineer.

9. Application:
   (a) The System shall be applied in the following distinct steps as follows:
      1) Substrate preparation,
      2) Priming,

3) Reinforcing material application over grouted joints, cracks, etc., embedded in wet membrane bonding layer,
4) Membrane application,
5) Membrane with aggregate.

(b) Immediately prior to the application of any components of the System, the surface shall be adequately dry (see Section 8(a) 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 shall be continued up the vertical, if shown on the plans or 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. All components shall be used from its original packaging (barrels) or be discarded – no mixing of like materials from different batches shall be allowed.

(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, squeegee 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.

Bond Strength: Random tests for adequate adhesion capacity shall be conducted on the primed substrate in accordance with the requirements of ASTM D7234 for concrete or ASTM D4541 for steel substrate. The minimum frequency shall be one test per 5,000 s.f. but not less than three adhesion tests per shift for each contiguous section worked on during that shift. The locations of the pull tests shall be at least a distance from each other equal to or greater than 1/3 of the width or length (whichever is greater) of the area

being worked in that section. The location of the pull tests shall be located in accordance with ASTM D3665 or a statistically based procedure of stratified random sampling approved by the Engineer.

Adequate adhesion 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.

Any primer not adequately applied shall be removed and new primer applied at the Contractor's expense, as directed by Engineer.

Delays to the membrane installation following installation of the primer may necessitate remedial measures. Re-application of the primer or any work required due to, but not limited to, precipitation, ambient or dew point temperatures falling out of allowable zone, materials dropped on the surface, shall be accomplished as outlined in the Installation Plan.

(g) Membrane and Reinforcing Material: Application of the membrane on the primed surface shall not commence until the primer is cured and adequate adhesion capacity achieved as described in Section 9(f) of this specification.

The waterproofing membrane shall consist of two equal 40 mil coats for a total dry film thickness of a minimum 80 mils but not to exceed 120 mils. successive coats shall be of a contrasting color to aid in Quality Assurance and inspection.

Hand sprayer application of a single layer at 80 mils may be allowed after demonstration on a test section of not less than 100 sq. feet, of the applicator's ability to meet specified tolerances has been reviewed and found acceptable to the Engineer.

Use of an automated mechanical applicator to achieve the required thicknesses in either one or two equal layers, may be allowed after demonstration on a test section of not less than 100 sq. feet, of the applicator's ability to meet specified tolerances has been reviewed and found acceptable to the Engineer.

Reinforcing material, if required, shall be applied as described in the Installation Plan.

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 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 adhesion shall be conducted on the membrane in accordance with the requirements of ASTM D7234 for concrete substrate or ASTM D4541 for steel substrate. 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.

Repair the membrane system following destructive testing and correct any deficiencies in the membrane system or substrate noted during QC testing in accordance with the Manufacturer's recommendations to the satisfaction of the Engineer at no additional cost to the State.

(h) Repairs: For areas left untreated or where the membrane hasn't bonded or 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, abraded and wiped with solvent (e.g. acetone or other manufacturer-recommended material) up to a width of at least six inches on the periphery, removing any contaminants unless otherwise recommended by the Manufacturer. The substrate shall be primed as necessary and tested for adhesion before the membrane layer(s) are applied. A continuous layer shall be obtained over the substrate with a six-inch overlap onto any adjacent existing membrane. The repaired area shall be tested for adhesion, with a minimum of one test per repair area.

(i) Overlapped areas: Where the membrane is to be joined to existing cured material, the overlapped area shall be cut back to sound material if necessary, abraded and wiped with solvent (e.g. acetone or other manufacturer-recommended material) or cleaned in accordance with the Installation Plan, up to a width of at least six inches prior to application of the overlapping membrane material. A continuous layer shall be obtained over the substrate with a six-inch overlap onto existing membrane. The overlapped section shall be tested for adhesion, with a minimum of one test per 200 lineal feet.

(j) 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 coated area to a point where no membrane material is visible. The membrane and aggregate shall be fully integrated after the aggregate has been applied and the membrane cured.
2) Using motorized mechanical sweepers followed by a vacuum or motorized blower apparatus, remove all loose and excess aggregate and fines from the surface, to the satisfaction of the Engineer, and dispose of properly prior to application of tack coat and overlay.

3) Traffic shall not be allowed to travel on the completed membrane system without prior approval of Engineer upon consultation with Manufacturers technical representative.
4) Localized areas not fully coated following removal of loose aggregate, defined as being at least 90% covered with well-adhered aggregate within any one square foot area, shall be touched-up with additional membrane and aggregate as needed. These areas shall then be swept and/or vacuumed or blown again prior to application of tack coat and overlay.
5) Tack coat: a Tack Coat Emulsion shall be applied to the aggregated finish prior to covering with a bituminous concrete mat. Material shall be applied in two coats of 0.06 - 0.08 gal/s.y. allowing it to break in between coats. This work shall be done as part of the paving operation and paid under separate, applicable Contract items.

10. 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 criteria that do not meet the requirements of the Engineer shall be addressed at this time.

Method of Measurement: This item will be measured by 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 and accepted in place, which price shall include submittals, Pre-Work Meeting, all surface preparation, furnishing, storing and applying the system, technical representative and Quality Control testing, and any necessary repairs and remediation work as well as all materials, equipment, tools, labor incidental to this work.

The asphalt emulsion (tack coat) will be paid separately.

Pay Item	**Pay Unit**
Membrane Waterproofing (Cold Liquid Elastomeric)	s.y.

ITEM #0819002A – PENETRATING SEALER PROTECTIVE COMPOUND

Description: Work under this item shall consist of cleaning concrete surfaces of dirt, dust, and debris, and furnishing and applying a clear, penetrating sealer to concrete surfaces where shown on the plans, to provide a barrier against the intrusion of moisture and chlorides. 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 and traffic from overspray.

Materials: The penetrating sealer shall conform to Article M.03.09. A Materials Certificate shall be submitted for the penetrating sealer in accordance with Article 1.06.07. A product not listed on the Qualified Products List (QPL) may be considered for approval. A Certified Test Report shall be submitted in accordance with Article 1.06.07 indicating that the product being considered conforms to the Test Requirements listed on the QPL.

Construction Methods:
Submittals: The Contractor shall submit to the Engineer Safety Data Sheets (SDS), Technical Data Sheets and product literature for the approved sealer. The literature shall include written instructions how to apply the sealer to vertical and horizontal surfaces, and where required, overhead surfaces. Application rate and number of applications of sealer shall be addressed.

The Contractor shall submit to the Engineer, in accordance with Article 1.05.02, written procedures for cleaning the concrete surfaces prior to sealer application 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 protection of the deck and curb to which membrane waterproofing will be applied. Should the membrane already be present, the submittal shall address shielding of the membrane. It shall also indicate how vegetation and regulated areas 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 concrete surfaces that:

- Need repair
- Require special attention or cleaning procedures
- Have been previously treated with coatings or curing compounds that would hinder penetration of the sealer into the concrete
- Will be new or newly repaired

Written procedures shall include observations listed above. Application of penetrating sealer to new concrete shall be addressed in the application procedures. Forms for surfaces of new

concrete to receive penetrating sealer shall not be treated using form release oil, which can inhibit or prevent penetration of the sealer into the concrete.

Surface Preparation: Concrete surfaces to which penetrating sealer will be applied shall be clean and free of grease, oil, and other surface contaminants, including biological growth. 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 that are to remain.

Application: Application of the sealer may begin only after the Engineer evaluates the concrete surfaces and determines that conditions for installation comply with the accepted written application procedures.

The sealer shall be applied in accordance with the accepted application procedures at the rate specified by the manufacturer. The Contractor shall monitor and record the number of square feet of concrete surface sealed and the number of gallons of sealer applied over that surface area to verify that the required application rate is being met. A minimum of three applications of sealer shall be assumed to be needed. After the first application of the sealer, curing time shall be recorded and submitted to the Engineer. Additional applications of sealer shall be applied as specified in the application instructions, provided adequate time between applications and appropriate curing of the sealer have occurred. For each application, the Contractor shall record the area and number of gallons of sealer applied as well as the curing time for that application. The Contractor may be directed to apply sealer in up to three separate applications if concrete surfaces readily absorb the previous application.

If the Contractor is directed to apply more than three applications of sealer, the additional applications will be compensated as extra work. Should salts, oil or other visually undesirable materials be evacuated from the concrete by the penetrating sealer and remain on the surface after sufficient rain events have occurred, the Engineer may order surface cleaning of the concrete as extra work.

The Engineer shall be provided access to inspect the concrete surface during application and after the sealer has had adequate time to cure.

Method of Measurement: This work will be measured for payment by the actual number of square yards of concrete, sealed 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.

The following are not included in the cost of this item and will be considered Extra Work:

- Special cleaning procedures ordered by the Engineer to properly prepare the concrete surface for application of the penetrating sealer (such as removal of tightly adherent biological growth, graffiti, or other difficult-to-remove surface contaminants)
- Additional applications of sealer as noted in the Construction Methods
- Cleaning of evacuated material from sealed surfaces as ordered by the Engineer.

Pay Item	**Pay Unit**
Penetrating Sealer Protective Compound	s.y.

ITEM #0904487A – METAL BRIDGE RAIL (HANDRAIL)

Description: Work under this item shall consist of fabricating and installing a metal bridge railing, consisting of extruded aluminum rail and aluminum plate support bracket connected to preset anchorages, as shown on the plans, as directed by the Engineer and in accordance with this specification.

Materials: Materials for this work shall conform to the following requirements:

1. Metal Bridge Rail:

The railing posts, post connection devices, splice bars, and rails shall be extruded aluminum and conform to the requirements of ASTM B221, 6061-T6 or 6005-T5.

Socket head cap screws shall be stainless steel and conform to the requirements of ASTM F837, Group 1 (ANSI Type 304).

Bolts and set screws shall be stainless steel and conform to the requirements of ASTM F593, Group 1, (ANSI Type 304). Nuts shall be stainless steel and conform to the requirements of ASTM F594, Group 1. Washers shall be stainless and conform to the requirements of ASTM A167, Type 302 through 305.

Cone point rivets shall confirm to ASTM B316, Aluminum Alloy 6061-T6 or ASTM B221, Aluminum Alloy 6061-T-6.

2. Preset Anchorage:

The preset anchorage shall be fabricated as detailed on the contract plans. Preset anchorages configured differently from those detailed on the plans may be used provided they utilize the same materials described below and are approved by the Engineer prior to fabrication.

The wire struts shall be cold-drawn and conform to ASTM A510, Grade 1030 with minimum tensile strength of 100 ksi. These wire struts shall be securely welded to the ferrules with the welds capable of developing the tensile strength of the struts and the ferrules. Steel welding shall be in accordance with the American Welding Society “Structural Welding Code-Steel”, ANSI/AWS D1.1.

The ferrules, either open end or closed end, shall conform to ASTM A108, Grade 12L14. A plastic cap shall be provided for sealing the bottom of each open end ferrule before placing concrete. Closed end ferrules shall provide a minimum full thread length of 2”. Removable plastic washers of the same diameter as the ferrules and approximately 3/32” in thickness shall be provided for the top of each ferrule and shall be left in place until the temporary supporting bolts are removed. Removable plastic caps shall be provided for sealing the top of each ferrule until the erection of railing posts.

After fabrication, the preset anchorage shall be hot-dip galvanized in accordance with ASTM A123. The bolts shall be "free running" in the ferrules after galvanization.

Bolts for the preset anchorage shall be stainless steel heavy hex head and shall conform to the requirements of ASTM F738M, Group 1 (AISI Type 304). The manufacturer's symbol and the grade shall be clearly marked on the bolt heads. Nuts shall be stainless steel and conform to the requirements of ASTM F836M, Group 1 (AISI Type 304). Washers shall be stainless steel and conform to the requirements of ASTM A167, Types 302 through 305.

4. Molded Pads:

Molded pads shall be manufactured from new unvulcanized elastomer and unused synthetic fibers, with a weight proportion of fiber content equal to approximately one-half of the total weight of the pad. The pads shall be formed into single sheets of 1/8" minimum thickness, with a tolerance of plus or minus 10 percent. Pads shall have a Shore A Durometer hardness within the range of 70 to 90.

The Contractor shall furnish a Materials Certificate in conformance with the requirements of Article 1.06.07 for the following materials: rails, rail sleeves, support brackets, post connections devices, rail splices, preset anchorages, bolts, washers and molded pads.

A sample preset anchorage, and samples of all sizes of bolts and washers used with the metal bridge rail, shall be submitted to the Engineer for approval prior to incorporation into the project.

Construction Methods: Before fabricating any materials, the Contractor shall submit shop drawings to the Engineer for approval in accordance with Article 1.05.02. These drawings shall include but not be limited to the following information: The layout plan showing all railing support bracket spacings, expansion joint locations, and material designations.

Aluminum welding shall be in accordance with the American Welding Society "Structural Welding Code-Aluminum", ANSI/AWS D1.2.

The preset anchorages shall be fabricated for installation perpendicular to the grade of the parapet. The anchorages shall be firmly and accurately held in position prior to and during the placing of concrete.

The railings shall be accurately fabricated and installed as shown on the plans. Lengths of rail elements shall be continuous over a minimum of four rail posts wherever possible and in no case less than two. Welding of two or more rails to form an element will not be allowed. Rail splices shall be located between the support brackets. Splice bars shall have a sliding fit in the rail sections.

One section of rail shall be attached to the splice pipe using a pair of stainless steel set screws. This will secure the rail in place and allow the rail to move into the mated section.

Posts shall be installed plumb.

For structures having railings with a radius of 410 feet or more, the railing may be sprung into place. For structures having railings with a radius of less than 410 feet, the railing shall be curved. Curving may be done by cold bending or by hot bending. Hot bending shall be done in accordance with Article 6.3 - Heating, of the "Specifications for Aluminum Structures".

Aluminum railings shall be carefully adjusted prior to fixing in place to insure proper matching at abutting joints and correct alignment and curvature throughout their length. After installation, all rails and posts shall be free of burrs, sharp edges and irregularities.

The open ends of the pipe rails shall be closed using an end cap.

Method of Measurement: This work will be measured for payment by the actual number of feet of metal bridge rail completed and accepted, measured along the rail from one rail end anchorage to the other rail end anchorage.

Basis of Payment: This work will be paid for at the contract unit price per foot for "Metal Bridge Rail (Handrail)" complete and accepted in place, which price shall include all materials, equipment, tools, labor and work incidental thereto.

Pay Item	**Pay Unit**
Metal Bridge Rail (Handrail)	lf

ITEM #0917010A - REPAIR GUIDERAIL

Description: Work under this item shall consist of the repair of newly installed guiderail. It shall be repaired in the locations originally installed and fabricated in conformity with the lines, designations, dimensions, and details shown on the plans or as ordered by the Engineer.

Materials: The material for guiderail shall meet the requirements as specified within the original applicable contract items.

When repairing guiderail, the Contractor shall reuse any undamaged existing guiderail elements, timber rail, wire rope, appropriate posts, delineators, lap bolts, and other hardware within the project limits as approved by the Engineer to repair the guiderail. The Contractor shall use new materials when any components of the existing railing are damaged or missing and cannot be obtained from other guiderail systems being removed or converted within the Project limits.

Construction Methods: The repair of guiderail shall be in accordance with contraction methods as specified within the original applicable contract items.

Guiderail, including end anchors, which has been installed in final condition and accepted by the Engineer, shall be eligible for reimbursement for repairs subject to the conditions described below. If multiple runs are to be installed in a single stage as indicated in the contract documents, determination for reimbursement shall be made when all runs within the stage are complete and accepted as previously described. On projects without designated stages, guiderail installations must be complete and serving the intended function as determined by the Engineer.

When newly installed guiderail is damaged by public traffic, the following conditions must be satisfied prior to reimbursement for payment;

1. The damage must have been caused solely by the traveling public.

2. The contractor shall provide satisfactory evidence that such damage was caused by public traffic. Such as accident reports obtained from the Connecticut Department of Public Safety, police agencies or insurance companies; statements by reliable, unbiased eyewitnesses; or identification of the vehicle involved in the accident.

3. The contractor shall attempt to collect the costs from the person or persons responsible for the damage and provide documentation of those efforts to the satisfaction of the Engineer.

4. If such evidence cannot be obtained, the Engineer may determine that the damage was not caused by the Contractor and reimbursement for payment is warranted.

This repair provision does not relieve the Contractor of the requirements of Section 1.07, any other contractual requirements for maintenance and protection of traffic and final acceptance and relief of responsibility for the project.

The contractor shall remain responsible for the safety and integrity of the guiderail system for the duration of the project. In the event the guiderail is damaged, the Contractor shall provide sufficient cones, drums and other traffic control devices to provide safe passage by the public. When ordered by the Engineer, the Contractor shall furnish replacement parts and immediately repair the guiderail, but in no case more than 24 hours after notification from the Engineer. In non-emergency situations, the guiderail shall be repaired within 72 hours. The repaired guiderail or anchorages, when completed, shall conform to these specifications for a new system. The Contractor shall be responsible for the removal and the proper disposal of all damaged material and debris.

Method of Measurement: Guiderail damaged solely by the traveling public will be measured for payment. Damage caused by the Contractor's equipment or operations will not be measured for payment.

The sum of money shown on the estimate and in the itemized proposal as "Estimated Cost" for repair of guiderail will be considered the price bid even though payment will be made only for actual work performed. The estimated cost figure is not to be altered in any manner by the bidder. Should the bidder alter the amount shown, the altered figures will be disregarded and the original price will be used to determine the total amount bid for the contract.

Basis of Payment: Repair of guiderail will be paid for in accordance with Article 1.09.04 as required to restore the rail to its full working condition in conformance with these specifications for a new system. There will be no payment for maintenance and protection of traffic for work associated with this item unless, in the opinion of the Engineer, the sole purpose of the maintenance and protection of traffic is for repair of the guiderail.

Pay Item	**Pay Unit**
Repair Guiderail	est. (est.)

ITEM #0950019A – TURF ESTABLISHMENT – LAWN

All of the provisions of Section 9.50 of the Standard Specifications shall apply as amended or supplemented by the following:

Article 9.50.02 - Materials: Replace the seed mix specified in M.13.04 with the following:

Metro Select Seed Mix
Pure Seed:

50% Turf type Perennial Ryegrass
20% Shamrock Kentucky Bluegrass
15% Foxfire Creeping Red Fescue
15% Brittany or Shadow II Chewings Fescue

Under no circumstances should annual Ryegrass, Italian Rye or any other seed be added to the seed mixture.

Article 9.50.03 - Construction Methods:

Replace the first paragraph with the following:

Construction methods shall be those established as agronomically acceptable and feasible and that are approved by the Engineer. Rate of application shall be field determined in Pure Live Seed (PLS) based on the minimum purity and minimum germination of the seed obtained. Calculate the PLS for each seed species in the mix. Adjust the seeding rate for the above composite mix, based on 1 lb. per 175sf. The seed shall be mulched in accordance with the Standard Specification.

Article 9.50.04 - Basis of Payment: Add the following:

This work will be paid for at the contract unit price per square yard for "Turf Establishment - Lawn" which price shall include all materials, mowing, maintenance, equipment, tools, labor, and work incidental thereto.

Pay Item	Pay Unit
Turf Establishment - Lawn	s.y.

ITEM #0969062A – CONSTRUCTION FIELD OFFICE, MEDIUM

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

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

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

Description \ Office Size	Small	Med.	Large	Extra Large
Minimum Sq. Ft. of floor space with a minimum ceiling height of 7 ft.	400	720	1400	2800
Minimum number of exterior entrances.	2	2	2	2
Minimum number of parking spaces.	7	7	10	15

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

Unless otherwise approved by the Engineer, office space shall be partitioned into segregated work areas for each user as follows:

A. Each work area (or cubicle) shall be a minimum of 8 feet × 8 feet, with full height walls or tall cubicle partitions (minimum 6 feet high), placed to provide a minimum of 6 feet walking space around and between each user work area (for social distancing).
B. Only one user (workstation/desk) per work area.
C. Desks, tables, and other work surfaces shall be arranged so that adjacent users do not face each other.

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, electronics, 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 and properly operating, heating, air conditioning, and ventilation equipment to maintain a temperature range of 68º-80º Fahrenheit within the field office. The Contractor shall increase ventilation rates and increase the percentage of outdoor air that circulates into the system where possible.

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 one (1) telephone line for phone/voice service. For an Extra-Large field office this shall consist of three (3) telephone lines for phone/voice service. The Contractor shall pay all charges.

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.

Data Communications Facility Wiring: As soon as the field office is in place, the Contractor shall propose a central wiring location, to designated CTDOT District personnel for the review and approval of CTDOT OIS. The central wiring location shall be large enough to house the Contractor supplied modem, Contractor supplied patch panel (if applicable), and CTDOT OIS supplied LAN switch and router. The Contractor shall supply the number of Category 6A 568B patch panels necessary to support the anticipated number of networked devices. The central wiring location shall also house the data circuit with appropriate power requirements and Category 6A cable run to the location of the installed data circuit. Power shall be provided at the central wiring location to power the hardware installed.

The Contractor shall install CAT 6A cables from the central wiring location to each workstation, Smart Board/TV location, Multifunction Laser Printer/Copier/Scanner and any other networked devices. The CAT 6A cables shall terminate in a (Category 6A 568B) wall or surface mount data jack at each networked device. Each run / jack shall be clearly labeled with an identifying Jack Number. The CAT 6A cables shall be terminated at the central wiring location with a service loop and RJ45 connectors. The Contractor shall also supply CAT6A cables of adequate length to reach from the wall or surface mount jack to the device being networked.

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

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

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

Furnishing Description (continued)	Office Size			
	Small	Med.	Large	Extra Large
	Quantity			
Telephone.	1	2	3	-
Full size stapler 20 (sheet capacity, with staples)	1	2	5	8
Desktop tape dispensers (with Tape)	1	2	5	8
8 Outlet Power Strip with Surge Protection	3	4	6	9
Rain Gauge	1	1	1	1
Business telephone system for three lines with ten handsets, intercom capability, and one speaker phone for conference table.	-	-	-	1
Mini refrigerator - 3.2 c.f. min.	1	1	1	1
Hot and cold-water dispensing unit. Disposable cups and bottled water shall be supplied by the Contractor for the duration of the project.	1	1	1	1
Microwave, 1.2 c.f., 1000W min.	1	1	1	1
Fire extinguishers - provide and install type and *number to meet applicable State and local codes for size of office indicated, including a fire extinguisher suitable for use on a computer terminal fire.	*	*	*	*
Electric pencil sharpeners.	1	2	2	2
Multi-Function Laser Printer/Copier/Scanner combination unit, network capable, as specified below under Field Office Technology	1	1	1	1
Field Office Internet Service and Hardware as specified below under Field Office Technology	1	1	1	1
Digital Camera as specified below under Field Office Technology	1	1	3	3
Teleconferencing Equipment as specified below under Field Office Technology	-	-	-	-
Infrared Thermometer, including annual third-party certified calibration, case, and cleaning wipes.	1	1	1	2
Concrete Curing Box as specified below under Concrete Testing Equipment.	1	1	1	1
Concrete Air Meter and accessories as specified below under Concrete Testing Equipment as specified below. Contractor shall provide third party calibration on a quarterly basis.	1	1	1	1
Concrete Slump Cone and accessories as specified below under Concrete Testing Equipment.	1	1	1	1
First Aid Kit	1	1	1	1
T-handle concrete cylinder mold splitter as specified below under Concrete Testing Equipment	1	1	1	1
Smart Phones as specified under Computer Related Hardware and Software.	-	-	-	-

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

Field Office Technology:
The Contractor shall supply the internet service connection, Contractor supplied modem, associated hardware, Digital Camera(s), Smart Phones, Multifunction Laser Printer/Copier/Scanner, Conference Room Teleconferencing Equipment, associated hardware and software meeting the requirements of this specification, as well as the latest minimum specifications posted, as of the Project advertising date, at CTDOTs Construction Field Office Technology web site.

Within 10 calendar days after the signing of the Contract, but before ordering/purchasing the required Digital Camera(s), Smart Phones, Multifunction Laser Printer/Copier/Scanner, Teleconferencing Equipment, 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 modem, digital cameras, smart phones, and Teleconferencing Equipment will be reviewed by CTDOT District personnel for approval. The Multifunction Laser Printer/Copier/Scanner 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, setup of the internet service connection and the configuration of the modem with a static IP address. Installation shall be coordinated with CTDOT District and Project personnel. Specifically, the Contractor shall supply the District with a Static IP Address, Subnet Mask Address and Gateway Address immediately upon establishment of internet service connection to assist with OIS equipment installation.

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 modem / Internet Service Connection, Digital Camera(s), Smart Phones, Multifunction Laser Printer/Copier/Scanner, Teleconferencing Equipment, as well as associated hardware, software, supplies, and support documentation. The hardware and cabling shall be installed in the field office to and at locations acceptable to the Engineer. Adequate electric service shall be supplied at all hardware and workstation locations to support the Department staff and hardware specified.

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

Once the Contract has been completed, the Contractor supplied 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 rainwater 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.

Electronic Level: The Contractor shall supply and maintain in working order, for the duration of the Contract, the number of electronic levels, identified in the Additional Equipment, Facilities and Services table of this specification. The electronic level(s) shall meet the following requirements:

A. 48-inch length, box beam type
B. IP65 water and dust proof
C. 0.1-degree accuracy
D. Backlit display
E. Carrying case included
F. New or like new condition

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 T 119, Standard Test Method for Slump of Hydraulic-Cement Concrete.
D. T-handle concrete cylinder mold splitter.

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) 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. Insured 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, 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, CTDOT will reimburse the Contractor for replacement costs exceeding the amount of the required coverage.

Maintenance: During field office occupancy by 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 professional cleaning including vacuuming carpet, washing and waxing floors, cleaning restrooms, removal of trash, general cleaning, 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 way 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 specified herein.

Pay Item	**Pay Unit**
Construction Field Office, (Medium)	Month

ITEM #0971001A – MAINTENANCE AND PROTECTION OF TRAFFIC

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

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

Route 313/River Street

The Contractor shall maintain and protect existing traffic operations, with the following exceptions:

1. During the allowable periods and when the Contractor is actively working, the Contractor will be permitted to maintain and protect at least an alternating one-way traffic operation no more than 300 feet in length on Route 313/River Street.

2. During the allowable periods the Contractor will be permitted to close Route 313/River Street to southbound traffic and detour traffic and pedestrians as shown on the Detour Plans. Northbound traffic shall be maintained on a paved travel path not less than 15 feet in width, as shown on the Maintenance & Protection Plans. The Contractor shall notify the Engineer at least 14 days in advance of implementing the detour.

3. During the allowable periods the Contractor will be permitted to close Route 313/River Street to traffic and detour traffic and pedestrians as shown on the Detour Plans.

   The Contractor shall notify the Engineer at least 14 days in advance of implementing the detour.

4. During the allowable periods, the Contractor will be permitted to close one lane of Route 313 westbound between Main Street and Derby Avenue to implement the pedestrian detour.

Route 67 / Bank Street

The Contractor shall maintain and protect existing traffic operations, with the following exceptions:

1. During the allowable periods and when the Contractor is actively working, the Contractor will be permitted to maintain and protect at least 1 lane of traffic in each direction with each lane on a paved travel path not less than 11 feet in width.

2. During the allowable periods and when the Contractor is actively working, the Contractor will be permitted to reduce eastbound traffic at the intersection with Route 313/River Street to one lane during the sanitary sewer bypass pumping operation as shown on the Maintenance and Protection of Traffic Plans. During this period, the

Contractor shall close the crosswalk across Route 313/River Street while maintaining all the other crosswalks at this intersection to allow alternative pedestrian circulation.

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

All Other Roadways

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

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

Commercial and Residential Driveways

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

Intermediate Term Sidewalk Closures

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

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

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

During the intermediate term sidewalk closure, all approaches to the sidewalk shall be blocked by Pedestrian Barricade with Sidewalk Closed signs.

The Contractor shall ensure that traffic control signals with pedestrian phases where access to the pushbuttons cannot be provided are revised at the start of the closure to automatically activate the pedestrian phase every signal cycle.

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

Pedestrians

The Contractor shall provide and maintain clear pedestrian travelpaths (minimum 4 feet wide) on new or existing sidewalk or temporary walks on at least one side of the street at all times at the Project site.

If the Contractor proposes changes to the plans, or the Contractor does not include plans, 30 days in advance of implementation the Contractor shall submit plans and procedures to the Engineer for review. The submittal shall be in accordance with typical details of the Manual on Uniform Traffic Control Devices (MUTCD) for maintaining pedestrian sidewalk access during the reconstruction of the sidewalk. When a sidewalk or pedestrian route is closed, pedestrian traffic must be detoured or temporary sidewalk must be provided. Pedestrian detours and temporary sidewalks must meet ADA requirements. The appropriate signs for the pedestrian detour shall be installed in accordance with the MUTCD. All approaches to the closed sidewalks shall be blocked by Pedestrian Barricade with Sidewalk Closed signs. Temporary bituminous sidewalk and ramps, if required, will be paid under Contract Item "Temporary Pavement" and all pedestrian detour signage will be paid under Contract Item "Construction Signs."

When crosswalks or other pedestrian facilities are closed or relocated, temporary facilities shall be detectable and shall include accessibility features consistent with the features present in the existing pedestrian facility. Pedestrian traffic signal displays controlling closed crosswalks shall be covered or deactivated.

Pedestrians shall be detoured to existing crosswalks, or temporary crosswalks, which shall be located at intersections. If this is not possible, temporary midblock crosswalks may be installed, if directed by the Engineer. On-street parking shall be restricted for at least 50 feet in advance of any temporary crosswalk.

ITEM #0979005A – PEDESTRIAN BARRICADE

Section 9.79 is supplemented and amended as follows:

9.79.01 – Description:

Replace the entire Article with the following:

Under this item the Contractor shall furnish all Pedestrian Barricades required on the Project as stated in the item "Maintenance and Protection of Traffic," as shown on the Plans, and as directed by the Engineer.

Pedestrian barricades visible to vehicular traffic shall have retroreflective sheeting compliant with the Retroreflective Sheeting: Construction Barricade Sheeting section of the Department's Qualified Product List on the side(s) facing vehicular traffic.

9.79.02 – Materials:

Replace the entire Article with the following:

Pedestrian Barricades used on the Project shall be listed on the Department's Qualified Product List under the Pedestrian Barricade category as follows:

- The barricades listed under the Test Level 3 category may be used on roadways with a posted speed limit of 60 miles per hour or less;
- The barricades listed under the Test Level 2 category may be used on roadways with a posted speed limit of 40 miles per hour or less;

Water filled Pedestrian Barricades shall only be used when the air temperature is above 33ºF. Such barricades shall only be filled with water and may not contain additional chemicals.

9.79.03 – Construction Methods:

Add the following:

Pedestrian Barricades shall be installed per manufacturer guidelines.

Barricade supports shall not protrude more than 4 inches into the pedestrian facility.

Pedestrian Barricades used to close a pedestrian facility shall cover the entire width of the pedestrian facility.

Pedestrian Barricades used for channelizing pedestrian traffic shall meet the following requirements:

1. Barricades along the pedestrian path shall be interlocked and the gap between adjacent devices shall not exceed 1 inch;

2. Barricades shall be installed to produce a smooth continuous length of barrier, except for locations where access to, or crossing, a pedestrian facility is allowed;

9.79.04 – Method of Measurement:

Replace the entire Article with the following:

Pedestrian Barricades will be measured as the number of feet along the top rail of pedestrian barricades installed and accepted on the Project.

9.79.05 – Basis of Payment:

Replace the entire Article with the following:

Pedestrian Barricades will be paid at the Contract unit price per linear foot for "Pedestrian Barricade." The length of Pedestrian Barricades will be paid for once, regardless of the number of times used on the Project.

Pay Item	**Pay Unit**
Pedestrian Barricade	l.f.

ITEM #1111200.01A – TEMPORARY DETECTION (SITE NO. 1)
ITEM #1111200.02A – TEMPORARY DETECTION (SITE NO. 2)

Description:

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

Materials:

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

Construction Methods:

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

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

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

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

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

Example Proposed Temporary Detection and Timing

Site 1

Warren, Rt. 45 at Rt. 341, Location #149-201

Approach	Phase	Phase Mode	TD Method	Area of Detection	Det Mode
Rt. 45 NB	***2***	***Min Recall***	***VIDS***	***150' from Stop Bar***	***Presence***
Rt. 45 SB	***2***	***Min Recall***	***SPVD***	***150' from Stop Bar***	***Pulse***
Rt. 341	***4***	***Lock***	***Microwave***	***30' from Stop Bar***	***Pulse***
Rt. 341	***4***	***Lock***	***Pushbutton***	***At SE & SW corners***	***n/a***

Temporary Phase Timing Settings:

Phase	Min	Ped	Ped Clr	Ext	Max 1	Max2	Yel	Red
2	***20***	***0***	***0***	***6***	***45***	***60***	***4***	***1***
4	***14***	***7***	***9***	***3***	***27***	***35***	***3***	***1***

Scheduled TD: ***July 4, 2011***

Site 2

Scotland, Rt. 14 at Rt. 97, Location #123-201

Approach	Phase	Phase Mode	TD Method	Area of Detection	Det Mode
Rt. 15 WB Left Turn	***1***	***Non-Lock***	***VIDS***	***5' in front to 10' Behind Stop Bar***	***Presence***
Rt. 14 EB	***2***	***Min Recall***	***Existing Loop***	***150' from Stop Bar***	***Pulse***
Ped Phase	***3***	***Non-Lock***	***Pushbutton***	***At all corners***	***n/a***
Rt. 14 WB	***6***	***Min Recall***	***VIDS***	***150' from Stop Bar***	***Presence***
Rt. 97	***4***	***Lock***	***Loop, Pre-formed***	***20' from Stop Bar***	***Pulse***

Temporary Phase Timing Settings:

Phase	Min	Ped	Ped Clr	Ext	Max 1	Max2	Yel	Red
1	***5***	***0***	***0***	***2***	***12***	***18***	***3***	***1***
2 & 6	***24***	***0***	***4***	***4***	***26***	***36***	***4***	***1***
3	***16***	***7***	***9***	***0***	***16***	***16***	***4***	***1***
4	***14***	***7***	***9***	***3***	***27***	***35***	***3***	***1***

Scheduled TD: ***July 4, 2011***

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

Provide a list of telephone numbers of personnel who will be responsible for the TD to the Engineer. If the TD malfunctions or is damaged, notify the Engineer and place the associated phase

on max recall. Respond to TD malfunctions by having a qualified representative at the site within three (3) hours. Restore detection to the condition prior to the malfunction within twenty-four (24) hours.

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

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

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

Method of Measurement:

Temporary Detection (TD) shall be measured for payment as follows:

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

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

Basis of Payment:

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

Pay Item	**Pay Unit**
Temporary Detection (Site No.XX)	L. S.

ITEM #1118050.01A – TEMPORARY SIGNALIZATION (SITE NO. 1)
ITEM #1118050.02A – TEMPORARY SIGNALIZATION (SITE NO. 2)

Description:

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

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

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

Materials:

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

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

1. Preliminary Inspection

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

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

- Support Structures
- Handholes, Conduit and Cable

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

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

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

2. Temporary Signalization (TS) Plan

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

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

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

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

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

The TS Plan shall also address the following elements:

Earthwork

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

Maintenance and Protection of Traffic

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

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

Utilities

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

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

Electrical Service and Telephone Service at Existing Signalized Intersections

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

Electrical Service for TS at Unsignalized Intersections

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

Temporary Signalization

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

Inspection

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

Detection

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

Emergency Vehicle Pre-emption System (EVPS)

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

Coordination

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

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

Maintenance

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

Signal Owner
CT DOT Electrical Maintenance Office or
Town Representative
Local Police Department

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

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

Duration

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

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

Ownership

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

Method of Measurement:

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

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

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

Basis of Payment:

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

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

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

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

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

Pay Item	Pay Unit
Temporary Signalization (Site No.XX)	L.S.

ITEM #1206023A - REMOVAL AND RELOCATION OF EXISTING SIGNS

Section 12.06 is supplemented as follows:

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

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

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

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

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

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

Pay Item	Pay Unit
Removal and Relocation of Existing Signs	L.S.

ITEM #1208937A – SIGN FACE - SHEET ALUMINUM (TYPE XI RETROREFLECTIVE SHEETING)

Section 12.08 is supplemented and amended as follows:

12.08.01 – Description:

Add the following:

All signs shall use Type XI retroreflective sheeting with the exception of side-mounted signs with white background which shall be Type IX.

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

Signs shall conform to the sign details located at https://portal.ct.gov/DOT/Traffic-Engineering/Catalog-of-Signs with legend for variable signs as shown in the plans.

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)

Number of Posts in Project =>	**51-100**	**101-250**	**251-1000**	**>1000**
Sample Size=>	**5 Posts**	**10 Posts**	**40 Posts**	**60 Posts**
0 Defects	1.0	1.0	1.025	1.025
1 Defect	0.9	0.95	0.975	0.983
2 Defects	Rejection	0.9	0.95	0.967
3 Defects	Rejection	Rejection	0.925	0.95
4 Defects	Rejection	Rejection	0.9	0.933
5 Defects	Rejection	Rejection	Rejection	0.917
6 Defects	Rejection	Rejection	Rejection	0.9
7 or more Defects	Rejection	Rejection	Rejection	Rejection

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

ITEM #1210110A – 4" (WHITE) TYPE I EPOXY RESIN PAVEMENT MARKINGS
ITEM #1210111A – 4" (YELLOW) TYPE I EPOXY RESIN PAVEMENT MARKINGS
ITEM #1210113A – 6" (WHITE) TYPE I EPOXY RESIN PAVEMENT MARKINGS

Section 12.10 *is supplemented and amended as follows:*

Article 12.10.01 – Description:

Replace the entire Article with the following:

This item shall consist of furnishing and installing retroreflective Yellow and White Type I Epoxy Resin Pavement Markings of the width and color specified at the locations indicated on the plans, in conformance with the plans, this specification, and as directed by the Engineer.

Type I Epoxy Resin Pavement Markings include center lines, lane lines, and shoulder lines.

Type I Epoxy Resin Pavement Markings shall be installed in a pavement marking groove. Pavement marking grooves are specified elsewhere in the Contract.

Article 12.10.02 – Materials:

Replace the entire Article with the following:

Type I Epoxy Resin Pavement Markings shall meet the requirements of **Article M.07.22 – Epoxy Resin Pavement Markings** amended as follows:

Delete the last sentence and add the following:

(j) Type I Epoxy Resin Pavement Markings shall consist of one of the following mixes of retroreflective beads, or approved equal:

- Potter's VISIMAX glass bead and a clear glass bead that meets the requirements of AASHTO M 247, Type 4.
- Potter's VISIULTRA glass bead and a clear glass bead that meets the requirements of AASHTO M 247, Type 1.
- 3M's tinted microcrystalline ceramic bead with minimum indexes of refraction of 1.89 (dry) and 2.4 (wet) when tested using the ASTM E1967 method and a clear glass bead that meets the requirements of AASHTO M 247, Type 4. Yellow tinted beads shall be installed on yellow pavement markings and white tinted beads shall be installed on white pavement markings.

Article 12.10.03 – Construction Methods:

In Subarticle **1. Equipment**, *delete paragraph 1 and add the following:*

Equipment furnished shall include an applicator truck of adequate size and power, together with:

(a) remote application equipment designed to apply an epoxy resin material in a continuous pattern, and
(b) portable retroreflective bead applicators, one for each size bead, designed to provide uniform and complete coverage of the epoxy binder by a controlled free-fall method. Pressurized retroreflective bead application shall not be used.

In Subarticle **2. Procedures**, *delete paragraphs 3, 7, and 8 and add the following:*

All surfaces that are power washed shall be allowed to dry sufficiently prior to the application of the epoxy markings. The areas to be marked shall be broom cleaned immediately prior to the application of the epoxy markings. Retroreflective beads shall be applied immediately after application of the epoxy resin marking to provide an immediate no-track system.

The epoxy for Type I Epoxy Resin Pavement Markings shall be uniformly applied to the surface to be marked to ensure a wet film thickness, without retroreflective beads, of 20 mils ± 1 mil.

For Potter's VISIMAX glass bead Type I Epoxy Resin Pavement Markings, a first drop consisting of Potter's VISIMAX glass beads shall be applied at the rate of 8 lb./gal. of epoxy pavement marking material, immediately followed by a second drop consisting of glass beads meeting the requirements of AASHTO M 247, Type 4 at the rate of 8 lb./gal. of epoxy pavement marking material. Traffic cones or other acceptable methods shall be used to protect the Type I Epoxy Resin Pavement Markings until cured.

For Potter's VISIULTRA glass bead Type I Epoxy Resin Pavement Markings, a first drop consisting of Potter's VISIULTRA glass beads shall be applied at the rate of 10 lb./gal. of epoxy pavement marking material, immediately followed by a second drop consisting of glass beads meeting the requirements of AASHTO M 247, Type 1 at the rate of 5 lb./gal. of epoxy pavement marking material. Traffic cones or other acceptable methods shall be used to protect the Type I Epoxy Resin Pavement Markings until cured.

For 3M's tinted microcrystalline ceramic bead Type I Epoxy Resin Pavement Markings, a first drop consisting of tinted microcrystalline ceramic beads shall be applied at the rate of 5 lbs./gal. of epoxy pavement marking material, immediately followed by a second drop consisting of glass beads meeting the requirements of AASHTO M 247, Type 4 at the rate of 10 lbs./gal. of epoxy pavement marking material. Traffic cones or other acceptable methods shall be used to protect the Type I Epoxy Resin Pavement Markings until cured.

Replace Subarticle **3. Initial Performance** *with the following:*

The retroreflectivity of the markings applied shall be measured by the Contractor using the procedure and equipment detailed below for the Initial Test Period, Review Period, and Observation Period.

Test Lots: The following test lots will be randomly selected by the Engineer to represent the line markings applied:

Table 12.10.03-3.1: Line Test Lots

Length of line	Number of Lots	Length of Test Lot
< 1000 feet	1	Length of Line
< 1.0 mile	1	1000 feet
≥ 1.0 mile	1 per 1.0 mile	1000 feet

Measurement Equipment and Procedure: Retroreflectometer equipment shall be calibrated using the instructions from the instrument manufacturer within 24 hours prior to use.

Skip line measurement shall be obtained for every other stripe, taking no more than 2 readings per stripe with readings no closer than 20 inches from either end of the marking.

Solid line test lots shall be divided into 10 sub-lots of 100 foot length and measurements obtained at 1 randomly select location within each sub-lot.

The Contractor shall perform retroreflectivity readings on the Type I Epoxy Resin Pavement Markings between 30 and 37 days after installation per the measurement and sampling procedures contained in ASTM D7585 (*Standard Practice for Evaluating Retroreflective Pavement Markings Using Portable Hand-Operated Instruments*). Portable Retroreflectometer and Mobile Retroreflectometer testing is allowed using the following methods.

- ASTM E1710 *(Standard Test Method for Measurement of Retroreflective Pavement Marking Materials with CEN-Prescribed Geometry Using a Portable Retroreflectometer)*;
- ASTM E2177 *(Standard Test Method for Measuring the Coefficient of Retroreflected Luminance (R_L) of Pavement Markings in a Standard Condition of Wetness).*

Additional Contents of Certified Test Report (CTR): The CTR shall also list:

- Project, Route number, and Route direction.
- Geographical location of the test site(s), including distance from the nearest reference point.
- Manufacturer and model of retroreflectometer used.
- Most recent calibration date for equipment used.
- Time of Day the readings are taken.

Recordings shall be certified by the Contractor, reviewed by the Engineer, and provided to the CTDOT Division of Traffic Engineering.

A CTR, in accordance with 1.06.07 or 1.20-1.06.07, shall be submitted to the Engineer no later than 10 days after the measurements are taken.

The Materials Certificates (MC) shall also list:

- Liquid binder application rate.
- Retroreflective bead type(s) and drop rate.

Recordings shall be certified by the Contractor, reviewed by the Engineer, and provided to the CTDOT Division of Traffic Engineering.

The MC, in accordance with 1.06.07 or 1.20-1.06.07, shall be submitted to the Engineer no later than 10 days after the measurements are taken.

Initial Test Period: The minimum initial retroreflectivity readings shall meet or exceed the following minimum values using an observation angle of 1.05 degrees and an entrance angle of 88.8 degrees:

	*Type I White Markings	*Type I Yellow Markings
ASTM E1710 (Dry)	350 mcd/lux/m^2	225 mcd/lux/m^2
ASTM E2177 (Wet Recovery)	300 mcd/lux/m^2	200 mcd/lux/m^2

Review Period: A 90-day Review Period shall be implemented for Type I Epoxy Resin Pavement Markings. The Contractor shall be responsible for any defects in materials and workmanship of the Type I Epoxy Resin Pavement Markings for a period of 90 days from the date the Type I Epoxy Resin Pavement Markings are installed and subjected to live traffic conditions.

At the end of the Review Period, the Engineer will inspect the Type I Epoxy Resin Pavement Markings for durability, color, and retroreflectivity, and inform the Contractor of all rejected pavement markings that require replacement. The Type I Epoxy Resin Pavement Markings will be rejected for any of the following conditions:

- Insufficient thickness or line width, uneven cross-section.
- Poor adhesion or delamination.
- Insufficient groove depth.

The Contractor shall be responsible for replacing all rejected Type I Epoxy Resin Pavement Markings at no cost to the State. All rejected Type I Epoxy Resin Pavement Markings shall be replaced within 14 days of notification to the Contractor of the failed Review Period test. All Type I Epoxy Resin Pavement Markings installed as the result of a failed Review Period test shall meet all testing requirements of the initial performance testing procedures, and shall be subject to an additional Review Period.

Article 12.10.04 – Method of Measurement:

Replace the entire Article with the following:

Type I Epoxy Resin Pavement Markings will be measured for payment by the actual number of linear feet of Type I Epoxy Resin Pavement Markings installed on the pavement and accepted by the Engineer.

The cost of all measuring and testing of the retroreflectivity of the Type I Epoxy Resin Pavement Markings by the Contractor will be considered incidental to the cost of the item.

Article 12.10.05 – Basis of Payment:

Replace the entire Article with the following:

This work will be paid for at the Contract unit price per linear foot for "Type I Epoxy Resin Pavement Markings" of the width and color specified, installed on the pavement and accepted. These prices shall be for all the work required by this Section and all materials, equipment, tools and labor incidental thereto. Payment will not be made for pavement markings affected by Contractor error and ordered removed.

Pay Item	**Pay Unit**
(Width) (Color) Type I Epoxy Resin Pavement Markings	l.f.

ITEM #1300007A – EXCAVATION AND DISPOSAL OF UNSUITABLE MATERIAL (WATER MAIN)

Description:

Work under this section shall include all labor, tools, and equipment necessary to excavate and legally dispose of Unsuitable Material.

Unsuitable Material under this item shall be defined as any material deemed unsatisfactory, by the Aquarion Representative, to provide a stable base below the pipe on which to install pipe. Unsuitable Material includes, but is not limited to, boney soil, clay, wet soil, organics, peat, soft or spongy soil, or any other material deemed unsatisfactory to provide a stable base below the pipe on which to install pipe.

The vertical limits of Removal of Unsuitable Material vary, and are below the pipe, as defined in the Typical Trench Detail. The vertical limits of Unsuitable Material shall be as directed by the Aquarion Representative.

Any excavated material that is deemed unsuitable material by the Aquarion Representative shall be removed from the site and properly disposed of. This refers to material throughout the entire depth of the trench. However, the payment limits for Removal of Unsuitable Material are below the pipe, as defined in the Typical Trench Detail. Unsuitable material removed from the rest of the trench to the lower vertical limit of the bedding material is included in the linear foot cost of the pipe installation.

Materials:

Work under this section shall include all materials necessary to excavate and legally dispose of unsuitable materials, including trench bracing, shoring, trench boxes, pumps and dewatering equipment.

Construction Methods:

Unsuitable Material shall be excavated, removed from the trench, and legally disposed of.

Trench bracing, sheeting and trench boxes shall be used in accordance with OSHA standards.

Method of Measurement:

Excavation and Disposal of Unsuitable Material (Water Main) will be measured for payment per cubic yard of Unsuitable Material removed from the trench below the pipe and to the limits as shown on the Typical Trench Detail or as directed by the Aquarion Representative.

Excavated material, down to the lower limit of bedding material, as defined in the Typical Trench Detail, that is deemed unsuitable material by the Aquarion Representative and removed from the

site will not be measured separately for payment, but shall be included in the linear foot cost of the pipe installation.

Basis of Payment:

Excavation and Disposal of Unsuitable Material will be paid for at the contract unit price per cubic yard of Unsuitable Material removed from the trench below the pipe and to the limits shown on the Typical Trench Detail or as directed by the Aquarion Representative.

No separate payment will be made for excavated material, down to the lower limit of bedding material, as defined in the Typical Trench Detail, that is deemed unsuitable material by the Aquarion Representative and removed from the site, but will be included in the linear foot cost of the pipe installation.

Pay Item	Pay Unit
Excavation and Disposal of Unsuitable Material (Water Main)	c.y.

ITEM #1300015A – ROCK IN TRENCH EXCAVATION 0' – 10' DEEP (WATER MAIN)

Description:

Work under this item shall include excavation, removal and disposal of all boulders 1/2 cubic yard or greater in volume, rock removal, and drilling and controlled blasting of boulders over 1 cubic yard, ledge formations, hoe ramming, hand chipping, and cement masonry or concrete structures to be removed from within the horizontal and vertical payment limits for pipe installation, as shown on the Typical Trench Detail.

Work under this item shall include removal, by hand labor, if required, of ledge rock, boulders, masonry or concrete structures in the vicinity of existing utilities.

Work under this item shall include pre-blast surveys, permits, drilling and blasting, excavation, and disposal of the excavated rock and/or boulders.

Work under this item shall include furnishing and installing bedding material to replace excavated rock to the limits shown on the Typical Trench Detail and compaction in 12" lifts of the entire trench.

Work under this item does not include furnishing and placing of Additional Backfill Material necessary to replace the excavated rock.

Definition of Rock

Rock shall be defined as solid ledge rock or boulders that, in the opinion of the Aquarion Representative, require drilling and blasting, wedging or sledging, and barring for its removal.

The following material shall not be measured or allowed for payment as rock excavation:

- soft or disintegrated rock or boulders which can be removed with a backhoe or excavator bucket
- loose or previously blasted rock
- broken stone in rock fills, walls, or elsewhere
- concrete, asphalt, or brick pavements
- concrete, asphalt, or stone curbs
- concrete, asphalt, or brick sidewalks
- boulders one half (1/2) cu. yd. or less

Limits of Rock Excavation

Rock shall be excavated to maintain minimum clearance between the outside of the structure or barrel of the pipe to the vertical side of the excavation, as shown by the horizontal payment limits on the Typical Trench Detail. Isolated points of rock shall not come closer to the outside of the structure or pipes and at joints as shown on the Typical Trench Detail for the purpose of maintaining sufficient room for properly making the joint. Refer to the Typical Trench Detail for the minimum distance between the bottom of the pipe, including the barrel, and rock at the bottom of the trench. This is the vertical limit of payment for rock.

Rock in miscellaneous excavations shall be excavated in accordance with the directions and to the limits directed by the Aquarion Representative.

The surface of the rock shall be stripped in sections satisfactory to the Aquarion Representative before the rock is excavated so that the proper measurements can be made.

Rock shall be removed to a depth below the pipe shown on the Typical Trench Detail. Bedding material shall be installed and compacted below the bottom of the pipe, and up to the vertical limits for bedding material as shown on the Typical Trench Detail. Replacement of excavated rock in this vertical limit for bedding material is considered bedding material, and is not considered as Additional Backfill Material.

Materials:

Materials under this section include any tools or equipment necessary to excavate, remove, and properly dispose of rock as defined in this section. Materials also include any tools or equipment necessary to backfill and compact material to replace excavated rock.

Construction Methods:

Mechanical Removal of Rock

Mechanical removal of rock shall include removal by hoe ram. The Contractor shall use mechanical means for removal of rock for the following conditions:

- due to the proximity of the pipeline route to existing structures
- due to restrictions against blasting set by federal, state, or local officials, or
- at the request of Aquarion

Frost Excavation

Frost excavation shall mean removal of frozen earth exceeding twelve (12) inches in depth, which in the opinion of Aquarion, requires for its removal, drilling and blasting or breaking with specialized power operated frost removal equipment.

Backfilling

Where pipe is laid in rock excavation, bedding material or Additional Backfill Material as specified in these specifications, shall be placed over the rock and compacted to sub grade. The minimum depth of bedding material as directed by the Owner's Representative shall be in accordance with the Typical Trench Detail. Excess rock, which cannot be used with earth to provide satisfactory backfill in the upper portions of the trench, shall be disposed of the same as excess earth excavation. No pieces of rock in excess of 12" shall be used in backfilling.

To replace excavated rock, the Contractor shall place backfill material obtained from excess material from other portions of the work or Additional Backfill Material, as specified in these specifications.

Additional Backfill Material shall be as directed by the Owner's Representative.

Method of Measurement:

Rock In Trench Excavation will be measured for payment per cubic yard of rock, as defined in this item, removed from the trench.

Bedding material furnished, installed, and compacted to replace excavated rock, to the limits shown on the Typical Trench Detail, will not be measured separately for payment, but shall be included in the linear foot cost of the pipe installation.

Additional Backfill Material furnished, installed, and compacted to replace excavated rock, to the limits shown on the Typical Trench Detail, will be measured separately for payment under the appropriate Item for Additional Backfill Material (Water Main).

Any cost beyond the unit prices for Rock Excavation for laborers and equipment that are idle during periods of rock removal will not be measured separately for payment.

Basis of Payment:

Rock in Trench Excavation will be paid for at the contract unit price per cubic yard of rock, as defined in this section, removed from the trench.

No separate payment will be made for bedding material furnished, installed, and compacted to replace excavated rock, to the bedding material limits shown on the Typical Trench Detail. Bedding material shall be included in the linear foot cost of the pipe installation.

Additional Backfill Material furnished, installed, and compacted to replace excavated rock, to the limits shown on the Typical Trench Detail, will be paid for separately at the contract unit price under the appropriate Item for Additional Backfill Material (Water Main).

No separate payment will be made for any cost beyond the unit prices for Rock Excavation for laborers and equipment that are idle during periods of rock removal.

Pay Item	**Pay Unit**
Rock In Trench Excavation 0’ – 10’ Deep (Water Main)	c.y.

ITEM #1300151A – ADDITIONAL BACKFILL MATERIAL (WATER MAIN)

Description:

Work under this item shall include furnishing, installing, placing and compacting bank run gravel, clean backfill, ¾" crushed stone, processed aggregate base, or native material as directed by the Aquarion Representative, which is not specifically included under other sections of these specifications as Additional Backfill Material.

Materials furnished and installed for backfill of rock or boulder removal, backfill of frost removal, replacement of unsuitable material, placement of bedding material, backfill, or pavement base are specified under this item. Acceptable material for backfill shall include bank run gravel, ¾" crushed stone, clean backfill, processed aggregate base, or native material.

Native material is acceptable material for Additional Backfill Material as long as it meets the requirements of these specifications.

The vertical pay limits of Additional Backfill Material are from 12" above the top of the installed pipe to the bottom of the Processed Aggregate Base or Rolled Granular Base layer (see the Typical Trench Detail) and the horizontal pay limits are as shown on the Typical Trench Detail.

All Additional Backfill Material shall be placed and compacted in 12" lifts.

Materials:

Bank Run Gravel

Bank Run Gravel shall consist of sound, tough, durable particles of crushed or uncrushed material free from soft, thin, elongated, laminated, friable, micaceous, or disintegrated pieces, mud, loam, organic matter, clay, or other deleterious material.

Bank Run Gravel shall be the product resulting from the deliberate mechanical crushing of gravel.

Bank Run Gravel shall not have stones larger than 2".

Bank Run Gravel shall meet the following gradation requirements:

Square Mesh Sieve	Percent Passing By Weight
2"	100
1-1/2"	90-100
1"	20-55
3/4"	0-15
3/8"	0-5

Processed Aggregate Base

Processed Aggregate Base is acceptable for use as Additional Backfill Material and shall conform to Connecticut Department of Transportation Standard Specifications, Section 3.04 and Article M.05.01.

Processed Aggregate Base shall not have stones larger than 2-1/2".

Processed Aggregate Base shall meet the following gradation requirements:

Square Mesh Sieve	Percent Passing By Weight
2-1/2"	100
2"	95-100
3/4"	50-75
1/4"	25-45
No. 40	5-20
No. 100	2-12

Clean Backfill

Clean Backfill shall be of a quality satisfactory to the Aquarion Representative and shall be free from large or frozen lumps, wood and other extraneous material. Clean Backfill shall be free from stones larger than 12 inches. Clean Backfill shall be placed in a manner acceptable to the Aquarion Representative. Unless otherwise ordered by the Aquarion Representative, the Clean Backfill shall be brought to the surface of the surrounding ground and neatly graded. Backfilling will only be done under the supervision of the Aquarion Representative.

¾" Crushed Stone

¾" Crushed Stone shall consist of sound, tough, durable particles of crushed or uncrushed material free from soft, thin, elongated, laminated, friable, micaceous, or disintegrated pieces, mud, or other deleterious material.

¾" Crushed Stone shall be the product resulting from the artificial crushing of rocks, boulders, or large cobblestones, all faces of which have resulted from the crushing operation.

¾" Crushed Stone shall not have stones larger than 1".

¾" Crushed Stone shall meet the following gradation requirements:

Square Mesh Sieve	Percent Passing By Weight
1"	100
¾"	90-100
½"	20-55
3/8"	0-15
No. 4 (3/16")	0-5

Native Material

Native material is acceptable for Additional Backfill Material as long as it meets the requirements of these specifications. Native material shall consist of natural material that is excavated from the trench or another portion of the job consisting of sound, tough and durable particles of soil and stone, free of clay, loam, or organic matter.

Aquarion reserves the right to require proof that the native material meets the requirements in these specifications through testing for gradation, organic content and compacted density. This testing will be at the expense of the Contractor if they wish to use the native material as backfill.

Native material shall not have stones larger than 3-1/2".

Native material shall meet the following gradation requirements:

Square Mesh Sieve	Percent Passing By Weight
3-1/2"	100
1-1/2"	55-100
1/4"	25-60
No. 10	15-45
No. 40	5-25
No. 100	0-10
No. 200	0-5

Construction Methods:

Bank run gravel, clean backfill, ¾" crushed stone, processed aggregate base, or native material shall be placed to the lines and grades ordered. Backfill shall be placed in layers not exceeding twelve inches (12") in thickness and shall be compacted in place by hand and/or by mechanical tamping devices.

Method of Measurement:

Work under this item will be measured for payment per cubic yard of Additional Backfill Material (Water Main) (regardless of the type of material used to backfill) installed, complete in place, compacted in the trench, and accepted.

Native material as Additional Backfill Material will not be measured separately for payment, but shall be included in the linear foot cost of the pipe installation.

Basis of Payment:

Work under this item will be paid for at the contract unit price per cubic yard of Additional Backfill Material (Water Main) (regardless of the type of material used to backfill) installed, complete in place, compacted in the trench, and accepted.

No separate payment will be made for native material as Additional Backfill Material, but shall be included in the linear foot cost of the pipe installation.

Pay Item	**Pay Unit**
Additional Backfill Material (Water Main)	c.y.

ITEM #1301082A – 8” DUCTILE IRON PIPE (WATER MAIN)

Description:

Work under this section shall include all labor, tools, and equipment necessary for installing 8” ductile iron water main, valves and fittings on this project including all appurtenances, complete in place, as shown on the drawings or as directed by the Aquarion Representative, and in accordance with the Aquarion Relocation Plans and Standard Details.

The Contractor shall have its pipe supplier prepare and shall submit to the Aquarion Water Company a "LAYING SCHEDULE" of all pipe and accessories to be furnished and installed under this Contract. No work shall be undertaken until the laying schedule has been submitted to and approved by the Aquarion Water Company.

Work under this section shall include all labor, tools, materials, and equipment necessary for:

- obtaining road opening permit, if directed by the Engineer
- coordination of Call-Before-You-Dig mark out
- saw-cutting of the roadway, sidewalks, or driveways
- traffic control equipment (signs, barriers, etc.)
- traffic control coordination, including scheduling of policemen and flagmen
- furnishing and maintaining lighting
- mobilization and demobilization
- clearing and grubbing
- excavation for pipeline trenches as measured from the existing grade to the trench subgrade
- excavation, forming and installing thrust blocks
- furnishing, installing, operating and maintaining a dewatering system
- furnishing, installing and removing sheeting, bracing and trench boxes
- furnishing, stockpiling, loading, hauling, placing and compacting pipe bedding material
- backfill and compaction of pipeline trenches
- stockpiling, loading, hauling and legally disposing of surplus material
- unloading and storage of pipe, fittings, valves, and other appurtenances
- stringing of pipe
- installing pipe, fittings, joint restraints, hardware and restrained joint pipe
- asphalt and concrete pavement removal and disposal
- removal and restoration of walls, fences, signs and any other structures which must be removed to carry out the work
- removal of topsoil and sod; restoration of area to original condition upon completion of work
- care and protection of existing pipes, utilities, and other structures

- piling and storage of excavated materials
- removal of and stacking of gate or butterfly valves at locations determined by the Aquarion Representative
- all other work shown, specified, or required for installing the water main, except that which is specifically included for payment under other items of this Contract.

The furnishing of ductile iron pipe, valves, bends and fittings is NOT included under this item of work. Refer to Item #1301861A – Furnishing Ductile Iron Pipe, Valves and Miscellaneous Fittings (Water Main) for more information.

Pressure testing of newly installed water main will be paid for under item 1301900A – Hydrostatic Pressure Test.

All public or private monuments, iron pipes or other types of property line and geodetic markers damaged or disturbed by operations under this Contract shall be reset by a licensed land surveyor, all at no additional cost to Aquarion or the State.

All water mains and appurtenances shall be installed in accordance with these Special Provisions and the Aquarion Relocation Plans and Details.

Materials:

The Contractor shall furnish materials based on the "List of Approved Materials" attached to special provision #1301861A – Furnishing Ductile Iron Pipe, Valves and Miscellaneous Fittings (Water Main). Additional materials, if required, shall be provided by the Contractor and shall be ordered by the Contractor from his material supplier. Additional materials must be approved by the Aquarion Representative at the site in order to be invoiced. There shall be no administrative mark up on additional materials ordered. A copy of all material invoices shall be given to Aquarion for review.

The Contractor shall furnish all pipe, fittings, appurtenances, and other materials to the project site. Leftover or unused materials that are to be returned to the Contractor's material supplier for credit shall be stockpiled in a neat and orderly fashion on pallets by the Contractor. These materials shall be picked up and removed from the site as soon as possible after the work on this item ends. The Aquarion Representative shall be present for the pickup of these materials and shall agree on which materials can be returned for credit with the Contractor's material supplier. The Aquarion Representative and the Contractor's material supplier shall document the materials on a credit form.

The Contractor shall remove and properly dispose of all trash and debris, including leftover materials that cannot be returned for credit.

Construction Methods:

Ductile Iron Pipe

Pipe coating that is damaged during shipment or placement shall be touched up in the field with two (2) coats of an asphaltic coating fully resistant to water and chemicals. Materials used for interior surfaces shall be acceptable for use in a potable drinking water supply and shall not impart any odors to the pipe and water.

At all changes in direction and dead ends a concrete thrust block and an approved length of restrained joints/pipe will be required utilizing the following chart for determining the number of joints to be restrained:

NUMBER OF RESTRAINED JOINTS AND LENGTHS

(100 psi, Cohesive Granular Soils, Ductile Iron Pipe)

Pipe Size	90º Bend	45º Bend	22 1/2º Bend	11 1/4º Bend	Dead End
6"	F(11)	F(5)	F(2)	F(1)	F+1(32)
8"	F(14)	F(6)	F(3)	F(1)	F+2(42)
10"	F+1(17)	F(7)	F(3)	F(2)	F+3(50)
12"	F+1(21)	F(9)	F(4)	F(2)	F+3(60)
16"	F+1(27)	F(11)	F(5)	F(3)	F+4(78)
24"	F+2(38)	F+1(16)	F(8)	F(4)	F+6(112)

Notes:

1. F + (any number listed in table) - Means fitting plus (the number of joints listed) on either side of the fitting.

2. (Any number listed in parentheses) - Means the number of feet on either side of the fitting that must be restrained, i.e. no short pieces.

3. For pressure greater than 100 psi. Aquarion will determine the number of restrained joints.

Mechanical joint locking gaskets may be used to restrain pipe joints and shall be Field Lock 350, Sure Stop 350, or approved equal and in accordance with ANSI/AWWA C111-12/A21.11 Standards, latest revision.

Installing Ductile Iron Pipe

All pipe installation shall conform to AWWA C600 Standards, latest revision, unless otherwise modified by these specifications.

Ductile iron pipe shall be laid to a minimum depth of 4'-6" to the top of the pipe as shown on the Typical Trench Detail, or as shown on the plans, unless otherwise directed by the Aquarion Representative. Where the pipeline crosses existing utilities, a vertical clearance of twelve inches (12") minimum shall be maintained, except for sanitary sewers where if the water main is within ten (10) horizontal feet of the sewer, the water main must be at least eighteen inches (l8") above the sewer. The pipe between bell holes shall bear continuously on approved material. If the Contractor excavates below the required limit, the trench bottom shall be brought to the required grade with an approved material as specified in these specifications at the Contractor's expense. In laying pipe, the deflections given in AWWA Standard C600 latest revision shall not be exceeded.

All pipe, valves and fittings shall be lowered carefully into the trench by means of mechanical equipment in such a manner as to prevent them from being damaged. The insides of all bells and outsides of spigots shall be wiped clean and dry and shall be free from oil or grease. During the laying of the pipe, extra care shall be taken to see that no dirt, debris, tools, clothing, or other illicit materials are allowed to be left in the pipe.

After the pipe is laid in the trench, the spigot end shall be centered in the bell and pushed into the bell. Under no circumstances shall pipe be laid where there is water in the trench. The Contractor shall install and joint the pipe in accordance with the manufacturer's instructions. The joints shall be made continuous by the installation of metal wedges per the manufacturer's instructions.

Aquarion will establish the location of the centerline of the pipeline. The Contractor shall establish bench marks and offsets, as necessary, a suitable distance from the work to be done so that proper lines and grades for the work may be maintained. The Contractor shall, to the best of their ability, protect all survey points from damage.

The Contractor shall be responsible for placing the pipe accurately to the established lines and grades as shown on the drawings or as directed by the Aquarion Representative.

When necessary to cut pipe in the field, the cutting shall be done such that neither the pipe nor the lining shall be damaged and such that a smooth, right angle cut is made. A machine designed for this purpose shall be used for the cutting.

It shall be the Contractor's sole responsibility to procure and maintain a suitable storage area for tools, materials, and equipment necessary to perform the work. The Contractor is responsible for all costs associated with the storage of equipment and materials and shall not invoice these costs to Aquarion or the State. The storage area obtained by the Contractor shall not obstruct or interfere with pedestrian or vehicle movement, and shall not occupy any space within the public right-of-way, except with specific permission by Aquarion or the State.

Materials shall be stored so as to insure the preservation of their quality and fitness for the work. When considered necessary, they shall be placed on wooden platforms and covered or stored in a suitable building. The Contractor shall not use the storage area for bulk storage of hazardous materials (e.g., gasoline, solvents, oil, etc.). Stored materials shall be located so as to facilitate prompt inspection. The Contractor shall be present to unload piping and other materials delivered to the jobsite prior to the Contractor's planned mobilization to the project.

Excavation

The excavation defined herein shall be deemed earth excavation, which shall include the removal of all material other than rock. The extent of trenching and excavation, including rock, shall be in accordance with the Typical Trench Detail, and shall be 4" below the bottom of the pipe in earth and 6" below the bottom of the pipe in rock. The depth of trench may be increased or decreased at the discretion of the Aquarion Representative as required to avoid obstructions.

Hand excavation shall be employed whenever, in the opinion of the Aquarion Representative, it is necessary to excavate around and/or expose existing utilities.

Excavated material, to the limits other than the limits defined for Removal of Unsuitable Material that is deemed unsuitable material for use as bedding material or backfill above 12" above the top of the pipe by the Aquarion Representative, shall be removed from the site and properly disposed of.

Special care shall be taken to excavate accurately to grade. If the trench is over-excavated, it shall be brought to grade, at the Contractor's expense, by refilling with approved material in compacted layers, each layer not to exceed 6" in thickness if the depth is less than 12" or 12" in thickness if the depth is greater than 12".

Where the bottom of the trench, below the limit of excavation for placement of bedding material, is found to be unstable or to contain material which, in the judgment of the Aquarion Representative, should be removed, the Contractor shall excavate and remove such material to the width and depth as shown on the Typical Trench Detail, as directed by the Aquarion Representative. This excavated material shall be paid for as Excavation and Disposal of Unsuitable Material (Water Main) (see Typical Trench Detail for vertical limit). Before the pipe is installed, the subgrade shall be prepared by refilling with bedding material, in compacted layers, each layer not to exceed 6" in thickness if the depth is less than 12" or 12" in thickness if the depth is greater than 12". The layers shall be thoroughly compacted so as to provide a uniform and continuous bedding for the pipe. This material shall be paid for under Additional Backfill Material (see Typical Trench Detail for vertical limit of Suitable Material).

Rock Excavation

Rock excavation and replacement with Additional Backfill Material, including bedding material, is specified under other sections of these specifications.

Unauthorized Excavation

All unauthorized excavations outside the lines and grades shown and specified shall be at the expense of the Contractor and the Contractor shall refill them with approved material, in a manner as specified at his own expense. All backfill for unauthorized excavations shall be compacted in 12" lifts.

Storage and Disposal of Excavated Materials

Materials removed from the trenches shall be stored in such a manner that they will not interfere unduly with pedestrian or vehicular traffic. Sufficient material suitable for backfill shall be stored and hauled as necessary to replace excavated material that is unsuitable for backfill. Excess excavated material shall be removed and legally disposed of away from the site by the Contractor on the same day as the backfill has been placed.

Bedding Material

Bedding material shall be free from soft, thin, elongated, laminated, friable, micaceous, or disintegrated pieces, mud, loam, organic matter, wood, clay, or other deleterious material, and frozen material.

Bedding material shall be used for backfilling trenches under, along and over the pipe to a level of 12" above the top of the pipe, as shown on the drawings or as directed by the Aquarion Representative, and shall be bank run gravel, ¾" crushed stone, processed aggregate base, or native material.

The Contractor must properly bed the pipe with bedding material and shall take care in doing so. The Contractor shall place bank run gravel, ¾" crushed stone, processed aggregate base, or native material under, along and over the pipe as bedding material to the minimum depth as shown on the Typical Trench Detail or as directed by the Aquarion Representative. Native material is acceptable as bedding material as long as it meets the requirements of these specifications. The bedding material shall be spread in layers and shall be compacted in place at the proper grade to provide a solid uniform bed for the pipe or structure for the full width and length of the bottom of the excavation. Bell holes shall be carefully dug at the ends of the pipe to provide ample room for properly making and checking of joints and providing room for the minimum depth of compacted bedding material under the bell.

When the pipe has been bedded satisfactorily and the joint completed, the recess under the bell shall be refilled and tamped on each side of the pipe to hold it securely in place, care being taken not to disturb the position of the pipe during the process, and in such a manner that the bearing is distributed evenly over the entire length of the pipe.

Any material used for Bedding Material shall not have stones larger than 4". No stones shall be in contact with the pipe or be within 4" of the pipe.

Backfilling

Unless otherwise specified or directed, all trenches and excavations shall be backfilled immediately after installation and inspection of the pipe.

The Contractor shall use suitable material from excess excavation from other portions of the work or from approved gravel pits. It shall be carefully deposited in uniform layers not exceeding twelve inches (12") in depth, and unless otherwise permitted, each layer shall be carefully and solidly tamped and compacted with appropriate tools in 12” lifts in such a manner as to avoid disturbing the completed work.

Backfill for the excavation (above the limits of the bedding material) shall be with approved Additional Backfill Material, as specified under Item #1300151A of these specifications, free from organic matter. No stones larger than 12” shall be used in the trench as backfill from 12” above the top of the pipe to the surface. In depositing stones up to 12”, care must be taken not to damage the pipe or any structure. Stones which are used in backfilling shall be so distributed through the mass that all interstices are filled with fine material. Backfill shall be deposited in layers not exceeding 12” in depth and compacted.

Rock and other excavated materials from trenches and excavations may be used as backfill, provided individual pieces of rock are not larger than 12” and that they are placed so that voids are filled with the backfill material. No rock or other excavated materials from trenches and excavations shall be placed within 12” from the top of the pipe.

Backfilling within 2' of structures shall be uniformly deposited on all sides and, unless otherwise permitted, solidly compacted in such manner as to avoid damaging the structure or producing unequal pressures thereon.

When sheeting is drawn, all cavities remaining in or adjoining the trench shall be solidly backfilled and compacted. When sheeting is permitted to be left in place, all cavities behind such sheeting shall be solidly backfilled and compacted.

If the material from the trench excavation is considered, in the opinion of the Aquarion Representative, to be unsuitable for use as backfill, the Aquarion Representative shall order the Contractor to furnish suitable Additional Backfill Material for backfill to the limits shown on the Typical Trench Detail. The removal and disposal of this material, if not suitable for backfill, down to the lower vertical limit of the bedding material is included in the linear foot price of the pipe installation. See the Typical Trench Detail for the vertical limits of Additional Backfill Material and bedding material.

Trench Bracing, Sheeting and Trench Boxes

Where trench conditions are found to consist of material which is unstable to such a degree that it cannot be removed and replaced with an approved material without creating an occupational hazard, the Contractor shall utilize trench bracing, sheeting or trench boxes to support the trench.

The Contractor must conform to all applicable State and OSHA standards for trench conditions. The sides of the trenches and excavations shall be supported by adequate trench bracing, sheeting, or trench boxes. The Contractor shall be held accountable and responsible for the amount of all trench bracing, sheeting, and trench boxes used and for all damages to persons or property resulting from the improper quality, strength, placing, maintaining, or removing of the trench bracing, sheeting, or trench boxes. When trench bracing, sheeting, or trench boxes are removed, care shall be taken not to disturb the newly installed pipe, appurtenances, or existing utilities and structures.

Trench bracing is defined as planks placed against opposite sides of the excavation and is held in place by timber struts or some extendable brace.

Sheeting is defined as continuous sheet piling of either steel or wood with whalers or shoring. No sheeting is to be left in place unless expressly permitted by the Aquarion Representative.

All materials necessary for trench bracing, sheeting, or trench boxes shall be provided by the Contractor and included in this section.

All construction methods necessary to install and maintain trench bracing, sheeting, or trench boxes shall conform to OSHA Standards.

Dewatering

The Contractor shall provide all necessary pumps, drains, well point systems, and other means for removing water from the trenches and from other parts of the work. Before pipes are laid or structures built, the trenches and excavations shall be free from water and, if necessary, suitable drainage facilities shall be provided and maintained. Any drainage system used by the Contractor shall be subject to the approval of the Aquarion Representative. Subgrade damaged by failure to properly dewater will be repaired and replaced at the Contractor's expense.

Water from the trenches and excavations shall be disposed of in such a manner as will neither cause injury to public health nor to public or private property, nor to the work completed or in progress.

Thrust Blocks

Concrete for thrust blocks shall be accordance with these specifications and the Aquarion Standard Details. Thrust blocks shall be in accordance with these specifications and the Aquarion Standard Details. Thrust blocks are required at all tees, bends and dead ends.

Warning Tape

In accordance with "Call Before You Dig" (CBYD) regulations, all underground utilities must be identified with warning tape during the pipe installation. The Contractor shall provide a suitable continuous length of warning tape located above the pipe, as shown on the Typical Trench Detail. The minimum separation between the facility and warning tape shall be 2'. The warning

tape shall be 3” wide (minimum), 4.0 MIL polyethylene film, blue in color in accordance with the APWA National Color Code, durable, designed to withstand extended underground exposure, and marked with the words "Water Main" durably imprinted in accordance with acceptable standards. Warning tape will be supplied by the Contractor. Warning tape shall be installed on all excavations regardless of the length of the water main being exposed.

Safety Procedures for Storing Pipe

- Pipe shall always be blocked to prevent it from rolling or falling.
- Threaded pipe shall be handled with care, because threads are sharp and can easily cause injury.
- Pipes larger than 2 inches in diameter shall be stacked in storage with spacing strips between each row.
- Each row of stacked pipe shall be arranged and blocked to prevent its rolling from the pile. All blocking shall be of reasonably permanent material, such as chemically-treated wood.
- Pipe shall always be withdrawn from the top row.
- In pipe storage areas where pipe material is handled by a crane, workers shall be conversant with the signals used by operators and be careful to stay clear of the load's path. Standard signals shall be used.
- Storage area shall be maintained in a safe condition at all times. Repairs to the storage area shall be made whenever necessary.

The Contractor will conform to all applicable State and OSHA standards for pipe line safety. AWWA-M3, "Safety Practice for Water Utilities" will be enforced.

During the progress of the work, all roads shall be kept open for the passage of traffic and pedestrians and shall not be unnecessarily obstructed unless authorized by the authority having jurisdiction over same. Driveways, sidewalks and crossings shall be closed as short a time as possible while pipe is being placed, and passage shall be restored as soon as possible thereafter by properly placed backfill or approved bridging. The Contractor shall take such measures at their own expense as may be necessary to keep the roads open for traffic, and shall give advance notice to the Engineer, town public works department, local police and state police as required.

Warning signs shall be provided along all roads where work is in progress. The Contractor shall notify and make all arrangements with the Connecticut Department of Transportation, town public works department, local police and state police for direction of traffic past the equipment, machinery, or construction operations. Barricades and lights shall be provided to protect traffic. Where trenches have been cut in road shoulders on which traffic may pass at times, warning signs shall be placed at frequent intervals and maintained until the shoulder is safe for travel. All such work and operations shall be in accordance with the requirements of the Connecticut Department of Transportation, public works department, local police and state police.

Should the Contractor or their employees neglect to set out and maintain barricades or lights, as required in these specifications, Aquarion may immediately and without notice, arrange for

furnishing, installing and maintaining barricades or lights, and any other precaution deemed necessary. The cost thereof shall be borne by the Contractor and may be deducted from any amount due or to become due to the Contractor under these specifications.

The Contractor shall be held responsible for any damages that may have to be paid as a consequence of the Contractor's failure to protect the public.

The Contractor must follow the Maintenance and Protection of Traffic specification in this Contract.

Before starting any work, the Contractor shall arrange with the municipal or state officials having jurisdiction for the use of routes of travel for hauling materials, including surplus earth and rock that will result in minimum inconvenience to the traveling public. Routes of travel so scheduled shall be adhered to throughout the course of the work, unless otherwise approved.

The Contractor shall take all necessary precautions to prevent and abate nuisance caused by dust arising from his operations. Approved methods applicable to various parts of the work such as application of water spray or calcium chloride shall be used. This also applies to maintaining temporary paving nuisance free until permanent paving is placed.

The Contractor shall provide, erect and maintain all necessary barricades, danger signals and signs, provide a sufficient number of watchmen and take all necessary precautions for the protection for the work and workmen and for the safety of the public.

Handling and Distribution of Pipe, Valves and Fittings

Pipe shall be handled and supported with woven fiber pipe slings, or approved equals. Hooks, chains, wire rope, or any other device that may cause damage to the pipe during handling and support shall not be used. Care shall be taken when handling the pipe so as not to cut, gouge, or scratch the pipe in any way.

The pipe, valves and fittings shall be handled and protected during loading, transporting, and unloading operations in such manner as to avoid damage. Pipe, specials, and valves shall be unloaded by lifting with hoists or skidding so as to avoid shock or damage. Under no circumstances shall they be dropped nor shall they be permitted to roll against pipe already on the ground. Insofar as practicable, each piece of pipe shall be delivered and unloaded near the place where it is to be installed and where it will not interfere with excavation operations, traffic, or adjacent property owners and may be readily inspected by the Aquarion Representative. If this is not possible, the pipe, valves and fittings shall be stored in a safe area as close to the job site as possible. The Contractor is responsible for identifying a location (staging area) for storage of pipe, valves, fittings, excavated material and borrow material. The Contractor is responsible for delivering all materials to said location. The Contractor is responsible for stringing pipe along the intended pipeline route. All damaged pipe, valves and fittings will be rejected by the Aquarion Representative and such rejected pipe, valves and fittings shall be removed from the site by the Contractor. In the event of slight damage to the coating or lining, Aquarion may permit the damage

to be repaired at the site. Such repairs shall be made at the Contractor's expense. Once the Contractor receives shipment of pipe, valves and fittings, the Contractor shall be responsible for replacing any materials that may be stolen from the Contractor's storage area.

Cleaning and Inspection of Pipe, Valves and Fittings

The insides of the pipes, valves and fittings shall be thoroughly cleaned before laying and shall be kept clean until accepted in the completed work. Whenever the work is interrupted, all open ends of pipe shall be temporarily closed by watertight plugs. No trench water shall be permitted to enter the pipe. All pipe and special castings shall be carefully examined for defects and no pipe or special casting shall be laid which is known to be defective. If any such pipe or casting is discovered to be defective after placement, it shall be removed and replaced with a sound pipe or casting by the Contractor at his own expense.

Clearing and Grubbing

The Contractor shall remove all trees, brush, shrubs, and debris where encountered in the line of work only to the extent necessary for the prosecution of the water main relocation work.

Unless otherwise specified, all brush and trees shall be cut within six inches (6") of the ground.

Cutting and removal of cleared materials shall be carried out in such manner as to avoid injury to other trees and structures.

Burning will not be permitted on the site.

Trees, stumps, brush, and debris shall be disposed of away from the site by the Contractor at no additional cost to Aquarion or the State.

Clean-Up

During progress of the work, the Contractor shall keep the construction areas in a neat condition, free from accumulations of waste material and rubbish.

On or before completion of the work and before acceptance and final payment shall be made, the Contractor shall clean and remove from the site and adjacent property, all surplus and discarded materials, rubbish and temporary structures, restore in an acceptable manner all property and leave the whole in a neat and presentable condition.

Periodically, as the work progresses and immediately after the work has been completed, the Contractor shall remove all excess materials from the area of the work. The area, in general, shall be kept clean and orderly and returned to a neat condition. The area of construction along roadways shall be swept with a broom, either by hand or mechanically, each day after completion of the day's work.

Trees, stumps, brush, and debris shall be disposed of by the Contractor off the site. Burning will not be permitted.

Method of Measurement:

Work under this section will be measured for payment per linear foot of ductile iron pipe installed, of the size required, complete in place, backfilled, tested and accepted.

The following will not be measured separately for payment, but shall be included in the linear foot cost of the pipe installation:

- saw-cutting of existing pavement
- removal of asphalt and concrete pavement up to and including 6" in depth
- excavating to the depth necessary to install the pipe and bedding material
- stockpiling and storing of the excavated material if suitable for backfill
- removal and disposal of the excavated material if deemed unsuitable for backfill
- furnishing and installing bedding material up to 12" above the top of the pipe
- backfilling with native material if suitable for backfill
- compacting in 12" lifts
- installation of bends, valves, reducers, sleeves, couplings and tees
- mechanical joint restraints, hardware, bolts, nuts, glands, and gaskets
- cutting, cleaning and fusing of HDPE pipe joints
- thrust block excavation, forming and installation
- warning tape
- trench bracing, sheeting and trench boxes
- dewatering

Hydrants and services, if included in this project, shall be measured separately for payment under those appropriate Items.

Bedding material furnished, installed, and compacted, to the bedding material limits shown on the Typical Trench Detail, will not be measured separately for payment, but shall be included in the linear foot cost of the pipe installation.

Rock In Trench, Excavation and Disposal of Unsuitable Material, Additional Backfill Material, and Pavement Replacement or Repair shall be measured separately for payment under those appropriate Items. Repairs, due to errors in installation, completed by the Contractor in order to pass the Hydrostatic Test will not be measured separately for payment.

Basis of Payment:

Work under this section will be paid for at the contract unit price bid per linear foot for "8" Ductile Iron Pipe (Water Main)" installed, complete in place, backfilled with suitable material, tested and accepted.

Hydrants, services, air relief valves, line stops and tapping sleeves, if included in this project, will be paid for separately as indicated elsewhere in these special provisions.

No separate payment will be made for installing bends, valves, reducers, sleeves, couplings, tees, plugs, mechanical joint restraints, hardware, cutting, cleaning or fusing of HDPE joints or thrust block installation, but the installation of these items shall be included in the linear foot cost of the pipe installation.

No separate payment will be made for bedding material furnished, installed, and compacted, to the bedding material limits shown on the Typical Trench Detail, but shall be included in the linear foot cost of the pipe installation.

Rock In Trench, Excavation and Disposal of Unsuitable Material, Additional Backfill Material, and Pavement Replacement or Repair will be paid for separately at the contract unit price under those appropriate Items.

No separate payment will be made for repairs, due to errors in installation, completed by the Contractor in order to pass the Hydrostatic Test.

Pay Item	**Pay Unit**
8” Ductile Iron Pipe (Water Main)	l.f.

ITEM #1301652A – 8" DUCTILE IRON PIPE INSTALLED ON BRIDGE (WATER MAIN)

Description:

Work under this section shall consist of the installation of all insulated 8" ductile iron water main crossing Bridge No. 01585 carrying River Street (Route 313) over Little River as indicated on the Aquarion drawings, for a complete, functioning water system crossing the bridge. Water main with less than 4' – 0" of cover shall be insulated. The Contractor will furnish the insulated water main, support brackets, support steel and hardware, galvanized steel sleeves, link seals, insulated joint kits and all required water main hardware for assembly and installation of the water main for the crossing below the reconstructed Bridge No. 01585.

The Contractor shall coordinate all water work with the Aquarion project representative.

Filling, flushing and disinfection of the new main on the bridge will be completed by Aquarion. Pressure and leakage testing will be performed by the Contractor. All required repairs shall be completed by the Contractor at no cost to the State or Aquarion.

Materials:

All materials furnished for installation by the Contractor on the bridge shall be new and unused. The pipe to be installed on the bridge shall be ductile iron Class 53 with TR FLEX joints, pre-insulated with a factory application of 2.16" of rigid polyurethane insulation in a 0.175" HDPE outer jacket. The upper TR FLEX 45° elbows shall be insulated with insulation kits. The lower elbows shall have tandem megalugs.

Polymer-coated, form fitting insulation kits shall be utilized by the Contractor to insulate pipe joints according to the pipe supplier's recommendations. The pipe, insulation, outer jacket and joint kits shall be a manufactured system by Tricon or approved equal, furnished by the Contractor.

All material for the water main support system (including but not limited to the L6x6x1/2 angles, WT8x44.5 beams, masonry plates, threaded rods, roller supports, steel plates, anchor bolts, insulated water main, and all required hardware and equipment) shall conform to the drawings, details and notes on the contract drawings. All threaded rods and hex nuts shall be galvanized. Standard pipe roll support shall conform to Anvil International, or approved equal. The Contractor shall acquire the pipe roll supports to be used on this project before drilling holes to ensure proper spacing of the holes.

Product data, manufacturer's product sheets, or other specified product information shall be provided to AWC, if required.

The Contractor shall provide product certificates prepared by the manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements. Certificates shall be furnished only as required by specific codes, upon request.

The storage and handling of all materials furnished to the Contractor shall comply with all stated product requirements.

Materials shall be delivered to the Contractor with identification labels intact. Materials shall be stored and protected from damage or exposure to harmful weather conditions.

The Contractor shall submit, for Aquarion's acceptance, manufacturer's standard warranty document executed by an authorized company official. Manufacturer's warranty is in addition to, and not a limitation of, any rights Aquarion may have under Contract Documents.

Warranty Period: 1 year commencing on Date of Substantial Completion.

Construction Methods:

It shall be the responsibility of the Contractor to coordinate their work schedule, where required, with that of other site Contractors. Proper implements, tools and facilities shall be provided and used by the Contractor for the safe and convenient performance of the work. Any damaged lining, coating or wrapping shall be satisfactorily repaired or replaced.

Every precaution shall be taken to prevent foreign matter from entering the pipe while it is being placed. If the pipe laying crew cannot put the pipe in place without getting foreign matter into it, the AWC representative may require that before installing the pipe, a heavy, tightly woven canvas bag of suitable size be placed over each end and left there until the connection is to be made to the adjacent pipe. At times when work is not in progress, open ends of pipe and fittings shall be securely closed so that no water, earth or other substances may enter the pipe or fittings. If necessary, the line shall be swabbed or flushed out to remove all foreign matter prior to testing.

Hydrostatic Testing:

Pressure testing and leakage testing shall be carried out by the Contractor on the assembled water main on the Water Main Support System in its final location below the bridge. These tests shall be included as part of the pipe on bridge installation and not measured separately for payment.

The sections of water main on the bridge shall be hydrostatically tested at a pressure of 150 psi for a period of at least two hours. "Pressurization" and "air removal" shall be accomplished as specified in Section 4.1.2 and 4.1.3 of ANSI/AWWA C600. After the test pressure is applied, any pipe or fitting found to be defective due to the Contractor's negligence shall become the property of the Contractor and shall be removed from the job site and replaced at the Contractor's expense with sound material. The test shall be repeated until satisfactory to the AWC.

A leakage test shall be conducted concurrently with the pressure test. Leakage shall be defined as the quantity of water that must be supplied into the newly laid pipe, or any valved 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.

The pipe installation cannot be accepted if the leakage is greater than that determined by the following formula:

$$L=\frac{SD\sqrt{P}}{148{,}000}$$

Where: L= Allowable leakage in gallons/hour
S=Length of pipe tested in feet
D=Normal pipe diameter in inches
P=Average test pressure during leakage test in pounds per square inch, gauge

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. All visible leaks shall be repaired regardless of the amount of leakage.

Any temporary thrust restraint required for testing sections of completed water main installation and later removed as directed by AWC shall be provided by the Contractor at no additional cost.

Disinfection:

Disinfection shall be carried out by AWC in accordance with ANSI/AWWA C65I-92.

There shall be a retention period of at least 24 hours and preferably more.

Method of Measurement:

This work will not be measured for payment, but will be paid for at the contract lump sum price for the completion of all coordination and work specified on the Contract Drawings or in these special provisions as work designated to be completed by the Contractor.

Payment limits for this item of work will extend across the bridge and downward to and including the bottom 45° bends at either end of the bridge up to five feet past the bottom 45° bends, including all insulated water main, TR FLEX bends, insulation kits, metallized steel support system with hardware and the installation thereof.

Basis of Payment:

This work will be paid for at the contract lump sum price for "8" Ductile Iron Pipe Installed on Bridge (Water Main)" completed and accepted in place, including the water main support system,

which price shall include all materials, equipment, tools, excavation, labor and work incidental thereto for work designated to be completed by the Contractor.

Pay Item	**Pay Unit**
8” Ductile Iron Pipe Installed on Bridge (Water Main)	l.s.

ITEM #1301861A – FURNISH DUCTILE IRON PIPE, VALVES AND MISCELLANEOUS FITTINGS (WATER MAIN)

Description:

A. Work under this Section covers the acquisition and furnishing of all materials, equipment, appurtenances and incidentals required as shown on the Aquarion Relocation Plans and specified herein, including ductile iron pipe, valves, tees, sleeves, fittings, bends, plugs, joint restraints, casing pipe and appurtenances of the various types specified in accordance with the drawings, specifications and as directed by the Engineer. Installation of the materials acquired under this special provision is not included in this work, but is paid for under the appropriate items.

B. Work and materials covered under this Section of the specifications shall be in strict compliance with Aquarion Water Company Standards. All water main materials shall conform to the Aquarion Water Company's "List of Approved Materials" dated October 2021, which is attached to this specification.

C. Interruption of and connection to the existing water main system, at the locations indicated on the Relocation Plans, shall be in strict accordance with the Aquarion Water Company's requirements and shall only occur with the prior approval of the Aquarion Water Company.

D. Under no circumstance shall the completed water main construction be placed into active service until final inspection by and written approval has been obtained from Aquarion.

E. All standards, codes, specifications, etc., referred to herein shall be the latest issue.

F. It is not intended that the Relocation Plans and Details shall show every pipe, fitting, valve, special or appurtenance but the Contractor shall acquire all material necessary to complete the Work in accordance with the best practice and the intent of the Relocation Plans, Details and these Special Provisions.

G. REFERENCES

1. All materials shall conform to the requirements of the Aquarion Water Company's "List of Approved Materials" (attached).

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 and Gray-Iron Pressure Pipe and Fittings
ANSI A21.51 Ductile-Iron Pipe, Centrifugally Cast in Metal Molds or Sand- Lined Moles, 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 C-104 Cement-Mortar Lining for Ductile-Iron Pipe and Fittings for Water
AWWA C-110 Ductile-Iron and Gray-Iron Fittings, 3 inch through 48 inch for Water and Other Liquids
AWWA C-111 Rubber Gasket Joints for Ductile-Iron and Gray-Iron Pressure Pipe and Fittings
AWWA C-151 Ductile-Iron Pipe, Centrifugally Cast in Metal Molds or Sand-lined Molds, for Water or Other Liquids
AWWA C-153 Ductile-Iron Compact Fittings, (3 inch through 12 inch), for Water and Other Liquids
AWWA C-600 Installation of Ductile Iron Water Mains and Appurtenances

H. QUALITY ASSURANCE

1. The Contractor shall furnish the Engineer any Certified Test Report and Materials Certificate required by the Contract or the Engineer. This shall include manufacturer’s notarized test reports and methods of test to show compliance with all specification requirements, and notarized certificates of conformance stating that all materials to be furnished under this Specification conform to all specification requirements, and each shipment of pipe, fittings, joints and gaskets and accessories meet all requirements of the Specifications.

2. The Contractor shall furnish to the Aquarion Water Company manufacturer's written transcripts in accordance with Section 51-14 of AWWA Standard C151, latest revision.

3. 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 the manufacturer of the piping, valves, fittings and appurtenances for the proper

installation procedures.

4. Comply with State and local controlling authority requirements for materials, installation, fire protection, testing, disinfection and connection to existing water mains.

5. Comply with NFPA 24 for fire-protection water main piping materials and installation.

I. SUBMITTALS

1. Submittals shall be made for the following items in accordance with the provisions of these Specifications and shall include the following:

   a. Manufacturer's Catalog Data and Standard Drawings for Pipe and Fittings.

   b. Manufacturer's Catalog Data and Standard Drawings for Joints and Couplings.

   c. Manufacturer's Catalog Data and Standard Drawings for Mechanical Sleeves and Seals

   d. Certificates of Compliance for pipe and fittings.

   e. Certificates of Compliance for shop-applied linings and coatings.

   f. Certificates of Compliance for pipe joint materials.

   g. Certificates shall attest that tests set forth in each applicable referenced publication have been performed, whether specified in that publication to be mandatory or otherwise and that production control tests have been performed at the intervals or frequency specified in the publication. Other tests shall have been performed within three (3) years of the date of submittal of certificates on the same type, class, grade, and size of material as is being provided for the project.

   h. All permanently incorporated steel and iron used in the construction of the Project must have been produced and fabricated in the United States.

   i. Contractor shall have its pipe supplier prepare and shall submit to the Aquarion Water Company a "LAYING SCHEDULE" of all pipe and accessories to be furnished and installed under this Contract. No work shall be undertaken until the laying schedule has been submitted to and approved by the Aquarion Water Company.

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 on 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 to 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 water main piping may be installed in conformance with the Aquarion Relocation Plans, details and Special Conditions.

3. It is not intended that the drawings shall show every pipe, fitting, valve, etc., but the Contractor shall be required to furnish, without additional charge, all material necessary to complete the work in accordance with the best practice and intent of drawings and specifications.

4. All necessary operations of valves required for the work of this contract will be conducted by the Aquarion Water Company**.** The Contractor shall be responsible for notifying the Aquarion Water Company a minimum of 2 weeks in advance of any desired valve operations.

L. SEQUENCING AND SCHEDULING

1. Coordinate connection to existing water main with the Aquarion Water Company.

2. Coordinate with other utility work.

3. Coordinate with the construction staging plans for this project.

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 Aquarion Water Company. The Aquarion Water Company shall have the right to reject any part of the work in case the materials or workmanship is not of satisfactory quality. The Contractor shall replace the same with acceptable work or materials at their own expense.

All materials shall conform to the requirements of the Aquarion Water Company's "List of Approved Materials".

B. APPROVAL OF MATERIALS: Before starting installation of materials or equipment, the Contractor shall submit to the Aquarion Water Company for approval, lists of materials and equipment to be incorporated in the work.

C. Should departures from the Relocation Plans 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 the Aquarion Water Company for prior approval. Said details shall include accurate layout drawings which clearly illustrate the intended departures from the Relocation Plans.

D. DUCTILE IRON PIPE, JOINTS, FITTINGS AND SPECIALS

1. All materials shall conform to the attached Aquarion Water Company "List of Approved Materials" attached hereto.

2. All piping and fittings shall be Class 52/54Tyton Joint Ductile Iron conforming to AWWA/ANSI C151/A21.5 (latest revision) and shall be CLASS **52 (**Rated Working Pressure of 250 psig with a MINIMUM Factor of Safety of 1.50, unless otherwise specified. 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. Piping and fittings for bridge crossings shall typically be Class 52 or 53 ductile iron with TR FLEX style joints, pre-insulated with rigid polyurethane insulation in a HDPE outer jacket. Insulated piping and fittings are paid for as specified under item #1301653A, if included in the project.

3. Fittings, bends and valves, where so indicated on the drawings, shall be mechanical joint with retaining glands. Retainer glands shall be "Mega-Lug" Series 1100 or 1700 Bell Harness as manufactured by EBAA Iron, or approved equal.

4. Ductile iron pipe and accessories shall conform to the following additional requirements:

   a. Laying Length: 18 or 20 Feet.
   b. Thickness Class: 52 or 53.
   c. Joint Type: Tyton Joint, Mechanical Joint or TR FLEX Joint.
   d. Interior Surface: Cement Lined (Double Thickness) Seal Coat (Double Coat).
   e. Exterior Surface: Asphaltic Coating.
   f. Field cut piping: Restraint of field cut pipe shall be provided with Mega-Lug Series 1700 Bell Harness as manufactured by EBAA Iron, or approved equal. Fittings for water mains shall conform in all respects to AWWA Standard C110, latest

revision, and to the additional requirements specified herein.

5. Fittings and accessories shall conform to the following additional requirements specified herein:

   a. Joint Type: Mechanical with retaining glands and split retaining glands. Retainer glands shall be "Mega lug" Series 1100 as manufactured by EBAA Iron, or approved equal. Locking Tyton type push on gaskets shall be Field Lok as manufactured by U.S. Pipe, or approved equal, where shown on the drawings and as directed by the Engineer.
   b. Pressure Rating: 350 psi c. Type of Iron: Ductile
   c. Interior Surface: Cement Lined (Double Thickness) Seal Coat (Double Coat)
   d. Exterior Surface: Asphaltic Coating

6. Cement mortar lining for pipe and 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.

7. Rubber gasket joints for the water main pipe and fittings, as specified above, shall conform to AWWA Standard C111/A21.11 Standard for Rubber Gasket Joints for Ductile Iron Pressure Pipe and Fittings (latest revision).

8. Pipe couplings and sleeves shall be installed where required for connection to existing work and as shown on the Drawings. Pipe couplings shall be solid sleeves giving a watertight seal suitable for water pressure to 250 psi. As approved by the Engineer

9. All pipe, pipe fittings, accessories and appurtenances shall be new and unused.

10. All bolts, nuts, rods, and miscellaneous connecting pieces not provided with an approved factory coating shall be given two (2) coats of bit mastic coal-tar after installation.

11. Corporation and curb stops shall be as specified in the attached "List of Approved Materials", "Ball Type". Corporation thread is to be CC (for DIP) and shall be in conformance with AWWA Standard C-800, latest edition. The corporation stop inlet shall have a standard AWWA corporation valve inlet thread and the outlet shall be a compression connection for copper tubing. Curb stops shall have a compression connection for copper tubing at both ends.

12. Copper pipe shall be of soft seamless copper tubes with no soldered joints underground, suitable for use as underground water service connections conforming to ASTM specification B-88-47, “Type K”.

13. Curb boxes shall be ASTM A-48 Cast with 358 Class Cast Iron. They shall be 2 piece slip Buffalo style 94E. The top of the cover shall be flush with the top of the box rim with the word “WATER” clearly marked. Top section to be 24”, bottom section to be 39”. An enlarged base is required for 2” services.

14. Fittings for Service Pipe

    a. Fitting for service pipe shall be of the cast bronze, compression, flared tube type or pack type.

E. HDPE PIPE

a. HDPE pipe shall be HDPE DR-11, Ductile Iron Pipe Size (DIPS), black, with 2 or more blue stripes for potable water applications.
b. HDPE pipe shall be manufactured from a polyethylene designation code PE 4710 resin which shall meet ASTM D 350 with a minimum cell classification of 445574C. HDPE pipe shall be manufactured to the dimensions of ASTM F 714.
c. HDPE DR-11 pipe shall have a minimum pressure rating of 200 psi. The pipe shall contain no recycled compounds except that generated in the manufacturer’s own plant from resin of the same specification from the same raw material.

F. VALVES

1. Gate valves shall conform in all respects to AWWA Standard C509 ULFM and C11 (latest revisions), and to the additional requirements specified in the Aquarion “List of Approved Materials”, typically:

2. Resilient Seat Gate Valves shall incorporate the following features:

    a. Type of Valve Ends: Mechanical Joint with Retainer Gland
    b. Type of Gate: Resilient Seat
    c. Type of Stem Seal: Double O-Ring
    d. Type of Mounting: Iron Body, Bronze Mounted
    e. Type of Stem: Bronze, Non Rising Stem
    f. Type of Gaskets: Mechanical Joint Gaskets
    g. Minimum Rated Working Pressure: 250 psi
    h. Direction of Operating Nut: Open Right
    i. As a minimum, the inside of the valve body and bonnet are to be coated with a fusion bonded epoxy in accordance with AWWA C550, latest revision

3. Wrench nut shall be 2 inch by 2 inch conforming to section 19 of AWWA C 509.

4. Butterfly valves shall conform to ANSI/AWWA C504-10 Class 150B for buried service only. Specific requirements shall be in accordance with the attached Aquarion “List of Approved Materials”.

5. Valve Box

   a. Valve boxes shall be ASTM A-48 Cast with 358 Class cast iron, two piece, slip type, with a 26” top section with bottom flange and 36” bottom section.
   b. Covers shall be cast iron, marked "WATER", with two notched openings.
   c. Valve boxes and covers shall be United States made only.
   d. Valve boxes shall be centered over the operating nut of the valve and set to be flush at final pavement or finished grade.
   e. Valve boxes shall be of good quality cast iron free from all defects in material and workmanship and shall be coated with coal-tar pitch enamel or other approved coating.

G. APPROVED MANUFACTURERS

1. Refer to the Aquarion Water Company “List of Approved Materials” (attached), unless otherwise noted below.

2. Bolt Through MJ Adapter For Joint Restraint

   a. Infact Corporation Foster Adapter 6-12 inches for the direct connection of MJ fittings, or approved equal.

3. Where there is a specific conflict between this specification and Aquarion Water Company’s “List of Approved Materials”, the List of Approved Materials shall apply.

Construction Methods:

A. INSTALLATION OF PIPE - GENERAL REQUIREMENTS

1. Refer to Item #1301082A.

B. INSTALLATION - PIPE, FITTINGS AND ACCESSORIES

1. Refer to Item #1301082A.
2. Refer to Item #1302901A.

C. HYDRANT ASSEMBLY

1. If required for this project, materials and methods required for the installation of hydrants will be detailed elsewhere in these special provisions.

Method of Measurement:

Work and materials included under this specification will not be measured for payment and will be paid for on a lump sum basis.

Basis of Payment:

The acquisition and delivery to the site of all ductile iron pipe, valves and miscellaneous fittings required for the construction of this project will be paid for at the contract lump sum price bid. The required materials shall be derived from a "laying schedule", or material list of all pipe, fittings, materials and accessories to be furnished and installed under this contract, prepared by the Contractor's supplier and reviewed and approved by Aquarion. Excepted from payment under this item will be those materials that are specifically included for acquisition as part of another Bid Item included in this project. Upon completion of work, any leftover material shall be returned for credit, and the final material payment shall be adjusted accordingly.

Pay Item	**Pay Unit**
Furnish Ductile Iron Pipe, Valves and Misc. Fittings (Water Main)	l.s.

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AQUARION WATER COMPANY
LIST OF APPROVED MATERIALS

Notes:		
Materials Must Be Manufactured in the USA or Canada.		
If an ARRA Project Materials Must Be Manufactured in the USA.		
All Stainless Steel hardware shall be Grade 304 or 316.		
The materials described in this list shall supercede any materials specified elsewhere.		
Revised October, 2021.		
Material Specification	**Approved Manufacturer**	**Mfg. Part #**
SECTION #1: DUCTILE IRON PIPE		
ANSI/AWWA C151-09/A21.5, Ductile Iron Pipe	McWane Pipe Company	Class 52 / 54 Tyton Joint
ANSI/AWWA C104-08/A21.4, Cement Mortar	American Cast Iron Pipe Company	Class 52 / 54 Tyton Joint
ANSI/AWWA C111-12/A21.22, Rubber-Gasket	Clow Pipe Company	Class 52 / 54 Tyton Joint
Nitrile Gasket	Griffin Pipe Company	Class 52 / 54 Tyton Joint
Joints for Ductile-Iron Pressure Pipe	United States Pipe & Foundry Company	Class 52 / 54 Tyton Joint
Class 52 / 54 Tyton Joint		
Pipe Shall be marked with Class, Manufacturer, Weight & Date of Manufacture		
SECTION #2: GATE VALVES: DUCTILE IRON		
ANSI/AWWA C509 ULFM	Clow Valve	2639-F6100
250 PSIG Max Working Pressure standard	Kennedy	8571D1
Full body, ductile iron	Mueller	A2362/A2361
Fusion Epoxy Coated	U.S. Valve & Hydrant Company	AUSP02
All hardware shall be Stainless Steel		
Mechanical Joint Connections		
See Table "Valves & Hydrants by Town"		
SECTION #3: BUTTERFLY VALVES		
ANSI/AWWA C504-10 Class 150B for Buried Service Only	Mueller	B3211 Lineseal III
Mechanical Joint Connections	Pratt	Groundhog
Fusion Epoxy Coated Inside & Out	Valmatic	Series 2100
Stainless Steel Shaft Type 304	M&H Valve	Series 4500
With 304 SS Fasteners		
See Table "Valves & Hydrants by Town"		
SECTION #4: VALVE BOXES		
ASTM A-48 Cast with 35B Class Cast Iron	Bibby St. Croix	700 Series
AASHTO H20 Wheel Load	Tyler Union	6850 Series
Type: 2 Piece Slip	Pioneer	S Series
Cover to read: "WATER"		
Top Section 26" with Bottom Flange		
Bottom Section 36"		
SECTION #5: MJ FITTINGS		
ANSI/AWWA C153-11/A21.53-06 and NFPA 3"-16" Listed (EX2111)	Tyler Union	C153 or C110
2" - 24" rated @ 350 psi; 30" - 48" & all fittings with Flanged branches rated @ 250 psi	United States Pipe & Foundry Company	C153 or C110
Asphalt Coating ANSI/AWWA C104-08/A21.4-08 - ANSI/AWWA C153		
Cement Lining ANSI/AWWA C104-08/A21.4-08		
Ductile Iron		
ANSI/AWWA C110-12/A21.10-08 and NFPA 3"-12" up Listed (EX2111)		
2" - 24" rated @ 350 psi; 30" - 48" all fittings with Flanged branches rated @ 250 psi		
Asphalt Coating ANSI/AWWA C104-08/A21.4-08 - ANSI/AWWA C153		
Cement Lining ANSI/AWWA C104-08/A421.4-08		
Ductile Iron		
Ductile Iron tapped tees		
As available Compact C-153 MJ Fittings are preferred over C-110		
SECTION #6: SERVICE (CURB) BOXES		
ASTM A-48 Cast with 35B Class Cast Iron	Bibby	5ME
Type: 2 Piece Slip Buffalo Style 94E	Ford	5ME
Cover to read: 'WATER'	McDonald	5ME
Top Section 24"	Mueller Canada	5ME
Bottom Section 39"	Tyler Union	5ME
Enlarged Base Required for 2" Services		
SECTION #7: MJ & TYTON JOINT RESTRAINT	EBAA Iron, Inc.	MI: 1100 Series Megalug
	EBAA Iron, Inc.	Tyton: 1700 Bell Harness
Design		
1. Restraint devices for nominal pipe sizes 3 inch through 48 inch shall consist of multiple gripping		
wedges incorporated into a follower gland meeting the applicable requirement of		
ANSI/AWWA C110/A21.20.		
2. The devices shall be working pressure rating of 350 psi for 3-16 inch and 250 psi for 18-48 inch.		
ratings are for water pressure and must include a minimum safety factor of 2 to 1 in all sizes		
Material		
1. Gland body, wedges, and wedge actuating components shall e cast from grade 65-45 12 ductile		
iron material in accordance with ASTM A536.		
2. Ductile iron gripping wedges shall be heat treated within a range of 370 to 470 BHN.		

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3. Three(3) test bars shall be incrementally poured per production shift as per Underwriter's		
Laboratory (U.L.) specifications and ASTM A536. Testing for tensile, yield and elongation shall be done		
in accordance with ASTM E8.		
4. Chemical and nodularity tests shall be performed as recommended by the Ductile Iron Society,		
on a per ladle basis.		
Traceability		
1. An identification number consisting of year, day, plant and shift &YYDDD (plant designation)		
(shift number), shall be cast into each gland body.		
2. All physical and chemical test results shall be recorded such that they can be accessed via the		
identification number on the casting. These Material Traceability Record (MTR's) are to be made		
available, in hard copy, to the purchaser that requests such documentation and submits his gland		
body identification number.		
3. Production pieces that are too small to accommodate individual numbering, such as fasteners		
, shall be controlled in segregate inventory until such time as all quality control tests		
are passed. These component parts may then be released to a general inventory for final		
assembly and packaging.		
4. All components shall be manufactured and assembled in the United States. The purchaser shall,		
with reasonable notice, have the right to plant visitation at his/her expense.		
Coatings:		
The coating system shall be MEGA-BOND by EBBA Iron, Inc.		
Zinc coating.		
SECTION #8: FIELD LOK GASKETS		
ANSI/AWWA/ C111-12/A21.11 Standard for	McWane Company	Sure Stop 350
Rubber Gasket joints for Ductile Iron	United States Pipe & Foundry Company	Field Lok/Field Lok 350
Pressure Pipe and Fittings		
SECTION #9: MJ ACCESSORY SETS (LESS GLANDS)		
Standard T-Bolts & Anti-Rotation T-Bolts	EBBA Iron, Inc.	ANSI/AWWA C111/A21.11
Corrosion Resistant, High Strength, Low-Alloy Steel in accordance with ANSI/AWWA C111/A21.11	Star Pipe Products	ANSI/AWWA C111/A21.11
	Tyler Union	ANSI/AWWA C111/A21.11
	United States Pipe & Foundry Company	ANSI/AWWA C111/A21.11
MECHANICAL JOINT GASKETS		
ANSI/AWWA C111-12/A21.11		
SECTION #10: TAPPING SLEEVES		
Stainless Steel Type AWWA C223-13 with MJ outlet	Mueller Company SS	H304MJ
The tapping sleeve body and neck shall be made of heavy 18-8 Type 304 stainless steel	Powerseal SS	3490 MJ
	Smith Blair SS	665 MJ
The Flange shall be 18-8 Type 304 stainless steel, AWWA C207 Class D (ANSI 150# drilling)		
and recessed to accommodate tapping valves. The bolts shall be 18-8 type 304 stainless steel		
with NC threads and epoxy coated. The nuts shall be 304 stainless steel, fluoropolymer		
includes stainless steel full seal tapping valves when tapping size on size.		
Steel Type AWWA C223-13 with MJ or Flanged Outlet	Powerseal CS	3460/3460MJ
The tapping sleeve shall have a body made of carbon steel per ASTM A283 C. The neck shall be	Smith Blair CS	622/622MU
carbon steel per ASTM A53. The flange shall be carbon steel A36. The flange drilling shall be per	Mueller	
AWWA C111 Ductile Fusion bonded Flexi-Coat epoxy per AWWA C213. Average of 12-mil thick,		
all fasteners must be stainless steel.		
SECTION #11: TAPPING VALVES		
ANSI/AWWA C515 ULFM (4"-12" Valves)	Clow Valve	2639-F6114
250 PSIG Max Working Pressure	Kennedy	8590D DI
Full Body - Ductile Iron	Mueller company	T2362/2361
Fusion Epoxy Coated	U.S. Valve & Hydrant Co.	TUSP02
All hardware shall be Stainless Steel		
MJxFLG Connection		
ANSI/AWWA C515 for 12"-18"Valves Only		
See Table "Valves & Hydrants by Town"		
***NO PAPER GASKET MATERIALS SHOULD BE USED		
SECTION #12: REPAIR CLAMPS		
Certified to NSF/ANSI 61-G	Ford	F1 CC4
The full circle repair clamp shall have an 18-8 Type 304 stainless steel band.	Mueller Company	500/504
Tapped sleeves are to be 1" CC thread	Powerseal	3121/3412AS
All hardware shall be Stainless Steel	Smith Blair	226/238
	Smith Blair	227/239
SECTION #13: CAST BOLT ON COUPLINGS AND END CAPS		
Certified to NSF/ANSI 61-G	Ford	FC2A
Meets applicable AWWA C219 Standards	Powerseal	3501
16" & Up must be Wide Type Band	Mueller	MFC
All hardware shall be Stainless Steel	Smith Blair	411/413/441/442
Hymax Grip: AWWA C219, NSF-61, NSF-372	Krausz	
SECTION #14: SERVICE SADDLES		
Certified to NSF/ASI 61-G	Ford	F202
Meets applicable AWWA C800 Standards	Mueller	DR2A
Double Strapped with CC thread	Powerseal	3413
Fusion Bonded, Epoxy Coated	Smith Blair	313
Ductile Iron Body per ASTM A536	New Hampshire	317 SS

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Must have Stainless Steel nuts, bolts and bands		
SECTION #15: FIRE HYDRANTS (CONNECTICUT)		
ANSI/AWWA C502 - ULFM Approved	Kennedy	K81D
5-1/4" Valve Opening	Mueller	Super Centurion 250
6" MJ D-150 Shoe Connection		
Connecticut Town Hydrants Open LEFT (See Table "Valves & Hydrants By Town)		
3 Way Design (Pumper & (2) Hose Nozzles) with Chains		
Hydrant fasteners are to be Stainless Steel		
Upper Section finish to be Factory Painted Coating Only		
Lower barrel to be Stenciled with:		
AQUARION WATER as well as with "SPEC ONE" or "SPEC TWO" and Distributor ID# for		
For Exact Town Spec and Color see Table "Valves & Hydrants by Town"		
SECTION #16: FIRE HYDRANTS (MASSACHUSETTS & NEW HAMPSHIRE)		
ANSI/AWWA C502 - ULFM Approved	Mueller	Super Centurion 250
5-1/4" Valve Opening		
6" MJ D-150 Shoe Connection		
For Direction of Opening see "Hydrants by Town" T-28 Revised 6/1/12		
3 Way Design (Pumper @ (2) Hose Nozzles) with Chains		
Hydrant fasteners are to be Stainless Steel		
Upper Section finish to be Factory Painted Coating Only		
Lower barrel to be Stenciled with:		
AQUARION WATER as well as with "SPEC ONE" or "SPEC TWO" and Distributor ID# for		
For Exact Town Spec and Color see Table "Valves & Hydrants by Town"		
SECTION #17: AIR VENT & BLOW-OFF ASSEMBLIES		
2" James Jones Reduced Port LLB Blowoff Valve with Rectangular Operating Nut	James Jones Company	E1998 L/C
	Ford Meter Box Company	BLA18-777-TA-NL
Ductile Iron tapped tees	Tyler Union	C153
Air Vent / Blow-Off Boxes - Aquarion Standard Blow-Off Box. See Appendix A - Aquarion Standard Details SD-49	General Foundries	BHCO BOX
SECTION #18: METER PITS		
1" Meter Pits:	Ford	PS BHC 488-20-48
Depth of bury = 52" as per Standard Detail	Mueller	330R51854FFBN
Pit Size = 20"	McDonald	80-448WWPP 44 x 24
Meter Size: 1" or can be plumbed to reduce and accommodate 3/4", 5/8" x 3/4" or 5/8" x 1/2" meter		
Pit Material:		
Co-molded wall with insulated middle section. Black exterior with white interior.		
UV degradation protected. Nominal wall thickness (min.) = 1/2".		
Meter Box Cover is Ductile Iron with 15" non-recessed DI lid.		
Solid lids or lids with 1-3/4" hole are available for Reader "Touch Pads"		
Smooth wall interior/exterior. Vertical crush exceeds 20,000 lbs.		
360 degree anti-settling lip and thermal insulating pack internal shelf.		
2" Meter Pits:	Ford	PM BHC 788-36-48
Depth of bury = 52" as per Standard Detail		
Pit Size = 30"		
Meter Size: 2" x 17" typical meter or can be plumbed for 1-1/2" meter		
Pit Material:		
Co-Extruded PE Pit. Black exterior with white interior. UV degradation protected.		
Nominal wall thickness (min.) = 1/2".		
Meter Box Cover is Ductile Iron, 77 lb.		
Smooth wall interior/exterior. Vertical crush exceeds 20,000 lbs.		
Molded-in internal Anti-settling flange		
SECTION #19: BELL JOINT LEAK CLAMPS		
Ductile Iron Per ASTM 536	Ford	FBC
Pressure rated - 150 PSI (water)	Powerseal	3232
Fusion Epoxy Coated	Smith Blair	274
All hardware shall be Stainless Steel		
SECTION #20: SERVICE BRASS		
ANSI/AWWA C800	Cambridge Brass	Compression Type
Compression Joints	Ford	Compression Type
300 PSIG Max Working Pressure	McDonald	Compression Type
Corporations & Curb Stops are to be "Ball Type"	Mueller Company	Compression Type
Corporation Thread is to be CC (for DIP)		
SECTION #21: PRESSURE REDUCING VALVES & BACKFLOW PREVENTORS	Febco	
	Watts	
	Ames	
	Wilkins	
	Hersey	
	Cla-Val	
SECTION #22: IPS BRASS FITTINGS	Merit	Domestic Only
ANSI/ASME B16.15 & WW-P-460	Mueller Industries	Domestic Only
Fittings must be made from STM B584 Copper Alloy C84400	Lee Brass	Domestic Only
	SA	Domestic Only
SECTION #23: COPPER TUBING	Cambridge Lee	Type K- Soft
Copper Tubing to be Type "K" Soft	Cerro	Type K- Soft

FOR INFORMATION ONLY

ASTM B88 - USA & Canada Only	Halstead	Type K- Soft
	Howell	Type K- Soft
	Mueller Industries	Type K- Soft
SECTION #24: HYDROSTATIC TESTING	Great Lakes	Type K - Soft
Hydrostatic Testing per AWWA C600-05 Section 5.2, latest revision		
Please refer to Notice on Illegal Use of fire Hydrants		
Tester must be Certified and Comply with all OSHA Regulations		
State of CT DCP Licensing Required (P1, P6 or P7)		
SECTION #25: INSERTION VALVES	Team Industrial Services	Insert Valve
Material must be AWWA Specifications	Advanced Valve Technologies	EZ-2
Installer must be Licensed, Certified and Comply with all OSHA Regulations		
State of CT DCP Licensing Required (P1, P6 or P7)		
See Table "Valves & Hydrants by Town"		
All hardware shall be Stainless Steel		
Prior approval from Aquarion needed before any Contractor installs EZ-2 (Easy Valve)		
SECTION 26: MJ x MJ DI CONNECTOR (Foster Adapters)	Infact Corporation	
Ductile Iron 350PSI USA		
SECTION #27: MISC		
Portland Cement Type I - 94 lbs. Bags	Any	
Inverted Tip Marking Spray Paint - All Colors	Rustoleum	17oz
	Krylon	17oz
	Aervoe	17oz
Underground Marking Tape 2x1000' Detectable to read "WATER" in Blue	Any	
Traffic Cones are to be 28" orange with two (2) reflective bands	Any	
SECTION #28: HDPE PIPE	National Pipe and Plastics	
AWWA C906-15, ASTM D3350, ASTM F2620, ASTM F714, DR11, DIPS, Black with 2 or more Blue Stripes	Performance Pipe	
Resin Code PE4710, minimum cell classification of 445574C	JM Eagle	
	Flying W Plastics	
SECTION #29: HDPE FITTINGS		
Tees, Bends, Reducers, Solid Caps: butt fused directly onto HDPE pipe with electro fusion as an option.	Central Plastics (Georg Fischer)	
For service taps: Electrofused service saddles (2" with a 2" x 1" brass bushing), with IP corp. thread	Integrity Plastics (Div. of Brentwood Ind.)	
Mechanical stainless steel spring loaded saddles are allowable with AWC approval only.	HD Supply	
HDPE to Mechanical Joint Adapters with accessories.	Harrington Corporation	
Restraint rings for HDPE adapters shall be epoxy coated or stainless steel.	Tega	
For air vents/blowoffs: no tapped tees, 2" saddles (with 2" x 1" bushing as needed)	Specified Fittings	
electrofused directly onto HDPE pipe		
For tapping sleeves: electrofused directly onto HDPE pipe (stainless steel with MJ outlet as an option)		
For gate valves: AWWA C509 with HDPE to mechanical joint adapters		
For restraints: 2000 PV Series HDPE Restraints with stainless steel inserts as an option	EBAA Iron, Inc.	2000 PV Series
SECTION #30: TRACER WIRE	Agave Wire	
12 AWG or thicker, insulated copper, UL approved for direct burial		
Waterproof connectors	Dryconn or equal	
SECTION #31: POLYETHYLENE ENCASEMENT	United States Pipe & Foundry Company	V-BIO
SECTION #32: HDPE MARKING DEVICES		
Electronic Marking System (EMS) Caution Tape	3M	7613-XR
Marker Balls	3M	1403-XR Extended Range

State	Town	Valve Direction of Opening Distribution System Only	Property Valve Direction of Opening Fire Lines	Hydrant Thread Spec	Hydrant Direction of Opening	Hydrant Controlling Valve Direction of Opening	Hydrant Color Spec.	Hydrant Thread Specification & Designs
CT	Beacon Falls	OTL	OTR	SPEC 2 - NST	OTL	OTL	Kenney Yellow W/Silver Bonnet	SPEC 2 - Pumper (Steamer) & Side Nozzles are all NST
CT	Bethel	OTL	OTR	SPEC 2 - NST	OTL	OTL	Kennedy Red	SPEC 2 - Pumper (Steamer) & Side Nozzles are all NST
CT	Bridgeport	OTR	OTL	SPEC 2 - NST	OTL	OTR	Kenney Yellow W/Silver Bonnet	SPEC 2 - Pumper (Steamer) & Side Nozzles are all NST
CT	Brookfield	OTR	OTL	SPEC 2 - NST	OTL	OTR	Kennedy Red	SPEC 2 - Pumper (Steamer) & Side Nozzles are all NST
CT	Canaan	OTL	OTL	SPEC 2 - NST	OTL	OTL	Kenney Yellow	SPEC 2 - Pumper (Steamer) & Side Nozzles are all NST
CT	Cornwall	OTL	OTL	SPEC 2 - NST	OTL	OTL	Kenney Yellow	SPEC 2 - Pumper (Steamer) & Side Nozzles are all NST
CT	Danbury	OTR	OTL	DANBURY SPECIAL	OTL	OTR	Kenney Yellow W/Silver Bonnet	DANBURY: Pumper Special 4" NST & Side Nozzles are all NST
CT	Darien	OTL	OTR	DARIEN SPECIAL	OTL	OTL	Kenney Yellow W/Silver Bonnet & Caps	DARIEN: Kennedy K-81
CT	East Granby	OTL	OTL	SPEC 2 - NST	OTL	OTL	Kennedy Red	SPEC 2 - Pumper (Steamer) & Side Nozzles are all NST
CT	East Hampton	OTL	OTR	SPEC 2 - NST	OTL	OTL	Kenney Yellow W/Silver Bonnet	SPEC 2 - Pumper (Steamer) & Side Nozzles are all NST
CT	Easton	OTR	OTL	SPEC 2 - NST	OTL	OTR	Kennedy Yellow W/Silver Bonnet	SPEC 2 - Pumper (Steamer) & Side Nozzles are all NST
CT	Fairfield	OTR	OTL	SPEC 2 - NST	OTL	OTR	Kennedy Yellow W/Silver Bonnet	SPEC 2 - Pumper (Steamer) & Side Nozzles are all NST
CT	Georgetown	OTR	OTL	SPEC 2 - NST	OTL	OTR	Kennedy Yellow W/Silver Bonnet	SPEC 2 - Pumper (Steamer) & Side Nozzles are all NST
CT	Goshen	OTL	OTR	SPEC 2 - NST	OTL	OTL	Kennedy Yellow W/Silver Bonnet	SPEC 2 - Pumper (Steamer) & Side Nozzles are all NST
CT	Granby	OTL	OTL	SPEC 2 - NST	OTL	OTL	Kennedy Red	SPEC 2 - Pumper (Steamer) & Side Nozzles are all NST
CT	Greenwich	OTR	OTL	GREENWICH	OTL	OTR	Kennedy Yellow W/Silver Bonnet & Caps	GREENWICH: Kennedy K-81
CT	Groton	OTL	OTR	SPEC 2 - NST	OTL	OTL	Kennedy Yellow W/Silver Bonnet	SPEC 2 - Pumper (Steamer) & Side Nozzles are all NST
NH	Hampton	OTL	OTR	SPEC 2 - NST	OTL	OTL	Kennedy Yellow	SPEC 2 - Pumper (Steamer) & Side Nozzles are all NST
MA	Hingham	OTR	OTL	SPEC 2 - NST	OTR	OTR	Kennedy Red	SPEC 2 - Pumper (Steamer) & Side Nozzles are all NST
MA	Hull	OTR	OTL	SPEC 2 - NST	OTR	OTR	Kennedy Red	SPEC 2 - Pumper (Steamer) & Side Nozzles are all NST
CT	Kent	OTL	OTR	SPEC 2 - NST	OTL	OTL	Kennedy Yellow W/Silver Bonnet	SPEC 2 - Pumper (Steamer) & Side Nozzles are all NST
CT	Lebanon	OTL	OTR	SPEC 2 - NST	OTL	OTL	Kennedy Yellow W/Silver Bonnet	SPEC 2 - Pumper (Steamer) & Side Nozzles are all NST
CT	Litchfield	OTR	OTL	SPEC 2 - NST	OTL	OTR	Kennedy Yellow W/Silver Bonnet	SPEC 2 - Pumper (Steamer) & Side Nozzles are all NST
MA	Millbury	OTR	OTL	SPEC 2 - NST	OTL	OTR	Kennedy Red	SPEC 2 - Pumper (Steamer) & Side Nozzles are all NST
CT	Monroe	OTR	OTL	SPEC 2 - NST	OTL	OTR	Kennedy Yellow W/Silver Bonnet	SPEC 2 - Pumper (Steamer) & Side Nozzles are all NST
CT	New Canaan	OTR	OTL	SPEC 2 - NST	OTL	OTR	Kennedy Yellow W/Silver Bonnet	SPEC 2 - Pumper (Steamer) & Side Nozzles are all NST
CT	New Fairfield	OTR	OTL	SPEC 2 - NST	OTL	OTR	Kennedy Yellow W/Silver Bonnet	SPEC 2 - Pumper (Steamer) & Side Nozzles are all NST
CT	New Milford	OTL	OTR	SPEC 2 - NST	OTL	OTL	Kennedy Red	SPEC 2 - Pumper (Steamer) & Side Nozzles are all NST
CT	Newtown	OTL	OTR	SPEC 2 - NST	OTL	OTL	Kennedy Red	SPEC 2 - Pumper (Steamer) & Side Nozzles are all NST
CT	Norfolk	OTL	OTL	SPEC 2 - NST	OTL	OTL	Kennedy Yellow	SPEC 2 - Pumper (Steamer) & Side Nozzles are all NST
CT	North Canaan	OTL	OTL	SPEC 2 - NST	OTL	OTL	Kennedy Yellow	SPEC 2 - Pumper (Steamer) & Side Nozzles are all NST
NH	North Hampton	OTL	OTR	SPEC 2 - NST	OTL	OTL	Kennedy Yellow	SPEC 2 - Pumper (Steamer) & Side Nozzles are all NST
CT	Norwalk	OTR	OTL	SPEC 2 - NST	OTL	OTR	Kennedy Yellow W/Silver Bonnet	SPEC 2 - Pumper (Steamer) & Side Nozzles are all NST
CT	Oxford	OTL	OTR	SPEC 2 - NST	OTL	OTL	Kennedy Yellow W/Silver Bonnet	SPEC 2 - Pumper (Steamer) & Side Nozzles are all NST
MA	Oxford	OTL	OTR	SPEC 2 - NST	OTL	OTL	Kennedy Red	SPEC 2 - Pumper (Steamer) & Side Nozzles are all NST
CT	Plainville	OTR	OTR	SPEC 2- NST	OTL	OTL	Kennedy Yellow W/Silver Bonnet	SPEC 2 - Pumper (Steamer) & Side Nozzles are all NST
CT	Ridgefield	OTR	OTL	SPEC 2 - NST	OTL	OTR	Kennedy Yellow W/Silver Bonnet	SPEC 2 - Pumper (Steamer) & Side Nozzles are all NST
NH	Rye	OTL	OTR	SPEC 2 - NST	OTL	OTL	Kennedy Yellow	SPEC 2 - Pumper (Steamer) & Side Nozzles are all NST
CT	Salisbury	OTL	OTL	SPEC 2 - NST	OTL	OTL	Kennedy Yellow	SPEC 2 - Pumper (Steamer) & Side Nozzles are all NST
CT	Seymour	OTL	OTR	SPEC 2 - NST	OTL	OTL	Kennedy Yellow W/Silver Bonnet	SPEC 2 - Pumper (Steamer) & Side Nozzles are all NST
CT	Sharon	OTL	OTR	SPEC 2 - NST	OTL	OTL	Kennedy Red	SPEC 2 - Pumper (Steamer) & Side Nozzles are all NST
CT	Shelton	OTR	OTL	SPEC 2 - NST	OTL	OTR	Kennedy Yellow W/Silver Bonnet	SPEC 2 - Pumper (Steamer) & Side Nozzles are all NST
CT	Sherman	OTL	OTR	SPEC 2 - NST	OTL	OTL	Kennedy Yellow W/Silver Bonnet	SPEC 2 - Pumper (Steamer) & Side Nozzles are all NST
CT	Simsbury	OTL	OTL	SPEC 2 - NST	OTL	OTL	Kennedy Yellow W/Silver Bonnet	SPEC 2 - Pumper (Steamer) & Side Nozzles are all NST
CT	Southbury	OTR	OTL	SPEC 2 - NST	OTL	OTR	Kennedy Yellow W/Silver Bonnet	SPEC 2 - Pumper (Steamer) & Side Nozzles are all NST
CT	Stamford	OTR	OTR	STAMFORD -	OTL	OTR	Kennedy Yellow	STAMFORD: Pumper 4"x 5.110"x 4 TPI - Nozzles: NST
CT	Stonington	OTL	OTR	SPEC 2 - NST	OTL	OTL	Kennedy Yellow W/Silver Bonnet	SPEC 2 - Pumper (Steamer) & Side Nozzles are all NST
CT	Stratford	OTR	OTL	SPEC 1 - SPECIAL	OTL	OTR	Kennedy Yellow	SPEC 1: Kennedy K-81
CT	Torrington	OTL	OTR	SPEC 2 - NST	OTL	OTL	Kennedy Yellow W/Silver Bonnet	SPEC 2 - Pumper (Steamer) & Side Nozzles are all NST
CT	Trumbull	OTR	OTL	SPEC 1 - SPECIAL	OTL	OTR	Kennedy Yellow	SPEC 1: Kennedy K-81
CT	Washington	OTL	OTR	SPEC 1 - SPECIAL	OTL	OTL	Kennedy Yellow	SPEC 2 - Pumper (Steamer) & Side Nozzles are all NST
CT	West. Suffield	OTL	OTR	SPEC 2 - NST	OTL	OTL	Kennedy Red	SPEC 2 - Pumper (Steamer) & Side Nozzles are all NST
CT	Weston	OTR	OTL	SPEC 2 - NST	OTL	OTR	Kennedy Yellow W/Silver Bonnet	SPEC 2 - Pumper (Steamer) & Side Nozzles are all NST
CT	Westport	OTR	OTL	SPEC 2 - NST	OTL	OTR	Kennedy Yellow W/Silver Bonnet	SPEC 2 - Pumper (Steamer) & Side Nozzles are all NST
CT	Wilton	OTR	OTL	SPEC 2 - NST	OTL	OTR	Kennedy Yellow W/Silver Bonnet	SPEC 2 - Pumper (Steamer) & Side Nozzles are all NST
CT	Woodbury	OTL	OTR	SPEC 2 - NST	OTL	OTL	Kennedy Red	SPEC 2 - Pumper (Steamer) & Side Nozzles are all NST

ITEM #1301900A – HYDROSTATIC PRESSURE TEST

Description:

Work under this item shall include furnishing all labor, materials, tools, and equipment necessary for performing the Hydrostatic Testing as specified in AWWA C600 Section 5.2, latest revision. The Contractor will be responsible for ensuring the new main passes the Hydrostatic Testing.

The Contractor shall supply all tools, labor, equipment and materials necessary for performing the Hydrostatic Test.

After the completion of the water main installation, or a segment thereof, Aquarion will chlorinate and fill the main with water for disinfection. After a satisfactory test by Aquarion's Water Quality Department, the Contractor shall perform a Hydrostatic Test on the new main. Aquarion personnel must be on-site to witness the test.

The test pressure shall not be less than 1.25 times the stated working pressure of the pipeline measured at the highest elevation along the test section and not less than 1.5 times the stated working pressure at the lowest elevation of the test section.

The testing allowance shall be defined as the maximum quantity of makeup water that is added into a pipeline undergoing hydrostatic pressure testing, or any valved section thereof, in order to maintain pressure within 5 psi +/- of the specified test pressure (after the pipeline has been filled with water and the air has been expelled). No pipeline installation will be accepted if the quantity of makeup water is greater than that determined by the following formula:

$$L = \frac{SD\sqrt{P}}{148{,}000}$$

Where:
L = testing allowance (makeup water), in gallons per hour
S = length of pipe tested, in feet
D = nominal diameter of the pipe, in inches
P = average test pressure during the hydrostatic test, in pounds per square inch (gauge)

For purposes of the Hydrostatic Test, the test pressure in the main shall be maintained for a period of two (2) hours.

All leaks due to errors in installation shall be repaired by the Contractor at their expense until the requirements of the Hydrostatic Testing are met.

Materials:

All materials necessary to complete the Hydrostatic Testing shall be provided by the Contractor.

Construction Methods:

All construction methods shall conform to AWWA C600-05 Section 5.2, latest revision.

Method of Measurement:

Hydrostatic Testing will be measured for payment per each hydrostatic test performed.

Performing a re-test of the hydrostatic test will not be measured for payment.

Basis of Payment:

Hydrostatic Testing will be paid for at the contract unit price per each hydrostatic test performed.

Performing a re-test of the hydrostatic test will not be reimbursed.

Testing for Item #1301653A - "8" Ductile Iron Pipe Installed on Bridge (Water Main)" will not be paid for separately but shall be included under that item.

Pay Item	Pay Unit
Hydrostatic Pressure Test	ea.

ITEM #1302901A – AIR RELIEF VALVE (WATER MAIN)

Description:

Work under this section shall include all labor, tools, materials, and equipment necessary to furnish and install the 2" Air Relief Valve, complete as shown in the Aquarion Standard Details or as directed by the Aquarion Representative.

Work under this section shall include all labor, tools, materials, and equipment necessary for:

- obtaining road opening permit, if required by the Engineer
- coordination of Call-Before-You-Dig mark out
- saw-cutting of the roadway, sidewalks, or driveways
- traffic control equipment (signs, barriers, etc.)
- traffic control coordination, including scheduling of policemen and flagmen
- furnishing and maintaining lighting
- mobilization and demobilization
- clearing and grubbing
- excavation as measured from the existing grade to the trench subgrade
- concrete thrust block installation, if required
- furnishing, installing, operating and maintaining a dewatering system
- furnishing, installing and removing sheeting, bracing and trench boxes
- furnishing, stockpiling, loading, hauling, placing and compacting pipe bedding material
- backfill and compaction of excavations
- stockpiling, loading, hauling and legally disposing of surplus material
- unloading and storage of pipe, fittings, and valves
- installing pipe, fittings, joint restraint assemblies, and restrained joint pipe
- asphalt and concrete pavement removal and disposal (including necessary saw cutting)
- removal and restoration of walls, fences, signs and any other structures which must be removed to carry out the work
- removal of topsoil and sod; restoration of area to original condition upon completion of work
- care and protection of existing pipes, utilities, and other structures
- piling and storage of excavated materials

Materials:

Materials for Air Relief Valve assemblies include, but are not limited to, ductile iron tapped tees, brass accessories including a James Jones valve, or approved equal, 15" PVC riser pipe, cast iron blow-off box, blow-off box cover, and any concrete blocking necessary to provide a suitable base for supporting the 15" PVC riser pipe. Blow-off assemblies at dead ends shall include a mechanical joint plug, restraints and hardware.

The Contractor shall order materials based on the Aquarion List of Approved Materials (attached to the special provision for Item No. 1301861A – Furnish Ductile Iron Pipe, Valves and Misc. Fittings). Additional materials, if required, must be approved by the Aquarion Representative at the site in order to be invoiced. There shall be no administrative mark up on additional materials ordered.

Construction Methods:

The Air Relief Valve shall be installed as shown on the drawings or as directed by the Aquarion Representative. Air Relief Valve installations shall conform to the Aquarion Standard Details.

Abandonment of Air Relief Valves shall include making sure the valve is in the off position, excavating, removing the blow-off box and lid, removing or cutting the 15" PVC down to a level below existing grade to the satisfaction of the Aquarion Representative, and backfilling the excavation with approved bedding and backfill material. The abandonment of Air Relief Valves also includes removal of the old Air Relief Valve and the installation of a plug into the water main. The air vent/blow-off shall no longer be visible at the surface and shall be reported to Utility Operations as abandoned and no longer in service. When tapping a new or existing water main for an air relief valve, the tap shall be type CC, or AWWC thread to match the valve.

Installing an Air Relief Valve on an existing main shall include excavation and cleaning of the existing main. All debris and buildup shall be removed from the existing main so it is smooth. The existing main shall then be tapped and the appropriate hardware and accessories installed and brought to the surface using the materials and methods as specified herein.

All Air Relief Valve boxes shall be set so that they are centered over the valve and standpipe.

Method of Measurement:

Work under this section for the size and type specified, will be measured for payment per each Air Relief Valve (Water Main) furnished and installed, complete in place, and accepted.

Bedding material furnished, installed, and compacted, to the bedding material limits shown on the Typical Trench Detail, will not be measured separately for payment, but shall be included in the cost per each air relief valve installed. Brass accessories including a James Jones valve, or approved equal, 15" PVC riser pipe, cast iron blow-off box, blow-off box cover, and any concrete blocking necessary to provide a suitable base for supporting the 15" PVC riser pipe will not be measured for separate payment, but shall be included in the cost of the air relief valve.

Rock In Trench, Excavation and Disposal of Unsuitable Material, Additional Backfill Material, and Pavement Replacement or Repair will be measured separately for payment under those appropriate Items.

Basis of Payment:

Work under this section for the size and type specified, will be paid for at the contract unit price per each Air Relief Valve (Water Main) furnished, installed, complete in place, and accepted.

No separate payment will be made for bedding material furnished, installed, and compacted, to the bedding material limits shown on the Typical Trench Detail, but shall be included in the cost per each Air Relief Valve installed.

Rock In Trench, Excavation and Disposal Unsuitable Material, Additional Backfill Material, and Pavement Replacement or Repair will be paid for separately at the contract unit price under those appropriate Items.

Pay Item	Pay Unit
Air Relief Valve (Water Main)	ea.

ITEM #1304060A – TEMPORARY PAVEMENT REPAIRS (WATER MAIN)

Description:

Work under this section shall include all labor, tools, materials, and equipment necessary for:

- furnishing and installing bituminous concrete pavement as specified in this section
- maintaining the temporary pavement for up to one year after installation
- furnishing and applying tack coat
- saw-cutting or keying of the pavement
- saw-cutting of the roadway, sidewalks, or driveways
- traffic control equipment (signs, barriers, etc.)
- traffic control coordination, including scheduling of policemen and flagmen
- furnishing and maintaining lighting
- mobilization and demobilization
- compacting pavement
- removal of and resetting all manhole frames, catch basins, valve boxes, and air vent/blow-off boxes, etc.
- repairing of traffic loop detectors
- re-striping of traffic pavement markings

The Contractor who installed the pipeline and temporary paving will be responsible for maintaining the temporary paving for the period specified herein.

Work under this section shall include furnishing all labor, materials, tools, and equipment necessary for installing pavement on Town and State roads disturbed by the Contractor's operations and associated with the installation of the Water Main as shown on the drawings within Subset 07 – Utility - AWC.

Materials and Construction Methods:

Temporary/Permanent Pavement

Refer to the following table for the horizontal limits of Temporary Pavement, Permanent Pavement, Processed Aggregate Base and Rolled Granular Base. The Permanent Pavement widths reflect a 1' cut back on either side of the trench.

Add 2 feet to each width below if a trench box is used.

PAVEMENT, PROCESSED AGGREGATE BASE AND ROLLED GRANULAR BASE LIMITS

Pipe Size	Temporary Pavement Width Limit	Permanent Pavement Width Limit
6"	4.00 feet	6.00 feet
8"	4.00 feet	6.00 feet
10"	4.00 feet	6.00 feet
12"	4.00 feet	6.00 feet
16"	4.00 feet	6.00 feet
20"	5.00 feet	7.00 feet
24"	5.00 feet	7.50 feet
30"	6.00 feet	8.00 feet
36"	6.00 feet	8.50 feet

In pavement, the Contractor shall, immediately after backfilling, place temporary or permanent pavement as directed by Aquarion's Representative, unless directed otherwise by the Town or State. In town roads, the Processed Aggregate Base or Rolled Granular Base thickness shall be 12". The Processed Aggregate Base shall meet the requirements of the State of Connecticut Department of Transportation Standard Specifications, Section 3.04 and the Rolled Granular Base shall meet the requirements of the State of Connecticut Department of Transportation Standard Specifications. In State Highways, the Processed Aggregate Base or Rolled Granular Base thickness shall be 12". At the commencement of the project, Aquarion, the Town, or the State will determine whether the trench repair will be temporary or permanent.

Aquarion will determine the type of material to be used as temporary/permanent pavement. The temporary material will be either "cold patch" or "hot patch". Cold patch shall only be used on extreme cold weather conditions. No additional payment will be made to remove cold patch and replace with hot patch if required by Town or State officials.

Hot patch shall be a HMA S0.5 Traffic Level 2 material as per the requirements of the Connecticut Department of Transportation Standard Specifications, Section 4.06, and Section M.04, Bituminous Concrete Mix. The permanent material under this Section will be a HMA S1 Traffic Level 2 Binder as per the requirements of the Connecticut Department of Transportation Standard Specifications, Section 4.06 and Section M.04, Bituminous Concrete Mix. During the progress of the work and until construction of the final surface, the Contractor shall maintain the surface of the streets in good and safe condition. The Contractor shall frequently inspect and promptly fill all depressions adjacent to trenches caused by settlements to existing grade. The Contractor shall be responsible for maintaining the trench paving for a period of 1 year at their own cost, from the date of installation of the temporary or permanent hot patch. Any leveling course required will not be reimbursed.

Generally, in town roads, the pavement shall consist of a two (2) to three (3) inches HMA S0.5 Traffic Level 2 or 3 binder courses and a two (2) to three (3) inch HMA S0.5 Traffic Level 2 or 3

or HMA S0.375 Traffic Level 2 or 3 wearing course as directed by Aquarion. In State roads the pavement shall consist of a six inch (6") HMA S1 Traffic Level 2 binder course and a three inch (3") HMA S0.5 Traffic Level 2 or 3 wearing course placed in one and a half inch (1 1/2") lifts. However, thicknesses may vary depending on more specific Town or State requirements. All stated pavement thickness refer to compacted and rolled thicknesses. On State construction projects the paving materials shall conform to those specified for use by the Contract Documents.

All bituminous concrete pavement shall meet the requirements of the State of Connecticut Department of Transportation Standard Specifications, Section 4.06, and Section M.04, Bituminous Concrete Mix, or the Contract Documents.

Where existing pavement is disturbed at the intersection of driveways and street lines, replacement of permanent pavement shall be "lipped".

Pavement in State highways shall meet the approval of the Connecticut Department of Transportation.

Processed Aggregate Base and Rolled Granular Base

The Contractor shall prepare the subgrade by constructing a processed aggregate base or rolled granular base course, in conformity with the line, grade, dimensions and compacted thickness shown on the drawings, or as directed by the Owner's Representative. Rolled granular base shall consist of one or more courses constructed on the prepared subbase in conformity with the lines, grades, compacted thickness and typical cross-section as shown on the plans or as determined by the Engineer. The materials for rolled granular base shall conform to the requirements of Article M.02.03.

Bases of 6 inches or less in specified depth may be constructed in one course; bases over 6 inches in specified depth shall be constructed in two courses of equal depth.

Gravel or reclaimed miscellaneous aggregate shall be spread upon the prepared subbase to such depth that this course will be of the specified depth after final compaction. If, after the material has been spread and shaped, it is found that additional binder is necessary, it shall be furnished and applied in an amount directed by the Engineer. Such binder material shall be carefully and uniformly incorporated with the material in place by scarifying, harrowing, brooming or other approved methods. The material shall then be shaped, wetted and compacted with a power roller with a mass of not less than 10 tons or an equivalent vibratory roller or compactor until thoroughly compacted. All areas of segregated coarse or fine material shall be corrected or removed and replaced with well-graded material, as directed by the Engineer. The compacting and wetting shall be continued until all voids are filled, after which this portion may be left to dry. The compacting shall be continued until the course is thoroughly compacted to a firm and uniform surface satisfactory to the Engineer. The material shall be re-compacted and wetted on succeeding days. The rate and extent of the compacting and the quantity and method of applying water shall be as directed by the Engineer.

After the first course has been compacted and bound as specified herein, the succeeding course, if necessary in order to achieve the specified base depth, shall be similarly placed.

Permanent Pavement

The Contractor shall be responsible for coordinating with local and/or State authorities to define when permanent paving can be performed and the bituminous materials to be utilized. Upon completion of the water main installation, the Contractor shall inform Aquarion, in writing, of the anticipated date of paving.

In preparation for the permanent pavement, the remaining edges of the existing pavement shall be cut back (saw cut) a minimum of twelve inches (12") from the original edges of the trench. If required, the temporary pavement shall be removed and the subgrade formed to the required line, grade, and cross-section and properly compacted.

The Contractor shall exercise care so as not to damage the cut edge of the existing pavement.

After the base has been properly prepared, subject to the approval of Aquarion's Representative, the final courses of bituminous concrete pavement shall be constructed. Immediately prior to laying the binder and wearing courses, the trimmed edges shall be stable and unyielding, free of loose or broken pieces and edges and shall be thoroughly swept and coated with an approved tack coat. The binder course shall be tack coated prior to placing the wearing course.

Bituminous Concrete Resurfacing Course

If required for the project, the Contractor shall construct a 2" (compacted thickness) course of bituminous concrete pavement. This work shall be performed in conformity with the line, grade and dimensions as shown on the drawings or as directed by Aquarion's Representative.

Materials and method of construction shall conform to applicable provisions of Connecticut Department of Transportation Specifications, Section 4.06, Bituminous Concrete, HMA S0.375 Traffic Level 2 or 3.

All edges of pavement along the existing roadway shall be cut straight, vertically, in a neat and workmanlike manner, and shall receive an approved tack coat prior to constructing the new pavement.

Paving Equipment

Paving equipment shall be of the self-powered type with an adapter to provide guidance of the screeding action. The screed or strike-off member shall be adjustable to the shape of the cross-section of the finished pavement. The screed shall be tilted while in operation to secure the proper "drag" and to provide the compressive screeded surface required. The machine shall have a sufficient number of driving wheels so there will be no undue amount of slippage. Whenever the design of the equipment and plan of operation are such that the driving wheels travel on the

finished surface of a completed pavement, said wheels shall be equipped with rubber tires or other means to protect the finished surface. Screeding members shall be preheated, and means shall be provided for heating the screeding members by some method that will prevent accumulation of bituminous material.

Automatic Grade and Slope Control

All paving equipment used on divided highways of four or more lanes in excess of one thousand feet long, shall be equipped with automatic grade and slope screed controls with sensors for either or both sides of the paver. These systems shall be capable of overriding the normal function of the self-leveling screed and maintain screed deviation relative to an external reference. This reference may be an existing grade, mat, slab, or curb.

The grade sensor shall react from a reference line or a floating beam or shoe (ski) traveling over the reference plans.

The transverse slope controller shall be capable of maintaining the screed at the desired slope within +/- 0.1 percent.

Method of Measurement:

Work under this section shall be measured for payment per square yard of paving related work performed and installed, complete and accepted in place, including all materials.

Furnishing, installing and compacting the base for the roadway shall not be measured separately for payment.

Processed Aggregate Base, Rolled Granular Base, Asphalt and concrete shall not be measured for payment.

Basis of Payment:

Work under this section will be paid for at the contract unit price per square yard of paving related work defined herein, performed and installed, including all materials, complete and accepted in place.

No separate payment will be made for Processed Aggregate Base, Rolled Granular Base, HMA S0.5 Traffic Level 2 or 3, HMA S0.375 Traffic Level 2 or 3, HMA S1 Traffic Level 2 or 3 Bituminous Concrete, or PMA.

Pay Item	**Pay Unit**
Temporary Pavement Repairs (Water Main)	s.y.

ITEM #1400000A – TEST PIT EXCAVATION (SANITARY SEWER)

Description: The work under this item shall consist of removal of all materials including, but not limited to, pavements, soils, and water within the limits of test pit as necessary to locate existing sanitary sewers. Also included in the work is the satisfactory stockpiling and/or disposal of surplus or unsuitable material, locating existing sewers and invert elevations by survey, and backfilling the test pits with compacted granular fill or on-site borrow.

Materials: Compacted granular fill shall meet the requirements of Section 2.14.

Construction Methods: The Contractor shall excavate the test pits in the locations indicated on the plans or as directed by the Engineer and shall locate and document existing sanitary sewers horizontally and vertically by survey. Test pits performed in locations where new sanitary sewer manholes and piping are to be installed may be temporarily backfilled with borrow. Test pits performed at all locations where no further excavation is to take place shall be backfilled with Granular Fill (Sanitary Sewer). The surface of the area disturbed for excavation of test pit shall be restored to existing condition unless otherwise directed by the Engineer.

The Contractor shall notify the Engineer of any discrepancies per the plans and incorporate the survey information into sanitary sewer shop drawing submittals.

Excavations of test pits shall be accomplished by such means as are required to ensure that any underground utilities or structures encountered are not damaged. It shall be the Contractor's sole responsibility for repair of any damages caused by excavation. Any such damages shall be repaired or replaced by the Contractor, where permitted, to the satisfaction of the Engineer at the Contractor's sole expense.

Method of Measurement: Payment lines for test pits shall have a maximum size of 5-feet by 5-feet by 10-feet deep prior to beginning another test pit to locate the specified item.

Basis of Payment: This work will be paid for at the Contract unit price per cubic yard for Test Pit Excavation (Sanitary Sewer), complete in place, which price shall include all coordination and surveying, excavation, disposal, backfill, materials, equipment, tools, labor and work incidental thereto.

Compacted granular backfill, where directed by the Engineer, will be paid separately under item "1405081A – Granular Fill (Sanitary Sewer)".

Pay Item	**Pay Unit**
Test Pit Excavation (Sanitary Sewer)	c.y.

ITEM #1400004A – ROCK IN TRENCH 0’-10’ DEEP (SANITARY SEWER)

Work under this item shall meet the requirements of Section 2.86, amended as follows:

2.86.01 – Description: *Add the following:*

This item shall consist of excavation necessary for the proper installation of sanitary sewer structures, pipes, and any other incidental sanitary sewer items.

2.86.05 – Basis of Payment: *Add the following:*

Rock in Trench Excavation 0’-10’ Deep (Sanitary Sewer): When rock, conforming to the description in 2.86.01 is encountered within the limits of sanitary sewer trench excavation, its removal will be classified and paid for at the Contract unit price per cubic yard for “Rock in Trench Excavation 0’-10’ Deep (Sanitary Sewer)”.

Pay Item	Pay Unit
Rock in Trench Excavation 0’-10’ Deep (Sanitary Sewer)	c.y.

ITEM #1400102A – 8" POLYVINYL CHLORIDE PIPE (SANITARY SEWER)

Description: The work under this item shall consist of furnishing, preparing, installing and testing of sanitary sewer pipe, bedding material, joint sealant, rubber gaskets, clamps, collars, grout, grout collars, trench excavation, dewatering, satisfactory disposal of all materials, the removal of which is necessary for the proper completion of the work, and connecting proposed sanitary sewer systems, as shown on the plans or directed by the Engineer and in accordance with Town of Seymour Water Pollution Control Authority (WPCA) details and standards.

Materials: The materials for this work shall meet WPCA requirements:

Polyvinyl Chloride Pipe (PVC) and fittings shall be suitable for non-pressure conveyance of sewage conforming to ASTM D3034, Type PSM SDR-35.

Pipe and fittings shall be made from Virgin Type I Grade 1, Polyvinyl Chloride compounds as defined and described in ASTM D1784 for "Rigid Poly (Vinyl Chloride) Compounds and Chlorinated Poly (Vinyl Chloride) Compounds. Fittings shall be made in the sizes and to the dimensions of standard pipe as above.

Straight pipe shall be furnished in lengths not more that 20 feet, and full pipe lengths shall be installed wherever possible. For pipe of nominal size 8 inches, minimum wall thickness shall be 0.240 inches. Pipe shall be marked along the outside of the barrel in bold style type and shall indicate the manufacturer's name, pipe size, PVC compound used, and the ASTM material specification for the PVC compound used.

PVC pipe joints for PVC shall be push-on bell and spigot joints using elastomeric "O" ring gasket and shall conform to ASTM D3212.

Crushed stone for bedding material shall meet the gradation requirements of M.01.02 for No. 6 stone.

Warning tape shall be a minimum 3-inches wide, 4.0 mil polyethylene film suitable for buried utility. The tape shall be green in color per the A.P.W.A. National color Code and shall be permanently imprinted with a warning label indicating "Sewer Main Buried Below", or as otherwise approved by the Engineer.

Construction Methods: Sanitary sewer lines shall be laid and maintained to the lines and grades shown on the plans or based on approved shop drawings.

Trench excavation shall be performed in accordance with 2.86.03 (2) of the Standard Specifications.

All pipe, fittings, and accessories shall be loaded and unloaded in a manner that avoids damage or distortion of the pipes. Under no circumstances shall material be dropped. All

materials shall be stored so they will be protected from damage. All gaskets shall be stored in a cool location protected from direct sunlight.

All pipes, fittings and other appurtenances shall be examined carefully for damage and other defects prior to installation. Defective materials may be rejected the Engineer. Pipe and fittings shall be clean inside and outside of spigot end shall be cleaned and free from dirt, sand, grit or any foreign materials prior to installation. No foreign materials shall be allowed to enter the pipe or fittings prior to, during, or after installation. Any material accumulating within the pipe and fittings shall be removed. Care shall be taken to prevent pipe floating should the trench fill with water. When installed, fittings and bends shall be fully seated ensuring gaskets remain in the intended position. Care shall be taken to avoid damage to pipe and fittings when joining.

Pressure testing of the sanitary sewer shall be performed using low-pressure air testing in accordance with ASTM F1417 Standard Practice for Installation of Plastic Non-pressure Sewer Lines Using Low-Pressure Air and Uni-Bell Specification UBPPA UNI-B-6 Recommended Low-Pressure Air Testing of Installed Sewer Pipe.

Vacuum test sanitary manholes in accordance with ASTM C1244 Standard Test Method for Concrete Sewer Manholes.

Repair or replace sections of pipe and manhole penetrations or connections that fail pressure testing and repeat testing until within allowances specified at no additional cost.
Sanitary sewer shall be bedded in crushed stone and placed to the limits shown on the plan details.

Warning tape shall be installed as shown on the plan details and in accordance with applicable law.

Method of Measurement: This work will be measured for payment by the number of linear feet of pipe completed and accepted in place and measured through all fittings.

Basis of Payment: This work will be paid for at the Contract unit price per linear foot for 8" Polyvinyl Chloride Pipe (Sanitary Sewer), complete in place, which price shall include all excavation, bedding, materials, bends and fittings, warning tape, equipment, tools, labor and work incidental thereto.

There will be no direct payment made for low-pressure air testing, the cost for which shall be included in the cost of the work for "8" Polyvinyl Chloride Pipe (Sanitary Sewer)".

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

Rock-in-trench, where encountered or required for removal of existing reinforced concrete sanitary sewer, shall be paid under the item "1400004A - Rock-in-Trench Excavation 0'-10' Deep (Sanitary Sewer)".

Backfill for sanitary sewer shall be paid separately under item “1405081A – Granular Fill (Sanitary Sewer)”.

Pay Item	**Pay Unit**
8” Polyvinyl Chloride Pipe (Sanitary Sewer)	l.f.

ITEM #1401248A – 24" DUCTILE IRON PIPE (SANITARY SEWER)

Description: The work under this item shall consist of furnishing, preparing, installing and testing of sanitary sewer pipe, bedding material, joint sealant, rubber gaskets, clamps, collars, grout, grout collars, trench excavation, dewatering, satisfactory disposal of all materials, the removal of which is necessary for the proper completion of the work, and connecting proposed sanitary sewer systems, as shown on the plans or directed by the Engineer and in accordance with Town of Seymour Water Pollution Control Authority (WPCA) details and standards.

Materials: The materials for this work shall meet WPCA standards. The Contractor shall submit to the Engineer manufacturer's specifications, data, catalog cuts, etc., for all sewer system materials and products incorporated into the work. The WPCA shall be permitted to inspect and approve all materials furnished by the Contractor at the manufacturer's plant. All pipe, bends, fittings, and appurtenances shall be subject to inspection by WPCA at the point of delivery. Material found to be defective due to manufacture or damage in shipment shall be rejected, recorded on the bill of lading and removed from the job site. In case of failure of the pipe or appurtenance to comply with such specifications, the replacement of the defective materials shall become the responsibility of the Contractor.

1. Ductile Iron Sewer Main:

Pipe shall be Thickness Class 54 manufactured and finished in The United States of America and in accordance with ANSI/AWWA C151/A21.5, latest revision. All ductile iron pipe shall be double cement mortar-lined and double bituminous seal coated inside and bituminous seal coated on the exterior per ANSI/AWWA C104/A21.4, latest revision.

All fittings shall be ductile iron in accordance with ANSI/AWWA C153/A21.53, rated for 350 PSI working pressure, double cement lined and double seal coated inside and bituminous seal coated on the exterior per ANSI/AWWA C104/A21.4, latest revision.

Pipe and fitting joints shall be push-on type with mechanical or restrained flexible jointing (TR Flex) configuration matching connecting pipe, and/or as identified on the drawings. All pipe and fitting joints shall employ a single, elongated grooved rubber gasket to affect the joint seal.

Approved Manufacturers of Mechanical Joint Ductile Iron Pipe / Fittings

McWane Ductile
American Cast Iron Pipe Company
U. S. Pipe

All ductile iron pipe, fittings, and specialty items installed in the permanent underground sewer system, and where called out, shall have mechanical joints utilizing ductile iron restraints on all pipe joints. Restraints shall consist of a ductile iron harness bolted to the flange of the adjacent pipe bell, and utilizing serrated wedge type anchors to grip the pipe barrel. The harness shall be constructed of ASTM A 536 ductile iron. The harness shall be a one-piece design. The

anchors shall employ torque limiting twist-off nuts. Set screw type restraints shall not be used. Field Lok 350 gaskets (by U.S. Pipe) may be used for restraint.

Approved manufacturers of joint restraints
Megalug Series 1100, manufactured by EBAA Iron Inc.
Romagrip MJ Restraining gland, manufactured by Romac Industries, Inc.
Field Lok 350 gasket by U.S. Pipe

Gaskets shall be Styrene Butadiene Rubber (SBR) conforming to the requirements of ANSI A21.11/AWWA C111, supplied by the pipe or fitting manufacturer.

2. Pipe Bedding Material:
Crushed stone for bedding material shall meet the gradation requirements of M.01.02 for No. 6 stone.

3. Restrained Couplings:
Restrained couplings shall consist of a coupling sleeve of ductile iron per ASTM A536, with end restraint rings of ductile iron per ASTM A536, with gaskets and corrosion resistant, low alloy high strength, double ended threaded rods with nuts per AWWA C111/A21.11. Steel sleeves or steel restraint rings shall not be used. Wetted parts shall be lined with a minimum 15 mil fusion bonded epoxy coating per ANSI/AWWA C213, conforming to ANSI/NSF-61. Restraint rings shall have a heat cured protective coating and shall employ heat cured epoxy coated serrated wedges with torque limiting nuts to grip the connecting pipe. Set screw types shall not be used.

Approved Manufacturers

Restrained coupling shall be Series 3800 by EBAA Iron, Eastland, TX,
Alpha restrained Joint Coupling by Romac Industries
Hymax Grip Coupling by Mueller

4. Caulk/Sealant (End Wall)
A silicon rubber type “through penetration sleeve” insulating sealant system shall be provided for bridge end wall piping penetrations. The system shall be suitable for piping penetrations eccentric with respect to the sleeve, and where pipe and sleeve axes do not align. The system shall include inert silicone rubber shapes or “pillows” to fill the void of the annular space between pipe O.D. and sleeve I.D., to within the prescribed “pocket” depth from face of wall, following which the pockets will then be filled solid with caulk grade of silicon rubber, and troweled smooth, flush with face of wall or projecting sleeve. The material shall ne non-toxic in case of fire, watertight, UV and ozone resistant, remain flexible in winter temperatures, and permit thermal expansion and contraction of the pipe. Approved manufacturer systems include “Through Penetration Fire Stops” as manufactured by 3M, NOFIRNO as manufactured by Beele Engineering, or approved equal.

Warning tape shall be a minimum 3-inches wide, 4.0 mil polyethylene film suitable for buried utility. The tape shall be green in color per the A.P.W.A. National color Code and shall be

permanently imprinted with a warning label indicating “Sewer Main Buried Below,” or as otherwise approved by the Engineer.

Construction Methods:

1. Trench Excavation:

Trench excavation shall be performed in accordance with 2.86.03 (2) of the Standard Specifications .

2. Pipe and Fittings:

Sanitary sewer lines shall be laid and maintained to the lines and grades shown on the plans or based on approved shop drawings.

All pipe, fittings, and accessories shall be loaded and unloaded in a manner that avoids damage or distortion of the pipes. Under no circumstances shall material be dropped. All materials shall be stored in a manner they will be protected from damage. Pipe shall not be stacked higher than the limits specified by the manufacturer. The bottom tier of stacked pipe shall be kept off the ground on timbers, rails, or concrete, etc. Pipe in tiers shall be alternated: bell, plain end; bell, plain end and shall not make contact with one another. All gaskets shall be stored in a cool location protected from direct sunlight. Gaskets shall not come in contact with petroleum products. Gaskets shall be used on a first-in, first out basis.

All pipes, fittings and other appurtenances shall be examined carefully for damage and other defects prior to installation. Defective materials may be rejected the Engineer. All lumps, blisters, and excess coating shall be removed from the socket and plain ends of each pipe, and the outside of the plain end and the inside of bell end shall be wiped clean and dry and be free from dirt, sand, grit or any foreign materials before the pipe is laid. No foreign materials shall be allowed to enter the pipe or fittings prior to, during, or after installation. Any material accumulating within the pipe and fittings shall be removed. When installed, fittings and bends shall be fully seated ensuring gaskets remain in the intended position. Care shall be taken to avoid damage to pipe and fittings when joining.

At times when pipe laying is not in progress, the open ends of pipe shall be closed by a watertight plug or other means approved by the Engineer. The plug shall be fitted with a means for venting. The plug shall remain in place until the trench is pumped dry. Prior to removal of the plug, air and/or water pressure in the pipeline shall be safely released.

3. Sewer Main Joints and Assembly:

For Mechanical Joints (Restrained), the Contractor shall wipe clean the socket and the plain end. The plain end, socket and gasket should be washed with a soap solution to improve gasket seating. Place the restraint gland on the plain end with the lip extension toward the plain end, followed by the gasket with the narrow edge of the gasket toward the plain end. Use manufacturer approved mechanical joint restraint system at all joints made up under this item. Insert the pipe into the socket and press the gasket firmly and evenly into the gasket recess.

Keep the joint straight during assembly. Make deflection after joint assembly but before tightening bolts. Push the restraint gland toward the socket and center it around the pipe with the gland lip against the gasket. Insert bolts and hand-tighten nuts. Mechanical joint bolts (3/4-inch) for pipe sizes ranging from 4" to 24" diameter shall be tightened to the normal sequence and range of bolt torque recommended by the manufacturer, while at all times maintaining approximately the same distance between the restraint gland and the face of the flange at all points around the socket. This can be accomplished by partially tightening the bottom bolt first, then the top bolt, next the bolts at either side, finally the remaining bolts, or follow the manufacturer's recommended alternation sequence. Repeat the process until all bolts are within the appropriate range of torque. The final torque application will snap off the retainer bolt heads. When it is necessary to deflect the pipe from a straight line in either the horizontal or vertical plane, the amount of joint deflection shall not exceed 75% of the manufacturer's requirements.

Cutting pipe shall be done in conformance with all safety recommendations of the manufacturer of the cutting equipment. Field cutting of ductile iron pipe shall only be done on "gauged" pipe, that is, pipe so marked at the factory as to be within proper O.D. diameter and out of round tolerance for proper jointing at any position along the length. Cutting shall be done in a safe, workmanlike manner without creating damage to the pipe or cement-mortar lining. Ductile-iron pipe may be cut using an abrasive pipe saw, rotary wheel cutter, guillotine pipe saw, or milling wheel saw. Oxyacetylene or plasma torch or any flame cutting method shall not be used. Cut ends and rough edges shall be ground smooth, and sufficiently beveled for gasket makeup.

Fittings, plugs and caps shall be set and joined to the pipe in the manner specified in the specifications for cleaning, laying and joining pipe.

Dead ends on new mains shall be installed as indicated on the plans and in accordance with the plan details.

All pipe joints and fittings shall be installed with thrust restraining glands or retainers, as described above.

Pressure testing of the sanitary sewer shall be performed using low-pressure air testing in accordance with ASTM F1417 Standard Practice for Installation of Plastic Non-pressure Sewer Lines Using Low-Pressure Air and Uni-Bell Specification UBPPA UNI-B-6 Recommended Low-Pressure Air Testing of Installed Sewer Pipe.

Vacuum test sanitary manholes in accordance with ASTM C1244 Standard Test Method for Concrete Sewer Manholes.

Repair or replace sections of pipe and manhole penetrations or connections that fail pressure testing and repeat testing until within allowances specified at no additional cost.
Sanitary sewer shall be bedded in crushed stone and placed to the limits shown on the plan details.

Warning tape shall be installed as shown on the plan details and in accordance with applicable law.

Method of Measurement: This work will be measured for payment by the number of linear feet of pipe completed and accepted in place and measured through all fittings.

Basis of Payment: This work will be paid for at the Contract unit price per linear foot for 24" Ductile Iron Pipe (Sanitary Sewer), complete in place, which price shall include all excavation, dewatering, bedding, materials, bends and fittings, warning tape, equipment, tools, labor and work incidental thereto.

There shall be no direct payment for low-pressure air testing, the cost for which shall be included in the unit cost bid.

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

Rock-in-trench, where encountered or required for removal of existing reinforced concrete sanitary sewer, shall be paid under the item "1400004A - Rock-in-Trench Excavation 0'-10' Deep (Sanitary Sewer)."

Sanitary sewer installed on bridge will be paid separately under item "0603602A – Ductile Iron Pipe Supported on Bridge."

Sanitary sewer trench backfill will be paid separately under item "1405081A – Granular Fill (Sanitary Sewer)."

Pay Item	**Pay Unit**
24" Ductile Iron Pipe (Sanitary Sewer)	l.f.

ITEM #1403007A – SPECIAL SANITARY MANHOLE

ITEM #1403011A – DROP MANHOLE (SANITARY SEWER)

ITEM #1403030A – DOGHOUSE MANHOLE (SANITARY SEWER)

ITEM #1403094A – 60" I.D. MANHOLE (SANITARY SEWER)

ITEM #1403505A – REBUILD MANHOLE (SANITARY SEWER)

ITEM #1403517A – REMOVE SANITARY MANHOLE (SANITARY SEWER)

Description: The work under this item shall consist of furnishing, preparing, and installing sanitary sewer manholes, drop manholes and doghouse manholes complete, including frame and cover, and rebuilding of existing manholes, in conformity with the lines, grades, and dimensions and details shown on the plans. Included in this work is all required excavation and backfilling. All work shall be performed in accordance with Town of Seymour Water Pollution Control Authority (WPCA) details and standards.

Included in the work is the design for each manhole, including shop drawings signed and sealed by a Connecticut-licensed Professional Engineer, including, but not limited to, special, shallow, and oversized manholes and reinforced concrete top slab for shallow manholes as indicated on the plans.

Included in the work for "Drop Manhole (Sanitary Sewer)" is the outside drop assembly as indicated on the plans.

Materials: The materials for this work shall meet WPCA standards. The Contractor shall submit to the Engineer manufacturer's specifications, data, catalog cuts, etc., for all materials and products incorporated into the work. The WPCA shall be permitted to inspect and approve all materials furnished by the Contractor at the manufacturer's plant. All pipe, bends, fittings, and appurtenances shall be subject to inspection by WPCA at the point of delivery. Material found to be defective due to manufacture or damage in shipment shall be rejected, recorded on the bill of lading, and removed from the job site. In case of failure of the pipe or appurtenance to comply with such specifications, the replacement of the defective materials shall become the responsibility of the Contractor.

Precast reinforced concrete manhole bases, risers, bases, tops and grade rings shall be of the types indicated, or as directed, and shall conform to the requirements of ASTM C478 Precast Reinforced Concrete Manhole Sections. Reinforcing steel shall be deformed bars conforming to the requirements of ASTM A615/A706 for steel reinforcing bars. The exterior surfaces of all

manholes shall be shop coated with two coats of Tneme-Tar 46H-413, as manufactured by Tnemec, Koppers Bitumastic Super Service Black, Carboline Bitumastic 300M, or approved equal.

Each manhole base, riser, transition section, and top shall be constructed as a bell-and-spigot or tongue-and-groove ends machined for accurate tight joints, and grade rings shall be manufactured by the centrifugal, roller suspension or vertical cast process. Precast concrete grade rings shall be 6-inches wide with inner and outer diameters allowing for full bearing on the manhole top.

Manhole top slab, where required, shall be designed and manufactured in accordance with HS-20 load requirements.

Manufacturer shall provide openings in the precast concrete manhole bases and/or risers to receive pipe connections. Openings for pipe connections shall be provided with watertight mechanical joint sealing devices at the required elevations and as indicated on the approved shop drawings. Non-Shrink mortar shall be used to seal pipe penetrations for doghouse manholes.

Manhole steps shall be provided in precast concrete base and riser sections in the locations and to the dimensions shown on the plan details. Manhole steps shall be copolymer polypropylene plastic coated ½" Grade 60 steel reinforced step Model No. PS2-PFSL as manufactured by M.A. Industries, or equal, in conformance with ASTM C-478 Precast Reinforced Concrete Manhole Sections. Manhole steps shall meet latest OSHA Regulation 29 CFR 1910.27.

Joint sealant shall be butyl rubber mastic conforming to AASHTO M-198 Standard Specification for Joints for Concrete Pipe, Manholes, and Precast Box Sections Using Preformed Flexible Joint Sealants.

Drop manholes shall be outside drop type as shown on the plans and details. Tee, drop pipe, elbow and all bends and fittings shall be furnished in accordance with the provisions for "24" Ductile Iron Pipe (Sanitary Sewer)".

Manhole frames and covers shall be cast-iron and gasketed and shall conform to the plan and details. Rubber for self-sealing cover shall be Style #10 commercial neoprene compound, adaptable to extreme weather conditions, resistant to rotting, checking and cracking due to ozone exposure. Material shall be EPDM meeting ASTM D-2000 Standard Specification for Rubber Materials, color Black, and rubber hardness 60 durometer. Adhesive to fasten rubber gasket to cover shall be industrial type, Scotch-Grip 4799 as manufactured by 3M or approved equal.

Manhole frame joint sealing shall be designed to prevent infiltration of water into manhole over 20-year service life. Seal shall remain flexible, allowing repeated vertical and horizontal movement up to ½ inch. Sealing material shall be Parsonpoxy FG as manufactured by Parson Environmental Products, Inc., or approved equal.

Mortar grout shall be non-shrink type mortar or grout and shall be a factory-mixed ready-to-use product for watertight joints.

Concrete for precast concrete manhole sections shall have an average strength of 5,000 psi at 28 days. Strengths shall be determined by tests on 6-inch by 12-inch vibrated test cylinders cured in the same manner as the manhole sections, or otherwise approved method. Not less than two concrete strength tests shall be made for each 100 linear feet of manhole sections and the test results shall be included with shop drawing submittals.

Cement shall meet the requirements of ASTM C 150 Standard Specification for Portland Cement, Type I for brick work and type II for precast units. Absorption is to be determined by an absorption test described in ASTM C 478 Standard Specification for Precast Manhole Sections, and shall not exceed 8-percent dry weight.

Crushed stone for bedding material shall meet the gradation requirements of M.01.02 for No. 6 stone.

Compacted granular fill for abandonment of existing sanitary sewer manholes and for backfill after removal of existing sanitary sewer manholes shall meet the requirements of M.02.02.

Construction Methods: Trench excavation, including rock-in-trench excavation and backfilling, shall be performed in accordance with 2.86.03 and the requirements of the plans.

Each manhole base, transition section, riser, top, and grade ring shall be set so as not to disturb the crushed stone base elevation and so as to avoid damage to the sections being stacked. The Contractor shall provide all necessary slings, straps and other devices for the safe and satisfactory handling and support of manhole bases, transition sections, risers, tops and grade rings during lifting, installation and final positioning. Lifting holes may be permitted provided the holes are plugged and sealed watertight with mortar, as approved. The manhole base shall be firmly set on crushed stone base as shown on WPCA details.

Manholes, bases, transition sections, risers and tops shall be installed using approved Type A rubber gaskets for sealing joints. Jointing shall be watertight and performed in accordance with manufacturer recommendations and as approved. Manhole bases, transition sections, risers, and tops shall be installed level and plumb and so that manhole steps are in alignment. Water or sewage shall not be allowed to rise over newly made joints until after inspection and acceptance.

Cast-iron manhole frames shall be set on the manhole top to the finished grade indicated or as directed by the Engineer. Where there is at least 3 inches between the manhole top and the frame a precast concrete grade ring shall be used. Where there is less than 3 inches between manhole top and the frame, fast curing, high strength, low permeability concrete with minimum 2 hour compressive strength of 1,200 psi shall be used. The joint between the frame and precast

concrete grade ring shall be made watertight by a flexible seal. Where required for shallow manhole installations, a 4-inch frame may be substituted for the standard 8-inch frame indicated on the plans.

Concrete block masonry shall include precast concrete grade rings for extending manhole frames to grade, formed brick masonry for constructing manhole inverts and invert tables, and cement-mortar plaster on exterior surfaces.

Brick masonry shall be placed watertight and to the details and dimensions indicated on the plans or as approved. Exterior surfaces of brick masonry shall be plastered with a 1:2 Portland cement and sand mortar plaster to provide minimum thickness of ½-inch. Mortar joints shall be minimum ¼-inch thickness and joints on inside face of manhole walls shall be tooled slightly concave. Brick inverts shall have a cross section shaped to conform with connecting sewer pipes with transitions between differing pipe diameters being made gradually. No water or sewage shall be allowed to flow against brickwork until the mortar has cured and hardened. The Contractor shall take precautions to prevent freezing of mortar during construction or the curing process.

Cut-ins for new pipe openings into existing manholes shall be made at the approved location and elevation and providing for an annular space of around the pipe per manufacturer's recommendations for installation of watertight pipe-to-manhole connector/flexible rubber boot and sealing withnon-shrink grout. Pipe-to-manhole connector shall meet the requirements of ASTM C923 for Resilient Connectors Between Reinforced Concrete Manhole Structures, Pipes, and Laterals, as furnished by Kor-N-Seal or approved equal. Cut-ins shall be performed in a manner to avoid damage to the manhole structure, invert table, and existing pipes. The Contractor shall repair any damage to the satisfaction of the Engineer. Prior to grouting pipe in place, the pipe exterior and manhole opening shall be cleaned of any concrete dust, dirt, debris or other foreign material.

Brick invert tables in existing manholes to be rebuilt or otherwise modified shall be altered and rebuilt to provide proper sewage flow channels as required to accommodate the new piping arrangement. New flow channels shall be cut out of the existing invert table to smooth, uniform cross section and all cut surfaces shall be lined with a heavy coating of cement-mortar lining troweled and rubbed smooth. Modified inverts shall provide for smooth flow conditions and gradual transitions between pipes of differing diameters.

Placing compacted granular fill for abandonment of existing sanitary sewer manholes and for backfill after removal of existing sanitary sewer manholes shall meet the requirements of Section 2.14. The Contractor shall ensure compaction of granular fill placed in lifts.

For abandonment of existing sanitary sewer manhole the contractor shall remove and dispose of frame and cover, perforate the manhole bottom slab for drainage using a method approved by the Engineer, plug existing pipes, and backfill manhole to proposed subgrade using compacted granular fill.

For removal of existing sanitary sewer manholes, the contractor shall limit the excavation to the minimum area required for safe and complete removal of the structure. Any pipes to remain shall be plugged and the structure backfilled with compacted granular fill.

Method of Measurement: This work will be measured for payment by the number of each "Special Sanitary Manhole", "Drop Manhole (Sanitary Sewer)", "Doghouse Manhole (Sanitary Sewer), "60" I.D. Manhole (Sanitary Sewer), "Rebuild Manhole (Sanitary Sewer), or "Remove Sanitary Manhole (Sanitary Sewer) complete and accepted.

Basis of Payment: This work will be paid for at the Contract unit price per each "Special Sanitary Manhole", "Drop Manhole (Sanitary Sewer)", "Doghouse Manhole (Sanitary Sewer), "60" I.D. Manhole (Sanitary Sewer), "Rebuild Manhole (Sanitary Sewer), or "Remove Sanitary Manhole (Sanitary Sewer), complete in place, which price shall include all excavation, backfill, materials, equipment, tools, labor and work incidental thereto.

There will be no separate payment for low-pressure air testing, the cost for which shall be included in the items for "8" Polyvinyl Chloride Pipe (Sanitary Sewer)" and "24" Ductile Iron Pipe (Sanitary Sewer)".

There will be no separate payment for compacted granular fill for backfilling associated with "Remove Sanitary Manhole (Sanitary Sewer)", the cost for which shall be included in the cost of the work for the respective items.

Rock-in-trench, where encountered or required for removal of existing reinforced concrete sanitary sewer, shall be paid under the item "1400004A - Rock-in-Trench Excavation 0'-10' Deep (Sanitary Sewer)".

Pay Item	**Pay Unit**
Drop Manhole (Sanitary Sewer)	ea.
Special Sanitary Manhole	ea.
Doghouse Manole (Sanitary Sewer)	ea.
60" I.D. Manhole (Sanitary Sewer)	ea.
Rebuild Manhole (Sanitary Sewer)	ea.
Remove Sanitary Manhole (Sanitary Sewer)	ea.

ITEM #1403501A – RESET MANHOLE (SANITARY SEWER)

Description: The work under this item shall consist of resetting sanitary sewer manholes to final grade, as shown on the plans or as directed by the Engineer. It shall also include the legal, off-site disposal of existing sanitary appurtenances and all surplus material. All work and materials shall be in accordance with the Town of Seymour Water Pollution Control Authority (WPCA) standards and the Standard Specifications, and to the satisfaction of the Engineer.

Materials: Mortar, masonry units, grade rings, new frames and covers, resurfacing materials, any additional fill required and all other appurtenances shall comply with the WPCA standards and the Standard Specifications. Backfill materials within the proposed pavement section shall be in accordance with applicable roadway pavement details.

Construction Methods: For resetting of manholes, the Contractor shall carefully excavate around the manhole, remove the frame, cover, and any risers or sections as necessary, adjust the grade with masonry units, grade rings, precast concrete sections, and mortar as necessary, reinstall frame and cover to final grade and refill the excavation. If the existing frame and grate are not acceptable because of their poor condition, as determined by the Engineer, the Contractor shall install a new frame and cover.

Care shall be taken to prevent material from falling inside the manhole. Any debris or material which falls inside the manhole shall be removed by the Contractor. The excavated area around the manhole shall be filled with gravel or processed aggregate to conform to the plans and specifications, graded, compacted and prepared for paving.

Any damage done to sanitary sewer facilities by the Contractor shall be repaired or replaced by the Contractor at no extra cost to the project, the WPCA, or the State.

All work performed shall be in accordance with WPCA standards and the Standard Specifications, and to the satisfaction of the Engineer.

Method of Measurement: This work will be measured for payment and paid for by the actual number of each sanitary manhole reset, “Reset Manhole (Sanitary Sewer)”, completed and accepted by the Engineer.

Basis of Payment: The unit price bid per each “Reset Manhole (Sanitary Sewer)” shall include sawcutting, pavement removal, any additional fill materials required, grading, compaction, mortar, masonry units, grade rings, new frames and covers, and all materials, equipment, tools and labor incidental thereto.

Any material deemed unsuitable for refilling by the Engineer and any excess material shall be removed and disposed of by the contractor at no additional cost.

Pay Items	**Pay Unit**
Reset Manhole (Sanitary Sewer)	ea.

ITEM #1405081A – GRANULAR FILL (SANITARY SEWER)

Description: The work under this item shall consist of furnishing and placing compacted granular fill as trench backfill for installation of sanitary sewer pipe and for removal of existing sanitary sewer pipe.

Materials: Compacted granular fill shall meet the requirements of Section M.02.02.

Construction Methods: Placing of compacted granular fill shall meet the requirements of Section 2.14. For sanitary sewer trench backfill, compacted granular fill shall be placed above bedding material and below roadway subbase. The Contractor shall adjust means and methods as necessary to achieve compaction within manholes to be abandoned in place.

Method of Measurement: Compacted granular fill will be measured in place after compaction, by the average area end method, or a method approved by the Engineer.

Basis of Payment: This work will be paid for at the Contract unit price per cubic yard for "Granular Fill (Sanitary Sewer)", complete in place, which price shall include materials, equipment, tools, compaction testing and labor incidental thereto.

Pay Item	Pay Unit
Granular Fill (Sanitary Sewer)	c.y.

ITEM #1408455A – TEMPORARY SANITARY SEWER BYPASS

Description: Work under this item shall consist of temporarily handling sanitary sewage necessary to maintain system flows including sewage, wet weather flows and any infiltration, as required, and for as many operations required, for permanent relocation of sanitary sewers. The Contractor shall furnish all materials, equipment, tools, labor work necessary to maintain uninterrupted flow of the 24-inch interceptor and 8-inch sanitary sewer as indicated on the plans, and shall maintain continuity of sanitary sewer service to each facility connected to the affected segments of sewer main. Work under these items shall include but not be limited to:

- Coordination with the Town of Seymour Water Pollution Control Authority (WPCA) and affected customers for each temporary bypass operation;
- Developing and furnishing a temporary bypass plan and narrative submittal, for each temporary bypass operation, for acceptance;
- Furnishing and installing the sanitary sewer bypass hose, pipe, bends, and fittings of the size and type at all depths in accordance with the Contractor's own approved plan or as indicated on the plans;
- Trenching and temporary pavement
- Coring and grouting at connection to existing sanitary manholes (if required);
- Temporary plugging of existing pipes at manholes;
- Forming of inverts at manholes (if required);
- Bypass pumping and/or gravity flow of sanitary sewage necessary to maintain service throughout construction including electric service, metering, backup power source, and backup pumps as may be necessary.

In connection with this work it is expressly understood and agreed that any approvals given by the Engineer shall not relieve the Contractor of full responsibility for any injury or damage resulting from the Contractor's operations or for complying with all regulations or requirements of State or Local authorities.

Materials: Materials for temporary sewer lines shall be submitted for approval prior to installation.

Construction Methods:

A. Flow Control Plans:

Expected flow:

The contractor shall coordinate with the WPCA regarding average daily and peak flow conditions.

The Contractor shall submit to the Engineer for approval a detailed plan for handling sanitary sewage and/or controlling flow, for each temporary bypass operation, in accordance with the following:

(1) The Contractor shall submit flow control and sewage bypassing arrangement plans to the Engineer for review and approval at least two weeks prior to commencing work on each portion of the system. Flow control includes, but is not limited to, plugging, bypass pumping or trucking as appropriate for the work performed. The plans must be specific and complete, and shall include, but not be limited to, the following details:

(a) Capacities of equipment.
(b) Road crossing details.
(c) Protection against pipe breaks.
(d) Sewer plugging methods and bypass time duration for each sewer section.
(e) Size, length, material, and method of installation for suction and discharge piping.
(f) Method noise control for each pump and/or generator.
(g) Bypass pumping locations.
(h) Backup pumping equipment, including backup power source, shall be held in reserve on the job site and must be included in the submittal.
(i) Inventory of affected customers, schedule and duration or timeframe for planned service interruptions, and methods for notifying individual buildings of the proposed work

(2) Bypassed flows must be discharged to the sanitary sewer system, appropriate watertight vehicle, or appropriate watertight container.

(3) Flows shall be diverted, trucked, or otherwise handled to prevent flows from interfering with the work to be performed on that portion of the system.

(4) When pumping/bypassing is required, the Contractor shall supply the necessary pumps, conduits, engines, and other equipment to divert the flow of sewage as appropriate. The Contractor shall have backup equipment available should the primary system fail, and the pumping/bypass system shall be adequate in size to handle the existing peak use flows and additional flows that occur with rainstorms.

(5) The Contractor shall also furnish the labor and supervision to set up, operate, and maintain the pumping/bypass system. The Contractor shall select pumping/bypass equipment that will not have excessive noise levels from a maximum of sixty-nine decibels (69 db) at a distance of 30 feet.

(6) Any standing water or sewage in manholes shall be pumped out when necessary to perform scheduled alterations, and as directed by the Engineer.

B. Flow Control Precautions:

(1) The Contractor shall have a worker on-site at all times while bypass pumping is in operation and shall furnish name and contact information to the Engineer and WPCA in advance.

(2) When flow in a sewer line is plugged, blocked, or bypassed by the Contractor, the Contractor shall take precautions to protect the public health and to protect the sewer lines from damage that might result from sewer surcharging. Further, the Contractor shall take precautions to ensure that sewer flow control operations do not cause flooding or damage to public or private property being served by the sewers involved and the Contractor shall be responsible for any damage resulting from his flow control operations. The Contractor shall be solely responsible for clean-up, repair, property damage costs and claims resulting from failure of the diversion system.

(3) When flow in a sewer line is plugged or blocked by the Contractor, the Contractor shall monitor the conditions upstream of the plug and shall be prepared to immediately start bypass pumping, if needed. Any liquid or solid matter which is bypass pumped from the sewer collection system shall be discharged to another sewer manhole or appropriate watertight vehicle or container only. No such liquid or solid matter shall be allowed to be discharged, stored, or deposited on the ground, swale, road, stormwater drainage system, watercourses, or open environment. The Contractor shall protect all pumps, conduit, and other equipment used for bypass from traffic.

(4) Should any liquid or solid matter from the sewer collection system be spilled, discharged, leaked, or otherwise deposited to the open environment as a result of the Contractor's flow control operations, he shall immediately clean up and disinfect the affected area and assume all costs associated with same. The Contractor shall also notify the sewer system operating personnel and appropriate regulatory agencies and perform required cleanup operations at no additional cost to the Owner.

Method of Measurement: Temporary sanitary sewer bypass, 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 "Temporary Sanitary Sewer Bypass" which price shall include all materials, tools, equipment and labor incidental thereto.

Pay Item	**Pay Unit**
Temporary Sanitary Sewer Bypass	l.s.

PERMITS AND/OR REQUIRED PROVISIONS:

The following Permits and/or Required Provisions follow this page and are hereby made part of this Contract.

- **PERMITS AND/OR PERMIT APPLICATIONS**

Flood Management General Certification	Approved May 14, 2026
CT DEEP IWRD General	Anticipated Approval August 7, 2026

- **Construction Contracts - Required Contract Provisions (Contracts Funded by FHWA and State)**

1 **STATE OF CONNECTICUT**
DEPARTMENT OF TRANSPORTATION

m e m o r a n d u m

FLOOD MANAGEMENT GENERAL CERTIFICATION
Project No.:0124-0165
Description: Route 313 and Bridge 01585 Improvements

Town: Seymour
Date: May 14, 2026

to: Michael E. Hogan
Trans. Principal Engineer
Hydraulics and Drainage
Bureau of Engineering and Construction

from: Sebastian A. Cannamela
Principal Engineer
Highway Consultant Design

Sebastian Cannamela Digitally signed by Sebastian Cannamela Date: 2026.05.14 13:59:29-04'00'

Please review this request for Flood Management General Certification (FMGC) and indicate your concurrence below.

Certification (to be completed by designer and/or requesting office)

I have read the Flood Management General Certification and the descriptions for the approved DOT minor activities. This project qualifies for the Flood Management General Certification under the following Category(ies):

(x) 1. Minor Safety Improvements, Streetscape, and Transportation Facility & Enhancement Projects	(x) 7. Guide Rail Installation
(x) 2. Roadway Repair, Repaving, Maintenance and Underground Utilities	( ) 8. Bridge Deck and Superstructure Replacements
(x) 3. Minor Stormwater Drainage Improvements	(x) 9. Minor Culvert and Bridge Repairs
( ) 4. Removal of Sediment or Debris from a Floodplain	( ) 10. Fisheries Enhancements
( ) 5. Wetland Restoration, Creation, or Enhancement	( ) 11. Surveying and Testing
( ) 6. Scour Repairs at Structures; (*Must acquire DEEP Fisheries Concurrence to be eligible*)	( ) 12. Bicycle / Pedestrian, Multi Use Trails and Enhancement Projects
	( ) 13. Transfer of State Real Property
	( ) 14. Waste Stockpile Areas within the 500-Yr Floodplain

The following required documentation is attached in support of this certification for Categories 1-12, 14:

- Project description
- Location plan
- Description of Floodplain involvement and how project qualifies for general certification
- 8-1/2" by 11" excerpt copy of the FEMA Flood Insurance Rate Map (FIRM) and Floodway Boundary Map (if applicable)
- Design plans, (dated November 14, 2025) with FEMA floodplain and floodway boundaries plotted, cross sections and profiles, as necessary, that clearly depict the floodplain involvement
- For WSAs, design plans with the FEMA 500-year floodplain boundary also plotted
- FEMA 100-year flood elevation plotted on elevation view (for structures)

The following required documentation is attached in support of this certification for Category 13:

- 8-1/2" by 11" excerpt copy of the FEMA Flood Insurance Rate Map (FIRM)
- A draft copy of the release map and/or property title with language, if available, restricting development within the floodplain.
- Name/Signature (below) not required for requests from the Property Management Section, Division of Rights of Way.

Print Name: Shelley Plude P.E.	Title: Project Manager
Signature	Date: 05-14-2026

Concurrence (to be completed by Hydraulics and Drainage)

(X) ***Categories 1-12, 14*** - Based on the documentation submitted, I hereby concur that the project qualifies for the FMGC.

( ) ***Category 13*** - Based on the documentation submitted, I hereby concur that the Transfer of State Real Property qualifies for the FMGC subject to satisfying the requirements listed in Attachment A.

If there are any changes to the proposed activities within the floodplain or floodway, the project must be re-submitted for review and approval.

Signature Michael E Hogan Digitally signed by Michael E. Hogan, P.E. Date: 2026.05.14 16:48:09-04'00'	Date

cc: Michael E. Hogan - Chong L. Chow - Won S. Son
Christine A. Xenelis - Amanda M. Saul
Sebastian A. Cannamela - Jeffrey Pfaffinger - Charles J. Grillo
Jeff Caiola (DEEP)

Rev. September 2022

FLOOD MANAGEMENT GENERAL CERTIFICATION

Route 313 and Bridge No. 01585 Spot Improvements | Seymour, Connecticut

May 13, 2026
Naugatuck Valley Council of Governments
State Project No. 0124-0165

SLR International Corporation (SLR) has prepared the following documents to support the application for a Connecticut Department of Transportation (CTDOT) Flood Management General Certification (FMGC) for State Project No. 0124-0165, Route 313 (River Street) and Bridge No. 01585 Spot Improvements[1]. The FMGC is being submitted for minor activities within a Federal Emergency Management Agency (FEMA)-designated 100-year floodplain to the Little River at its confluence with the Naugatuck River in downtown Seymour. Minor activities will also take place within the floodway to the Naugatuck River at this location. This project is seeking FMGC approval under the Connecticut Department of Energy & Environmental Protection (CTDEEP) License number 202112522-FM, Flood Management General Certification for Statewide Minor Activities, dated March 22, 2022, under the following categories:

- Category 1 – Minor Safety Improvements, Streetscape, and Transportation Facility & Enhancement Projects
- Category 2 – Roadway Repair, Repaving, Maintenance, and Underground Utilities
- Category 3 – Minor Stormwater Drainage Improvements
- Category 7 – Guiderail Installation
- Category 9 – Minor Culvert and Bridge Repairs, including proper containment

Project Description

All project activities are depicted on the attached abridged project plans (**Attachment 5**) entitled *Spot Improvements on River Street (Route 313), Town of Seymour,* prepared by SLR for CTDOT. The proposed improvements along Route 313 will encroach upon the floodplain in one location along Route 313, south of Bridge No. 01585 (**see Attachment 1, Figures 1 and 2**). On August 18, 2024, during the course of the design of this project, the site experienced a major flood event which resulted in the overtopping of Route 313 and the failure of the eastern side of the roadway embankment south of the bridge. The roadway was subsequently reconstructed by CTDOT under an Emergency Declaration. This roadway reconstruction work altered the topography in some areas and some previously existing stormwater drainage structures were removed resulting in modifications to the work being performed under 0124-0165. The calculated FEMA 100-year floodplain boundary was adjusted to meet the revised topography that resulted following the Emergency Declaration work.

The project will include the following activities, located within the floodplain/floodway to the Little River and the Naugatuck River, which will result in net fill in the Little River/Naugatuck River floodplain of approximately 30 cubic yards (CY).

[1] This project is a breakout project from the initial DOT Project No. 124-165, which included spot improvements along Route 67 as well as the Route 313 activities described herein.

Roadway Improvements

- Mill and overlay approximately 656 feet of Route 313
- Construction of a 5-foot-wide sidewalk along the southbound lane of the roadway (western side of Route 313) with three-beam attachment guiderail
- Construction of a 57-foot retaining wall (Retaining Wall 101) to support sidewalk addition
- Installation of a new catch basin with 4-foot sump within the existing roadway will be installed at the northwestern corner of the bridge and discharge through the existing northwest bridge wingwall onto a slope of heavy riprap on the bank of the Little River. This will be installed to replace a paved leak off northwest of the Route 313 bridge which will be lost due to the sidewalk installation and to prevent stormwater from crossing the bridge. A plunge pool dissipator will not be installed below the stormwater outfall due to the heavy armoring of the bank.
- Installation of a series of new catch basins within the existing road on the westerly side of the southern approach. The last catch basin in the system will have a 4-foot-deep sump and a new 15-inch-diameter stormwater outfall to in the same location as the existing outfall with new modified riprap armoring.

Bridge Improvements

- Widening on the western side of Bridge No. 01585 to add a 5-foot-wide sidewalk with 15-inch-thick vertical concrete parapet with aluminum handrail
- Partial reconstruction and raising of the northwestern wingwall to align with the new location of parapet and accommodate the handrail
- Relocation of 24-inch-diameter sewer main and 8-inch-diameter water main along the bridge
- Installation of new cast-in-place bridge deck on the widened portion of the bridge
- New approach guiderail installation on each bridge approach

Alterations to Existing Topography Resulting from the Flood Event and Emergency Repairs

- A comparison of the topographic survey before and after the flood event appears to show an increase in elevation along the western side of Route 313 within the right-of-way and on the privately owned parcel at the southwestern corner of Bridge No. 01585. The majority of this increase in elevation was observed within the floodplain and may have been the result of deposition of sediment during the flood. Any fill observed beyond the limits of the proposed work for 0124-0165 was excluded from the cut-fill analysis. Where an increase in elevation was observed within the limits of proposed work, this apparent deposition of material is contributing to the reported net fill.
- Under the Emergency Declaration, Route 313 was repaved and the southbound lane was superelevated. This also resulted in a net fill in the floodplain.
- To address the bank failure from the flood, the eastern side of the embankment/western side of the Naugatuck River was reconstructed and large diameter riprap was placed to stabilize and protect the bank.

- A deposition of material was observed within the Little River channel upstream of Bridge No. 01585 along the southerly side of the channel. Based on field observations and a comparison of the topography of the area before and after the storm event, it is estimated that approximately 65 CY of sediment has been deposited in the channel upstream of the bridge. The proposed work under 0124-0165 does not include removal of this material.

Summary of FMGC Project Qualifications

This project meets the requirements listed under 202112522-FM for Category 1, Minor Safety Improvements, Streetscape, and Transportation Facility and Enhancement Projects in the following manner:

- New areas of sidewalk will occur above the floodway depicted by FEMA and will result in no net fill within the floodway.
- Proposed activities will not adversely impact the hydraulic conveyance of the floodway or change the hydraulic opening of the bridge.
- The project does not propose any new structures/obstructions that increase the Base Flood (100-year) Elevations in the floodway or floodplain.
- While the installation of sidewalk south of the bridge will result in 30 CY of net fill placed within the interpolated floodplain, this fill is considered minor in nature and was determined at an interagency meeting not to warrant compensatory floodplain mitigation (Attachment 6).

This project meets the requirements listed under 202112522-FM for Category 2, Roadway Repair, Repaving, Maintenance & Underground Utilities in the following manner:

- The fill produced under 0124-0165 can largely be attributed to the construction of a sidewalk along the western side of the roadway which is introducing a 6-inch curb where none exists today.

This project meets the requirements listed under 202112522-FM for Category 3, Minor Stormwater Drainage Improvements in the following manner:

- The proposed outfall pipe will be less than 36” in diameter and placed to reconfigure an existing drainage system.
- There will be no net fill in the Little River 100-year floodplain or floodway associated with the outfall and no increase in peak discharge is anticipated.

This project meets the requirements listed under 202112522-FM for Category 7, Guide Rail Installation in the following manner:

- Proposed guide rail will connect to the bridge parapet and will include appropriate substrate material to prevent erosion.

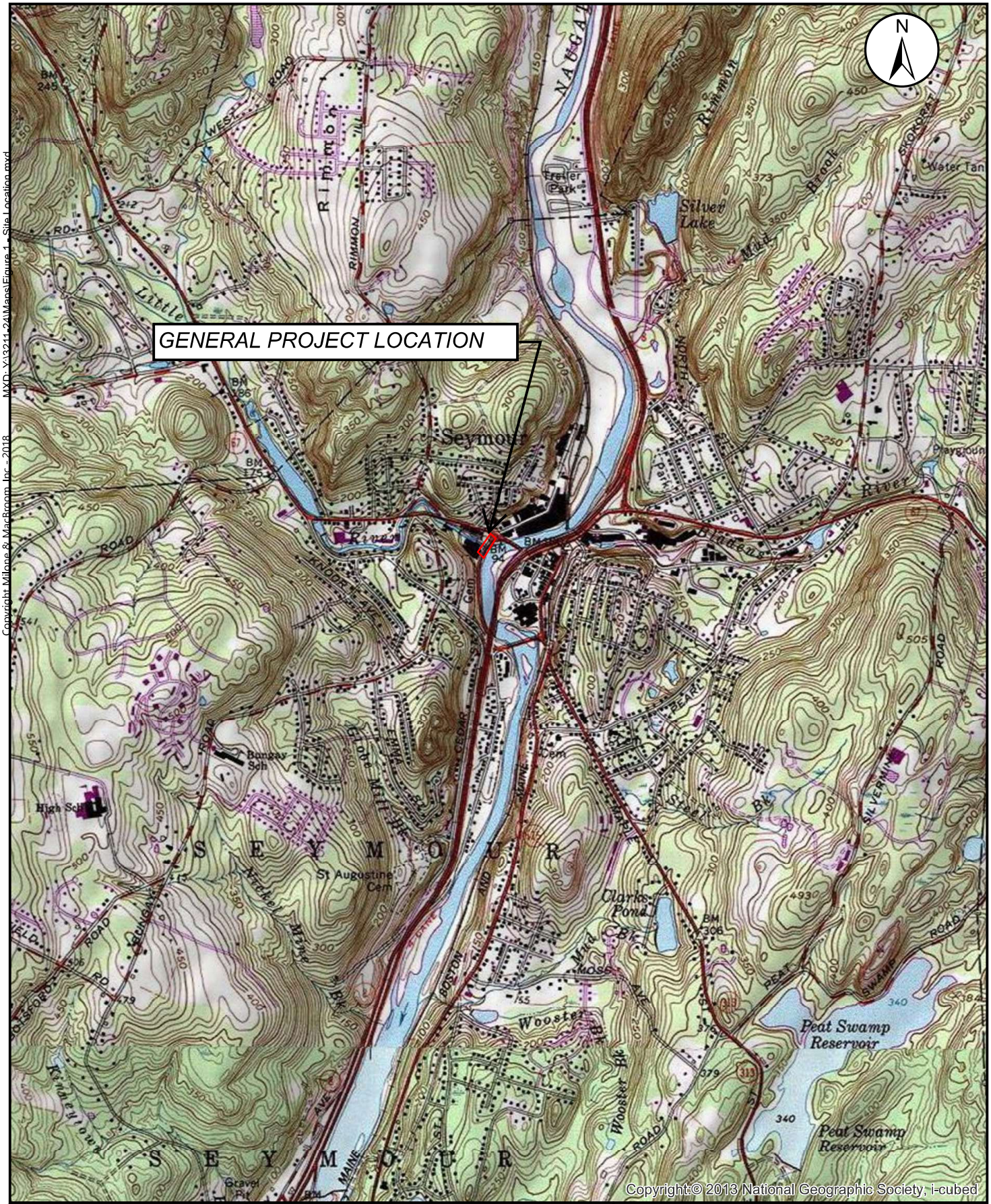
This project meets the requirements listed under 202112522-FM for Category 9, Minor Culvert and Bridge Repairs in the following manner:

- Proposed conditions of the bridge will include upgrade to existing parapet and railing.
- No permanent in-water impacts will be incurred by the project; temporary impacts for construction of 200 square feet below the ordinary high water line (OHWL) will include temporary scaffolding and ladders.

In conclusion, the Route 313 and Bridge No. 01585 Spot Improvements project and Emergency Declaration repair work described above will require or have already resulted in activities within the interpolated 100-year floodplains to both the Little River and the Naugatuck River. As such, this project meets the requirements with the conditions for authorized activities under the CTDOT FMGC license (202112522-FM).

Please refer to the following attached documentation for additional project information:

- Attachment 1 – Figures 1 and 2
- Attachment 2 – Excerpt copy of FEMA Flood Insurance Rate Map (FIRM)
- Attachment 3 – FEMA FIRM Profile Panel for Project Location
- Attachment 4 – FEMA Floodway Data Table for Little River
- Attachment 5 – Project Site Plans
- Attachment 6 – Interagency Coordination Meeting Notes
- Attachment 7 – Email from CTDOT H&D



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MXD: Y:\3211-24\Maps\Figure 1 - Site Location.mxd

SLR 99 REALTY DRIVE CHESHIRE, CT 06410 230-271-1773	SITE LOCATION ROUTE 67 SPOT IMPROVEMENTS DOT PROJECT # 124-172 NAUGATUCK VALLEY COUNCIL OF GOVERNMENTS ROUTE 67 SEYMOUR, CONNECTICUT	DESIGNED KFK / DRAWN KFK / CHECKED MJS SOURCE: 2013, NATIONAL GEOGRAPHIC SOCIETY	DATE: 6/13/2023 SCALE: 1 " = 2,000 ' PROJ. NO.: 3211-24 DRAWING NAME: **FIG. 1**	

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MXD: Y:\3211-24\Maps\Figure 2 - Wetland Delineation.mxd

SLR
99 REALTY DRIVE
CHESHIRE, CT 06410
230-271-1773

DETAILED PROJECT SITE

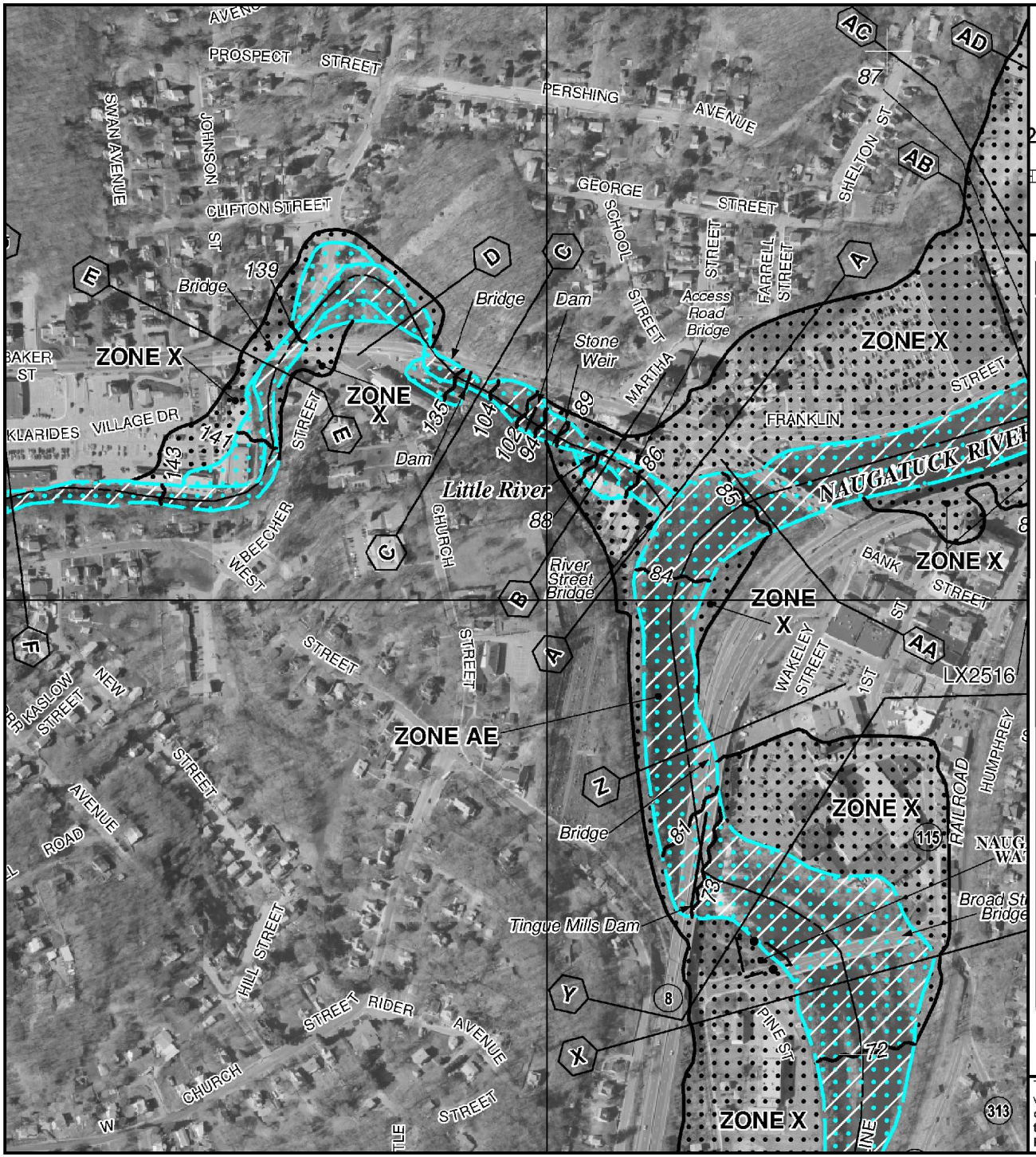
ROUTE 67 SPOT IMPROVEMENTS

NAUGATUCK VALLEY COUNCIL OF GOVERNMENTS
ROUTE 67, DOT PROJECT # 124-172
SEYMOUR, CONNECTICUT

DESIGNED	DRAWN	CHECKED
KFK	KFK	MJS

SOURCE:
2016, CT DEEP ORTHOIMAGERY

DATE: 6/13/2023
SCALE: 1 " = 250 '
PROJ. NO.: 3211-24
DRAWING NAME:
FIG. 2



MAP SCALE 1" = 500'

250 0 500 1000 FEET

METER

PANEL 0264H

NATIONAL FLOOD INSURANCE PROGRAM

FIRM

FLOOD INSURANCE RATE MAP

NEW HAVEN COUNTY, CONNECTICUT

(ALL JURISDICTIONS)

PANEL 264 OF 635

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
BEACON FALLS, TOWN OF	090072	0264	H
OXFORD, TOWN OF	090150	0264	H
SEYMOUR, TOWN OF	090088	0264	H

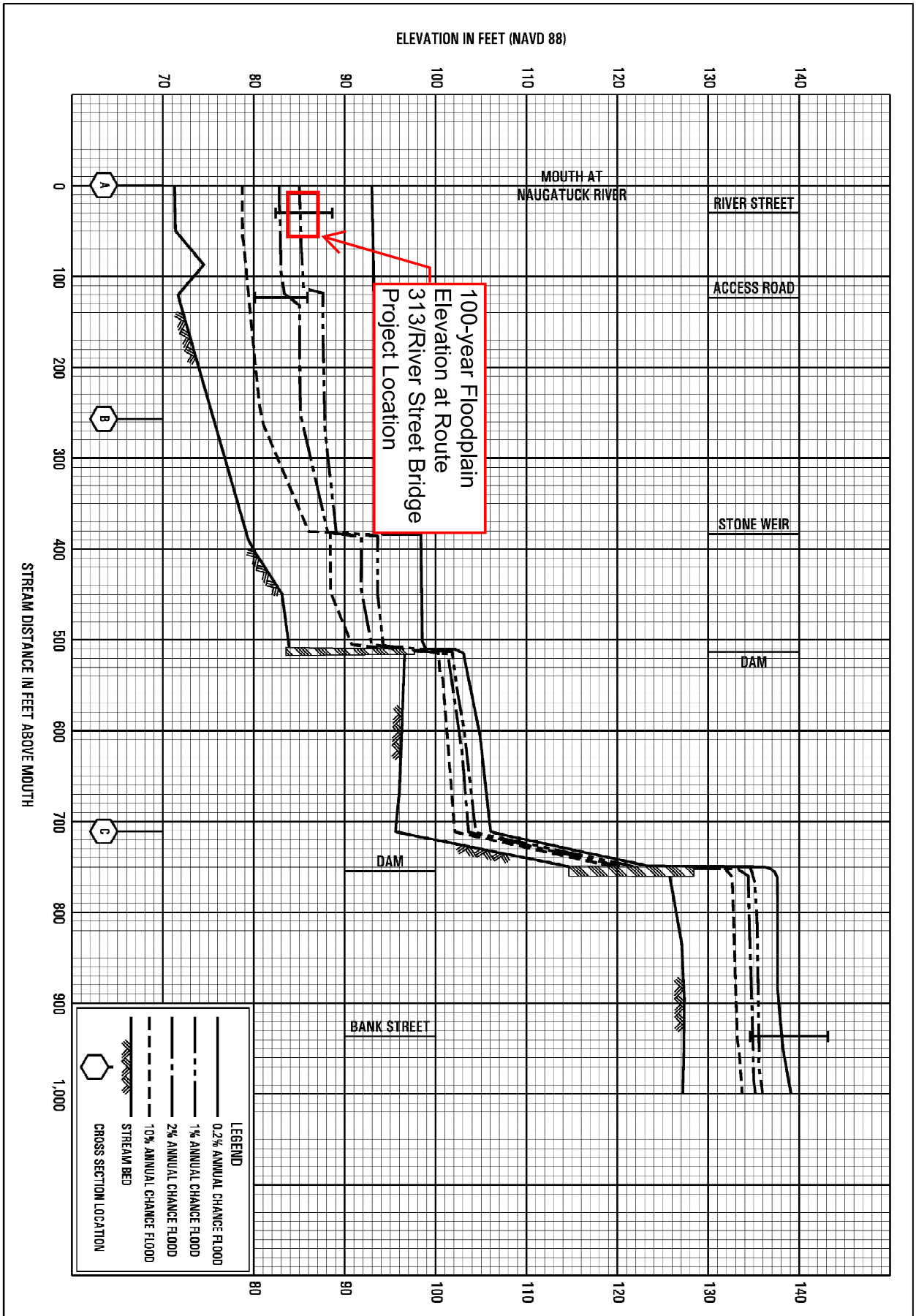
Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
09009C0264H

EFFECTIVE DATE
DECEMBER 17, 2010

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov



211P

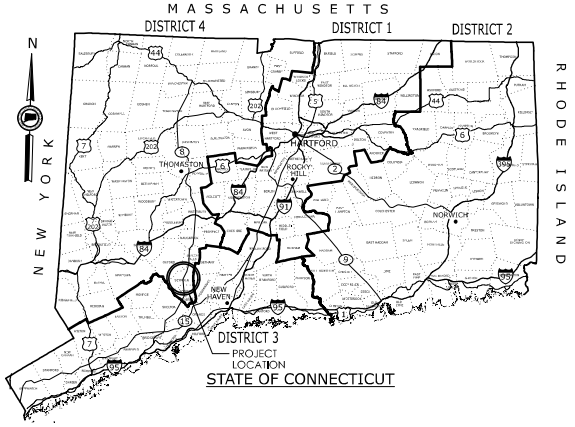
FEDERAL EMERGENCY MANAGEMENT AGENCY

NEW HAVEN COUNTY, CT

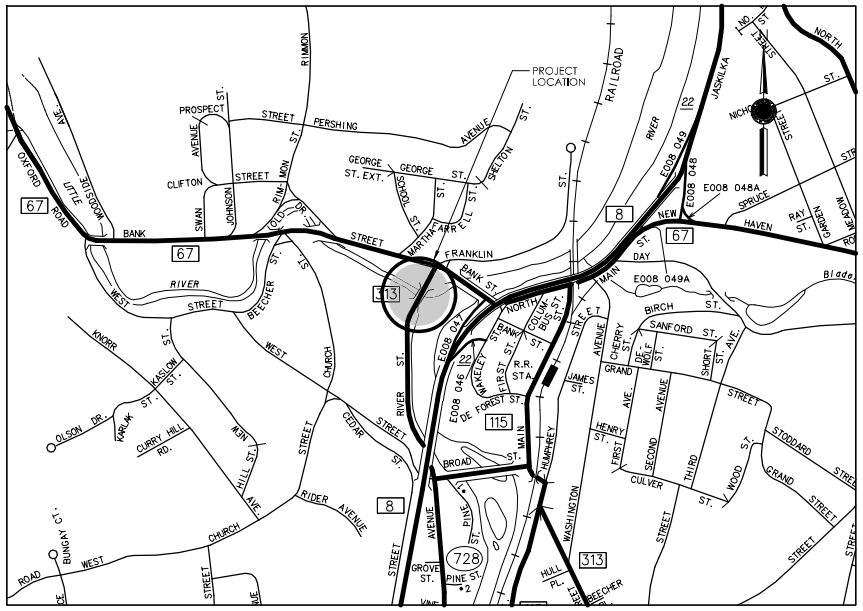
(ALL JURISDICTIONS)

FLOOD PROFILES

LITTLE RIVER



ENVIRONMENTAL PERMIT PLANS
STATE PROJECT NO. 0124-0165
SPOT IMPROVEMENTS ON RIVER STREET (ROUTE 313)
IN THE TOWN OF SEYMOUR



LOCATION PLAN
SCALE: 1" = 500'

GENERAL NOTES:

1. THESE PLANS ARE NOT FOR CONSTRUCTION AND ARE INTENDED ONLY FOR ENVIRONMENTAL PERMITTING PURPOSES. THESE PLANS HOLD AUTHORITY FOR ALL ACTIVITIES CONCERNING THE REGULATED AREA. FOR DETAILED PLANIMETRIC INFORMATION AND PAYMENT, REFER TO THE APPLICABLE CONTRACT DOCUMENTS.
2. THE NAUGATUCK VALLEY COUNCIL OF GOVERNMENTS (NVCOG) WILL ONLY SUBMIT REVISIONS TO DEEP AND USACE FOR CHANGES TO THE DESIGN THAT WILL AFFECT REGULATED AREAS.
3. FOR A DESCRIPTION OF THE WATERCOURSES, WETLANDS AND WETLAND SOILS SEE RELEVANT SECTIONS OF THE PERMIT APPLICATION.
4. 400 FOOT GRID BASED ON CONNECTICUT COORDINATE SYSTEM N.A.D. 1927 VERTICAL DATUM BASED ON NGVD OF 1929.
5. ALL CONSTRUCTION ACTIVITIES WILL BE CONDUCTED IN ACCORDANCE WITH THE DEPARTMENT'S STANDARD SPECIFICATIONS FOR ROADS, BRIDGES, FACILITIES, AND INCIDENTAL CONSTRUCTION, FORM 819. SECTION 1.10 AND WILL ALSO FOLLOW REQUIRED BEST MANAGEMENT PRACTICES (BMPs) AND SEDIMENT AND EROSION CONTROL MEASURES IN ACCORDANCE WITH THE DEEP CONNECTICUT GUIDELINES FOR SOIL EROSION & SEDIMENT CONTROL AND THE DEEP CONNECTICUT STORMWATER QUALITY MANUAL.

LIST OF DRAWINGS	
DRAWING NO.	DRAWING TITLE
PMT-01	TITLE SHEET
PMT-02	INDEX PLAN
PMT-03	EXISTING CONDITIONS
PMT-04 TO PMT-05	ROADWAY PLAN
PMT-06 TO PMT-07	WETLAND, WATERCOURSE AND FLOODPLAIN IMPACTS PLAN
PMT-08	BRIDGE PLAN & ELEVATION
PMT-09	BRIDGE PLAN- STAGE CONSTRUCTION

ENVIRONMENTAL PERMIT PLANS
PLAN DATE: APRIL 15, 2025

REV | DATE | REVISION DESCRIPTION

SIGNATURE BLOCK:
SLR
99 REALTY DRIVE
CHESHIRE, CT 06410
203.271.1773
SLRCONSULTING.COM
DESIGNER/DRAFTER: J.KABUMBA CHECKED BY: S. PLUDE

CTDOT
CONNECTICUT DEPARTMENT OF TRANSPORTATION

PROJECT TITLE: SPOT IMPROVEMENTS ON RIVER STREET (ROUTE 313)
TOWN(S): SEYMOUR
DRAWING TITLE: SPOT IMPROVEMENTS ON RIVER STREET (ROUTE 313)
PROJECT NO.: 0124-0165
DRAWING NO.: PMT-01
SHEET NO.: 01

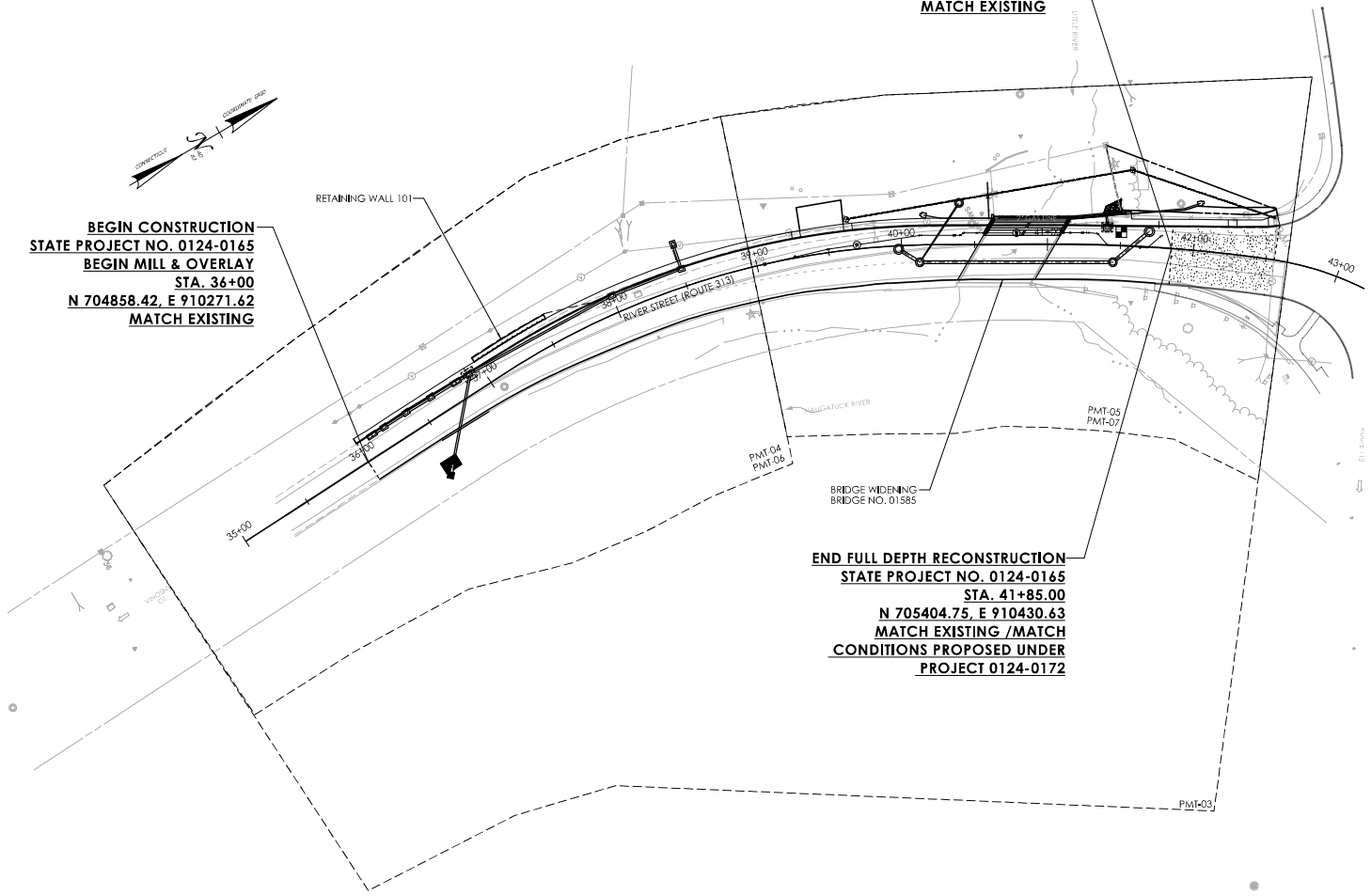
LASTED SAVED BY: joyce.kabumba FILE NAME: W:\CADDesign_CTDOT_Projects\124-165 (Bridge)\Env_Perm\HW_CP_0124-0165_TSH_rev.dgn
PLOTTED DATE: 4/16/2026

GENERAL NOTES:

1. TOPOGRAPHIC SURVEY AND BOUNDARY MAPPING PROVIDED BY CTDOT DISTRICT 4. NORTH ARROW AND BEARINGS ARE BASED UPON THE CONNECTICUT COORDINATE SYSTEM (NAD 1983). VERTICAL DATUM BASED UPON NAVD 1988.
2. CONSTRUCTION SPECIFICATIONS: CONNECTICUT DEPARTMENT OF TRANSPORTATION, STANDARD SPECIFICATIONS FOR ROADS, BRIDGES, FACILITIES, AND INCIDENTAL CONSTRUCTION, FORM 819 DATED 2024, SUPPLEMENTAL SPECIFICATIONS DATED JULY 2025; AND SPECIAL PROVISIONS.
3. INFORMATION REGARDING THE LOCATION OF EXISTING UTILITIES HAS BEEN INDICATED ON THE PLANS BASED UPON BEST AVAILABLE INFORMATION AND SURVEY OF UTILITY APPURTENANCES VISIBLE IN THE FIELD. WHERE SHOWN, BURIED UTILITIES SHOULD BE CONSIDERED APPROXIMATE IN LOCATION. THE LOCATION OF ALL EXISTING UTILITIES SHOULD BE CONFIRMED PRIOR TO BEGINNING CONSTRUCTION. CALL "CALL BEFORE YOU DIG" BY DIALING 811 OR GO TO WWW.CBYD.COM AT LEAST TWO FULL WORKING DAYS PRIOR TO CONSTRUCTION. ALL FIELD UTILITY LOCATIONS THAT DO NOT MATCH LOCATIONS SHOWN ON THE PLANS SHALL IMMEDIATELY BE BROUGHT TO THE ATTENTION OF THE ENGINEER FOR RESOLUTION.
4. SLR ACCEPTS NO RESPONSIBILITY FOR THE ACCURACY OF MAPS AND DATA WHICH HAVE BEEN SUPPLIED BY OTHERS.
5. ANY FIELD DISCREPANCIES IN DIMENSIONS OR ELEVATIONS SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER FOR RESOLUTION.
6. SEDIMENT AND EROSION CONTROL MEASURES AS DEPICTED ON THESE PLANS AND DESCRIBED IN THE PROJECT SPECIFICATIONS SHALL BE IMPLEMENTED AND MAINTAINED UNTIL PERMANENT COVER AND STABILIZATION IS ESTABLISHED. ALL SEDIMENT AND EROSION CONTROL MEASURES SHALL CONFORM TO THE "CONNECTICUT GUIDELINES FOR SOIL EROSION & SEDIMENT CONTROL".
7. ALL PROPOSED CONTOURS AND SPOT ELEVATIONS INDICATE FINISHED GRADE.
8. THE PLANS REQUIRE A CONTRACTOR'S WORKING KNOWLEDGE OF LOCAL, MUNICIPAL, WATER AUTHORITY, AND STATE CODES FOR UTILITY SYSTEMS. ANY CONFLICTS BETWEEN MATERIALS AND LOCATIONS SHOWN, AND LOCAL REQUIREMENTS SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER PRIOR TO THE EXECUTION OF WORK. THE ENGINEER WILL NOT BE HELD LIABLE FOR COSTS INCURRED TO IMPLEMENT OR CORRECT WORK WHICH DOES NOT CONFORM TO LOCAL CODE.
9. COMPLIANCE WITH THE PERMIT CONDITIONS IS THE RESPONSIBILITY OF BOTH THE CONTRACTOR AND THE PERMITTEE.
10. ALL MAILBOXES OR SIGNS IMPACTED BY THE WORK SHALL BE RELOCATED USING EXISTING SUPPORTS. WHERE EXISTING SUPPORTS ARE NOT SUITABLE FOR RELOCATION, THE CONTRACTOR SHALL PROVIDE A SIMILAR APPLICATION AT NO ADDITIONAL EXPENSE. THIS WORK SHALL BE INCLUDED IN THE COST OF "CLEARING AND GRUBBING".
11. ALL RELOCATED SIGNS SHALL BE INSTALLED ON NEW POSTS WITH NEW HARDWARE, UNLESS DETERMINED OTHERWISE BY THE ENGINEER IN THE FIELD.
12. CHD HIGHWAY MONUMENTS DISTURBED BY CONSTRUCTION SHALL BE RESET BY A CT LICENSED SURVEYOR. THE COST FOR WHICH SHALL BE INCLUDED IN ITEM NO. 0107090A.
13. THE CONTRACTOR SHALL COORDINATE CONSTRUCTION WITH APPROPRIATE UTILITY COMPANIES REGARDING RELOCATIONS OF THEIR FACILITIES AND/OR SCHEDULING OF SUCH WORK. ALL NEW AND RELOCATED UTILITY POLES TO BE INSTALLED A MINIMUM OF 18" BEHIND THE CURB LINE AND SHALL PROVIDE MINIMUM 48" CLEAR PASSAGE FOR PEDESTRIAN ACCESSIBILITY WHEN LOCATED IN A SIDEWALK.
14. ALL WASTE MATERIALS SHALL BE DISPOSED OF IN ACCORDANCE WITH LOCAL, STATE AND FEDERAL LAW. THE SITE SHALL BE KEPT FREE FROM CONSTRUCTION DEBRIS.
15. WHERE GRANITE STONE CURBING IS INSTALLED, REPLACEMENT CATCH BASIN TOPS SHALL BE VERTICAL CURB SECTION TYPE WITH 1" DEPRESSION AT BACK OF GRATE.

LEGEND

- 20 SCALE SHEET BOUNDARY
- 40 SCALE SHEET BOUNDARY
- 100YR — 100-YR FLOODPLAIN (INTERPOLATED)
- OHW — ORDINARY HIGH WATER
- FW — FEMA FLOODWAY



REVISION DESCRIPTION | DATE | BY

SIGNATURE BLOCK:
SLR
99 REALTY DRIVE
CHESHIRE, CT 06410
203.271.1773
SLRCONSULTING.COM
DESIGNER/DRAFTER: S. PLUDE CHECKED BY: A. CIRIELLO

HORIZONTAL SCALE 1" = 40'

CTDOT
CONNECTICUT DEPARTMENT OF TRANSPORTATION

PROJECT TITLE: SPOT IMPROVEMENTS ON RIVER STREET (ROUTE 313)
TOWN(S): SEYMOUR
DRAWING TITLE: INDEX PLAN
PROJECT NO.: 0124-0165
DRAWING NO.: PMT-02
SHEET NO.: 02

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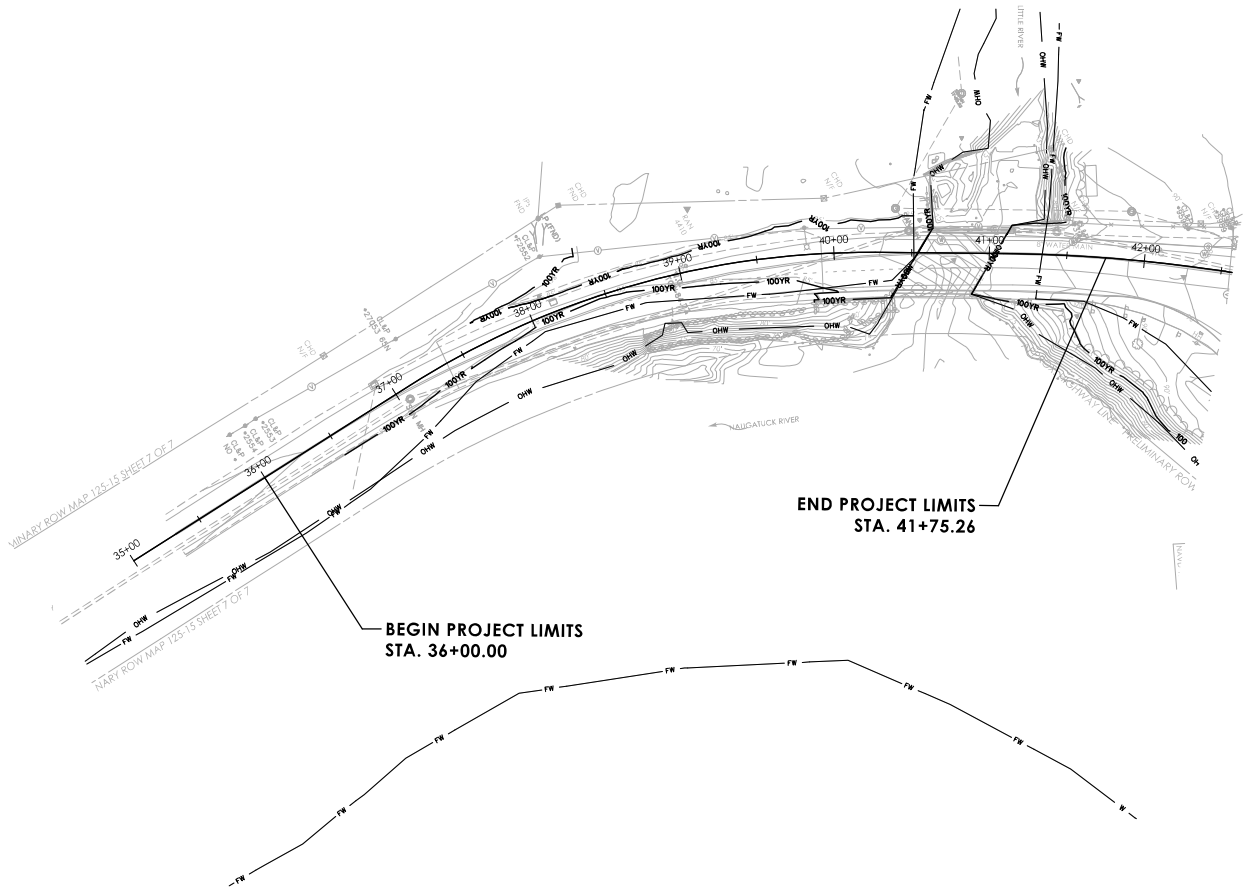
PLOTTED DATE: 4/16/2026



LEGEND

100YR	100-YR FLOODPLAIN (CALCULATED)
OHW	ORDINARY HIGH WATER
FW	FEMA FLOODWAY

294

REV	DATE	REVISION DESCRIPTION

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CHESHIRE, CT 06410
203.271.1773
SLRCONSULTING.COM

DESIGNER/DRAFTER: L. BUCHELI CHECKED BY: S. PLUDE

HORIZONTAL SCALE
1" = 40'

CTDOT
CONNECTICUT DEPARTMENT OF TRANSPORTATION

PROJECT TITLE: SPOT IMPROVEMENTS ON RIVER STREET (ROUTE 313)

TOWN(S): SEYMOUR

DRAWING TITLE: EXISTING CONDITIONS

PROJECT NO.: 0124-0165

DRAWING NO.: PMT-03

SHEET NO.: 03

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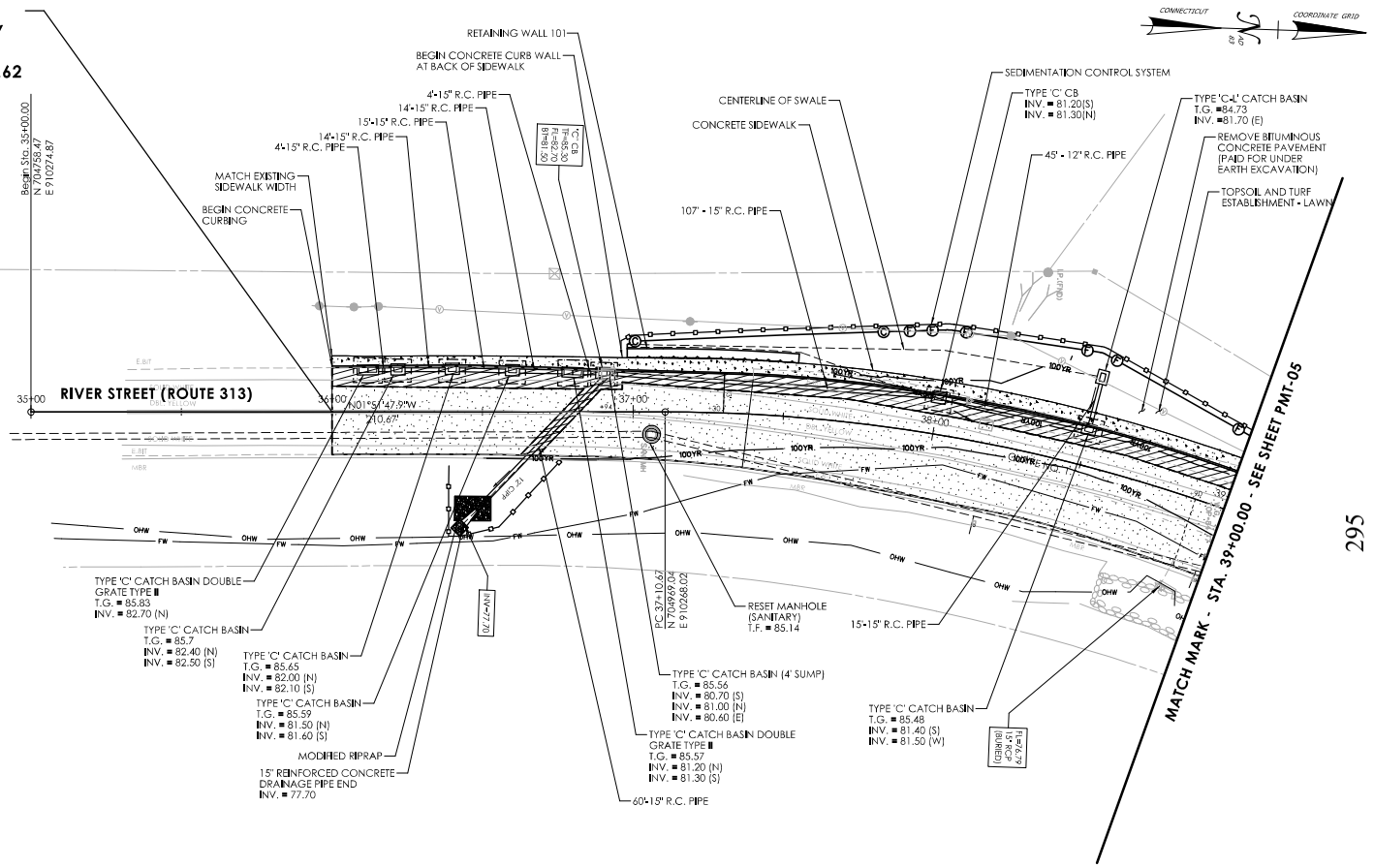
PLOTTED DATE: 4/16/2026

BEGIN CONSTRUCTION
BEGIN MILL & OVERLAY
STA. 36+00
N 704858.42, E 910271.62
MATCH EXISTING



295

LEGEND

- 2" FINE MILLING / 2" PMA S0.5 OVERLAY TRAFFIC LEVEL 3 OVERLAY
- FULL DEPTH ROADWAY RECONSTRUCTION
- CONCRETE SIDEWALK
- CUT BITUMINOUS CONCRETE PAVEMENT
- SEDIMENT CONTROL SYSTEM AT CATCH BASIN
- 100YR — FEMA 100 YEAR FLOOD (CALCULATED)
- OHW — ORDINARY HIGH WATER
- FW — FEMA FLOODWAY

NOTES
DISCHARGE FROM PROPOSED OUTFALL:
Q_{100} =5.1 CFS
V_{100} =4.5 CFS

REV	DESCRIPTION	DATE

SIGNATURE BLOCK:
SLR — 99 REALTY DRIVE, CHESHIRE, CT 06410, 203.271.1773, SLRCONSULTING.COM
DESIGNER/DRAFTER: S. PLUDE — CHECKED BY: A. CIRIELLO
HORIZONTAL SCALE 1" = 20'

CONNECTICUT DEPARTMENT OF TRANSPORTATION

PROJECT TITLE: SPOT IMPROVEMENTS ON RIVER STREET (ROUTE 313)
TOWN(S): SEYMOUR
DRAWING TITLE: ROADWAY PLAN
PROJECT NO.: 0124-0165
DRAWING NO.: PMT-04
SHEET NO.: 04

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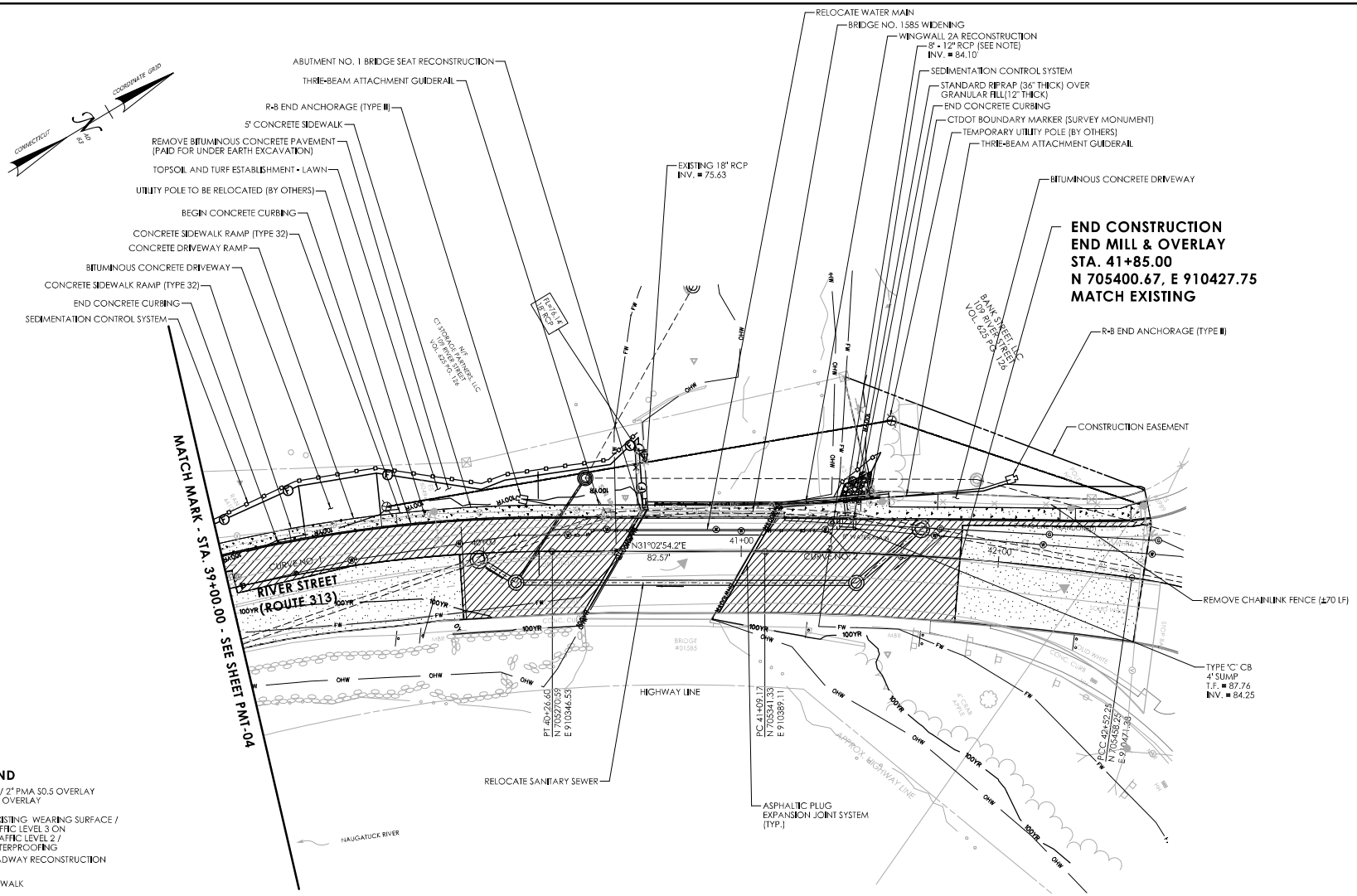
PLOTTED DATE: 4/16/2026



LEGEND

- 2" FINE MILLING / 2" PMA S0.5 OVERLAY TRAFFIC LEVEL 3 OVERLAY
- REMOVAL OF EXISTING WEARING SURFACE / 2" PMA S0.5 TRAFFIC LEVEL 3 ON 1" HMA S0.25 TRAFFIC LEVEL 2 / MEMBRANE WATERPROOFING
- FULL DEPTH ROADWAY RECONSTRUCTION
- CONCRETE SIDEWALK
- CUT BITUMINOUS CONCRETE PAVEMENT
- SEDIMENT CONTROL SYSTEM AT CATCH BASIN
- 100YR — FEMA 100 YEAR FLOOD (CALCULATED)
- OHW — ORDINARY HIGH WATER
- FW — FEMA FLOODWAY

NOTE:
DISCHARGE FROM PROPOSED OUTFALL:
Q_{100} = 0.7 CUBIC FEET PER SECOND
V_{100} = 4.1 FEET PER SECOND

REV	DATE	REVISION DESCRIPTION

SIGNATURE BLOCK:
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99 REALTY DRIVE
CHESHIRE, CT 06410
203.271.1773
SLRCONSULTING.COM
DESIGNER/DRAFTER: S.PLUDE
CHECKED BY: A. CIRIELLO

HORIZONTAL SCALE
1" = 20'

CTDOT
CONNECTICUT DEPARTMENT OF TRANSPORTATION

PROJECT TITLE: SPOT IMPROVEMENTS ON RIVER STREET (ROUTE 313)
TOWN(S): SEYMOUR
DRAWING TITLE: ROADWAY PLAN
PROJECT NO.: 0124-0165
DRAWING NO.: PMT-05
SHEET NO.: 05

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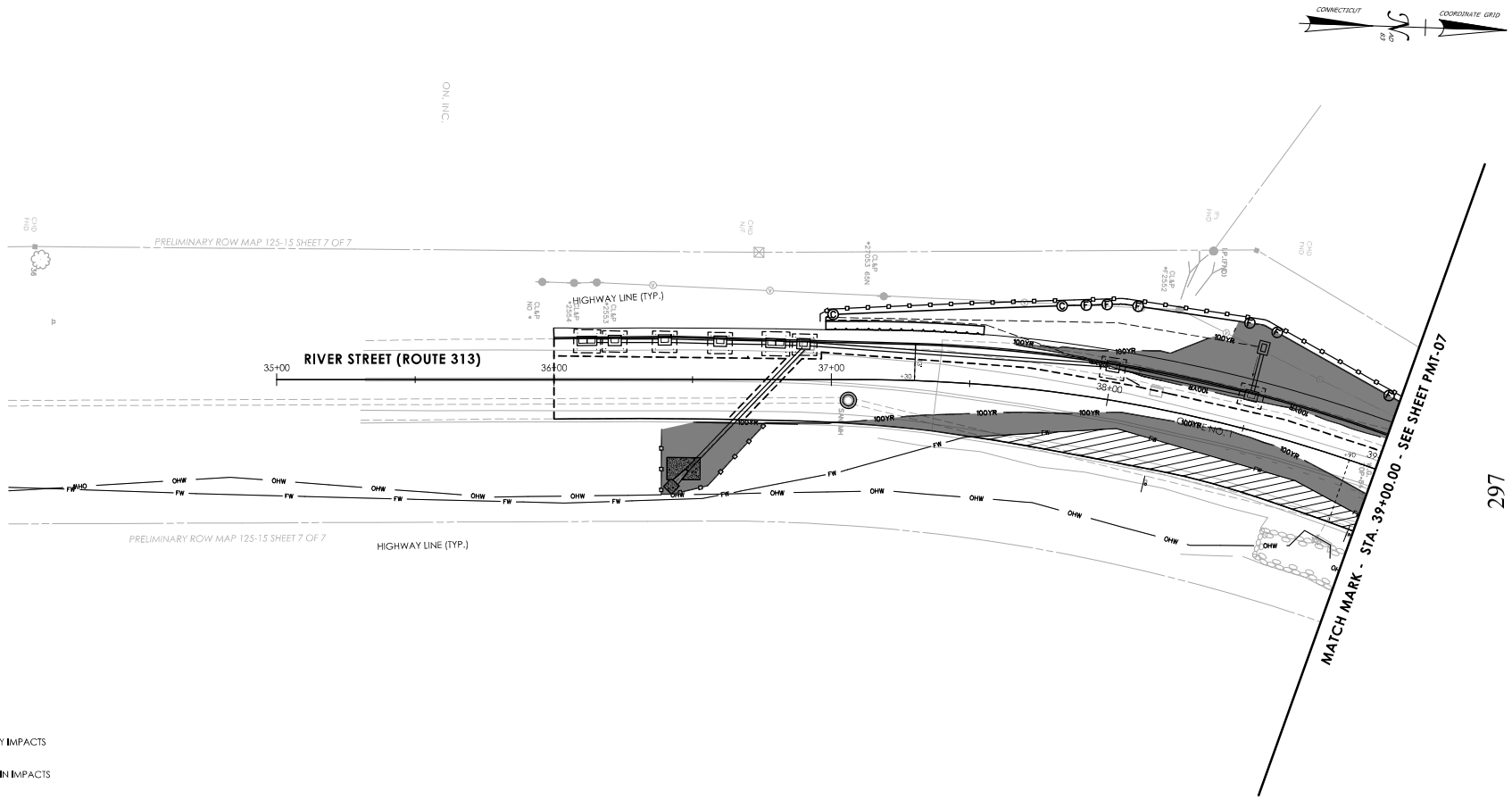


297

LEGEND

PERMANENT FLOODWAY IMPACTS

PERMANENT FLOODPLAIN IMPACTS

100YR — 100-YR FLOODPLAIN (CALCULATED)

OHW — ORDINARY HIGH WATER

FW — FEMA FLOODWAY

100-YEAR FLOODPLAIN AND FLOODWAY IMPACTS CUT AND FILL	
VOLUME IMPACTS	
EXCAVATION IN FEMA FLOODPLAIN	FILL IN FEMA FLOODPLAIN
2 C.Y.	32 C.Y.
EXCAVATION IN FEMA FLOODWAY	FILL IN FEMA FLOODWAY
~~1 C.Y.~~	~~2 C.Y.~~

SLR has eliminated these impacts from the design based on comments by CTDOT

REVISION DESCRIPTION | DATE | BY

SIGNATURE BLOCK:
SLR
99 REALTY DRIVE
CHESHIRE, CT 06410
203.271.1773
SLRCONSULTING.COM
DESIGNER/DRAFTER: S.PLUDE CHECKED BY: A. CIRIELLO

HORIZONTAL SCALE 1" = 20'

CTDOT
CONNECTICUT DEPARTMENT OF TRANSPORTATION

PROJECT TITLE: SPOT IMPROVEMENTS ON RIVER STREET (ROUTE 313)

TOWN(S): SEYMOUR

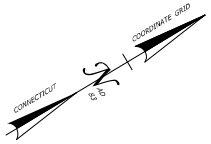
DRAWING TITLE: WETLAND, WATERCOURSE AND FLOODPLAIN IMPACTS PLAN

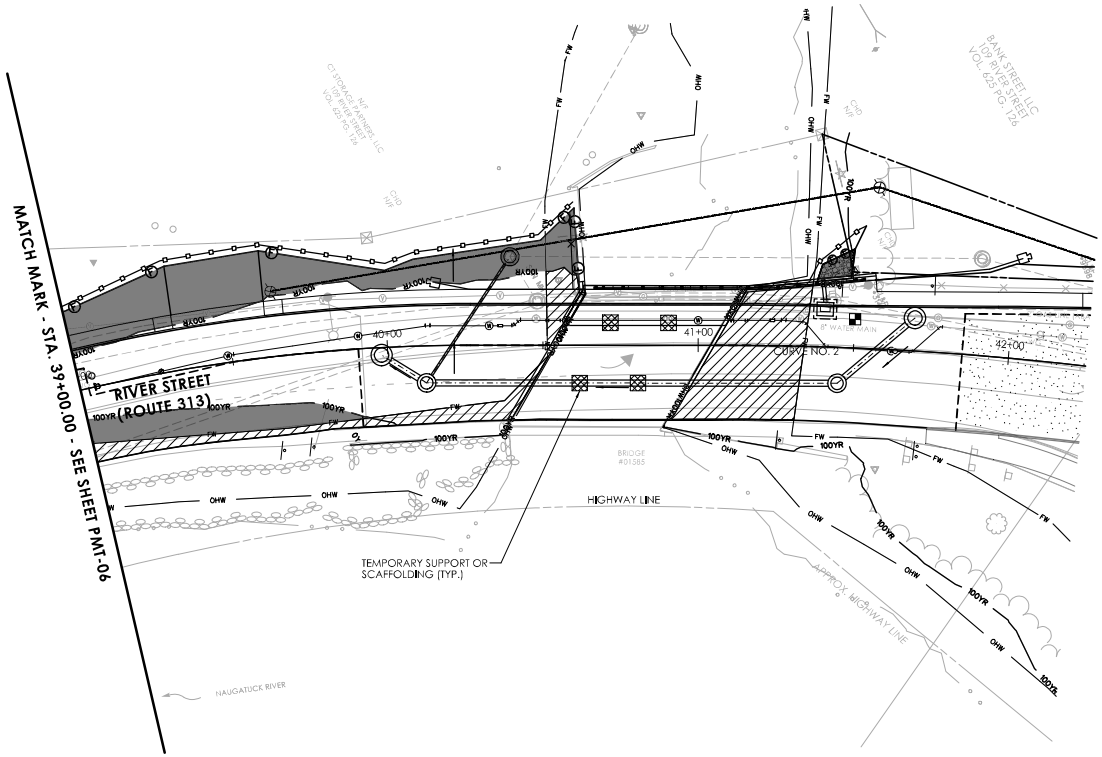
PROJECT NO.: 0124-0165

DRAWING NO.: PMT-06

SHEET NO.: 06

LASTED SAVED BY: joyce.kabumba FILE NAME: W:\CADDesign_CTDOT_Projects\124-165 (Bridge)\Env_Perm\0124-0165_Impacts.dgn
PLOTTED DATE: 4/16/2026





LEGEND

- TEMPORARY FLOODPLAIN IMPACTS
- PERMANENT FLOODPLAIN IMPACTS
- TEMPORARY WATERCOURSE IMPACTS
- 100YR — 100-YR FLOODPLAIN (CALCULATED)
- OHW — ORDINARY HIGH WATER
- FW — FEMA FLOODWAY

WETLAND AND WATERCOURSE IMPACT TABLE			
	WETLAND IMPACTS	WATERCOURSE IMPACTS	TOTAL
PERMANENT IMPACTS	0 S.F. (0 AC.)	0 S.F. (0 AC.)	0 S.F. (0 AC.)
TEMPORARY IMPACTS	0 S.F. (0 AC.)	200 S.F. (0.005 AC.)	200 S.F. (0.005 AC.)
TOTAL	0 S.F. (0 AC.)	200 S.F. (0.005 AC.)	200 S.F. (0.005 AC.)

NOTES:

1. THERE SHALL BE NO EXCAVATION OF EXISTING CHANNEL MATERIAL. FOLLOWING REMOVAL OF TEMPORARY SUPPORT OR SCAFFOLDING FOR THE INSTALLATION OF THE UTILITIES, CONTRACTOR SHALL SMOOTH ANY DISTURBED CHANNEL MATERIAL.
2. TO PROTECT INLAND FISH SPECIES, UNCONFINED IN-WATER WORK SHALL ONLY BE ALLOWED FROM JUNE 1ST TO SEPTEMBER 30TH, INCLUSIVE. ADDITIONALLY, CONSTRUCTION DEBRIS/MATERIAL CONTROLS SHALL BE INSTALLED AND MAINTAINED THROUGHOUT THE DURATION OF THE PROJECT.

REV | DATE | REVISION DESCRIPTION

SIGNATURE BLOCK:
SLR
99 REALTY DRIVE
CHESHIRE, CT 06410
203.271.1773
SLRCONSULTING.COM
DESIGNER/DRAFTER: S.PLUDE CHECKED BY: A. CIRIELLO

0 20 40
HORIZONTAL SCALE
1" = 20'

CTDOT
CONNECTICUT DEPARTMENT OF TRANSPORTATION

PROJECT TITLE:
SPOT IMPROVEMENTS ON RIVER STREET (ROUTE 313)

TOWN(S):
SEYMOUR

DRAWING TITLE:
WETLAND, WATERCOURSE AND FLOODPLAIN IMPACTS PLAN

PROJECT NO.:
0124-0165

DRAWING NO.:
PMT-07

SHEET NO.:
07

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PLOTTED DATE: 4/16/2026

Connecticut
Department of Energy & Environmental Protection
LAND & WATER RESOURCES

LWRD License Application Form O

General Permit Request for Authorization, Water Resources Construction Activities (Activity 10)

All sections of the LWRD License Application, when applicable, must be posted to the DEEP LWRD FTP site as instructed on Part VII of the LWRD Transmittal Form.

Application Number (as assigned in CPPU e-mail): _____

Applicant Name (same name used on Part III of the LWRD Transmittal Form): Connecticut Department of Transportation

Supporting Documents

Check the box by the attachments listed to indicate that they have been submitted. When submitting any supporting documents, please label the documents as indicated in this part (e.g., Attachment 31, etc.) and be sure to include the same applicant name used above. NOTE: Attachment numbering is NOT consecutive as the attachments relate to multiple LWRD program applications.

☒ **Attachment 20 Natural Diversity Data Base (NDDB) – Endangered or Threatened Species**
Completed NDDB Determination #:_____

According to the most current "Natural Diversity Data Base Areas Maps", will the activity which is the subject of this application, including all impacted areas*, be located within an area identified as, or otherwise known to be, a habitat for state listed endangered, threatened or special concern species? ☐ Yes ☒ No Date of Map: December 2025

If yes, complete and submit a Natural Diversity Data Base Review Request using the DEEP's ezFile portal (filings.deep.ct.gov/DEEPPortal/). To get started, create a user account and start a new NDDB filing. Additional information about this new filing process can be found on the NDDB website. ***All requests for review must go through the new NDDB portal*. Email deep.nddbrequest@ct.gov if you need help.**

Please note if NDDB biologist review is required, it may take 6 to 8 weeks and may require the applicant to produce additional documentation, such as ecological surveys, which must be completed prior to submitting this permit application.

A copy of the NDDB Determination response letter that has not expired *must* be submitted with this completed application as Attachment 20. Include a copy of any NDDB mitigation measures developed for this activity and approved by NDDB. Be aware that you must renew your NDDB Determination if it expires before project work commences.

* NDDB review must cover all areas of project activity, including impact and compensation areas. If your project requires compensatory mitigation and the mitigation site is in a mapped NDDB area, then an NDDB Determination must be provided for the mitigation site location(s) prior to approval of the compensatory Mitigation Plan (Attachment 17).

☐ **Attachment 31 USACE Self-Verification**, attach a copy of the USACE Self-Verification (SV) letter of authorization, SV Notification form and plans. USACE SV # _____

☒ **Attachment 32 Flood Management Certification** (FMC), if applicable, must be issued prior to submittal of this form. Attach a copy of the FMC License. FMC # 202112522-FM

Connecticut
Department of Energy & Environmental Protection
LAND & WATER RESOURCES

CPPU USE ONLY
App #s: _____
_____
_____ -DIV
_____ -FM/E
Doc #: _____
Check #: _____

LWRD License Application Transmittal Form

The Land & Water Resources Division (LWRD) License Application* consists of this Transmittal Form and the program-specific form. All application forms can be found on the Department of Energy & Environmental Protection (DEEP) website at Land Use Permits and General Permits (ct.gov). Submit application forms per instructions provided in Part VII of this transmittal form.

Part I: License Type and Fee Information

The table below lists various License types issued by DEEP LWRD. Check the boxes below that correspond with the LWRD license(s) being requested. If more than one license is necessary for a project, complete only one Transmittal Form. Complete as many Program Forms as applicable for the project.

Type of Review/License	Program Form	Fee	DEEP USE ONLY
Licenses for Activities in Tidal Waters			
☐ **Structures, Dredging & Fill[2]**	C	$660	[#439]
☐ **Structures, Dredging & Fill[2] and Tidal Wetlands (TW)**	C	$660	[#1058]
☐ **Structures, Dredging & Fill[2] and Section 401 Water Quality Certificate (WQC)[3]**	C	$660	[#1769]
☐ **Structures, Dredging & Fill[2]; TW; and Section 401 WQC[3]**	C	$660	[#1772]
☐ **Certificate of Permission (if applicable, WQC will be included)**	D	$375	[#410]
[2] For projects larger than 825 square feet, provide Attachment A with an additional fee. Refer to the instructions (page 4) for fee calculations.			
[3] For activities requiring a Sec.404 Permit from United States Army Corps of Engineers (USACE).			
General Permit Registration for Coastal Maintenance			
☐ **Marina and Mooring Field Reconfiguration**	E	$700	[#992]
☐ **Remedial Activities Required by Order**	F	$700	[#427]
☐ **Residential Modification to FEMA Standards**	G	$100	[#423]
☐ **Reconstruction of Permitted Structures**	H	$300	[#1741]
General Permit Registration for Minor Coastal Structures			
☐ **4/40 Docks/Access Stairs**	I	$700	[#426]
☐ **Non-Harbor Moorings**	J	$250	[#422]
General Permit Registration for Dolphin Cove			
☐ **Structures, Fill, Obstructions, or Encroachments in Dolphin Cove Lagoon, Stamford**	K	$100	[#420]
For Federal Actions Only:			
☐ **Section 401 Water Quality Certificate (Tidal)**	C	None	[#1186]
Federal Coastal Consistency – contact LWRD staff			

Part I: License Type and Fee Information (continued)

Type of License	Program Form	Fee	DEEP USE ONLY
Licenses for Activities in Non-Tidal Waters			
☐ **Section 401 Water Quality Certificate (Individual)**[3]	L	None	[#1195]
☐ **Pre-Construction Notification, USACE General Permits for CT**[3]	L	None	[#1188]
☐ **Inland Wetlands and Watercourses**[4]	L	None	[#365]
☐ **Inland Wetlands and Watercourses**[4] **and WQC**[3]	L	None	[#2225]
[3] For activities requiring a Sec.404 Permit from USACE. **Check either Individual 401 WQC *or* PCN, not both. Contact staff if you need assistance to determine which box is applicable.**			
[4] For State Agency Activities OR Activities Conducted on State Owned/Controlled Lands.			
General Permit Registration for Water Resources Construction Activities **Inland Wetlands – State agencies only** **Non-Consumptive Water Diversion – Public, municipal, and state agencies**			
☒ **Activities 1-5: Maintenance and State Property Use Plans**	M	$5,000	[#2243]
☐ **Activities 6-8: Infrastructure and State Facility Resiliency Projects**	N	$5,000	[#2244]
☐ **Activity 9: Conservation Activities**	N	$2,500	[#2245]
☒ **Activity 10: Infrastructure Projects with Interagency Coordination**	O	$2,500	[#2246]
Additional Licenses for Activities **These licenses may be combined with Tidal or Non-Tidal Waters licenses.**			
Water Diversion – Non-consumptive			
☐ Watershed < 0.5 sq. mi.	L	$2,050	[#457]
☐ Watershed ≥ 0.5 sq. mi and < 2.0 sq. mi.	L	$4,000	[#456]
☐ Watershed ≥ 2.0 sq. mi.	L	$6,250	[#455]
For State Agency Activity/Activities Receiving Funding Through a State Agency:			
☐ **Flood Management Certification**	P	None	[#1185]
☐ **Flood Management Certification with Exemption Request**	P	None	[#1185]
Fee from Attachment A, if applicable			
Total			

*For processing purposes, the terms Application and Applicant are synonymous with the terms Registration and Registrant.

In addition to applicable boxes above, check here if your application is:

- ☐ eligible for a municipal 50% discount;
- ☐ for work in tidal waters and being submitted pursuant to CGS section 22a-361(a)(2)(d) to address a violation; or
- ☒ receiving state funding including federal funding administered by the state (to help determine need for Flood Management Certification); or
- ☒ being submitted by a state agency, therefore the fee will be paid by Inter-Agency Transfer of Funds. State Agencies should submit the registration or application package without the registration/application fee.

Part II: Project and Site Information

1a. Project: Provide a brief description of project/activity/work:

This project involves the widening of Bridge No. 01585 (Route 313 over Little River) and minor roadway improvements along Route 313 (River Street) in the Town of Seymour, Connecticut. Sidewalk is being added to the west side of Bridge No. 01585 to accommodate safe pedestrian passage along River Street. The project begins at the intersection of River Street at Route 67 (Bank Street) and extends southerly along River Street to approximately 450 feet south of Bridge No. 01585, for a total length of approximately 700 feet.

1b. Site Name and Location

Name of Site: DOT Project No. 0124-0165 - Route 313 and Bridge No. 01585

Address of Site: Route 313 City/Town: Seymour State: CT Zip Code: 06483

Parcel Location/Tax Assessor's Reference: Map NA Block _____ Lot _____

GPS Coordinates/Latitude and Longitude: Provide the exact location of proposed activity, in degrees/minutes/seconds or in decimal degrees: Latitude: 41.396421 N Longitude: -73.076602 W

Parcel/Easement size: If the project is located on a parcel, indicate parcel acreage: NA acres

If the project is located on a utility/transportation right-of-way or easement, indicate dimensions or acres: see permit plans

Part III: Applicant Information

- *If an applicant is a corporation, limited liability company, limited partnership, limited liability partnership, or a statutory trust, they must be registered with the Secretary of State. If applicable, the applicant'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 (onlineBusinessSearch (ct.gov).*
- *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 Innovative Partnerships and Planning at DEEP.OPPD@ct.gov . For any other changes, contact the specific program from which you hold a current DEEP license.*

1. Applicant/Registrant* Information

Name: Connecticut Department of Transportation

Mailing Address: 2800 Berlin Turnpike

City/Town: Newington State: CT Zip Code: 06111

Business Phone: 860-594-2928 Ext.: _____

Contact Person: Christine Xenelis Phone: 860-694-2928 Ext: _____

E-mail Address†: christine.xenelis@ct.gov

†Applicant Email is **Required**. 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.

☐ **If co-applicant(s), check this box and attach co-applicant information as Attachment B following this form. If work will occur on more than one property, each property owner must be a co-applicant.**

a) Applicant Type (check one):

☐ individual ☐ federal agency ☒ state agency ☐ municipality ☐ tribal

☐ business entity (if a business entity, complete i through iii below):

i) business 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 *the Secretary of State's database (onlineBusinessSearch (ct.gov).*

iii) ☐ check here if your business is **NOT** registered with the Secretary of State's Office.

*For processing purposes, the terms Application and Applicant are synonymous with the terms Registration and Registrant.

Part III: Applicant Information (continued)

b) Applicant's interest in property at which the proposed activity is located:

☒ site owner ☐ option holder ☐ lessee ☐ facility owner

☐ easement holder ☐ operator ☐ other (specify): _____

2. List billing contact, if different than the applicant:

Name: _____

Mailing Address: _____

City/Town: _____ State: _____ Zip Code: _____

Business Phone: _____ Ext.: _____

Contact Person: _____ Title: _____

E-mail: _____

3. Primary contact for departmental correspondence (including an email confirmation receipt from the Central Permit Processing Unit) and inquiries if different than applicant:

Name: _____

Mailing Address: _____

City/Town: _____ State: _____ Zip Code: _____

Business Phone: _____ Ext.: _____

Contact Person: _____ Title: _____

E-mail: _____

4. Site/Property Owner*, if different than applicant:

Name: _____

Mailing Address: _____

City/Town: _____ State: _____ Zip Code: _____

Business Phone: _____ Ext.: _____

Contact Person: _____ Title: _____

E-mail: _____

***If the applicant is not the property owner, submit written permission from the owner as Attachment C**

5. Facility Owner, if different than applicant:

Name: _____

Mailing Address: _____

City/Town: _____ State: _____ Zip Code: _____

Business Phone: _____ Ext.: _____

Contact Person: _____ Title: _____

E-mail: _____

6. Facility Operator, if different than applicant:

Name: _____

Mailing Address: _____

City/Town: _____ State: _____ Zip Code: _____

Business Phone: _____ Ext.: _____

Contact Person: _____ Title: _____ E-mail: _____

Part III: Applicant Information (continued)

7. Attorney or other representative, if applicable.

Firm Name: _____

Mailing Address: _____

City/Town: _____ State: _____ Zip Code: _____

Business Phone: _____ Ext.: _____

Attorney: _____ Title: _____

E-mail: _____

8. 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: SLR International Corporation

Mailing Address: 99 Realty Drive

City/Town: Cheshire State: CT Zip Code: 06410

Business Phone: 203-271-1773 Ext.: _____

Contact Person: Shelley Plude Title: _____

E-mail: splude@slrconsulting.com

Service Provided: Engineering

Part IV: Pre-Application Coordination

If pre-application coordination occurred, provide DEEP LWRD staff contact information:

Staff Name: Interagency Coordination Meeting Date: 8/19/2021, 11/16/2023

Part V: Supporting Documents

As applicable, check the box by the attachments listed to indicate that they have been submitted. 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 this application form. Attach the materials below following this transmittal form.

- ☐ Attachment A Structures, Dredging and Fill fee calculation plan. (**Required** for projects larger than 825 square feet) Provide a plan view delineating the work area and show the computation. Refer to the instructions (page 4) for fee calculations.
- ☐ Attachment B Co-applicant information sheet (if applicable)
- ☐ Attachment C Written permission from property owner (if applicant is not the owner)
- ☐ Attachment D Additional signature sheet (if applicable)

Part VI: Applicant Certification

The applicant(s) *and* any individual(s) responsible for actually preparing the application must sign this section. An application will be considered insufficient unless *all* required signatures are provided.

"I have personally examined and am familiar with the information submitted in the LWRD application 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 the LWRD 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, if applicable, as listed in Section 22a-6g of the General Statutes."

Signature of Applicant	Date
Rabih M. Baraket	Bureau Chief, Policy & Planning
Name of Applicant (print or type)	Title (if applicable)
Marlee Antill	6-1-2026
Signature of Preparer (if different than above)	Date
Marlee Antill	Environmental Scientist
Name of Preparer (print or type)	Title (if applicable)

☐ Check here if additional signatures are required. If so, please reproduce this sheet and attach signed copies to this sheet as Attachment D. 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.).

Part VII: Application Submission

Instructions for submitting an application to DEEP LWRD:

1. **Once the Application Form and all relevant Attachments have been completed,** submit a hardcopy of **only** this completed License Application Transmittal Form and fee. (The Application will be submitted electronically after Step 3, below.) Applications will not be processed without the fee. The fee is non-refundable and shall be paid by check or money order to the Connecticut Department of Energy & Environmental Protection or through the E-Payment portal.

   Send the Transmittal Form and fee (if paying by check or money order) to:

   CENTRAL PERMIT PROCESSING UNIT
   DEPARTMENT OF ENERGY & ENVIRONMENTAL PROTECTION
   79 ELM STREET
   HARTFORD, CT 06106-5127

   ☐ Check here if paying online through the E-Payment portal.
   After the Transmittal Form is received by the Central Permit Processing Unit and entered in the system, payment instructions will be emailed to the **Billing Contact** listed in Part III, paragraph 2., above.

   State Agencies should submit the applicable registration/application package ***without*** the application fee and check the box in Part I, above, to indicate the fee will be paid by Inter-Agency Transfer of Funds.

2. Keep an electronic copy of this Transmittal.

3. Upon receipt of the Transmittal Form and fee, the Central Permit Processing Unit (CPPU) will e-mail a confirmation receipt letter to the Primary contact (Part III, #3, above) containing the DEEP assigned application number and upload instructions to the LWRD File Transfer Protocol (FTP) website. Follow directions contained in the email for uploading the application sections.

Please note, the application will not be considered complete until a PDF copy of the application with all relevant attachments has been uploaded. The official Date of Receipt of the application will be the date the electronic version of all application materials are uploaded to the DEEP LWRD FTP Site. If the application is not uploaded within ten business days of the CPPU confirmation of receipt letter date, the file will be closed. **DO NOT submit the Transmittal Form until the Application and Attachments are complete and ready for submission**.

If you are not capable of submitting the application electronically or if you have other questions or concerns regarding application submittals, please contact LWRD staff at 860-424-3019.

Construction Contracts - Required Contract Provisions
(FHWA and State Funded Contracts)

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1. Federal Highway Administration (FHWA) Form 1273 (Revised October 2023)

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Index of Exhibits

EXHIBIT A - FHWA Form 1273 (Begins on page 17)
EXHIBIT B - Title VI Contractor Assurances (page 31)
EXHIBIT C - Health Insurance Portability and Accountability Act of 1996 (HIPAA) (page 33)
EXHIBIT D - Affirmative Action Policy Statement (page 41)
EXHIBIT E - State Wage Rates & Other Related Information (Attached at the end)
EXHIBIT F - Federal Wage Rates (Attached at the end)

1. Federal Highway Administration (FHWA) Form 1273

The Contractor shall comply with the Federal Highway Administration (FHWA), Form 1273 attached at Exhibit A, as revised, which is hereby made part of this contract. The Contractor shall also require its subcontractors to comply with the FHWA – Form 1273 and include the FHWA – Form 1273 as an attachment to all subcontracts and purchase orders.

2. Title VI of the Civil Rights Act of 1964 / Nondiscrimination Requirements

The Contractor shall comply with Title VI of the Civil Rights Act of 1964 as amended (42 U.S.C. 2000 et seq.), all requirements imposed by the regulations of the United States Department of Transportation (49 CFR Part 21) issued in implementation thereof, and the Title VI Contractor Assurances attached hereto at Exhibit B, all of which are hereby made a part of this Contract.

3. Requirements of Title 49, Code of Federal Regulations (CFR), Part 26, Participation by DBEs, as may be revised.

Pursuant to 49 CFR 26.13, the following paragraph is part of this Contract and shall be included in each subcontract the Contractor enters into with a subcontractor:

"The Contractor, subrecipient or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The Contractor shall carry out applicable requirements of 49 CFR Part 26, Participation by DBEs, in the award and administration of U.S. DOT-assisted contracts. Failure by the Contractor to carry out these requirements is a material breach of this Contract, which may result in the termination of this contract or such other remedy as ConnDOT (recipient) deems appropriate, which may include, but is not limited to: (1) Withholding monthly progress payments, (2) Assessing sanctions, (3) Liquidated damages; and/or, (4) Disqualifying the contractor from future bidding as non-responsible."

4. Contract Wage Rates

The Contractor shall comply with:

The Federal and State wage rate requirements indicated in Exhibits F and G hereof, as revised, are hereby made part of this Contract. The Federal wage rates (Davis-Bacon Act) applicable to this Contract shall be the Federal wage rates that are current on the US Department of Labor website (http://www.wdol.gov/dba.aspx) as may be revised 10 days prior to bid opening. These applicable Federal wage rates will be physically incorporated in the final contract document executed by both parties. The Department will no longer physically include revised Federal wage rates in the bid documents or as part of addenda documents, prior to the bid opening date. During the bid advertisement period, bidders are responsible for obtaining the appropriate Federal wage rates from the US Department of Labor website.

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

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

Prevailing Wages for Work on State Highways; Annual Adjustments. With respect to contracts for work on state highways and bridges on state highways, the Contractor shall comply with the provisions of Section 31-54 and 31-55a of the Connecticut General Statutes, as revised.

As required by Section 1.05.12 (Payrolls) of the State of Connecticut, Department of Transportation's Standard Specification for Roads, Bridges and Incidental Construction (FORM 819), 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.

5. 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.

6. 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 3l-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.

7. 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).

8. Executive Orders and Other Enactments

(a) All references in this Contract to any Federal, State, or local law, statute, public or special act, executive order, ordinance, regulation or code (collectively, "Enactments") shall mean Enactments that apply to the Contract at any time during its term, or that may be made applicable to the Contract during its term. This Contract shall always be read and interpreted in accordance with the latest applicable wording and requirements of the Enactments. Unless otherwise provided by Enactments, the Contractor is not relieved of its obligation to perform under this Contract if it chooses to contest the applicability of the Enactments or the Client Agency's authority to require compliance with the Enactments.

(b) 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 this Contract as if they had been fully set forth in it.

(c) This Contract may be subject to (1) Executive Order No. 14 of Governor M. Jodi Rell, promulgated April 17, 2006, concerning procurement of cleaning products and services; and (2) Executive Order No. 61 of Governor Dannel P. Malloy promulgated December 13, 2017, concerning the Policy for the Management of State Information Technology Projects, as issued by the Office of Policy and Management, Policy ID IT-SDLC-17-
04. If any of the Executive Orders referenced in this subsection is applicable, it is deemed to be incorporated into and made a part of this Contract as if fully set forth in it.

9. Non-Discrimination Requirement and Certification (pursuant to section 4a-60 and 4a-60a o f the Connecticut General Statutes, as revised): References to "minority business enterprises" in this Section are not applicable to Federal-aid projects/contracts. Federal-aid projects/contracts are instead subject to the Federal Disadvantaged Business Enterprise Program.

(a) For purposes of this Section, the following terms are defined as follows:

i. "Commission" means the Commission on Human Rights and Opportunities;

ii. "Contract" and "contract" include any extension or modification of the Contract or contract;

iii. "Contractor" and "contractor" include any successors or assigns of the Contractor or contractor;

iv. "Gender identity or expression" means a person's gender-related identity, appearance or behavior, whether or not that gender-related identity, appearance or behavior is different from that traditionally associated with the person's physiology or assigned sex at birth, which gender-related identity can be shown by providing evidence including, but not limited to, medical history, care or treatment of the gender-related identity, consistent and uniform assertion of the gender-related identity or any other evidence that the gender-related identity is sincerely held, part of a person's core identity or not being asserted for an improper purpose;

v. "good faith" means that degree of diligence which a reasonable person would exercise in the performance of legal duties and obligations;

vi. "good faith efforts" includes, but is not limited to, those reasonable initial efforts necessary to comply with statutory or regulatory requirements and additional or substituted efforts when it is determined that such initial efforts will not be sufficient to comply with such requirements;

vii. "marital status" means being single, married as recognized by the state of Connecticut, widowed, separated or divorced;

viii. "mental disability" means one or more mental disorders, as defined in the most recent edition of the American Psychiatric Association's "Diagnostic and Statistical Manual of Mental Disorders", or a record of or regarding a person as having one or more such disorders;

ix. "minority business enterprise" means any small contractor (1) fifty-one per cent or more of the capital stock, if any, or assets of which are owned by a person or persons who (a) exercise operational authority over the daily affairs of the enterprise, (b) have the power to direct the management and policies and receive the beneficial interest of the enterprise, (c) possess managerial and technical competence and experience directly related to the principal business activities of the enterprise, and (d) are members of a minority, as defined in C.G.S. § 32-9n, or are individuals with a disability, or (2) which is a nonprofit corporation in which fifty-one per cent or more of the persons who exercise operational authority over the enterprise, (a) possess managerial and technical competence and experience directly related to the principal business activities of the enterprise, (b) have the power to direct the management and policies of the enterprise, and (c) are member of a minority, as defined in C.G.S. § 32-9n, or are individuals with a disability; and

x. "public works contract" means any agreement (A) for construction, rehabilitation, conversion, extension, demolition or repair of changes or improvements in real property, and (B) that is financed in whole or in part by the state, including, but not limited to, matching expenditures, grants, loans, insurance or guarantees where such funding equals one hundred fifty thousand dollars or more.

For purposes of this Section, the terms “Contract” and “contract” do not include a contract where each contractor is (1) a political subdivision of the state, including, but not limited to, a municipality, unless the contract is a public works contract, (2) any other state, including but not limited to any federally recognized Indian tribal governments, as defined in C.G.S. § 1-267, (3) the federal government, (4) a foreign government, or (5) an agency of a subdivision, state or government described in the immediately preceding enumerated items (1), (2), (3),or (4).

(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, sexual orientation, gender identity or expression, status as a veteran, status as a victim of domestic violence, status as a victim of sexual assault or status as a victim of trafficking in persons, 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 ensure 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, sexual orientation, status as a veteran, status as a victim of domestic violence, status as a victim of sexual assault or status as a victim of trafficking in persons,

intellectual disability, mental disability or physical disability, including, but not limited to, blindness, unless it is shown by the Contractor that such disability prevents performance of the work involved;

(2) the Contractor agrees, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, to state that it is an "affirmative action-equal opportunity employer" in accordance with regulations adopted by the Commission;

(3) the Contractor agrees to provide each labor union or representative of workers with which the Contractor has a collective bargaining Agreement or other contract or understanding and each vendor with which the Contractor has a contract or understanding, a notice to be provided by the Commission, advising the labor union or workers' representative of the Contractor's commitments under this Section and to post copies of the notice in conspicuous places available to employees and applicants for employment;

(4) the Contractor agrees to comply with each provision of this Section and Connecticut General Statutes §§ 46a-68e and 46a-68f and with each regulation or relevant order issued by said Commission pursuant to Connecticut General Statutes §§ 46a-56, 46a-68e, 46a-68f and 46a-86; and

(5) the Contractor agrees to provide the Commission 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 or she 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; the timing and value of bids; 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 in every subcontract entered into in order to fulfill any obligation of a public works contract, 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) Pursuant to subsection (c) of section 4a-60 of the Connecticut General Statutes, the Contractor, for itself and its authorized signatory of this Contract, affirms that it understands the obligations of this Section and that it will maintain a policy for the duration of the Contract to assure that the Contract will be performed in compliance with the nondiscrimination requirements of such section. The Contractor and its authorized signatory of this Contract demonstrate their understanding of this obligation by (A) having provided an affirmative response in the required online bid or response to a proposal question which asks if the contractor understands its obligations under such sections, (B) signing this Contract, or (C) initialing this nondiscrimination affirmation in the following box: ☐

10. 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.

11. 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.

12. 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.

13. 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.

14. Health Insurance Portability and Accountability Act of 1996 (HIPAA)

The Contractor shall comply, if applicable, with the Health Insurance Portability and Accountability Act of 1996 and, pursuant thereto, the provisions attached at Exhibit D, and hereby made part of this Contract.

15. 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.

16. Summary of State Ethics Laws

Pursuant to the requirements of section 1-101qq of the Connecticut General Statutes (a) the State has provided to the Contractor the summary of State ethics laws developed by the Office of State Ethics pursuant to section 1-81b of the Connecticut General Statutes, which summary is incorporated by reference into and made a part of this Contract as if the summary had been fully set forth in this Contract; (b) the Contractor represents that the chief executive officer or authorized signatory of the Contract and all key employees of such officer or signatory have read and understood the summary and agree to comply with the provisions of state ethics law; (c) prior to entering into a contract with any subcontractors or consultants, the Contractor shall provide the summary to all subcontractors and consultants and each such contract entered into with a subcontractor or consultant on or after July 1, 2021, shall include a representation that each subcontractor or consultant and the key employees of such subcontractor or consultant have read and understood the summary and agree to comply with the provisions of state ethics law; (d) failure to include such representations in such contracts with subcontractors or consultants shall be cause for termination of the Contract; and (e) each contract with such contractor, subcontractor or consultant shall incorporate such summary by reference as a part of the contract terms.

17. 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.

18. Campaign Contribution Restriction

Campaign Contribution Restriction. For all State contracts, defined in section 9-612 of the Connecticut General Statutes as having a value of $50,000 or more, or a combination or series of such agreements or contracts having a value of $100,000 or more in a calendar year, the authorized signatory to this Agreement represents that they have received 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.

19. Tangible Personal Property

(a) The Contractor on its behalf and on behalf of its Affiliates, as defined below, shall comply with the provisions of Conn. Gen. Stat. §12-411b, as follows:

(1) For the term of the Contract, the Contractor and its Affiliates shall collect and remit to the State of Connecticut, Department of Revenue Services, any Connecticut use tax due under the provisions of Chapter 219 of the Connecticut General Statutes for items of tangible personal property sold by the Contractor or by any of its Affiliates in the same manner as if the Contractor and such Affiliates were engaged in the business of selling tangible personal property for use in Connecticut and had sufficient nexus under the provisions of Chapter 219 to be required to collect Connecticut use tax;

(2) A customer's payment of a use tax to the Contractor or its Affiliates relieves the customer of liability for the use tax;

(3) The Contractor and its Affiliates shall remit all use taxes they collect from customers on or before the due date specified in the Contract, which may not be later than the last day of the month next succeeding the end of a calendar quarter or other tax collection period during which the tax was collected;

(4) The Contractor and its Affiliates are not liable for use tax billed by them but not paid to them by a customer; and

(5) Any Contractor or Affiliate who fails to remit use taxes collected on behalf of its customers by the due date specified in the Contract shall be subject to the interest and penalties provided for persons required to collect sales tax under chapter 219 of the general statutes.

(b) For purposes of this section of the Contract, the word "Affiliate" means any person, as defined in section 12-1 of the general statutes, that controls, is controlled by, or is under common control with another person. A person controls another person if the person owns, directly or indirectly, more than ten per cent of the voting securities of the other person. The word "voting security" means a security that confers upon the holder the right to vote for the election of members of the board of directors or similar governing body of the business, or

that is convertible into, or entitles the holder to receive, upon its exercise, a security that confers such a right to vote. "Voting security" includes a general partnership interest.

(c) The Contractor represents and warrants that each of its Affiliates has vested in the Contractor plenary authority to so bind the Affiliates in any agreement with the State of Connecticut. The Contractor on its own behalf and on behalf of its Affiliates shall also provide, no later than 30 days after receiving a request by the State's contracting authority, such information as the State may require to ensure, in the State's sole determination, compliance with the provisions of Chapter 219 of the Connecticut General Statutes, including, but not limited to, §12-411b.

20. 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.

21. Consulting Agreement Representation

Pursuant to section 4a-81 of the Connecticut General Statutes, the person signing this Contract on behalf of the Contractor represents, to their best knowledge and belief and subject to the penalty of false statement as provided in section 53a-157b of the Connecticut General Statutes, that the Contractor has not entered into any consulting agreements in connection with this Contract, except for the agreements listed below or in an attachment to this Contract. "Consulting agreement" means any written or oral agreement to retain the services, for a fee, of a consultant for the purposes of

(A) providing counsel to a contractor, vendor, consultant or other entity seeking to conduct, or conducting, business with the State, (B) contacting, whether in writing or orally, any executive, judicial, or administrative office of the State, including any department, institution, bureau, board, commission, authority, official or employee for the purpose of solicitation, dispute resolution, introduction, requests for information, or (C) any other similar activity related to such contracts. "Consulting agreement" does not include any agreements entered into with a consultant who is registered under the provisions of chapter 10 of the Connecticut General Statutes as of the date such contract is executed in accordance with the provisions of section 4a-81 of the Connecticut General Statutes.

Consultant's Name and Title _____ Name of Firm (if applicable) _____

Start Date _____ End Date _____ Cost _____

The basic terms of the consulting agreement are: _____

Description of Services Provided: _____

Is the consultant a former State employee or former public official? ☐ YES ☐ NO If YES: _____

Name of Former State Agency Termination Date of Employment

22. Cargo Preference Act Requirements (46 CFR 381.7(a)-(b)) – Use of United States Flag Vessels

The Contractor agrees to comply with the following:

(a) ***Agreement Clauses***.

(1) Pursuant to Pub. L. 664 (43 U.S.C. 1241(b)) at least 50 percent of any equipment, materials or commodities procured, contracted for or otherwise obtained with funds granted, guaranteed, loaned, or advanced by the U.S. Government under this agreement, and which may be transported by ocean vessel, shall be transported on privately owned United States-flag commercial vessels, if available.

(2) Within 20 days following the date of loading for shipments originating within the United States or within 30 working days following the date of loading for shipments originating outside the United States, a legible copy of a rated, 'on-board' commercial ocean bill-of-lading in English for each shipment of cargo described in paragraph (a)(1) of this section shall be furnished to both the Contracting Officer (through the prime contractor in the case of subcontractor bills-of- lading) and to the Division of National Cargo, Office of Market Development, Maritime Administration, Washington, DC 20590.

(b) ***Contractor and Subcontractor Clauses.*** The contractor agrees—

(1) To utilize privately owned United States-flag commercial vessels to ship at least 50 percent of the gross tonnage (computed separately for dry bulk carriers, dry cargo liners, and tankers) involved, whenever shipping any equipment, material, or commodities pursuant to this contract, to the extent such vessels are available at fair and reasonable rates for United States-flag commercial vessels.

(2) To furnish within 20 days following the date of loading for shipments originating within the United States or within 30 working days following the date of loading for shipments originating outside the United States, a legible copy of a rated, 'on-board' commercial ocean

bill-of-lading in English for each shipment of cargo described in paragraph (b) (1) of this section to both the Contracting Officer (through the prime contractor in the case of subcontractor bills-of-lading) and to the Division of National Cargo, Office of Market Development, Maritime Administration, Washington, DC 20590.

(3) To insert the substance of the provisions of this clause in all subcontracts issued pursuant to this contract.

23. Sovereign Immunity

The parties acknowledge and agree that nothing in the Solicitation or the Contract shall be construed as a modification, compromise or waiver by the State of any rights or defenses of any immunities provided by Federal law or the laws of the State of Connecticut to the State or any of its officers and employees, which they may have had, now have or will have with respect to all matters arising out of the Contract. To the extent that this section conflicts with any other section, this section shall govern.

24. Large State Contract Representation for Contractor

Pursuant to section 4-252 of the Connecticut General Statutes and Acting Governor Susan Bysiewicz Executive Order No. 21-2, promulgated July 1, 2021, the Contractor, for itself and on behalf of all of its principals or key personnel who submitted a bid or proposal, represents:

(1) That no gifts were made by (A) the Contractor, (B) any principals and key personnel of the Contractor, who participate substantially in preparing bids, proposals or negotiating State contracts, or (C) any agent of the Contractor or principals and key personnel, who participates substantially in preparing bids, proposals or negotiating State contracts, to (i) any public official or State employee of the State agency or quasi- public agency soliciting bids or proposals for State contracts, who participates substantially in the preparation of bid solicitations or requests for proposals for State contracts or the negotiation or award of State contracts, or (ii) any public official or State employee of any other State agency, who has supervisory or appointing authority over such State agency or quasi-public agency;

(2) That no such principals and key personnel of the Contractor, or agent of the Contractor or of such principals and key personnel, knows of any action by the Contractor to circumvent such prohibition on gifts by providing for any other principals and key personnel, official, employee or agent of the Contractor to provide a gift to any such public official or State employee; and

(3) That the Contractor is submitting bids or proposals without fraud or collusion with any person.

25. Large State Contract Representation for Official or Employee of State Agency

Pursuant to section 4-252 of the Connecticut General Statutes and Acting Governor Susan Bysiewicz Executive Order No. 21-2, promulgated July 1, 2021, the State agency official or employee represents that the selection of the person, firm or corporation was not the result of collusion, the giving of a gift or the promise of a gift, compensation, fraud or inappropriate influence from any person.

26. Iran Investment Energy Certification

(a) Pursuant to section 4-252a of the Connecticut General Statutes, the Contractor certifies that it has not made a direct investment of twenty million dollars or more in the energy sector of Iran on or after October 1, 2013, as described in Section 202 of the Comprehensive Iran Sanctions, Accountability and Divestment Act of 2010, and has not increased or renewed such investment on or after said date.

(b) If the Contractor makes a good faith effort to determine whether it has made an investment described in subsection (a) of this section, then the Contractor shall not be deemed to be in breach of the Contract or in violation of this section.

A "good faith effort" for purposes of this subsection includes a determination that the Contractor is not on the list of persons who engage in certain investment activities in Iran created by the Department of General Services of the State of California pursuant to Division 2, Chapter 2.7 of the California Public Contract Code. Nothing in this subsection shall be construed to impair the ability of the State agency or quasi-public agency to pursue a breach of contract action for any violation of the provisions of the Contract.

27. Access to Contract and State Data

The Contractor shall provide to the Client Agency access to any data, as defined in Conn. Gen Stat. Sec. 4e-1, concerning the Contract and the Client Agency that are in the possession or control of the Contractor upon demand and shall provide the data to the Client Agency in a format prescribed by the Client Agency and the State Auditors of Public Accounts at no additional cost.

28. Affirmative Action Policy Statement

The Contractor shall comply with the Affirmative Action Policy Statement, as applicable, attached at Exhibit E and hereby made part of this Contract.

29. Compliance with Consumer Data Privacy and Online Monitoring

Pursuant to section 4e-72a of the Connecticut General Statutes, Contractor shall at all times comply with all applicable provisions of sections 42-515 to 42-525, inclusive, of the Connecticut General Statutes, as the same may be revised or modified.

EXHIBIT A

FHWA-1273 – Revised June 25, 2026

CONTRACT PROVISIONS FOR
FEDERAL-AID CONSTRUCTION CONTRACTS

I. General
II. Nondiscrimination
III. Davis-Bacon and Related Act Provisions
IV. Contract Work Hours and Safety Standards Act Provisions
V. Subletting or Assigning the Contract
VI. Safety: Accident Prevention
VII. False Statements Concerning Highway Projects
VIII. Implementation of Clean Air Act and Federal Water Pollution Control Act
IX. Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion
X. Certification Regarding Use of Contract Funds for Lobbying
XI. Use of United States-Flag Vessels

ATTACHMENTS

A. Employment and Materials Preference for Appalachian Development Highway System or Appalachian Local Access Road Contracts (included in Appalachian contracts only).

I. GENERAL

1. Historically, contracting agencies using Federal-aid highway funds were required to ensure Form FHWA-1273 was physically incorporated into all contracts and subcontracts. Effective June 10, 2026, this requirement was eliminated [91 FR 25492]. Future use of Form FHWA-1273 is now optional on the part of the contracting agency using Federal-aid highway funds. FHWA continues to make Form FHWA-1273 available as a convenience to contracting agencies. Contracting agencies must continue to ensure compliance with the provisions cited in Form FHWA-1273 in accordance with the provisions regardless of the use of Form FHWA-1273. Accordingly, the contracting agency retains the authority to determine whether the contractor must use Form FHWA-1273 to physically incorporate required contract provisions in each subcontract and in lower tier contracts. Where permitted by the contracting agency, the contractor may choose other ways to include required contract provisions in each subcontract, besides incorporating Form FHWA-1273. Contract provisions in Form FHWA-1273 are not required to be physically included in subcontracts for design services on Federal-aid design-build contracts, or in purchase orders, rental agreements and other agreements for supplies or services.

The applicable provisions of Form FHWA-1273 are incorporated by reference for work done under any purchase order, rental agreement or agreement for other services. The prime contractor or design-builder shall be responsible for compliance by any subcontractor, lower-tier subcontractor or service provider.

Contracting agencies may reference Form FHWA-1273 in solicitation-for-bids or request-for-proposals documents.

2. Subject to the applicability criteria noted in the following sections, these contract provisions shall apply to all work performed on the contract by the contractor's own organization and with the assistance of workers under the contractor's immediate superintendence and to all work performed on the contract by piecework, station work, or by subcontract.

3. A breach of any of the stipulations contained in these Required Contract Provisions may be sufficient grounds for withholding of progress payments, withholding of final payment, termination of the contract, suspension / debarment or any other action determined to be appropriate by the contracting agency and FHWA.

4. Selection of Labor: During the performance of this contract, the contractor shall not use convict labor for any purpose within the limits of a construction project on a Federal-aid highway unless it is labor performed by convicts who are on parole, supervised release, or probation. 23 U.S.C. 114(b). The term Federal-aid highway does not include roadways functionally classified as local roads or rural minor collectors. 23 U.S.C. 101(a).

II. NONDISCRIMINATION

The contractor and all subcontractors must comply with the following policies: 29 CFR Parts 1625-1627, 23 U.S.C. 140, Section 504 of the Rehabilitation Act of 1973, as amended (29 U.S.C. 794), Title VI of the Civil Rights Act of 1964, as amended (42 U.S.C. 2000d et seq.), and related regulations including 49 CFR Parts 21, 26, and 27, including any amendments thereto.

Note: The U.S. Department of Labor has exclusive authority to determine compliance with 29 CFR Parts 1625-1627. The contracting agency and the FHWA have the authority and the responsibility to ensure compliance with 23 U.S.C. 140, Section 504 of the Rehabilitation Act of 1973, as amended (29 U.S.C. 794), and Title VI of the Civil Rights Act of 1964, as amended (42 U.S.C. 2000d et seq.), and related regulations including 49 CFR Parts 21, 26, and 27, including any amendments thereto.

The provisions of the Americans with Disabilities Act of 1990 (42 U.S.C. 12101 et seq.) set forth under 28 CFR Part 35 and 29 CFR Part 1630 are incorporated by reference in this contract.

1. Assurances Required:

a. The requirements of 49 CFR Part 26, including any amendments thereto, and the State DOT's FHWA-approved Disadvantaged Business Enterprise (DBE) program are incorporated by reference.

b. The contractor, subrecipient or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The contractor shall carry out applicable requirements of 49 CFR part 26, including any amendments thereto, in the award and administration of DOT-assisted contracts. Failure by the contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy as the recipient deems appropriate, which may include, but is not limited to:

(1) Withholding monthly progress payments;
(2) Assessing sanctions;
(3) Liquidated damages; and/or
(4) Disqualifying the contractor from future bidding as non-responsible.

c. The Title VI and nondiscrimination provisions of U.S. DOT Order 1050.2A at Appendixes A and E, including any amendments thereto, are incorporated by reference. 49 CFR Part 21.

III. DAVIS-BACON AND RELATED ACT PROVISIONS

This section is applicable to all Federal-aid construction projects exceeding $2,000 and to all related subcontracts and lower-tier subcontracts (regardless of subcontract size), in accordance with 29 CFR 5.5. The requirements apply to all projects located within the right-of-way of a roadway that is functionally classified as Federal-aid highway. 23 U.S.C. 113. This excludes roadways functionally classified as local roads or rural minor collectors, which are exempt. 23 U.S.C. 101. Where applicable law requires that projects be treated as a project on a Federal-aid highway, the provisions of this subpart will apply regardless of the location of the project. Examples include: Surface Transportation Block Grant Program projects funded under 23 U.S.C. 133 [excluding recreational trails projects], the Nationally Significant Freight and Highway Projects funded under 23 U.S.C. 117, and National Highway Freight Program projects funded under 23 U.S.C. 167.

The following provisions are from the U.S. Department of Labor regulations in 29 CFR 5.5 “Contract provisions and related matters” with minor revisions to conform to the FHWA-1273 format and FHWA program requirements.

1. Minimum wages (29 CFR 5.5)

a. *Wage rates and fringe benefits.* All laborers and mechanics employed or working upon the site of the work (or otherwise working in construction or development of the project under a development statute), will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by regulations issued by the Secretary of Labor under the Copeland Act (29 CFR part 3)), the full amount of basic hourly wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the contractor and such laborers and mechanics. As provided in paragraphs (d) and (e) of 29 CFR 5.5, the appropriate wage determinations are effective by operation of law even if they have not been attached to the contract. Contributions made or costs reasonably anticipated for bona fide fringe benefits under the Davis-Bacon Act (40 U.S.C. 3141(2)(B)) on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of paragraph 1.e. of this section; also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics must be paid the appropriate wage rate and fringe benefits on the wage determination for the classification(s) of work actually performed, without regard to skill, except as provided in paragraph 4. of this section. Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein: *Provided,* That the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classifications and wage rates conformed under paragraph 1.c. of this section) and the Davis-Bacon poster (WH–1321) must be posted at all times by the contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers.

b. *Frequently recurring classifications.* (1) In addition to wage and fringe benefit rates that have been determined to be prevailing under the procedures set forth in 29 CFR part 1, a wage determination may contain, pursuant to § 1.3(f), wage and fringe benefit rates for classifications of laborers and mechanics for which conformance requests are regularly submitted pursuant to paragraph 1.c. of this section, provided that:

(i) The work performed by the classification is not performed by a classification in the wage determination for which a prevailing wage rate has been determined;

(ii) The classification is used in the area by the construction industry; and

(iii) The wage rate for the classification bears a reasonable relationship to the prevailing wage rates contained in the wage determination.

(2) The Administrator will establish wage rates for such classifications in accordance with paragraph 1.c.(1)(iii) of this section. Work performed in such a classification must be paid at no less than the wage and fringe benefit rate listed on the wage determination for such classification.

c. *Conformance.* (1) The contracting officer must require that any class of laborers or mechanics, including helpers, which is not listed in the wage determination and which is to be employed under the contract be classified in conformance with the wage determination. Conformance of an additional classification and wage rate and fringe benefits is appropriate only when the following criteria have been met:

(i) The work to be performed by the classification requested is not performed by a classification in the wage determination; and

(ii) The classification is used in the area by the construction industry; and

(iii) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.

(2) The conformance process may not be used to split, subdivide, or otherwise avoid application of classifications listed in the wage determination.

(3) If the contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and the contracting officer agree on the

classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken will be sent by the contracting officer by email to *DBAconformance@dol.gov*. The Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30–day period that additional time is necessary.

(4) In the event the contractor, the laborers or mechanics to be employed in the classification or their representatives, and the contracting officer do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), the contracting officer will, by email to *DBAconformance@dol.gov*, refer the questions, including the views of all interested parties and the recommendation of the contracting officer, to the Administrator for determination. The Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30–day period that additional time is necessary.

(5) The contracting officer must promptly notify the contractor of the action taken by the Wage and Hour Division under paragraphs 1.c.(3) and (4) of this section. The contractor must furnish a written copy of such determination to each affected worker or it must be posted as a part of the wage determination. The wage rate (including fringe benefits where appropriate) determined pursuant to paragraph 1.c.(3) or (4) of this section must be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.

d. *Fringe benefits not expressed as an hourly rate.* Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the contractor may either pay the benefit as stated in the wage determination or may pay another bona fide fringe benefit or an hourly cash equivalent thereof.

e. *Unfunded plans.* If the contractor does not make payments to a trustee or other third person, the contractor may consider as part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program, *Provided,* That the Secretary of Labor has found, upon the written request of the contractor, in accordance with the criteria set forth in § 5.28, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the contractor to set aside in a separate account assets for the meeting of obligations under the plan or program.

f. *Interest.* In the event of a failure to pay all or part of the wages required by the contract, the contractor will be required to pay interest on any underpayment of wages.

2. Withholding (29 CFR 5.5)

a. *Withholding requirements.* The contracting agency may, upon its own action, or must, upon written request of an authorized representative of the Department of Labor, withhold or cause to be withheld from the contractor so much of the accrued payments or advances as may be considered necessary to satisfy the liabilities of the prime contractor or any subcontractor for the full amount of wages and monetary relief, including interest, required by the clauses set forth in this section for violations of this contract, or to satisfy any such liabilities required by any other Federal contract, or federally assisted contract subject to Davis-Bacon labor standards, that is held by the same prime contractor (as defined in § 5.2). The necessary funds may be withheld from the contractor under this contract, any other Federal contract with the same prime contractor, or any other federally assisted contract that is subject to Davis-Bacon labor standards requirements and is held by the same prime contractor, regardless of whether the other contract was awarded or assisted by the same agency, and such funds may be used to satisfy the contractor liability for which the funds were withheld. In the event of a contractor's failure to pay any laborer or mechanic, including any apprentice or helper working on the site of the work all or part of the wages required by the contract, or upon the contractor's failure to submit the required records as discussed in paragraph 3.d. of this section, the contracting agency may on its own initiative and after written notice to the contractor, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.

b. *Priority to withheld funds.* The Department has priority to funds withheld or to be withheld in accordance with paragraph 2.a. of this section or Section IV, paragraph 3.a., or both, over claims to those funds by:

(1) A contractor's surety(ies), including without limitation performance bond sureties and payment bond sureties;

(2) A contracting agency for its reprocurement costs;

(3) A trustee(s) (either a court-appointed trustee or a U.S. trustee, or both) in bankruptcy of a contractor, or a contractor's bankruptcy estate;

(4) A contractor's assignee(s);

(5) A contractor's successor(s); or

(6) A claim asserted under the Prompt Payment Act, 31 U.S.C. 3901–3907.

3. Records and certified payrolls (29 CFR 5.5)

a. *Basic record requirements* (1) *Length of record retention.* All regular payrolls and other basic records must be maintained by the contractor and any subcontractor during the course of the work and preserved for all laborers and mechanics working at the site of the work (or otherwise working in construction or development of the project under a development statute) for a period of at least 3 years after all the work on the prime contract is completed.

(2) *Information required.* Such records must contain the name; Social Security number; last known address, telephone number, and email address of each such worker; each worker's correct classification(s) of work actually performed; hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in 40 U.S.C. 3141(2)(B) of the Davis-Bacon Act); daily and weekly number

of hours actually worked in total and on each covered contract; deductions made; and actual wages paid.

(3) *Additional records relating to fringe benefits.* Whenever the Secretary of Labor has found under paragraph 1.e. of this section that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in 40 U.S.C. 3141(2)(B) of the Davis-Bacon Act, the contractor must maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits.

(4) *Additional records relating to apprenticeship.* Contractors with apprentices working under approved programs must maintain written evidence of the registration of apprenticeship programs, the registration of the apprentices, and the ratios and wage rates prescribed in the applicable programs.

b. *Certified payroll requirements* (1) *Frequency and method of submission.* The contractor or subcontractor must submit weekly, for each week in which any DBA- or Related Acts-covered work is performed, certified payrolls to the contracting agency. The prime contractor is responsible for the submission of all certified payrolls by all subcontractors. A contracting agency or prime contractor may permit or require contractors to submit certified payrolls through an electronic system, as long as the electronic system requires a legally valid electronic signature; the system allows the contractor, the contracting agency, and the Department of Labor to access the certified payrolls upon request for at least 3 years after the work on the prime contract has been completed; and the contracting agency or prime contractor permits other methods of submission in situations where the contractor is unable or limited in its ability to use or access the electronic system.

(2) *Information required.* The certified payrolls submitted must set out accurately and completely all of the information required to be maintained under paragraph 3.a.(2) of this section, except that full Social Security numbers and last known addresses, telephone numbers, and email addresses must not be included on weekly transmittals. Instead, the certified payrolls need only include an individually identifying number for each worker (*e.g.,* the last four digits of the worker's Social Security number). The required weekly certified payroll information may be submitted using Optional Form WH–347 or in any other format desired. Optional Form WH–347 is available for this purpose from the Wage and Hour Division website at *https://www.dol.gov/sites/dolgov/files/WHD/legacy/files/wh347/.pdf* or its successor website. It is not a violation of this section for a prime contractor to require a subcontractor to provide full Social Security numbers and last known addresses, telephone numbers, and email addresses to the prime contractor for its own records, without weekly submission by the subcontractor to the contracting agency.

(3) *Statement of Compliance.* Each certified payroll submitted must be accompanied by a "Statement of Compliance," signed by the contractor or subcontractor, or the contractor's or subcontractor's agent who pays or supervises the payment of the persons working on the contract, and must certify the following:

(i) That the certified payroll for the payroll period contains the information required to be provided under paragraph 3.b. of this section, the appropriate information and basic records are being maintained under paragraph 3.a. of this section, and such information and records are correct and complete;

(ii) That each laborer or mechanic (including each helper and apprentice) working on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in 29 CFR part 3; and

(iii) That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification(s) of work actually performed, as specified in the applicable wage determination incorporated into the contract.

(4) *Use of Optional Form WH–347.* The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH–347 will satisfy the requirement for submission of the "Statement of Compliance" required by paragraph 3.b.(3) of this section.

(5) *Signature.* The signature by the contractor, subcontractor, or the contractor's or subcontractor's agent must be an original handwritten signature or a legally valid electronic signature.

(6) *Falsification.* The falsification of any of the above certifications may subject the contractor or subcontractor to civil or criminal prosecution under 18 U.S.C. 1001 and 31 U.S.C. 3729.

(7) *Length of certified payroll retention.* The contractor or subcontractor must preserve all certified payrolls during the course of the work and for a period of 3 years after all the work on the prime contract is completed.

c. *Contracts, subcontracts, and related documents.* The contractor or subcontractor must maintain this contract or subcontract and related documents including, without limitation, bids, proposals, amendments, modifications, and extensions. The contractor or subcontractor must preserve these contracts, subcontracts, and related documents during the course of the work and for a period of 3 years after all the work on the prime contract is completed.

d. *Required disclosures and access* (1) *Required record disclosures and access to workers.* The contractor or subcontractor must make the records required under paragraphs 3.a. through 3.c. of this section, and any other documents that the contracting agency, the State DOT, the FHWA, or the Department of Labor deems necessary to determine compliance with the labor standards provisions of any of the applicable statutes referenced by § 5.1, available for inspection, copying, or transcription by authorized representatives of the contracting agency, the State DOT, the FHWA, or the Department of Labor, and must permit such representatives to interview workers during working hours on the job.

(2) *Sanctions for non-compliance with records and worker access requirements.* If the contractor or subcontractor fails to submit the required records or to make them available, or refuses to permit worker interviews during working hours on the job, the Federal agency may, after written notice to the contractor, sponsor, applicant, owner, or other entity, as the case may be, that maintains such records or that employs such workers, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available, or to permit worker interviews during working hours on the job, may be grounds for debarment action pursuant to § 5.12. In addition, any contractor or other person that fails to submit the required records or make those records available to WHD within the time WHD requests that the records be produced will be precluded from introducing as evidence in an administrative proceeding under 29 CFR part 6 any of the required records that were not provided or made available to WHD. WHD will take into consideration a reasonable request from the contractor or person for an extension of the time for submission of records. WHD will determine the reasonableness of the request and may consider, among other things, the location of the records and the volume of production.

(3) *Required information disclosures.* Contractors and subcontractors must maintain the full Social Security number and last known address, telephone number, and email address of each covered worker, and must provide them upon request to the contracting agency, the State DOT, the FHWA, the contractor, or the Wage and Hour Division of the Department of Labor for purposes of an investigation or other compliance action.

4. Apprentices and equal employment opportunity (29 CFR 5.5)

a. *Apprentices* (1) *Rate of pay.* Apprentices will be permitted to work at less than the predetermined rate for the work they perform when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Office of Apprenticeship (OA), or with a State Apprenticeship Agency recognized by the OA. A person who is not individually registered in the program, but who has been certified by the OA or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice, will be permitted to work at less than the predetermined rate for the work they perform in the first 90 days of probationary employment as an apprentice in such a program. In the event the OA or a State Apprenticeship Agency recognized by the OA withdraws approval of an apprenticeship program, the contractor will no longer be permitted to use apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(2) *Fringe benefits.* Apprentices must be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator determines that a different practice prevails for the applicable apprentice classification, fringe benefits must be paid in accordance with that determination.

(3) *Apprenticeship ratio.* The allowable ratio of apprentices to journeyworkers on the job site in any craft classification must not be greater than the ratio permitted to the contractor as to the entire work force under the registered program or the ratio applicable to the locality of the project pursuant to paragraph 4.a.(4) of this section. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated in paragraph 4.a.(1) of this section, must be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under this section must be paid not less than the applicable wage rate on the wage determination for the work actually performed.

(4) *Reciprocity of ratios and wage rates.* Where a contractor is performing construction on a project in a locality other than the locality in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyworker's hourly rate) applicable within the locality in which the construction is being performed must be observed. If there is no applicable ratio or wage rate for the locality of the project, the ratio and wage rate specified in the contractor's registered program must be observed.

b. *Equal employment opportunity.* The use of apprentices and journeyworkers under this part must be in conformity with 29 CFR part 30, including any amendments thereto.

c. Apprentices and Trainees (programs of the U.S. DOT).

Apprentices and trainees working under apprenticeship and skill training programs which have been certified by the Secretary of Transportation as promoting EEO in connection with Federal-aid highway construction programs are not subject to the requirements of paragraph 4 of this Section III. 23 CFR 230.111(e)(2). The straight time hourly wage rates for apprentices and trainees under such programs will be established by the particular programs. The ratio of apprentices and trainees to journeyworkers shall not be greater than permitted by the terms of the particular program.

5. Compliance with Copeland Act requirements. The contractor shall comply with the requirements of 29 CFR part 3, which are incorporated by reference in this contract as provided in 29 CFR 5.5.

6. Subcontracts. The contractor or subcontractor must insert in any subcontracts the clauses set forth in paragraphs (1) through (11) of this section, along with the applicable wage determination(s) and such other clauses or contract modifications as the contracting agency may by appropriate instructions require, and a clause requiring the subcontractors to include these clauses and wage determination(s) in any lower tier subcontracts. The prime contractor is responsible for the compliance by any subcontractor or lower tier subcontractor with all the contract clauses in this section. In the event of any violations of these clauses, the prime contractor and any subcontractor(s) responsible will be liable for any unpaid wages and monetary relief, including interest from the date of the underpayment or loss, due to any workers of lower-tier subcontractors, and may be subject to debarment, as appropriate. 29 CFR 5.5.

7. Contract termination: debarment. A breach of the contract clauses in 29 CFR 5.5 may be grounds for termination of the

contract, and for debarment as a contractor and a subcontractor as provided in 29 CFR 5.12.

8. Compliance with Davis-Bacon and Related Act requirements. All rulings and interpretations of the Davis-Bacon and Related Acts contained in 29 CFR parts 1, 3, and 5 are herein incorporated by reference in this contract as provided in 29 CFR 5.5.

9. Disputes concerning labor standards. As provided in 29 CFR 5.5, disputes arising out of the labor standards provisions of this contract shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the Department of Labor set forth in 29 CFR parts 5, 6, and 7. Disputes within the meaning of this clause include disputes between the contractor (or any of its subcontractors) and the contracting agency, the U.S. Department of Labor, or the employees or their representatives.

10. Certification of eligibility. a. By entering into this contract, the contractor certifies that neither it nor any person or firm who has an interest in the contractor's firm is a person or firm ineligible to be awarded Government contracts by virtue of 40 U.S.C. 3144(b) or § 5.12(a).

b. No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of 40 U.S.C. 3144(b) or § 5.12(a).

c. The penalty for making false statements is prescribed in the U.S. Code, Title 18 Crimes and Criminal Procedure, 18 U.S.C. 1001.

11. Anti-retaliation. It is unlawful for any person to discharge, demote, intimidate, threaten, restrain, coerce, blacklist, harass, or in any other manner discriminate against, or to cause any person to discharge, demote, intimidate, threaten, restrain, coerce, blacklist, harass, or in any other manner discriminate against, any worker or job applicant for:

a. Notifying any contractor of any conduct which the worker reasonably believes constitutes a violation of the DBA, Related Acts, this part, or 29 CFR part 1 or 3;

b. Filing any complaint, initiating or causing to be initiated any proceeding, or otherwise asserting or seeking to assert on behalf of themselves or others any right or protection under the DBA, Related Acts, this part, or 29 CFR part 1 or 3;

c. Cooperating in any investigation or other compliance action, or testifying in any proceeding under the DBA, Related Acts, this part, or 29 CFR part 1 or 3; or

d. Informing any other person about their rights under the DBA, Related Acts, this part, or 29 CFR part 1 or 3.

IV. CONTRACT WORK HOURS AND SAFETY STANDARDS ACT

Pursuant to 29 CFR 5.5(b), the following clauses apply to any Federal-aid construction contract in an amount in excess of $100,000 and subject to the overtime provisions of the Contract Work Hours and Safety Standards Act. These clauses shall be inserted in addition to the clauses required by 29 CFR 5.5(a) or 29 CFR 4.6. As used in this paragraph, the terms laborers and mechanics include watchpersons and guards.

1. Overtime requirements. No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek. 29 CFR 5.5.

2. Violation; liability for unpaid wages; liquidated damages. In the event of any violation of the clause set forth in paragraph 1. of this section the contractor and any subcontractor responsible therefor shall be liable for the unpaid wages and interest from the date of the underpayment. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchpersons and guards, employed in violation of the clause set forth in paragraph 1. of this section, in the sum currently provided in 29 CFR 5.5(b)(2)* for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph 1. of this section.

* $33 as of January 15, 2025 (See 90 FR 1859) as may be adjusted annually by the Department of Labor, pursuant to the Federal Civil Penalties Inflation Adjustment Act of 1990.

3. Withholding for unpaid wages and liquidated damages

a. *Withholding process.* The FHWA or the contracting agency may, upon its own action, or must, upon written request of an authorized representative of the Department of Labor, withhold or cause to be withheld from the contractor so much of the accrued payments or advances as may be considered necessary to satisfy the liabilities of the prime contractor or any subcontractor for any unpaid wages; monetary relief, including interest; and liquidated damages required by the clauses set forth in this section on this contract, any other Federal contract with the same prime contractor, or any other federally assisted contract subject to the Contract Work Hours and Safety Standards Act that is held by the same prime contractor (as defined in § 5.2). The necessary funds may be withheld from the contractor under this contract, any other Federal contract with the same prime contractor, or any other federally assisted contract that is subject to the Contract Work Hours and Safety Standards Act and is held by the same prime contractor, regardless of whether the other contract was awarded or assisted by the same agency, and such funds may be used to satisfy the contractor liability for which the funds were withheld.

b. *Priority to withheld funds.* The Department has priority to funds withheld or to be withheld in accordance with Section III paragraph 2.a. or paragraph 3.a. of this section, or both, over claims to those funds by:

(1) A contractor's surety(ies), including without limitation performance bond sureties and payment bond sureties;

(2) A contracting agency for its reprocurement costs;

(3) A trustee(s) (either a court-appointed trustee or a U.S. trustee, or both) in bankruptcy of a contractor, or a contractor's bankruptcy estate;

(4) A contractor's assignee(s);

(5) A contractor's successor(s); or

(6) A claim asserted under the Prompt Payment Act, 31 U.S.C. 3901–3907.

4. Subcontracts. The contractor or subcontractor must insert in any subcontracts the clauses set forth in paragraphs 1. through 5. of this section and a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor is responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs 1. through 5. In the event of any violations of these clauses, the prime contractor and any subcontractor(s) responsible will be liable for any unpaid wages and monetary relief, including interest from the date of the underpayment or loss, due to any workers of lower-tier subcontractors, and associated liquidated damages and may be subject to debarment, as appropriate.

5. Anti-retaliation. It is unlawful for any person to discharge, demote, intimidate, threaten, restrain, coerce, blacklist, harass, or in any other manner discriminate against, or to cause any person to discharge, demote, intimidate, threaten, restrain, coerce, blacklist, harass, or in any other manner discriminate against, any worker or job applicant for:

a. Notifying any contractor of any conduct which the worker reasonably believes constitutes a violation of the Contract Work Hours and Safety Standards Act (CWHSSA) or its implementing regulations in this part;

b. Filing any complaint, initiating or causing to be initiated any proceeding, or otherwise asserting or seeking to assert on behalf of themselves or others any right or protection under CWHSSA or this part;

c. Cooperating in any investigation or other compliance action, or testifying in any proceeding under CWHSSA or this part; or

d. Informing any other person about their rights under CWHSSA or this part.

V. SUBLETTING OR ASSIGNING THE CONTRACT

This provision is applicable to all Federal-aid construction contracts on the National Highway System pursuant to 23 CFR 635.116.

1. The contractor shall perform with its own organization contract work amounting to not less than 30 percent (or a greater percentage if specified elsewhere in the contract) of the total original contract price, excluding any specialty items designated by the contracting agency. Specialty items may be performed by subcontract and the amount of any such specialty items performed may be deducted from the total original contract price before computing the amount of work required to be performed by the contractor's own organization (23 CFR 635.116).

a. The term “perform work with its own organization” in paragraph 1. of this section refers to workers employed or leased by the prime contractor, and equipment owned or rented by the prime contractor, with or without operators. Such term does not include employees or equipment of a subcontractor or lower tier subcontractor, agents of the prime contractor, or any other assignees. The term may include payments for the costs of hiring leased employees from an employee leasing firm meeting all relevant Federal and State regulatory requirements. Leased employees may only be included in this term if the prime contractor meets all of the following conditions: (based on longstanding interpretation)

(1) the prime contractor maintains control over the supervision of the day-to-day activities of the leased employees;
(2) the prime contractor remains responsible for the quality of the work of the leased employees;
(3) the prime contractor retains all power to accept or exclude individual employees from work on the project; and
(4) the prime contractor remains ultimately responsible for the payment of predetermined minimum wages, the submission of payrolls, statements of compliance and all other Federal regulatory requirements.

b. "Specialty Items" shall be construed to be limited to work that requires highly specialized knowledge, abilities, or equipment not ordinarily available in the type of contracting organizations qualified and expected to bid or propose on the contract as a whole and in general are to be limited to minor components of the overall contract. 23 CFR 635.102.

2. Pursuant to 23 CFR 635.116(a), the contract amount upon which the requirements set forth in paragraph 1. of this section is computed includes the cost of material and manufactured products which are to be purchased or produced by the contractor under the contract provisions.

3. Pursuant to 23 CFR 635.116(c), the contractor shall furnish (a) a competent superintendent or supervisor who is employed by the firm, has full authority to direct performance of the work in accordance with the contract requirements, and is in charge of all construction operations (regardless of who performs the work) and (b) such other of its own organizational resources (supervision, management, and engineering services) as the contracting officer determines is necessary to assure the performance of the contract.

4. No portion of the contract shall be sublet, assigned or otherwise disposed of except with the written consent of the contracting officer, or authorized representative, and such consent when given shall not be construed to relieve the contractor of any responsibility for the fulfillment of the contract. Written consent will be given only after the contracting agency has assured that each subcontract is evidenced in writing and that it contains all pertinent provisions and requirements of the prime contract. (based on long-standing interpretation of 23 CFR 635.116).

5. The 30-percent self-performance requirement of paragraph (1) is not applicable to design-build contracts; however,

contracting agencies may establish their own self-performance requirements. 23 CFR 635.116(d).

VI. SAFETY: ACCIDENT PREVENTION

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

1. In the performance of this contract the contractor shall comply with all applicable Federal, State, and local laws governing safety, health, and sanitation (23 CFR Part 635). The contractor shall provide all safeguards, safety devices and protective equipment and take any other needed actions as it determines, or as the contracting officer may determine, to be reasonably necessary to protect the life and health of employees on the job and the safety of the public and to protect property in connection with the performance of the work covered by the contract. 23 CFR 635.108.

2. It is a condition of this contract, and shall be made a condition of each subcontract, which the contractor enters into pursuant to this contract, that the contractor and any subcontractor shall not permit any employee, in performance of the contract, to work in surroundings or under conditions which are unsanitary, hazardous or dangerous to his/her health or safety, as determined under construction safety and health standards (29 CFR Part 1926) promulgated by the Secretary of Labor, in accordance with Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C. 3704). 29 CFR 1926.10.

3. Pursuant to 29 CFR 1926.3, it is a condition of this contract that the Secretary of Labor or authorized representative thereof, shall have right of entry to any site of contract performance to inspect or investigate the matter of compliance with the construction safety and health standards and to carry out the duties of the Secretary under Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C. 3704).

VII. FALSE STATEMENTS CONCERNING HIGHWAY PROJECTS

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

In order to assure high quality and durable construction in conformity with approved plans and specifications and a high degree of reliability on statements and representations made by engineers, contractors, suppliers, and workers on Federal-aid highway projects, it is essential that all persons concerned with the project perform their functions as carefully, thoroughly, and honestly as possible. Willful falsification, distortion, or misrepresentation with respect to any facts related to the project is a violation of Federal law. To prevent any misunderstanding regarding the seriousness of these and similar acts, Form FHWA-1022 shall be posted on each Federal-aid highway project (23 CFR Part 635) in one or more places where it is readily available to all persons concerned with the project:

18 U.S.C. 1020 reads as follows:

"Whoever, being an officer, agent, or employee of the United States, or of any State or Territory, or whoever, whether a person, association, firm, or corporation, knowingly makes any false statement, false representation, or false report as to the character, quality, quantity, or cost of the material used or to be used, or the quantity or quality of the work performed or to be performed, or the cost thereof in connection with the submission of plans, maps, specifications, contracts, or costs of construction on any highway or related project submitted for approval to the Secretary of Transportation; or

Whoever knowingly makes any false statement, false representation, false report or false claim with respect to the character, quality, quantity, or cost of any work performed or to be performed, or materials furnished or to be furnished, in connection with the construction of any highway or related project approved by the Secretary of Transportation; or

Whoever knowingly makes any false statement or false representation as to material fact in any statement, certificate, or report submitted pursuant to provisions of the Federal-aid Roads Act approved July 11, 1916, (39 Stat. 355), as amended and supplemented;

Shall be fined under this title or imprisoned not more than 5 years or both."

VIII. IMPLEMENTATION OF CLEAN AIR ACT AND FEDERAL WATER POLLUTION CONTROL ACT (42 U.S.C. 7606; 2 CFR 200.88; EO 11738)

This provision is applicable to all Federal-aid construction contracts in excess of $150,000 and to all related subcontracts. 48 CFR 2.101; 2 CFR 200.327.

By submission of this bid/proposal or the execution of this contract or subcontract, as appropriate, the bidder, proposer, Federal-aid construction contractor, subcontractor, supplier, or vendor agrees to comply with all applicable standards, orders or regulations issued pursuant to the Clean Air Act (42 U.S.C. 7401-7671q) and the Federal Water Pollution Control Act, as amended (33 U.S.C. 1251-1387). Violations must be reported to the Federal Highway Administration and the Regional Office of the Environmental Protection Agency. 2 CFR Part 200, Appendix II.

The contractor agrees to include or cause to be included the requirements of this Section in every subcontract, and further agrees to take such action as the contracting agency may direct as a means of enforcing such requirements. 2 CFR 200.327.

IX. CERTIFICATION REGARDING DEBARMENT, SUSPENSION, INELIGIBILITY AND VOLUNTARY EXCLUSION

This provision is applicable to all Federal-aid construction contracts, design-build contracts, subcontracts, lower-tier subcontracts, purchase orders, lease agreements, consultant contracts or any other covered transaction requiring FHWA approval or that is estimated to cost $25,000 or more – as defined in 2 CFR Parts 180 and 1200. 2 CFR 180.220 and 1200.220.

1**. Instructions for Certification – First Tier Participants:**

a. By signing and submitting this proposal, the prospective first tier participant is providing the certification set out below.

b. The inability of a person to provide the certification set out below will not necessarily result in denial of participation in this

covered transaction. The prospective first tier participant shall submit an explanation of why it cannot provide the certification set out below. The certification or explanation will be considered in connection with the department or agency's determination whether to enter into this transaction. However, failure of the prospective first tier participant to furnish a certification or an explanation shall disqualify such a person from participation in this transaction. 2 CFR 180.320.

c. The certification in this clause is a material representation of fact upon which reliance was placed when the contracting agency determined to enter into this transaction. If it is later determined that the prospective participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the contracting agency may terminate this transaction for cause of default. 2 CFR 180.325.

d. The prospective first tier participant shall provide immediate written notice to the contracting agency to whom this proposal is submitted if any time the prospective first tier participant learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances. 2 CFR 180.345 and 180.350.

e. The terms "covered transaction," "debarred," "suspended," "ineligible," "participant," "person," "principal," and "voluntarily excluded," as used in this clause, are defined in 2 CFR Parts 180, Subpart I, 180.900-180.1020, and 1200. “First Tier Covered Transactions” refers to any covered transaction between a recipient or subrecipient of Federal funds and a participant (such as the prime or general contract). “Lower Tier Covered Transactions” refers to any covered transaction under a First Tier Covered Transaction (such as subcontracts). “First Tier Participant” refers to the participant who has entered into a covered transaction with a recipient or subrecipient of Federal funds (such as the prime or general contractor). “Lower Tier Participant” refers any participant who has entered into a covered transaction with a First Tier Participant or other Lower Tier Participants (such as subcontractors and suppliers).

f. The prospective first tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency entering into this transaction. 2 CFR 180.330.

g. The prospective first tier participant further agrees by submitting this proposal that it will include the clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transactions," provided by the department or contracting agency, entering into this covered transaction, without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions exceeding the $25,000 threshold. 2 CFR 180.220 and 180.300.

h. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. 2 CFR 180.300; 180.320, and 180.325. A participant is responsible for ensuring that its principals are not suspended, debarred, or otherwise ineligible to participate in covered transactions. 2 CFR 180.335. To verify the eligibility of its principals, as well as the eligibility of any lower tier prospective participants, each participant may, but is not required to, check the System for Award Management website (https://www.sam.gov/). 2 CFR 180.300, 180.320, and 180.325.

i. Nothing contained in the foregoing shall be construed to require the establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of the prospective participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

j. Except for transactions authorized under paragraph (f) of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency may terminate this transaction for cause or default. 2 CFR 180.325.

* * * * *

2. Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion – First Tier Participants:

a. The prospective first tier participant certifies to the best of its knowledge and belief, that it and its principals:

(1) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participating in covered transactions by any Federal department or agency, 2 CFR 180.335;

(2) Have not within a three-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State, or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property, 2 CFR 180.800;

(3) Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph (a)(2) of this certification, 2 CFR 180.700 and 180.800; and

(4) Have not within a three-year period preceding this application/proposal had one or more public transactions (Federal, State or local) terminated for cause or default. 2 CFR 180.335(d).

(5) Are not a corporation that has been convicted of a felony violation under any Federal law within the two-year period preceding this proposal (USDOT Order 4200.6 implementing appropriations act requirements); and

(6) Are not a corporation with any unpaid Federal tax liability that has been assessed, for which all judicial and administrative remedies have been exhausted, or have lapsed, and that is not being paid in a timely manner pursuant to an agreement with the authority responsible for collecting the tax liability (USDOT Order 4200.6 implementing appropriations act requirements).

b. Where the prospective participant is unable to certify to any of the statements in this certification, such prospective participant should attach an explanation to this proposal. 2 CFR 180.335 and 180.340.

* * * * *

3. **Instructions for Certification - Lower Tier Participants:**

(Applicable to all subcontracts, purchase orders, and other lower tier transactions requiring prior FHWA approval or estimated to cost $25,000 or more - 2 CFR Parts 180 and 1200). 2 CFR 180.220 and 1200.220.

a. By signing and submitting this proposal, the prospective lower tier participant is providing the certification set out below.

b. The certification in this clause is a material representation of fact upon which reliance was placed when this transaction was entered into. If it is later determined that the prospective lower tier participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the department, or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

c. The prospective lower tier participant shall provide immediate written notice to the person to which this proposal is submitted if at any time the prospective lower tier participant learns that its certification was erroneous by reason of changed circumstances. 2 CFR 180.365.

d. The terms "covered transaction," "debarred," "suspended," "ineligible," "participant," "person," "principal," and "voluntarily excluded," as used in this clause, are defined in 2 CFR Parts 180, Subpart I, 180.900 – 180.1020, and 1200. You may contact the person to which this proposal is submitted for assistance in obtaining a copy of those regulations. “First Tier Covered Transactions” refers to any covered transaction between a recipient or subrecipient of Federal funds and a participant (such as the prime or general contract). “Lower Tier Covered Transactions” refers to any covered transaction under a First Tier Covered Transaction (such as subcontracts). “First Tier Participant” refers to the participant who has entered into a covered transaction with a recipient or subrecipient of Federal funds (such as the prime or general contractor). “Lower Tier Participant” refers any participant who has entered into a covered transaction with a First Tier Participant or other Lower Tier Participants (such as subcontractors and suppliers).

e. The prospective lower tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency with which this transaction originated. 2 CFR 1200.220 and 1200.332.

f. The prospective lower tier participant further agrees by submitting this proposal that it will include this clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transaction," without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions exceeding the $25,000 threshold. 2 CFR 180.220 and 1200.220.

g. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant is responsible for ensuring that its principals are not suspended, debarred, or otherwise ineligible to participate in covered transactions. To verify the eligibility of its principals, as well as the eligibility of any lower tier prospective participants, each participant may, but is not required to, check the System for Award Management website (https://www.sam.gov/), which is compiled by the General Services Administration. 2 CFR 180.300, 180.320, 180.330, and 180.335.

h. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

i. Except for transactions authorized under paragraph e of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment. 2 CFR 180.325.

* * * * *

4. Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion--Lower Tier Participants:

a. The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its principals:

(1) is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participating in covered transactions by any Federal department or agency, 2 CFR 180.355;

(2) is a corporation that has been convicted of a felony violation under any Federal law within the two-year period preceding this proposal (USDOT Order 4200.6 implementing appropriations act requirements); and

(3) is a corporation with any unpaid Federal tax liability that has been assessed, for which all judicial and administrative remedies have been exhausted, or have lapsed, and that is not being paid in a timely manner pursuant to an agreement with the authority responsible for collecting the tax liability. (USDOT Order 4200.6 implementing appropriations act requirements)

b. Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant should attach an explanation to this proposal.

* * * * *

X. CERTIFICATION REGARDING USE OF CONTRACT FUNDS FOR LOBBYING

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts which exceed $100,000. 49 CFR Part 20, App. A.

1. The prospective participant certifies, by signing and submitting this bid or proposal, to the best of his or her knowledge and belief, that:

a. No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

b. If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

2. This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by 31 U.S.C. 1352. Any person who fails to file the required certification shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.

3. The prospective participant also agrees by submitting its bid or proposal that the participant shall require that the language of this certification be included in all lower tier subcontracts, which exceed $100,000 and that all such recipients shall certify and disclose accordingly.

XI. USE OF UNITED STATES-FLAG VESSELS:

This provision is applicable to all Federal-aid construction contracts, design-build contracts, subcontracts, lower-tier subcontracts, purchase orders, lease agreements, or any other covered transaction. 46 CFR Part 381.

This requirement applies to material or equipment that is acquired for a specific Federal-aid highway project. 46 CFR 381.7. It is not applicable to goods or materials that come into inventories independent of an FHWA funded-contract.

When oceanic shipments (or shipments across the Great Lakes) are necessary for materials or equipment acquired for a specific Federal-aid construction project, the bidder, proposer, contractor, subcontractor, or vendor agrees:

1. To utilize privately owned United States-flag commercial vessels to ship at least 50 percent of the gross tonnage (computed separately for dry bulk carriers, dry cargo liners, and tankers) involved, whenever shipping any equipment, material, or commodities pursuant to this contract, to the extent such vessels are available at fair and reasonable rates for United States-flag commercial vessels. 46 CFR 381.7.

2. To furnish within 20 days following the date of loading for shipments originating within the United States or within 30 working days following the date of loading for shipments originating outside the United States, a legible copy of a rated, ‘on-board’ commercial ocean bill-of-lading in English for each shipment of cargo described in paragraph (b)(1) of this section to both the Contracting Officer (through the prime contractor in the case of subcontractor bills-of-lading) and to the Office of Cargo and Commercial Sealift (MAR-620), Maritime Administration, Washington, DC 20590. (MARAD requires copies of the ocean carrier's (master) bills of lading, certified onboard, dated, with rates and charges. These bills of lading may contain business sensitive information and therefore may be submitted directly to MARAD by the Ocean Transportation Intermediary on behalf of the contractor). 46 CFR 381.7.

ATTACHMENT A - EMPLOYMENT AND MATERIALS PREFERENCE FOR APPALACHIAN DEVELOPMENT HIGHWAY SYSTEM OR APPALACHIAN LOCAL ACCESS ROAD CONTRACTS (40 U.S.C. sections 14501(d) and 14701 and the Appalachian Regional Commission Code as authorized under 40 U.S.C. section 14302)
This provision is applicable to all Federal-aid projects funded under the Appalachian Regional Development Act of 1965.

1. During the performance of this contract, the contractor undertaking to do work which is, or reasonably may be, done as on-site work, shall give preference to qualified persons who regularly reside in the labor area as designated by the DOL wherein the contract work is situated, or the subregion, or the Appalachian counties of the State wherein the contract work is situated, except:

a. To the extent that qualified persons regularly residing in the area are not available.

b. For the reasonable needs of the contractor to employ supervisory or specially experienced personnel necessary to assure an efficient execution of the contract work.

c. For the obligation of the contractor to offer employment to present or former employees as the result of a lawful collective bargaining contract, provided that the number of nonresident persons employed under this subparagraph (1c) shall not exceed 20 percent of the total number of employees employed by the contractor on the contract work, except as provided in subparagraph (4) below.

2. The contractor shall place a job order with the State Employment Service indicating (a) the classifications of the laborers, mechanics and other employees required to perform the contract work, (b) the number of employees required in each classification, (c) the date on which the participant estimates such employees will be required, and (d) any other pertinent information required by the State Employment Service to complete the job order form. The job order may be placed with the State Employment Service in writing or by telephone. If during the course of the contract work, the information submitted by the contractor in the original job order is substantially modified, the participant shall promptly notify the State Employment Service.

3. The contractor shall give full consideration to all qualified job applicants referred to him by the State Employment Service. The contractor is not required to grant employment to any job applicants who, in his opinion, are not qualified to perform the classification of work required.

4. If, within one week following the placing of a job order by the contractor with the State Employment Service, the State Employment Service is unable to refer any qualified job applicants to the contractor, or less than the number requested, the State Employment Service will forward a certificate to the contractor indicating the unavailability of applicants. Such certificate shall be made a part of the contractor's permanent project records. Upon receipt of this certificate, the contractor may employ persons who do not normally reside in the labor area to fill positions covered by the certificate, notwithstanding the provisions of subparagraph (1c) above.

5. The provisions of 40 U.S.C. 14501 allow the contracting agency to provide a contractual preference for the use of mineral resource materials native to the Appalachian region.

6. The contractor shall include the provisions of Sections 1 through 4 of this Attachment A in every subcontract for work which is, or reasonably may be, done as on-site work.

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EXHIBIT B
TITLE VI CONTRACTOR ASSURANCES
APPENDIX A

During the performance of this contract, the contractor, for itself, its assignees and successors in interest (hereinafter referred to as the "contractor") agrees as follows:

1. **Compliance with Regulations**: The contactor (hereinafter includes consultants) will comply with the Regulations relative to Nondiscrimination in Federally assisted programs of the United States Department of Transportation Federal Highway Administration and Federal Transit Administration, as they may be amended from time to time, which are herein incorporated by reference and made a part of this contract.

2. **Nondiscrimination:** The contractor, with regard to the work performed by it during the contract, will not discriminate on the grounds of race, color, national origin, sex, age, disability, income or Limited English Proficiency in the selection and retention of subcontractors, including procurements of materials and leases of equipment. The contractor will not participate directly or indirectly in the discrimination prohibited by the Acts and Regulations, including employment practices when the contract covers any activity, project, or program set forth in Appendix B of 49 CFR Part 21.

3. **Solicitations for Subcontracts, Including Procurements of Materials** and Equipment: In all solicitations, either by bidding, or negotiation made by the contractor for work to be performed under a subcontract, including procurements of materials, or leases of equipment, each potential subcontractor or supplier will be notified by the contractor of the contractor's obligations under this contract and Acts and the Regulations relative to Non- discrimination on the grounds of race, color, or national origin.

4. **Information and Reports:** The contractor will provide all information and reports required by the Acts, the Regulations, and directives issued pursuant thereto and will permit access to its books, records, accounts, other sources of information, and its facilities as may be determined by the Recipient or the Federal Highway Administration or Federal Transit Administration to be pertinent to ascertain compliance with such Acts, Regulations, and instructions. Where any information required of a contractor is in the exclusive possession of another who fails or refuses to furnish this information, the contractor will so certify to the Recipient or the Federal Highway Administration or the Federal Transit Administration, as appropriate, and will set forth what efforts it has made to obtain the information.

5. **Sanctions for Non-compliance:** In the event of the contractor's non-compliance with the non-discrimination provisions of this contract, the Recipient will impose such contract sanctions as it or the Federal Highway Administration or the Federal Transit Administration may determine to be appropriate, including, but not limited to:

   a. withholding contract payments to the contractor under the contract until the contractor complies; and/or
   b. cancelling, terminating, or suspending a contract, in whole or in part.

6. **Incorporation of Provisions:** The contractor will include the provisions of paragraphs one through six in every subcontract, including procurements of materials and leases of equipment, unless exempt by the Acts, the Regulations and directives issued pursuant thereto. The contractor will take action with respect to any subcontract or procurement as the Recipient or the Federal Highway Administration or the Federal Transit Administration may direct as a means of enforcing such provisions including sanctions for non-compliance. Provided, that if the contractor becomes involved in, or is threatened with, litigation by a subcontractor, or supplier because of such direction, the contractor may request the Recipient to enter into any litigation to protect the interests of the Recipient. In addition, the contractor may request the United States to enter into the litigation to protect the interests of the United States.

APPENDIX B

TITLE VI CONTRACTOR ASSURANCES

During the performance of this contract, the contractor, for itself, its assignees, and successors in interest (hereinafter referred to as the "contractor") agrees to comply with the following nondiscrimination statutes and authorities; including but not limited to:

- Title VI of the Civil Rights Act of 1964 (78 Stat. 252, 42 U.S.C. § 2000d et seq.), (prohibits discrimination on the basis of race, color, national origin), as implemented by 49 C.F.R. § 21.1 et seq. and 49 C.F.R. part 303;
- The Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, (42 U.S.C. § 4601) (prohibits unfair treatment of persons displaced or whose property has been acquired because of Federal or Federal-aid programs and projects);
- Federal-Aid Highway Act of 1973 (23 U.S.C. § 324 et seq.) (prohibits discrimination on the basis of sex);
- Section 504 of the Rehabilitation Act of 1973, as amended (29 U.S.C. § 794 et seq.) (prohibits discrimination on the basis of disability); and 49 C.F.R. part 27;
- The Age Discrimination Act of 1975, as amended (42 U.S.C. § 6101 et seq.) (prohibits discrimination on the basis of age);
- Airport and Airway Improvement Act of 1982 (Pub. L. 97-248 (1982)), as amended (prohibits discrimination based on race, creed, color, national origin, or sex);
- The Civil Rights Restoration Act of 1987 (102 Stat. 28) *(" ... which restore[d] the broad scope of coverage and to clarify the application of Title IX of the Education Amendments of 1972, section 504 of the Rehabilitation Act of 1973, the Age Discrimination Act of 1975, and Title VI of the Civil Rights Act of 1964.");*
- Titles II and III of the Americans with Disabilities Act, which prohibit discrimination on the basis of disability in the operation of public entities, public and private transportation systems, places of public accommodation, and certain testing entities (42 U.S.C. §§ 12131 --12189), as implemented by Department of Justice regulations at 28 C.F.R. parts 35 and 36, and Department of Transportation regulations at 49 C.F.R. parts 37 and 38;

- The Federal Aviation Administration's Non-discrimination statute (49 U.S.C. § 47123) (prohibits discrimination on the basis of race, color, national origin, and sex);
- Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, which ensures non-discrimination against minority populations by discouraging programs, policies, and activities with disproportionately high and adverse human health or environmental effects on minority and low-income populations;
- Executive Order 13166, Improving Access to Services for Persons with Limited English Proficiency, and resulting agency guidance, national origin discrimination includes discrimination because of limited English proficiency (LEP). To ensure compliance with Title VI, you must take reasonable steps to ensure that LEP persons have meaningful access to your programs (70 Fed. Reg. at 74087 to 74100);
- Title of the Education Amendments of 1972, as amended, which prohibits you from discriminating because of sex in education programs or activities (20 U.S.C. § 1681 et seq).

EXHIBIT C

Health Insurance Portability and Accountability Act of 1996 ("HIPAA").

(a) If the Contactor is a Business Associate under the requirements of the Health Insurance Portability and Accountability Act of 1996 ("HIPAA"), the Contractor must comply with all terms and conditions of this Section of the Contract. If the Contractor is not a Business Associate under HIPAA, this Section of the Contract does not apply to the Contractor for this Contract.

(b) The Contractor is required to safeguard the use, publication and disclosure of information on all applicants for, and all clients who receive, services under the Contract in accordance with all applicable federal and state law regarding confidentiality, which includes but is not limited to HIPAA, more specifically with the Privacy and Security Rules at 45 C.F.R. Part 160 and Part 164, subparts A, C, and E; and

(c) The State of Connecticut Agency named on page 1 of this Contract (hereinafter the "Department") is a "covered entity" as that term is defined in 45 C.F.R. § 160.103; and

(d) The Contractor, on behalf of the Department, performs functions that involve the use or disclosure of "individually identifiable health information," as that term is defined in 45
C.F.R. § 160.103; and

(e) The Contractor is a "business associate" of the Department, as that term is defined in 45 C.F.R. § 160.103; and

(f) The Contractor and the Department agree to the following in order to secure compliance with the HIPAA, the requirements of Subtitle D of the Health Information Technology for Economic and Clinical Health Act (hereinafter the HITECH Act), (Pub. L. 111-5, sections 13400 to 13423), and more specifically with the Privacy and Security Rules at 45 C.F.R. Part 160 and Part 164, subparts A, C, and E.

(g) Definitions

(1) "Breach shall have the same meaning as the term is defined in section 13400 of the HITECH Act (42 U.S.C. §17921(1))

(2) "Business Associate" shall mean the Contractor.

(3) "Covered Entity" shall mean the Department of the State of Connecticut named on page 1 of this Contract.

(4) "Designated Record Set" shall have the same meaning as the term "designated record set" in 45 C.F.R. § 164.501.

(5) "Electronic Health Record" shall have the same meaning as the term is defined in section 13400 of the HITECH Act (42 U.S.C. §17921(5))

(6) "Individual" shall have the same meaning as the term "individual"' in 45 C.F.R. § 160.103 and shall include a person who qualifies as a personal representative as defined in 45 C.F.R. § 164.502(g).

(7) "Privacy Rule" shall mean the Standards for Privacy of Individually Identifiable Health Information at 45 C.F.R. part 160 and parts 164, subparts A and E.

(8) "Protected Health Information" or "PHI" shall have the same meaning as the term "protected health information" in 45 C.F.R. § 160.103, limited to information created or received by the Business Associate from or on behalf of the Covered Entity.

(9) "Required by Law"' shall have the same meaning as the term "required by law" in 45 C.F.R. § 164.103.

(10) "Secretary" shall mean the Secretary of the Department of Health and Human Services or his designee.

(11) "More stringent" shall have the same meaning as the term "more stringent" in 45 C.F.R. § 160.202.

(12) "This Section of the Contract" refers to the HIPAA Provisions stated herein, in their entirety.

(13) "Security Incident" shall have the same meaning as the term "security incident" in 45 C.F.R.§ 164.304.

(14) "Security Rule" shall mean the Security Standards for the Protection of Electronic Protected Health Information at 45 C.F.R. part 160 and parts 164, subpart A and C.

(15) "Unsecured protected health information" shall have the same meaning as the term as defined in section 13402(h)(1)(A) of HITECH. Act. (42 U.S.C. §17932(h)(1)(A)).

(h) Obligations and Activities of Business Associates.

(1) Business Associate agrees not to use or disclose PHI other than as permitted or required by this Section of the Contract or as Required by Law.

(2) Business Associate agrees to use appropriate safeguards to prevent use or disclosure of PHI other than as provided for in this Section of the Contract.

(3) Business Associate agrees to use administrative, physical and technical safeguards that reasonably and appropriately protect the confidentiality, integrity, and availability of electronic protected health information that it creates, receives, maintains, or transmits on behalf of the Covered Entity.

(4) Business Associate agrees to mitigate, to the extent practicable, any harmful effect that is known to the Business Associate of a use or disclosure of PHI by Business Associate in violation of this Section of the Contract.

(5) Business Associate agrees to report to Covered Entity any use or disclosure of PHI not provided for by this Section of the Contract or any security incident of which it becomes aware.

(6) Business Associate agrees to ensure 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 notification's 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.

EXHIBIT D
AFFIRMATIVE ACTION POLICY STATEMENT (October 2023)

It is the policy of this firm to assure that applicants are employed, and that employees are treated during employment, without regard to an individual's race, color, religion, creed, sex, gender identity or expression, marital status, national origin, age, ancestry, status as a veteran, intellectual disability, mental disability, learning disability or physical disability, including but not limited to blindness, unless such disability prevents performance of the work involved and to promote the full realization of equal employment opportunity through positive and continuous affirmative efforts. Such action shall include employment, promotion, demotion or transfer, recruitment or recruitment advertising, layoff or terminations, rates of pay or other forms of compensation, selection for training/apprenticeship, pre-apprenticeship opportunities, and on-the-job training opportunities.

This firm will implement, monitor, enforce and achieve full compliance with this Affirmative Action Policy Statement in conjunction with the applicable Federal and State laws, regulations, executive orders, and contract provisions, including but not limited to those listed below:

Dissemination of Policy:
All members of the firm who are authorized to hire, supervise, promote, and discharge employees, or who recommend such action, or who are substantially involved in such action, will be made fully cognizant of, and will implement, this firm's Equal Employment Opportunity (EEO) policy and contractual responsibilities to provide EEO in each grade and classification of employment. These actions shall include:

1. Periodic meetings of supervisory and personnel office employees will be conducted before the start of work and then not less often than once every six months, at which time the firm's EEO policy and its implementation will be reviewed and explained. These meetings will be conducted by the EEO officer.
2. All new supervisory or personnel office employees will be given a thorough indoctrination by the EEO Officer, covering all major aspects of the contractor's EEO obligations within thirty days following their reporting for duty with the contractor.
3. All personnel who are engaged in direct recruitment for the firm will be instructed by the EEO Officer of the contractor's procedures for locating and hiring minority group employees.
4. Notices and posters setting forth the firm's EEO policy will be placed in areas readily accessible to employees, applicants for employment and potential employees.
5. The firm's EEO policy and the procedures to implement such policy will be brought to the attention of employees by means of meetings, employee handbooks, or other appropriate means.
6. Sexual Harassment Prevention Resources including training and remedies must be available to all employees. See Connecticut General Assembly Public Acts 19–16 and 19–93.

Recruitment:
When advertising for employees, the firm will include in all advertisements the notation; "An Affirmative Action/Equal Opportunity Employer." All such advertisements will be placed in

publications having a large circulation among minority groups in the area where the workforce would normally be derived.

1. The firm will, unless precluded by a valid bargaining agreement, conduct systematic and direct recruitment through public and private employee referral sources likely to yield qualified minority and female applicants. To meet this requirement, the firm will identify referral sources and establish procedures for recruitment to obtain the referral of minority and female applicants.
2. In the event the firm has a valid bargaining agreement providing for exclusive hiring referrals, he/she is expected to observe the provisions of that agreement to the extent that the system permits the contractor's compliance with EEO contract provisions. (The United States Department of Labor has held that where implementation of such agreements has had the effect of discriminating against minorities or women, or obligates the contractor to do the same, such implementation violates Executive Order 11246, as amended.)
3. The firm will encourage his/her present employees to refer minority group applicants for employment. Information and procedures with regard to referring minority group applicants will be discussed with employees.

Personnel Actions:

Wages, working conditions, and employee benefits shall be established and administered, and personnel actions of every type, including hiring, upgrading, promotion, transfer, demotion, layoff, and termination, shall be taken without regard to an individual's race, color, religion, creed, sex, gender identity or expression, marital status, national origin, age, ancestry, status as a veteran, intellectual disability, mental disability, learning disability or physical disability, including but not limited to blindness, unless such disability prevents performance of the work involved. The following procedures shall be followed:

1. The firm will conduct periodic inspections of project sites to insure that working conditions and employee facilities do not indicate discriminatory treatment of personnel.
2. The firm will periodically review selected personnel actions in depth to determine whether there is evidence of discrimination. Where evidence is found, the contractor will promptly take correction action. If the review indicates that the discrimination may extend beyond the actions reviewed, such corrective action shall include all affected persons.
3. The firm shall periodically evaluate the spread of wages paid within each classification to determine any evidence of discriminatory wage practices.
4. The firm will promptly investigate all complaints of alleged discrimination made to the firm and will take appropriate corrective action within a reasonable time. If the investigation indicates that the discrimination may affect persons other than the complainant, such corrective actions shall include such other persons. Upon completion of each investigation, the contractor will inform every complainant of all of his avenues of appeal.

Training and Promotion:

The firm will assist in locating, qualifying, and increasing the skills of minorities and women. The firm will utilize the following tools to identify training and promotional opportunities in the firm:

1. The firm will advise employees and applicants for employment of available training programs and the entrance requirements.
2. The firm will periodically review the training and promotion of minority group and female employees and will encourage eligible employees to apply for such training and promotion.

Unions:

If the firm relies in whole or in part upon unions as a source of employees, the contractor will use his/her best efforts to obtain the cooperation of such unions to increase opportunities for minority groups and women within the unions, and to effect referrals by such unions of minority and female employees. Actions by the firm either directly or through a contractor's association acting as agent will include the procedures set forth below:

1. The firm will use best efforts to develop, in cooperation with the unions, joint training programs aimed toward qualifying more minority group members and women for membership in the unions and increasing the skills of minority group employees and women so that they may qualify for higher paying employment.
2. The firm will use best efforts to incorporate an EEO clause into each union agreement to the extent that such union will be contractually bound to refer applicants without regard to their to an individual's race, color, religion, creed, sex, gender identity or expression, marital status, national origin, age, ancestry, status as a veteran, intellectual disability, mental disability, learning disability or physical disability, including but not limited to blindness, unless such disability prevents performance of the work involved.
3. The firm is to obtain information as to the referral practices and policies of the labor union except that to the extent that such information is within the exclusive possession of the labor union and such labor union refuses to furnish the information to the contractor, the contractor shall notify the Connecticut Department of Transportation (CTDOT) of the efforts made to obtain the information.
4. In the event the union is unable to provide the firm with a reasonable flow of minority and women referrals within the time limit set forth in the collective bargaining agreement, the contractor will, through independent recruitment efforts, fill the employment vacancies. (The United States Department of Labor has held that it shall be no excuse that the union with which the contractor has a collective bargaining agreement providing for exclusive referral failed to refer minority employees.) In the event the union referral practice prevents the contractor from meeting the obligations under Executive Order 11246 as amended, and in compliance with 23 CFR Part 230, the firm will notify CTDOT.

Selection of Subcontractors:

The firm will not discriminate on the grounds race, color, religion, sex, sexual orientation, gender identity or expression, marital status, national origin, ancestry, age, intellectual disability, learning disability, physical disability, including, but not limited to, blindness, or status as a veteran in the selection and retention of subcontractors, including procurement of materials and leases of equipment.

1. The firm shall use his/her best efforts to ensure subcontractor/subconsultant compliance with Federal and State Equal Opportunity (EO) and EEO requirements.

Records and Reports:

The Contractor shall keep records as necessary to document compliance with EO/EEO requirements. Such reports shall be retained for a period of three years following completion of the contract work and shall be available at reasonable times and places for inspection by authorized representatives of CTDOT and/or the United States Department of Transportation. The following records should be maintained:

6. The number of minority and non-minority group members and women employed in each work classification;
7. The progress and efforts being made in cooperation with unions, when applicable to increase the employment opportunities for minorities and women;
8. The documentation showing progress and efforts being made in locating, hiring, training, qualifying, and upgrading minority and female employees; and
9. Complaints of Discrimination.

In implementing this policy and ensuring that affirmative action is being provided, each time a hiring opportunity occurs this firm will contact and request referrals from minority and female organizations, referral sources, and media sources. All advertising will emphasize that the firm is "An Affirmative Action/Equal Opportunity Employer."

In order to substantiate this firm's efforts and affirmative actions to provide equal opportunity, the firm will maintain and submit, as requested, documentation such as referral request correspondence, copies of advertisements utilized and follow-up documentation to substantiate that efforts were made in good faith. This firm will maintain the necessary internal audit procedures and record keeping systems to report the firm's affirmative action efforts.

It is understood by Owner/CEO/President of the firm and the firm's Equal Employment Opportunity Officer and supervisory and managerial personnel that failure to effectively implement, monitor and enforce this firm's affirmative action program and/or failure to adequately document and submit as required, the affirmative actions taken and efforts made to recruit and hire minority and female applicants in accordance with our affirmative action program in each instance of hire, will result in this firm being required to recommit itself to a modified and more stringent affirmative action program as a condition of approval. It is recognized that this policy is a contractual requirement and is a prerequisite for performing services for the contracting agency. This policy in addition to CTDOT's EO/EEO contract provisions and requirements, shall constitute the CTDOT Affirmative Program requirements.

The ultimate responsibility for the full implementation of this firm's Affirmative Action Program rests with the Chief Executive Officer of this firm.

EXHIBIT E

(Federal wage rate package will be inserted at the end after State wages for the final executed contract only. Refer to NTC – Federal Wage Determinations)

EXHIBIT F
State Wages and Other Related Information

Please refer to the Department of Labor website for the latest updates, annual adjusted wage rate increases, certified payroll forms and applicable statutes.
http://www.ctdol.state.ct.us/wgwkstnd/prevailwage.htm

Prevailing Wage Law Poster Language

THIS IS A PUBLIC WORKS PROJECT Covered by the PREVAILING WAGE LAW CT General Statutes Section 31-53 If

you have QUESTIONS regarding your wages CALL (860) 263-6790

Section 31-55 of the CT State Statutes requires every contractor or subcontractor performing work for the state to post in a prominent place the prevailing wages as determined by the Labor Commissioner.

Informational Bulletin

THE 10-HOUR OSHA CONSTRUCTION SAFETY AND HEALTH COURSE (applicable to public building contracts entered into on or after July 1, 2007, where the total cost of all work to be performed is at least $100,000)

(1) This requirement was created by Public Act No. 06-175, which is codified in Section 31-53b of the Connecticut General Statutes (pertaining to the prevailing wage statutes);

(2) The course is required for public building construction contracts (projects funded in whole or in part by the state or any political subdivision of the state) entered into on or after July 1, 2007;

(3) It is required of private employees (not state or municipal employees) and apprentices who perform manual labor for a general contractor or subcontractor on a public building project where the total cost of all work to be performed is at least $100,000;

(4) The ten-hour construction course pertains to the ten-hour Outreach Course conducted in accordance with federal OSHA Training Institute standards, and, for telecommunications workers, a ten-hour training course conducted in accordance with federal OSHA standard, 29 CFR 1910.268;

(5) The internet website for the federal OSHA Training Institute is http://www.osha.gov/fso/ote/training/edcenters/fact_sheet.html;

(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 non-compliance;

(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 ULTMATELY ARISE CONCERNIG THE CONSTRUCTION OF THE STATUTE OR THE REGULATIONS.

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.

CONNECTICUT DEPARTMENT OF LABOR
WAGE AND WORKPLACE STANDARDS DIVISION

CONTRACTORS WAGE CERTIFICATION FORM
Construction Manager at Risk/General Contractor/Prime Contractor

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

Rate Schedule Issued (Date):_____

Information Bulletin
Occupational Classifications

The Connecticut Department of Labor has the responsibility to properly determine "job classification" on prevailing wage projects covered under C.G.S. Section 31-53(d).

Note: This information is intended to provide a sample of some occupational classifications for guidance purposes only. It is not an all-inclusive list of each occupation's duties. This list is being provided only to highlight some areas where a contractor may be unclear regarding the proper classification. If unsure, the employer should seek guidelines for CTDOL.

Below are additional clarifications of specific job duties performed for certain classifications:

ASBESTOS WORKERS

Applies all insulating materials, protective coverings, coatings and finishes to all types of mechanical systems.

ASBESTOS INSULATOR

Handle, install apply, fabricate, distribute, prepare, alter, repair, dismantle, heat and frost insulation, including penetration and fire stopping work on all penetration fire stop systems.

BOILERMAKERS

Erects hydro plants, incomplete vessels, steel stacks, storage tanks for water, fuel, etc. Builds incomplete boilers, repairs heat exchanges and steam generators.

BRICKLAYERS, CEMENT MASONS, CEMENT FINISHERS, MARBLE MASONS, PLASTERERS, STONE MASONS, PLASTERERS. STONE MASONS, TERRAZZO WORKERS, TILE SETTERS

Lays building materials such as brick, structural tile and concrete cinder, glass, gypsum, terra cotta block. Cuts, tools and sets marble, sets stone, finishes concrete, applies decorative steel, aluminum and plastic tile, applies cements, sand, pigment and marble chips to floors, stairways, etc.

CARPENTERS, MILLWRIGHTS, PILEDRIVERMEN, LATHERS, RESILEINT FLOOR LAYERS, DOCK BUILDERS, DIKERS, DIVER TENDERS

Constructs, erects, installs and repairs structures and fixtures of wood, plywood and wallboard. Installs, assembles, dismantles, moves industrial machinery. Drives piling into ground to provide foundations for structures such as buildings and bridges, retaining walls for earth embankments, such as cofferdams. Fastens wooden, metal or rockboard lath to walls, ceilings and partitions of buildings, acoustical tile layer, concrete form builder. Applies firestopping materials on fire resistive joint systems only. Installation of curtain/window walls only where attached to wood or metal studs. Installation of insulated material of all types whether blown, nailed or attached in

other ways to walls, ceilings and floors of buildings. Assembly and installation of modular furniture/furniture systems. Free-standing furniture is not covered. This includes free standing: student chairs, study top desks, book box desks, computer furniture, dictionary stand, atlas stand, wood shelving, two-position information access station, file cabinets, storage cabinets, tables, etc.

LABORER, CLEANING

• The clean up of any construction debris and the general (heavy/light) cleaning, including sweeping, wash down, mopping, wiping of the construction facility and its furniture, washing, polishing, and dusting.

DELIVERY PERSONNEL

• If delivery of supplies/building materials is to one common point and stockpiled there, prevailing wages are not required. If the delivery personnel are involved in the distribution of the material to multiple locations within the construction site then they would have to be paid prevailing wages for the type of work performed: laborer, equipment operator, electrician, ironworker, plumber, etc.

• An example of this would be where delivery of drywall is made to a building and the delivery personnel distribute the drywall from one "stockpile" location to further sub-locations on each floor. Distribution of material around a construction site is the job of a laborer or tradesman, and not a delivery personnel.

ELECTRICIANS

Install, erect, maintenance, alteration or repair of any wire, cable, conduit, etc., which generates, transforms, transmits or uses electrical energy for light, heat, power or other purposes, including the Installation or maintenance of telecommunication, LAN wiring or computer equipment, and low voltage wiring. *License required per Connecticut General Statutes: E-1,2 L-5,6 C-5,6 T-1,2 L-1,2 V-1,2,7,8,9.

ELEVATOR CONSTRUCTORS

Install, erect, maintenance and repair of all types of elevators, escalators, dumb waiters and moving walks. ***License required by Connecticut General Statutes: R-1, 2, 5, 6.**

FORKLIFT 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 artwork 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 J1,2,3,4 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 re-laid.)

SHEETMETAL WORKERS

Fabricate, assembles, installs and repairs sheet metal 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, sunshades, lighting troughs, spires, ornamental roofing, metal ceilings, mansards, copings, ornamental and ventilation hoods, vertical and horizontal siding panels, trim, etc. The sheet metal classification also applies to the vast variety of coated metal material panels and composite metal material panels that have evolved over the years as an alternative to conventional ferrous and non-ferrous metals like steel, iron, tin, copper, brass, bronze, aluminum, etc. Fabrication, handling, assembling, erecting, altering, repairing, etc. of architectural metal roof, standing seam roof, composite metal roof, metal and composite bathroom/toilet partitions, aluminum gutters, metal and composite lockers and shelving, kitchen equipment, and walk-in coolers. To include testing and air –balancing ancillary to installation and construction.

SPRINKLER FITTERS

Installation, alteration, maintenance and repair of fire protection sprinkler systems. ***License required per Connecticut General Statutes: F-1, 2, 3, 4.**

TILE MARBLE AND TERRAZZO FINISHERS

Assists and tends the tile setter, marble mason and terrazzo worker in the performance of their duties.

TRUCK DRIVERS

~How to pay truck drivers delivering asphalt is under REVISION~

Truck Drivers are required to be paid prevailing wage for time spent "working" directly on the site. These drivers remain covered by the prevailing wage for any time spent transporting between the

actual construction location and facilities (such as fabrication, plants, mobile factories, batch plant, borrow pits, job headquarters, tool yards, etc.) dedicated exclusively, or nearly so, to performance of the contract or project, which are so located in proximity to the actual construction location that it is reasonable to include them. ***License required, drivers only, per Connecticut General Statutes**.

For example:

• Material men and deliverymen are not covered under prevailing wage as long as they are not directly involved in the construction process. If, they unload the material, they would then be covered by prevailing wage for the classification they are performing work in: laborer, equipment operator, etc.
• Hauling material off site is not covered provided they are not dumping it at a location outlined above.
• Driving a truck on site and moving equipment or materials on site would be considered covered work, as this is part of the construction process.

 Any questions regarding the proper classification should be directed to:

Public Contract Compliance Unit
Wage and Workplace Standards Division
Connecticut Department of Labor
200 Folly Brook Blvd, Wethersfield, CT 06109
(860) 263-6543.

Connecticut Department of Labor
Wage and Workplace Standards Division
FOOTNOTES

 Please Note: If the "Benefits" listed on the schedule for the following occupations includes a letter(s) (+ a or + a+b for instance), refer to the information below.

Benefits to be paid at the appropriate prevailing wage rate for the listed occupation.

If the "Benefits" section for the occupation lists only a dollar amount, disregard the information below.

Bricklayers, Cement Masons, Cement Finishers, Concrete Finishers, Stone Masons
(Building Construction) and (Residential- Hartford, Middlesex, New Haven, New London and Tolland Counties)

a. Paid Holiday: Employees shall receive 4 hours for Christmas Eve holiday provided the employee works the regularly scheduled day before and after the holiday. Employers may schedule work on Christmas Eve and employees shall receive pay for actual hours worked in addition to holiday pay.

Elevator Constructors: Mechanics

a. Paid Holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Veterans' Day, Thanksgiving Day, Christmas Day, plus the Friday after Thanksgiving.

b. Vacation: Employer contributes 8% of basic hourly rate for 5 years or more of service or 6% of basic hourly rate for 6 months to 5 years of service as vacation pay credit.

Glaziers

a. Paid Holidays: Labor Day and Christmas Day.

Power Equipment Operators
(Heavy and Highway Construction & Building Construction)

a. Paid Holidays: New Year's Day, Good Friday, Memorial Day, Independence Day, Labor Day, Thanksgiving Day and Christmas Day, provided the employee works 3 days during the week in which the holiday falls, if scheduled, and if scheduled, the working day before and the working day after the holiday. Holidays falling on Saturday may be observed on Saturday, or if the employer so elects, on the preceding Friday.

Ironworkers

a. Paid Holiday: Labor Day provided employee has been on the payroll for the 5 consecutive work days prior to Labor Day.

Laborers (Tunnel Construction)

a. Paid Holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day and Christmas Day. No employee shall be eligible for holiday pay when he fails, without cause, to work the regular work day preceding the holiday or the regular work day following the holiday.

Roofers

a. Paid Holidays: July 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.

Rev. 7/1/19

SEE BELOW FOR STATE WAGE RATES

EXHIBIT E

INSERT FEDERAL WAGES HERE
EXHIBIT F

Minimum Rates and Classifications for
Heavy/Highway Construction

ID#: 26-8454

Connecticut Department of Labor
Wage and Workplace Standards Division

By virtue of the authority vested in the Labor Commissioner under provisions of Section 31-53 of the General Statutes of Connecticut, as amended, the following are declared to be the prevailing rates and welfare payments and will apply only where the contract is advertised for bid within 20 days of the date on which the rates are established. Any contractor or subcontractor not obligated by agreement to pay to the welfare and pension fund shall pay this amount to each employee as part of his/her hourly wages.

Project Number:
Project Town: Seymour
State#: 0124-0165
FAP#: H101(002)
Project: Spot Improvements on River Street (Route 313)

CLASSIFICATION	Hourly Rate	Benefits
1) Boilermaker	50.21	30.01
1a) Bricklayer, Cement Masons, Cement Finishers, Plasterers, Stone Masons	46.09	36.29
2) Carpenters, Piledrivermen	44.48	29.74
2a) Diver Tenders	44.48	29.74
2b) Divers Effluent	67.52	29.74
3) Divers	52.94	29.74
03a) Millwrights	45.14	30.24
03b) Carpenter-Welder	44.98	29.74
03c) Carpenter: Working with creosote lumber or acid	45.48	29.74

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4) Painters: (Bridge Construction) Brush, Roller, Blasting (Sand, Water, etc.), Spray	61.85	27.65
4a) Painters: Brush and Roller	41.17	27.65
4b) Painters: Spray	44.17	27.65
4bc) Painters: Spray Helper	42.17	27.65
4c) Painters: Steel Only	43.17	27.65
4d) Painters: Blast	46.17	27.65
4de) Painter: Blast Helper	42.17	27.65
4e) Painters: Tanks, Tower and Swingstage etc.	43.17	27.65
4f) Elevated Tanks (60 feet and above)	50.17	27.65
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)	50.0	36.97+3% of gross wage
6) Ironworkers: Ornamental, Reinforcing, Structural, and Precast Concrete Erection	45.25	46.62 + 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)	52.08	36.80
----LABORERS---- -		
8) Group 1: General Laborers and concrete specialist	37.0	30.47

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8) Group 1a: Acetylene Burners (Hours worked with a torch)	38.0	30.47
9) Group 2: Chain saw operators, fence and guard rail erectors, pneumatic tool operators, powdermen	37.25	30.47
10) Group 3: Pipelayers	37.5	30.47
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	37.5	30.47
12) Group 5: Toxic waste removal (non-mechanical systems)	39.0	30.47
13) Group 6: Blasters	38.75	30.47
Group 7: Asbestos/lead removal, non-mechanical systems (does not include leaded joint pipe)	40.0	30.47
Group 8: Traffic control signalmen	22.2	30.47
Group 9: Hydraulic Drills	37.75	30.47
Group 10: Toxic Waste Removers A or B With PPE	40.0	30.47
----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	39.23	30.47 + a
13b) Brakemen, Trackmen, Miners' Helpers and all other men	38.26	30.47 + a

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----CLEANING, CONCRETE AND CAULKING TUNNEL----		
14) Concrete Workers, Form Movers, and Strippers	38.26	30.47 + a
15) Form Erectors	38.59	30.47 + a
----ROCK SHAFT LINING, CONCRETE, LINING OF SAME AND TUNNEL IN FREE AIR:----		
16) Brakemen, Trackmen, Tunnel Laborers, Shaft Laborers, Miners Helpers	38.26	30.47 + a
17) Laborers Topside, Cage Tenders, Bellman	38.15	30.47 + a
18) Miners	39.23	30.47 + a
----TUNNELS, CAISSON AND CYLINDER WORK IN COMPRESSED AIR: ----		
18a) Blaster	45.72	30.47 + a
19) Brakemen, Trackmen, Groutman, Laborers, Outside Lock Tender, Gauge Tenders	45.52	30.47 + a
20) Change House Attendants, Powder Watchmen, Top on Iron Bolts	43.54	30.47 + a
21) Mucking Machine Operator, Grout Boss, Track Boss	46.31	30.47 + a
----TRUCK DRIVERS----(*see note below)		
Block Truck	39.98	33.00 + a

2 Axle	38.66	33.00 + a
Helpers	36.16	33.00 + a
Three Axle Trucks; Two Axle Mixer	38.77	33.00 + a
Three Axle Mixer	38.83	33.00 + a
Four Axle	38.89	33.00 + a
Four Axle Mixer	40.69	33.00 + a
5 Axle	38.89	33.00 + a
5 Axle Mixer	40.69	33.00 + a
Heavy Duty Trailer (40 tons and over)	41.16	33.00 + a
Heavy Duty Trailer (up to 40 tons)	39.89	33.00 + a
Snorkle Truck	39.04	33.00 + a
Swivel Dump and Tack Truck	38.89	33.00 + a
Euclids and Semi Trailer	38.94	33.00 + a

----POWER EQUIPMENT OPERATORS----

Group 1: Crane Handling or Erecting Structural Steel or Stone, Hoisting Engineer (2 drums or over), Caisson Drilled Shaft over 14". (Trade License Required)	60.66	30.95 + a
Group 1a: Front End Loader (7 cubic yards or over); Work Boat 26 ft. and over.	55.6	30.95 + a
Group 2: Cranes (100 ton rate capacity and over). (Trade License Required)	60.24	30.95 + a
Group 2a: Cranes (under 100 ton rated capacity), Magni Type-360 Rotating Forklift.	59.2	30.95 + a
Group 2b: Excavator over 2 cubic yards; Pile Driver ($3.00 premium when operator controls hammer), HF-1 Forklift, Drills with self contained power units, Micropile up to 14 inches helical pile.	55.17	30.95 + a
Group 3: Excavator; 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)	54.13	30.95 + a
Group 4: Trenching Machines; Lighter Derrick; CMI Machine or Similar; Koehring Loader (Skooper), Goldhofer.	53.61	30.95 + a
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" mandrel)	52.78	30.95 + a
Group 5 continued: Side Boom; Combination Hoe and Loader; Directional Driller, Geothermal Drill.	52.78	30.95 + a
Group 6: Front End Loader (3 up to 7 cubic yards); Bulldozer (rough grade dozer).	52.35	30.95 + a
Group 7: Asphalt Roller; Concrete Saws and Cutters (ride on types); Vermeer Concrete Cutter; Stump Grinder; Scraper; Snooper; Skidder; Milling Machine (24" and under Mandrel)	51.89	30.95 + a

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Group 8: Mechanic, Grease Truck Operator, Hydroblaster, Barrier Mover, Power Stone Spreader; Welder; Work Boat under 26 ft.; Transfer Machine, Rigger Foreman.	51.34	30.95 + a
Group 9: Front End Loader (under 3 cubic yards), Skid Steer Loader regardless of attachments (Bobcat or Similar); Fork Lift, Power Chipper; Landscape Equipment (including hydroseeder), Vacuum Excavation Truck and Hydrovac Excavation Truck (27 HG pressure or greater).	50.74	30.95 + a
Group 10: Vibratory Hammer, Ice Machine, Diesel and Air Hammer, etc.	47.91	30.95 + a
Group 11: Conveyor, Earth Roller; Power Pavement Breaker (whiphammer), Robot Demolition Equipment.	47.91	30.95 + a
Group 12: Wellpoint Operator.	47.82	30.95 + a
Group 13: Compressor Battery Operator.	47.04	30.95 + a
Group 14: Elevator Operator; Tow Motor Operator (Solid Tire No Rough Terrain).	45.45	30.95 + a
Group 15: Generator Operator; Compressor Operator; Pump Operator; Welding Machine Operator; Heater Operator.	44.89	30.95 + a
Group 16: Maintenance Engineer and Articulating End Dump.	43.99	30.95 + a
Group 17: Portable Asphalt Plant Operator; Portable Crusher Plant Operator; Portable Concrete Plant Operator., Portable Grout Plant Operator, Portable Water Filtration Plant Operator.	49.95	30.95 + a
Group 18: Power Safety Boat; Vacuum Truck; Zim Mixer; Sweeper; (minimum for any job requiring CDL license), Rigger, Signalman.	46.6	30.95 + a
Surveyor: Chief of Party	50.21	30.95 + a

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Surveyor: Assistant Chief of Party	46.3	30.95 + a
Surveyor: Instrument Man	44.55	30.95 + a
Surveyor: Rodman or Chairman	38.34	30.95 + a

**NOTE: SEE BELOW

----LINE CONSTRUCTION----(Railroad Construction and Maintenance)----

20) Lineman, Cable Splicer, Technician	59.91	34.00
21) Heavy Equipment Operator	53.92	31.88
22) Equipment Operator, Tractor Trailer Driver, Material Men	50.92	30.84
23) Driver Groundmen	44.93	28.47
23a) Groundman Experienced	32.95	13.99

----OUTSIDE LINE CONSTRUCTION----

24) Driver Groundmen	43.78	28.42
25) Groundmen	32.1	13.95
26) Heavy Equipment Operators	52.53	31.83

27) Linemen, Cable Splicers, Dynamite Men	58.37	33.94
28) Material Men, Tractor Trailer Drivers, Equipment Operators	49.61	30.79
29) Technician	56.12	32.85
----COMMUNICATION----		
Sales & Service Technician: To include but not limited to: Installation, Repair, Splicing and Maintenance	52.07	20.62
----DREDGING----		
Class A1: Mechanical Dredge Operator	48.48	17.32+a+b
Class B1: Maintenance Engineer	41.93	16.87+a+b
Class C1: Mate/Welder	38.38	16.62+a+b
Class D: Deckhand	30.86	16.09+a+b

Welders: Rate for craft to which welding is incidental.
Surveyors: Hazardous material removal: $3.00 per hour premium.
*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.
Truck Drivers: Trainers Premium: $3.00 over wage rate.
Truck Drivers: Night Premium - Mixer Drivers: $2.00 over wage rate.

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

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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. 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.
Contracting Agencies are under no obligation pursuant to State labor law to pay any increase due to the annual adjustment provision.

Effective October 1, 2005 - Public Act 05-50: any person performing the work of any mechanic, laborer, or worker shall be paid prevailing wage

All Person who perform work ON SITE must be paid prevailing wage for the appropriate mechanic, laborer, or worker classification.

All certified payrolls must list the hours worked and wages paid to All Persons who perform work ON SITE regardless of their ownership i.e.: (Owners, Corporate Officers, LLC Members, Independent Contractors, et. al)

Reporting and payment of wages is required regardless of any contractual relationship alleged to exist between the contractor and such person.

~~Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clause (29 CFR 5.5 (a) (1) (ii)).

Please direct any questions which you may have pertaining to classification of work and payment of prevailing wages to the Wage and Workplace Standards Division, telephone (860)263-6790.

As of: July 30, 2026